2nd biennale ICIAP 2014

International Conference on
Indonesian Architecture and Planning

Space for the Next Generation

Proceeding

Yogyakarta, 21-22 August2014

organized by Department of Architecture and Planning,
Faculty of Engineering, Gadjah Mada University,
and supported by Bank Rakyat Indonesia.

BANK BRI
Melayani Dengan Setulus Hati

2nd Biennale

ICIAP

International Conference on Indonesian Architecture and Planning

Space for the Next Generation

Yogyakarta, Indonesia
August 21-22, 2014

The 2nd BIENNALE INTERNATIONAL CONFERENCE ON INDONESIAN ARCHITECTURE AND PLANNING

Proceedings of the international conference held in Yogyakarta
between 21-22 August 2014.

Editors: Ardhya Nareswari, ST, MT, Ph.D., Syam Rachma Marcillia S.T.,M.Eng., Ph.D.

First Edition | 30 Copies, August 2014
21 x 29,7 cm; 418 pages.
ISBN 9-786023-090211

Published by Architecture and Planning Dept, Engineering Faculty,
Gadjah Mada University

Organizing Committee
East Wing Building Department of Architecture and Planning
Jalan Grafika No.2 Kampus UGM Yogyakarta 55281 INDONESIA
Phone +62 274 580092
Fax +62 274 580853
Email iciap-ugm@archiplan.ugm.ac.id

2nd Biennale

ICIAP

International Conference on Indonesian Architecture and Planning

Space for the Next Generation

Yogyakarta, Indonesia
August 21-22, 2014

FOREWORD

It is with a great pleasure when I writing this Foreword for the Proceedings of the ICIAP 2014 or, the 2nd Biennale International Conference on Indonesian Architecture and Planning, to be held in Yogyakarta, Indonesia, from August 21st to 22nd, 2014. We started the idea to innititate the ICIAP several years ago with a big dream to make it as a barometer for the state of the arts of research in Indonesian planning and architecture. Now of course, it is still too early to jugde whether such dream could be realized. However, the fact that the 2nd ICIAP could be organized this year give me a more confident that such dream has already continued and materialized.

As a result of good publicity and hard work on the part of the organizing committee, over 80 submissions from Indonesia and other country, such as Malaysia, Japan, and New Zealand have been received. Manuscripts selected for publication and presentation at the ICIAP 2014 are subjected to a independent review by members of the ICIAP Reviewer Board with expertise in the subject matter addressed. As readers may discover, presentations are wide – ranging in subject matter and board in species and problem situations. I am very sure this proceedings will furnish and stimulate further study and research in Indonesian architecture and planning.

Finally, I would like to take this opportunity to thank all the reviewers as well as a great number of faculties and student volunteers at Department of Architecture and Planning, Gadjah Mada University, for their invaluable efforts, continued involvement and assistance. I also indebted to Bank Rakyat Indonesia and Universitas Gadjah Mada for their support and sponsorship.

Prof. Ir. Bakti Setiawan, MA,Ph.D
Head of Dept. Architecture and Planning, Faculty of Engineering, Gadjah Mada University

INTRODUCTION

First of all, let us express our thanks to God the Almighty who gave all of us a chance to meet again in this ICIAP 2014. As we know, this second International Conference on Indonesia Architecture and Planning (ICIAP) is part of a biennale international program at the Department of Architecture and Planning, Faculty of Engineering, Universitas Gadjah Mada. With the focus on the field of architecture and planning subject/discourse in Indonesia, the conference is expected to be able to capture ideas, concepts, methods, or practices that evolve continuously in this field.

After 2 years ago, the first ICIAP was bringing the theme of "Better Space Better Living", this second ICIAP in 2014 is undertaking a theme “Space for The Next Generation”. This theme may be seen as Indonesia's momentum to respond to the rise of spatial condition discourses in the near future. As we recognize that Indonesia requires efforts to adapt the high urbanization, middle-income trap, and other spatial issues through the demographic bonus that we will get soon during the next decade. Design, planning, and also spatial arrangement/management in this case are the important keywords to steer the success of Indonesian spaces in the next three decades.

Associated with these issues, ICIAP has intended to encourage continued discussions on this point. Nine invited keynote speakers come to deliver their specialties specifically related to the importance of space for future generations, from broader multi-dimensional aspects of these issues. Meanwhile as a longer process result, there are 46 papers that have been reviewed and eligible to participate in this event. These papers have been screened from over 80 abstract or full papers that have been submitted to the conference. From various perspectives, these papers have been grouped in several contexts, such as design, planning, socio-culture-behavior, history-heritage, disaster resilient, and green environment contexts. We can read them more detail in this proceeding.

In this opportunity, we would like to express many thanks to everyone, especially all the faculties, staffs, students, as well as the study programs at the Department of Architecture and Planning Faculty of Engineering, Universitas Gadjah Mada for their tireless supports and positive participations. Bank Rakyat Indonesia (BRI), which has became the sole sponsor of this event deserve to receive the high honor for their dedication to academic activities like ICIAP. We are also indebted to all of speakers who have dedicated time to share their invaluable knowledge in this forum. Of course, sincerely we send our high appreciation to the entire participants of ICIAP, from the authors, the presenters, as well as the observers who have been during two days conference gave a positive academic atmosphere through related discussions.

Last but not least, the highest honors is sent to our committee colleagues, who spent all of their thoughts and energies almost one year process to the success of this event. Not to be forgotten, we are fully realize that this event certainly will be impossible to satisfy all related parties. For this issue, we would like to send our sincere regret for the few shortcomings. May we meet with ICIAP 2016 that will come in the near future with a better performance.

M. Sani Roychansyah, S.T., M.Eng., D.Eng.
Chairperson Organizing Committee of ICIAP 2014

CONTENTS

Design Context

Historical and Heritage Context

Disaster Resilience Context

Environmental and Green Context

Unpresented Paper

2nd Biennale
ICIAP
International Conference on Indonesian Architecture and Planning

Space for the Next Generation

Yogyakarta, Indonesia
August 21-22, 2014

Social-Cultural-Behavior Context

Presentation Note Keynote Speaker: Ryuzo Ohno

First Session Parallel Note Moderator: Djoko Wijono

Second Session Parallel Note Moderator: Dwita Hadi R

Social-Cultural-Behavior Context

Ryuzo Ohno

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 08.30 – 10.00
Moderator	: Ikaputra
Presentation Duration	: 30 minutes

Cultural Identity of Space:
An environment – behavior study perspective

➔ include the systematic examination of relationships between the environment and human behavior and their application in design process. (Moore,1979)

Goal of architecture design: to create an environment that fit to user's fundamental needs

- Firmness → Physical/structural fitness
- Commodity → Functional fitness
- Delight → Psychological/behavioral fitness
  - Perceptual/cognitive aspects: providing information that leads proper behavior at the given situation
    - Distance perception
    - Risk perception
    - Emergency evacuation
    - Way-finding
    - Schema → Perceptual cycle model (schema model by U. Neisser, 1978)
  - Emotional aspects: creating/evoking atmosphere, ambience, aesthetics feelings
    - Color, lighting
    - Landscape
    - Place identity/attachment
    - Aesthetics

    Place attachment
    - Chongqing, China was famous for ist hilly city scape, but it has lost its identity in city scape. This change may affect people's place attachment.
  - Social aspects: regulating interaction between people
    - Crime prevention
    - Personal space
    - Proxemics
    - Social interaction
- Most of the facilities tested, particularly those familiar in daily life
- Traditional Area in Japan : Kabuki Theatre
- Crime Prevention Through Environmental Design (CPTED)

  The best-known building to have major architecture-behavior problems was the Pruitt-Igoe housing complex in St. Louis. It was a low-income piblic housing project to house 11,000 inhabitants in 1950s . But many of the buildings were abandoned, and crime and vandalism took over completely. Finally, in 1972 , large portions of it were demolished by the owner.

  Newman pointed out "Natural surveillance" make the space more defensible against vandalism and crime.
- Social interaction can be encouraged or discouraged by spatial layout.
- Considering growths in globalization and number of foreign visitors, an understanding of the diversity of cultural aspects of behavior should be useful toward making "spaces for the next generation" more interpretable while preserving their cultural landscapes.

The Prospect of Poor Home-Based Enterprises in Yogyakarta

Agam Marsoyo[1], Wahyu Kusuma Astuti[2]

[1]Head of Center for Studies in Regional Development and Planning, Universitas Gadjah Mada
[2]Research Assistant, Center for Studies in Regional Development and Planning, Universitas Gadjah Mada

Abstract

This paper involves a discourse of both the perspectives of government and home-based enterprises (HBEs) operators and the fore coming challenges from internal and external environments to see the prospect of poor HBE in the future. The paper is aimed at explaining the conditions, future potentials and opportunities, and strategies for HBE to alleviate poverty. The result implies that alongside with the affirmative assistance of the government, factors i.e. household and shelter condition, age of HBE and operators, and income affects the performance of HBE internally, whereas limited buyers, networking, dependency to government's assistance, location and profitability, competition, and technology challenge the development of HBE from the external side. The recommendation put forward the appropriate strategy for HBE to alleviate poverty i.e. microcredit group, innovation and technology, and networking.

Keywords: *Home-based enterprises, poverty, challenges, prospect*

I. Introduction

Urban informal economy has been noticed as a form of resilience in facing the urban economic pressure, on one hand, but also as a form of vulnerability in terms of competitiveness, on the other hand, to the power of wider economic scale (Meagher, 2013). Researches have prevailed that informal economic activities contributes significantly in the GDP and employment of a nation, instead of being a hindrance to the formal economic (Schneider & Enste, 2002; ILO, 2002). Despite the fact that it is unrecorded and illegal, the demand from buyers has influenced its existence, involving the rationality in economic, social redistribution, and failure of formal market to provide goods and service (Williams & Martinez-Perez, 2014).

Home-based enterprise has been widely introduced since 1980 as part of informal activities (Strassmann, 1985; Gilbert, 1988). Concluded as the micro business operated in a house by the members of family, terminologies as *home-based work, home-based income generation*, and *homeworking*, have disclosed the characters of HBE (Lipton, 1980; Edward & Hendrey, 2002; Gough & Kellett, 2001; Felstead & Jewson, 2000; Moore, 2006; Louw and de Vries, 2002; Green et.al, 2000). Previous research has unveiled that households with home-based enterprises tend to have larger income than non-home-based enterprise ones, with 3.6 and 1.4 times bigger, in Yogyakarta and Surabaya respectively (Marsoyo, 2012; Tipple, 2005). In relation to poverty line, almost half of HBE in Yogyakarta can exceed the line by only operating HBE, while the other half complements HBE with other employments (Marsoyo & Widiyanto, 2013). This finding calls attention to the research of Gough et.al (2003) and gives credence that home-based enterprises contribute to household poverty reduction.

In notion to the household source of income, 88.5% of HBEs are operated as the sole employment of households. Averagely, HBE activities contribute to 75.16% of the monthly income of the operators. This research revisits the findings of Marsoyo and Widiyanto (2013), that 91% of HBE in Yogyakarta has exceeded the poverty line according to consumption and income indicators of World Bank, Statistical Bureau, Sayogyo Rice Equivalency, and Minimum Regional Wage of Yogyakarta. It bears an outlook to the role of HBE to reduce the poverty of the household and at the same time poses the potential of the 9% of the rest to revive from

Agam Marsoyo
--- Head of Center for Studies in Regional Planning and Development, Universitas Gadjah Mada.
E-mail: agam@ugm.ac.id

poverty even if they only serve within the neighborhoods.

Roughly, in four sub-districts observed in Yogyakarta, the ratio of HBE and household number is 7:100, or equally 2 or 3 HBE in an RT (unit of neighborhood). The ratio is highest in Sorosutan and Tegalrejo, with 17:100 and 12:100, respectively. It indicates the role of HBE in supporting domestic activities of households in the neighborhood area. Moreover, the finding that 43% of HBE has the area of marketing in the local neighborhood emphasizes that HBE supports the livelihood in local area.

Despite of these works, little elaboration has explained about the internal and external challenges of poor households in operating the enterprises. This research aimed at, first, reviewing the perspective of government, in terms of policies and programs, to overlook HBEs in Yogyakarta as an aim to reduce poverty, and second, it serves to highlight the challenges and possible prospects of poor household in performing the small enterprises. Eventually, this research attempts to seek for the potentials of HBE to flourish in the future as a financial resilience strategy of poor households in urban area.

II. Methods

This qualitative research involves a random-sampling method to identify the samples in four sub districts in Yogyakarta, e.g. Tegalrejo, Pringgokusuman, Mergangsan, and Sorosutan. The locations of this research were purposively selected based on the poverty level which is the highest in the municipality. A set of questionnaire of both open and close questions was tested in 306 respondents, firstly, and further exploration of the poor HBE was conducted, after-wards. This study also involves an in-depth interview to the Social Department of Yogyakarta Municipality in relation to its policy and programs regarding HBE and poverty.

III. Results

3.1 HBE in Policies

Post-economic-crisis phase was the out peak of poverty level in Indonesia where 24.23% of the population was poor in 1998, increasing almost 7% from that of 1996. Poverty reduction, afterwards, has been prioritized by the government through policies and programs. Reflecting to the needs at grass-root level, community development was introduced through National Program for Community Development which started in 2006. This program is mostly associated with an attempt to improve the living conditions of the poor by improving substandard housing, providing infrastructure, and at the same time empowering the micro economic of the poor people. Since 2010, the policies have been clustered into three; family-based social assistance, community-based poverty alleviation, and micro-economic-empowerment-based poverty reduction, and has been under the National Team for Poverty Alleviation. The third cluster promotes a single program of micro credit for poor community which elaborates the attempts to assist the financial, marketing, and skill aspects of poor micro business operators.

Alongside with the implementation from the national government, local government promotes as well programs in conjunction to poverty reduction through micro-credit assistance. *Kelompok Usaha Bersama Fakir Miskin* (KUBE-FM)[1] and *Usaha Sosial Ekono-mi Produktif Keluarga Miskin* (USEP-KM)[2] are among the programs implemented by local government to trigger entrepreneurship and networking among poor HBE operators. KUBE-FM and USEP-KM emphasize on partnership between operators of HBE. A group of different types of business of KUBE-FM and USEP-KM requires the least of 10 and 30 people in the same neighborhood, respectively. Another prerequisite of the group is 20% of the members is not poor as these programs emphasize collective action and inclusiveness of business operators in a neighborhood.

Besides networking, the two programs give capital assistance to initiate, strengthen the institution, and develop further business within the group. The management of the fund is under the responsibility of the group. Not every group is able to continuously revolve the fund for the sake for business development. However, per year 2014, these program have reached 400 groups for KUBE-FM and 90 groups for USEP-KM. Besides, almost 70% of the targets is considered as successful in developing and even expanding the enterprises.

As part of the controlling process, monitoring and evaluation meeting is conducted every three months to analyze the problems of business group and address solution to each of the problem. Training and facilitation is also given during the meeting, e.g. food health certification socialization from Department of Health in order to persist the quality and expand the market of the business, business management training, and network building. Annually, local government also conduct a business fair for the groups of HBE to exhibit and market their products.

The two mentioned programs are under the Social Department, while there are also several other prog-rams from other government and private institution. One of the challenges that needs to be overcome is the overlap of assistance. Not only has it created inefficiency of poor alleviation programs, it also has been motivating poor HBE operators to rely on government's assistance without sustaining the business.

The incidence of home-based enterprises, however, is also difficult to be identified. There needs an annual update of the database because of the dynamics of the HBE. As micro enterprises and, in this study, operated by poor people, the appearance and disappearance of HBE cannot be predicted. Therefore this research elaborates internal and external factors as the two main challenges of the existence of HBE in poverty in the future. The internal factors entail household condition, skill of HBE operators, age of operators, age of HBE, while buyers, location and profitability, dependency to government's assistance and technology are explained under the external factors.

3.2 Challenge for the Future of the HBE in Poverty Household Condition

Family has been the main operators of HBE thus HBE performance is subject significantly to the commitment and condition of family in persisting the enterprises. Some cases have indicated that additional burden in the family and failure in the inheritance of the enterprise may threaten the existence of the enterprise in the future. In contrast, inheritance issue is one of the problems less considered by HBE operators, from 306 samples, only one respondent mentioned this problem. Incidence in family e.g. family member's illness, death, or additional needs e.g. education for children, were also among the causes for the decline of the performance of HBE.

3.3 Shelter Condition

Fig. 1. Sub-standard shelter of poor HBE
Source: Field Survey, 2014

The existence of HBE cannot be alienated from the place where it lays, the house. In order to develop the business, larger space is required, while most of poor household occupies substandard shelter with temporary materials and small domestic area.

3.4 Income

As a micro enterprise, HBE was be started with a very small capital and result also in a small return. Trade-type HBE has the lowest daily revenue, which is Rp65.000,00 compared to service and industry-type. In contrast, poor households operating HBE receive less than Rp10.000,00 a day while some of them operate HBE as the sole employment. With this much of income, it is difficult for household to persist or even develop the enterprises while at the same time spend the household expenditure in daily basis.

"I actually wish I could have another business but, how, I don't have any other skills. It is, of course, not enough to cover my daily basis. Sometimes, I borrow money from the neighbors to survive." (interview with Harjo Isman - Warung[3] owner, 13 June 2014, 13.42)

3.5 Age of Operators

Motivation and innovation of HBE depend on the age of operators. Elder operators tend to be effortless in promoting an innovation of the enterprise. Further, elder operators tend to have an aspiration to stop operating the HBE due to lack of energy and lack of people or family members who are willing to help them operating the HBE. Meanwhile the younger ones tend to have more energy and motivation to increase the performance of the HBE. Among them are the willingness to expand the enterprise in the future, for example increasing the number or variation of commodity, increasing the number of staffs, renovation of workplace e.g. stores and hair-do saloon, increasing facilities for service, and move the workplace to a more accessible place e.g. alongside of local street.

"I am getting old now, unlike when I was young I can go here and there, taking the commodity to Beringharjo Market myself. I used to be the one who has the most buyers, but since my husband passed away, when I was around 50, my income fell significantly and less people come to buy, I got only Rp200.000 per month. As I am getting older, I am too lazy to do shopping around, I have surrender to God no matter how much money I earn. It comes from God." (interview with Amir Wargono - Warung owner, 27 June 2014, 15.33)

3.6 Age of HBE

Along with the age of operators, it is also reflected in the average income of two types of HBE that HBE initiated before 1996 tend to have lower income than HBE initiated afterwards. Furthermore, HBE's vulnerability of poverty is shown highest for HBE which is initiated before 1996 and after 2005 (Marsoyo, et.al. 2013). It implies that the age of the enterprise impacts on the productivity, and less productivity threaten the existence of the HBE.

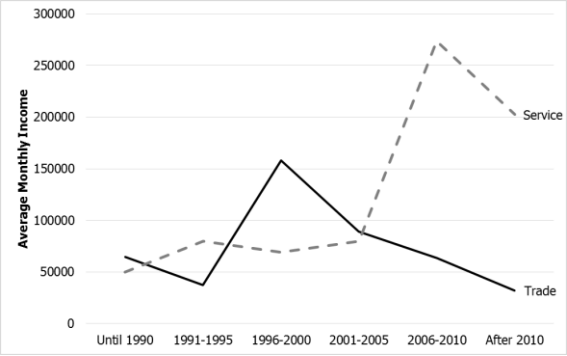


Fig. 2. Average monthly income of service and trade-type of HBE based on the year of business start-up
Source: Analysis, 2014

3.7 Limited Buyers

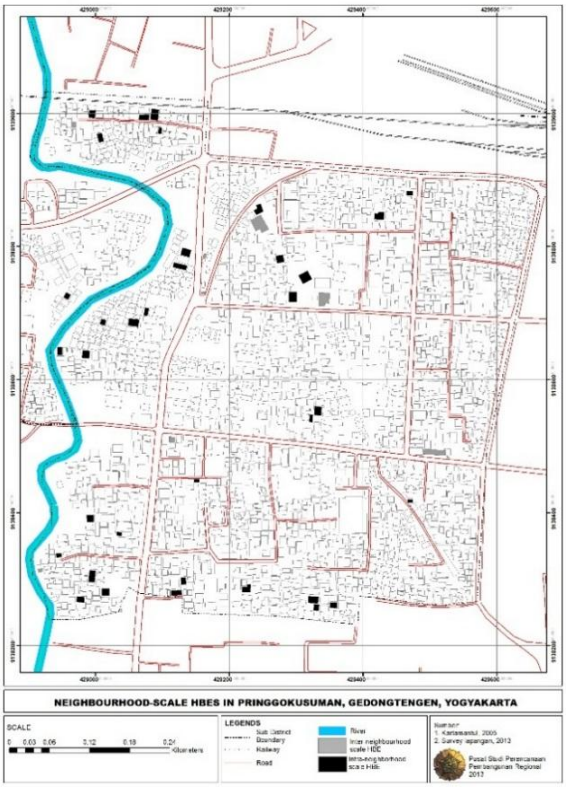


Fig.3. Neighborhood-scale HBE in Pringgokusuman
Source: Analysis, 2014

The problem of lack of buyers remains important in the context of poor HBE development. Accessibility, competition, and the high price of the commodities are among the reasons associated with the buyers' issue. Small-scale HBEs have limited market in local neighborhood area and thus be reached mostly by the neighbors. In this case, household finds hindrance in developing the business due to limited market and thus impacts in the limited income.

3.8 Networking

Individual HBE bears more risk to desertion when it is not connected to other similar of supporting parties in general. Networking here is identified as partnership between the same types of HBE, different type of HBE as the groups formed by the government's assistance, and relationship between HBE and other actors i.e. consumers, government, private sectors, NGO, etc. The expansion of networking enables HBE to promote and innovate the commodity and services. The role of networking between similar types of HBEs is significant regarding the ability of small-scale enterprise to produce, partnership can promote order sharing if one HBE finds difficulties to produce a commodity, i.e. printing service.

"My enterprise depends on the order, how I can find consumers like submitting proposals to supermarkets, schools, offices. If there are less consumer, I contact my friends asking for orders or brokers I know, if there is an order than I give 10% for the brokers." (interview with Bagyo-Printing Service in 27 June 2014, 14.00)

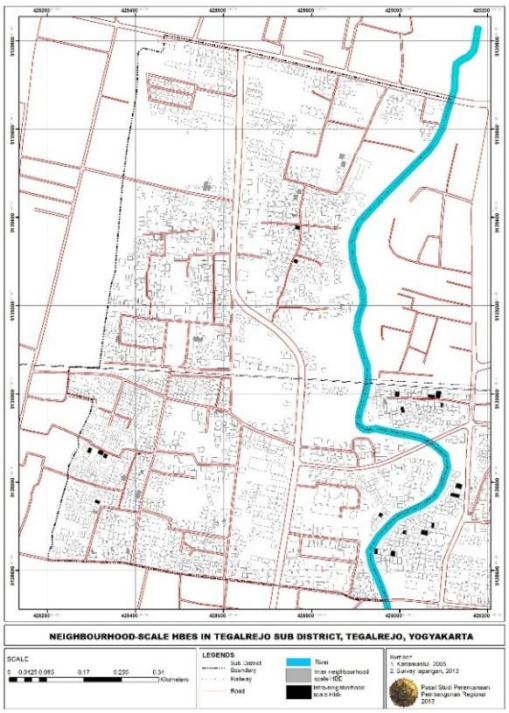


Fig.4. Neighborhood-scale HBE in Tegalrejo
Source: Analysis, 2014

3.9 Competition

Same type of HBE, with same commodity or service and market area, in the same neighborhood leads to rivalry between the operators. Within the competition, HBE with less competitiveness is threatened.

"For me, location, competition, consumer's affordability, and government's aid are very important because the location of my enterprise is less strategic because it is located in a settlement area and narrow alley makes it difficult for consumers to come. Mostly, it is only my neighbors who buy. I still depend very much on the government's aid like raskin and PNPM Mandiri, because I initiated this enterprise by taking loan from that program." (interview with Sunarsih-Warung owner, 12 June 2014, 15.02.

3.10 Location and Profitability

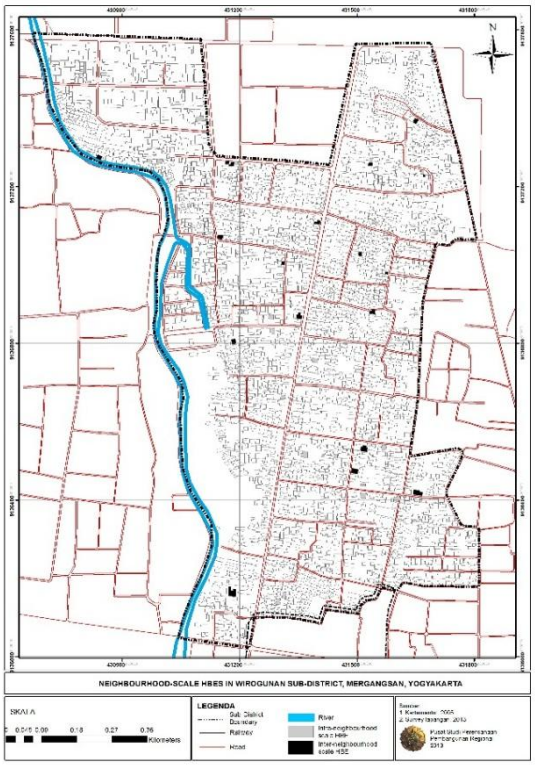


Fig.5. Neighborhood-scale HBE in Wirogunan
Source: Analysis, 2014

Apart from the fact that some HBE flourish in an area with less accessibility, many HBE operators find that accessibility is an important factor for their enterprises to grow.

"It is clear that location is important for selling fuel and phone credit, if it is not located in the main street's side, there must be less buyers because there are less consumers inside of a settlement." (interview with Leha-Fuel and phone credit seller in 27 June 2014 13.00)

Maps of the four sub-districts observed below implies the dispersion of HBE with neighborhood-scale market. The location of HBE influences the market as is shown in the maps. Most of the HBEs with low scope of consumers are located within the settlement area and are not alongside the main road. In average, inter-neighborhood scale HBEs gain Rp 55.000.00, with the range of Rp5.000-Rp200.000,00 per week. In contrast to that, city-scale HBE and province-scale HBE gain averagely Rp 121.000,- per week and Rp133.000,00 per week, respectively.

3.11 Dependency to Government's Assistance

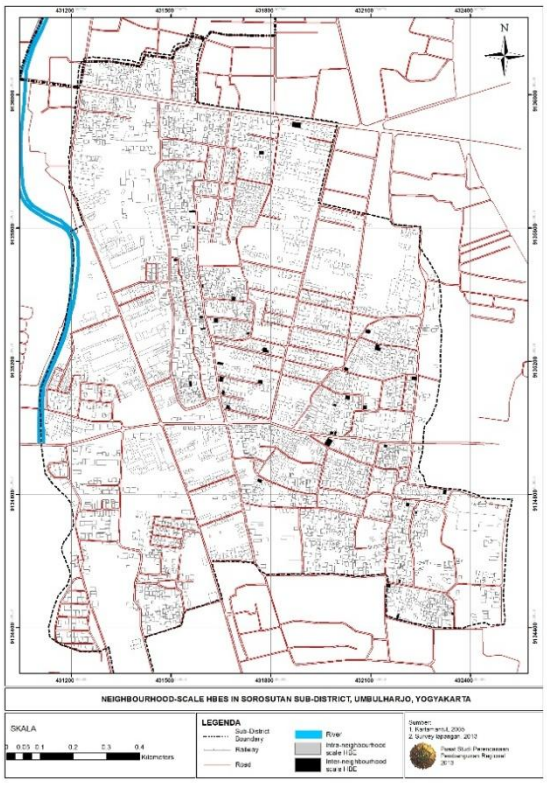


Fig. 6. Neighborhood-scale HBE in Sorosutan
Source: Analysis, 2014

In relation to the aspirations for HBE to thrive, government's affirmative action in providing block grant or facilitation is expected by HBE operators, particularly those in poverty. Meanwhile, the distribution of assistance and wrong target of the aid may cause social conflict in the end. That expectation of HBE operators is contrary to the fact that not only is that the government assistance often provided to incorrect beneficiaries, but also the assistance is still limited, first, in terms of the scope, second, in the terms of amount.

"There are many grants with wrong target, like me, I should have got the aid to expand this motorcycle salon, but because I have no relations with the people at the sub district's authority it is difficult if I want to take the loan." (Bambang Sutikno - Motorcycle Repair Shop, 16 June 2014, 10.45)

3.12 Technology

The usage of technology nowadays has expanded the definition of physical space to virtual space. Nevertheless, it is rarely acquired that poor HBEs use technology i.e. internet as a mean of networking or marketing. Triggering the usage of technology for the business of the poor people has been a challenge. Not only is that lack of familiarity in using technology, but also the motivation of households to expand the business through technology is less. One of the rational could be because the market of small-scale enterprise like HBE is in the range of neighborhoods, thus it needs rarely technology to market the product or service. One simple form of technology usage is requesting phone credit through phone or SMS to the vendor. Nevertheless, eventually it involves direct contact of vendor and customer for the payment. Another possible form of technology application is, for example for vegetable vendors, by collecting the phone number of the customers, thus customers can request certain commodity to buy and vendors can be more effective in spending the money.

IV. Discussion

This study has implied that both national and local government provides assistance for informal business, including HBE, particularly the poor ones. It can be considered as a form of support disregarding the unregistered and unmonitored existence of HBE and other informal businesses. This effort is shown through the policies and programs implemented where government assists not only financially, but also technically by building a network as an attempt to build an independent community through collective action. However, it is still limited that only 490 groups or 6700 enterprises have benefitted from the programs. The number of HBE is projected 2-3 times bigger than that the existing beneficiaries. It is potential, however, depending only on the government assistance will not improve poor HBEs without any significant change in the way the business is operated.

HBE operators expect to develop their enterprise beyond the existing condition, while with that scale of business and marketing HBE can only support the local neighborhood. The goal of government in giving the aid was to strengthen the livelihood of poor households by triggering micro business, thus the aid distributed to the community is not sufficient initiate bigger enterprise, unless the operators can manage to revolve the assisting fund provided to develop the enterprises, but how?

Initiating a group of small and micro enterprises for a micro credit group could be one of the options. Learning from Garment Bank, or Kali Jawi Association in Yogyakarta, community development fund can be started with a regular collective saving. The fund is then revolved through loan mechanism with very low interest for the development of the group. This strategy can be initiated even without the assistance of the government, or it can be cooperated with the stimulation fund from the government.

Secondly, innovation is required thus HBE can always deal with the future challenge. As mentioned before, with seven HBE in a neighborhood of 50 households, there is a tough competition to capture the consumers. If one HBE is well developed, others declined simultaneously because there is a preference from consumer, i.e. complete commodity, competitive price, or better quality of commodity. It is a *zero-sum game* in the neighborhood, considering market in physical perspective. It could be different if space is not determined only as a physical entity, but also a virtual entity. Even a micro scale HBE will be able to capture further market if technologies are applied. The use of telephone, for instance, enables consumers to inquire certain commodities so that vendors will have most of their commodities sold. Not only in terms of technology application, is innovation also necessary to cope with the market's dynamics i.e. the buyer's preference and type of commodities.

It is unalienable that networking leads to a more competitive and solid HBEs in urban area. Both micro credit group or technology application require a networking, i.e. to consumers, to other HBE, or to other parties including government. It functions in, first, creating wider market of the enterprise, and second, encouraging competition so that each of the member will innovate simultaneously. This networking form, in the greater area, should involve the government so that it can be coordinated with the strategic plan of the government.

No matter how positive we see the prospect of poor HBE to thrive in the future, that the government encourages, in a way, and some strategies may be applied to the enterprises, in other way, it cannot be neglected that some

problems need more individual solution rather than a collective action. For instance, the fact that inheritance or discontinuity of the enterprise due to the loss of a family member implies that not everybody, in the family, has the capability to manage the enterprise. Elder HBE operators may have no willingness to innovate or even capability to manage the enterprise anymore. Even young and active HBE does not always have a capability to revolve the income or persist the existence of HBE when there comes another priority. In this sense, despite of being a source of income, HBE poses the risk to overburden the poor household due to the high difficulties and cost in operating the business. However, in general, sufficient motivation and skill will eliminate the possibility that they will decline in the income and performance.

V. Conclusion

Micro informal economic activity, particularly operated by poor households, will have to deal with challenges to prosper in the future. In this case, poor home-based enterprise, which is associated with the family and house where it is located, has internal and external challenge to manage the business as a mean to alleviate poverty. Household and shelter condition, relatively low income, and age of operator and business are among the internal factors influencing the performance of HBE. Meanwhile, limited buyers, networking, competition, location and profitability, and dependency to government's assistance challenge the existence of HBE from the external environment. On the other hand, local government enacts in the poverty alleviation policies and programs to encourage the development of poor HBE although the extent of the assistance is yet sufficient. Eventually, several strategies, as micro credit group initiation, innovation including technology, and networking are recommended to poor HBE and other related stakeholders in order to revive HBE as a mean to improve the livelihood of the poor.

Footnote

[1] Group of Business for Very Poor Households
[2] Productive Social Economic Business for Poor Households
[3] Small and local store providing daily needs

Reference

1) Edwards, L. N. & Field-Hendrey, E., (2002). Home-Based Work and Women's Labor Force Decisions. *Journal of Labor Economics,* 20**,** 170.
2) Felstead, A. & Jewson, N., (2000). *In Work, at Home: Towards an Understanding of Homeworking,* London, Routledge.
3) Gilbert, A., (1988). Home Enterprises in Poor Urban Settlements: Constraints, Potential and Policy Options. *Regional Development Dialoque,* 9**,** 21-39.
4) Gough, K. V. & Kellett, P., (2001). Housing Consolidation and Home-based Income Generation: Evidence from Self-help Settlements in Two Colombian Cities. *Cities,* 18**,** 235-247.
5) Gough, K. V., Tipple, A. G. & Napier, M., (2003). Making a Living in African Cities: The Role of Home-based Enterprises in Accra and Pretoria. *International Planning Studies,* 8**,** 253-277.
6) Green, H., Strange, A. & Trache, H., (2000). The Homeworking Revolution: Considering the Property Dimension. *Regional Studies,* 34**,** 303-307.
7) International Labour Organization (2002). *Decent Work and the Informal Economy: Sixth Iten on the Agenda (90th Session).* Geneva: International Labour Office.
8) Lipton, M., (1980). Family, Fungibility and Formality: Rural Advantages of Informal Non-Farm Enterprise versus the Urban Formal State. *In:* AMIN, S. (ed.) *Human Resources, Employment, and Development, Volume 5, Developing Countries.* Proceedings of the Sixth World Congress of the International Economic Association, Mexico City: MacMillan, London.
9) Louw, E. & De Vries, P., (2002). Working at Home: The Dutch Property Dimension. *Planning Practice & Research,* 17**,** 17-30.
10) Marsoyo, A., (2012). *Constructing Spatial Capital: Household Adaptation Strategies in Home-Based Enterprises in Yogyakarta,* unpublished dissertation, Newcastle, University of Newcastle upon Tyne.
11) Marsoyo, A., & Widiyanto, D. (2013). The Role of Home-Based Enterprise in Poverty Alleviation in Yogyakarta. *International Conference on Regional Development, Sustainable Development: Conceptual Progress and Practical Challenges* (pp. 127-134). Semarang: Department or Urban and Regional Planning, Faculty of Engineering, Diponegoro University.
12) Meagher, K. (2013). Between Resilience and Vulnerability: Understanding Africa's Informal Economy in the Positive (Draft). *19th Annual Research Workshop of REPOA (Policy Research for Development).* Dar es Salaam.
13) Moore, J., (2006). Homeworking and Work-Life Balance: Does It Add to Quality of Life? *Revue européenne de psychologie appliquée,* 56 5-13.
14) Schneider, F., & Enste, D. (2002). *The Shadow Economy: An International Survey.* New York: Cambridge University Press.
15) Sekretariat Kelompok Kerja Pengendali Program Penanggulangan Kemiskinan Berbasis Pemberdayaan Masyarakat, *http://www.pnpm-mandiri.org/index.-php?option=comcontent&view=article&id=162&Itemid=301* accessed in July 10, 2014 09:30
16) Strassmann, W. P., (1986). Types of Neighbourhood and Home-Based Enterprises: Evidence from Lima, Peru. *Urban Studies,* 23**,** 485-500.
17) Tim Nasional Percepatan Penanggulangan Kemiskinan *http://www.tnp2k.go.id/id/program/sekilas/* accessed in July 10, 2014 10:31
18) Williams, C. C., & Martinez-Perez, A. (2014). Why do consumers purchase goods and services in the informal economy? *Journal of Business Research*, 802-806.

The Impact of Road Type on Fear of Crime in a Residential Neighbourhood

Aldrin Abdullah[1], Massoomeh Hedayati Marzbali[2], Nor Zarifah Maliki[3]

[1] Dean of School of Housing, Building and Planning, Universiti Sains Malaysia,
[2] Post-doctorate Fellow, School of Housing, Building and Planning, Universiti Sains Malaysia,
[3] Lecturer at School of Housing, Building and Planning, Universiti Sains Malaysia,

Abstract

Fear of crime literature has led scholars to the general conclusion that fear of crime is a multi-dimensional variable. Recent attention to the measurement of fear has underscored the value in examining crime-specific fear, indicating that the proximate causes of fear vary based on crime fear in question. This study seeks to examine a multidimensional nature of fear of crime by considering both fear of burglary and fear of violence. Aside from the variation in fear of crime measures, physical attributes of the built environment may also level differences in fear of crime. This research is carried out to assess the effects of gender and road type on residents' perceived fear of burglary and fear of violence in a residential neighbourhood in Penang, Malaysia. A total of 235 households participated in the study. Using a variety of fear of crime measures, the findings indicate that road type and gender can account for a significant proportion of the variance in residents' fear of burglary, but not fear of violence. Residents living in pure cul-de-sacs are less likely to worry about property crime than those living in higher hierarchical levels. The results further support the defensible space concept which advocates closed streets.

Keywords: *fear of burglary; fear of violence; gender; road type; residential neighbourhood.*

I. Introduction

Fear of crime has been considerably researched in recent years. Crime statistics recorded by the police often indicate victimisation rates, while ignoring the most crucial indicators of fear of crime (Cozens, 2008). The current debate regarding fear of crime refers to measuring this construct and its indicators (McCrea et al., 2005). Initial studies have only focused on fear of crime in the light of a unidimensional measure in citizen's fear of crime based on the US National Victimization Survey (NCVS) such as Baumer (1985) among others. Previous literature reported that the best measure of the fear of crime construct should be limited to feelings of fear (Hale, 1996), while others argued that it further includes cognitive judgements such as perceived risk after dark and the possibility of victimisation (Franklin & Franklin, 2009; Gabriel & Greve, 2003). Studies criticised the validity of unidimensional measure of fear, suggesting that (i) the intent of the question may influence by the absence of the word 'crime' (ii) all aspects of fear of crime may not be captured using singular measure and (iii) it does not differentiate emotional reactions to crime and objective risk assessment (Ferraro & Grange, 1987; Garofalo, 1979; Kanan & Pruitt, 2002).

There has been little consensus regarding the best way of measuring fear of crime (Ferraro & LaGrange, 1987; Hale, 1996). In measuring fear of crime, researchers generally faced many issues such as using global or specific measures of fear (McCrea et al., 2005). This could be referred to the fact that a global measure involves single indicator and does not indicate any specific crime (Hale, 1996), and it ambiguously overestimates the prevailing influence of fear (Farrall et al., 1997). They further suggested that specific measures distinguish different dimensions of fear (Farrall et al., 1997). Although specific measures are better than global measures for specific purposes, the latter have been however employed by most researchers (Hale, 1996) due to lower costs and less time consumption (McCrea et al., 2005).

1.1. Fear of Crime

Fear of crime ranges from cognitive (referring to perceptions of safety) to affective (referring to emotional responses to the probability

Aldrin Abdullah
--- Dean, School of Housing, Building and Planning, Universiti Sains Malaysia, 11800 Penang, Malaysia
E-mail: aldrin@usm.my

of being victimised by a specific crime type) dimensions (Ferraro & LaGrange, 1987). Given the range of possibilities in measuring fear of crime, it is conceivable that the causes of fear of crime vary depending on the type of fear (Rountree, 1996). Related to this, the literature suggests the value in examining crime-specific fears, indicating that the proximate causes of fear depends on the crime fear in question. Nonetheless, relatively few studies have taken potential distinctions of fear of crime into consideration. To overcome this concern, the current multi-dimensional fear of crime measure avoids the earlier ambiguity. It should be noted that a major contribution in the literature on fear of crime is the study by Warr and Stafford (1983), as they examined crime-specific fear and distinguished fear of crime from perceived risk.

A review of the literature further shows that the theories regarding fear of crime have generally been divided into two main categories, namely *facilitators* and *inhibitors*. Taken as a whole, there are three basic theories related to fear of crime, namely: the vulnerability hypothesis, the incivilities thesis and social disorganisation theory (McCrea et al., 2005). These theories consists of a number of variables related to fear of crime which can be categorised into fear of crime facilitators and inhibitors.

Substantial attention has been focused recently on the influence of vulnerability on fear of crime. The concept of the vulnerability hypothesis focuses on individual attributes (demographic characteristics), as predictors of fear of crime. Neighbourhood's social dynamics may have an effect on residents' concerns about fear of crime (Austin et al., 2002). Evidence suggested that individuals who assume they are unable to protect themselves may feel higher levels of fear than others (Franklin et al., 2008). Studies took into consideration the influence of demographic characteristics as social and physical vulnerability on fear of crime (Franklin & Frank-lin, 2009; Franklin et al., 2008; Schafer et al., 2006; Taylor & Hale, 1986). In this sense, demographic characteristics refer to physical vulnerability (such as gender and age) and social vulnerability (such as education, race, income and marital status).

Age and gender as physical vulnerabilities have received considerable attention in the literature. Physical vulnerability refers to a feeling of increased risk and decreased disability to protect themselves from a physical attack. A large portion of literature have posited that age and gender influence the fear of crime, bringing forward that women and the elderly probably perceive a higher risk compared to men and younger people (Fisher & Sloan, 2003; Hughes et al., 2003; Keane, 1998; Taylor & Hale, 1986). This may presumably refer to a lack of physical strength and less mobility for this group of people.

LaGrange and Ferraro (1989) suggested that there is no doubt women are more fearful than men, but as far as age groups are concerned, they found that the elderly felt a higher fear of crime by means of the US National Crime Survey (NCS) measure. They further indicated that in many previous studies, the fears of older people were overestimated due to measurement problems (LaGrange & Ferraro, 1989). Another study conducted by Adu-Mireku (2002) among Ghanaian households reported that accordingly with the previous literature, women were found to be more fearful than men. However, unlike a large body of studies, a negative association was found between the fear of crime and age (Adu-Mireku, 2002).

Second, the incivilities thesis emphasises on the relationship between incivilities and their influences on fear of crime. In this concept, perceived risk is considered as a mediator of the relationship between disorder and fear of crime (e.g. LaGrange et al., 1992).

Third, the social disorganisation theory focuses on the direct relationship of neighbourhood structure (such as socio-economic status) on crime and fear of crime by a mediation of social processes (such as neighbourhood trust, sense of community and informal social control). It links to the fear of crime by incorporating the incivilities thesis through a direct influence on incivilities (McCrea et al., 2005).

Taken as a whole, increased vulnerability and disorderly surrounding the environment would increase fear and are known as faciletators of fear, while inhibitors refer to factors such as community attachment, social cohesion and collective efficacy which would instead reduce fear (Franklin & Franklin, 2009). Many people are fearful of crime despite not having been victimised. Women and the elderly are among those with higher fear levels (Abdullah et al., 2013; Franklin & Franklin, 2009).

1.2. Road Type and Fear of Crime

Studies suggested that the built environment play a significant role in perception of safety and fear of crime (e.g., Abdullah et al., 2013). A review of the literature indicates that there are two quite divergent views on the relationship between street type and fear of crime. First, Jacobs (1961) in her well known discussion of crime and urban neighbourhood

claims that the use of street sidewalk that brings in more outsiders is a bedrock feature of a safe city. Jacobs and the proponents of Eyes on the Street concept believed that increasing the proportion of strangers into the street segment may create a secure climate that in turn helps to keep crime rates low and mitigate fear of crime. Similarly, the proponents of New Urbanism draw on the premise that the greater walkability tend to invite more pedestrians to the streets and consequently increase safety (CNU, 2001). Findings presented by Foster et al. (2010) provides some support for the New Urbanism theory in terms of the neighbourhood configurations that draw people into the street and encourage walkability.

Jacobs has argued that streets with higher accessibility allowing more passersby could attract more eyes to the street which is known natural surveillance that can effectively reduce crime (Jacobs, 1961). She suggested three main qualities that must be equipped for each city to make it as a great and successful city that are as follow (Jacobs, 1961, p.35): (i) there must be a clear demarcation between what public space is and what private space is; (ii) there must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street; and (iii) the sidewalk must have users on it fairly continuously. Jacobs (1961) further suggested that nobody enjoys sitting on a stoop or looking out a window at an empty street.

Similar to the conceptual framework of Jacobs' (1961) work, many other studies found that streets with higher accessibility are generally safer than those with lower accessibility (Abdul Mohit & Hassan Elsawahli, 2010; Baran et al., 2007; Hillier, 1988, Hillier & Shu, 2000; Shu, 2009; Shu & Huang, 2003).

Second, contrary to Jacobs, the proponents of Newman's (1972) defensible space concept demonstrate their advocacy towards cul-de-sac streets. In the same vein, studies observe that the higher density of people on city streets is associated with the greater of fear. A previous study has also indicated that residents living on high permeable streets have limited their activities in the use of property frontage and their exposure to the strangers (Appleyard & Lintell, 1972).

Similar to conceptual framework of Newman, studies suggested that there is a fairly strong evidence of defensible space techniques to reduce crime by street closures (Armitage, 2007; Bevis & Nutter, 1977; Brantingham & Brantingham, 1991; Budd, 1999; Johnson & Bowers, 2010; Poyner & Web, 1991; Welsh et al., 2010). Similar to conceptual framework postulated by Newman, Poyner (2006) explained that pure cul-de-sac street patterns have few crime problems, especially in middle-income housing. Research indicated that when cul-de-sacs are connected to a footpath network, they are associated with high crime rates and may facilitate crime opportunities (Armitage, 2007; Poyner, 2006).

Due to the above dispute on the role of street type in relation to fear of crime, this study seeks to address this issue in the Malaysian context. The present work attempts to investigate the relationship between road type and fear of crime and to draw a clear picture of how the patterns of human behaviour are influenced by street type. This approach contributes to our under- standing of the effects of street design on perceived fear.

1.3. Conceptual Framework

Austin et al. (2002) found three general aspects that influenced fear of crime: (1) demographic effects, (2) victimisation experiences and (3) neighbourhood and urban conditions. There is no doubt that both social and physical factors have an effect on human behaviour. Aside from social factors, it is hypothesised that physical attributes of an area play a significant role in perception of safety. Numerous studies have proven that the spatial layout of the built environment do affect human behaviour and routine activities. Direct assessments of the links between the built environment and fear of crime are still rare in urban planning literature. The focus of current study is on vulnerability hypothesis. This study seeks to examine crime-specific fear in order to distinguish fear based on emotional reactions to the likelihood of being victimised by both property and violent crime. According to the vulnerability hypothesis, women are more fearful than men in all types of crime due to their perceived risk of such offences in their everyday life. This is mainly attributed to the increased feelings of vulnerability among women. Meanwhile, the study aims to explore the impact of gender and road type on residents' fear of crime. Fear of crime is a multidimensional construct, consists of fear of burglary and fear of violence. These discussions lead to the following hypotheses as shown on a hypothesised model (see **Fig. 1**).

H1 Fear of burglary and fear of violence form two distinct but correlating latent factors of fear of crime.

H2 Gender plays a significant role in respondents' fear of burglary and fear of violence.

H3 Street type is significantly related to both fear of burglary and fear of violence.

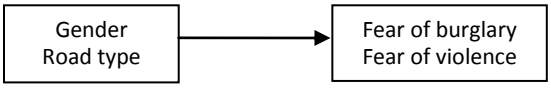


Fig. 1. The conceptual pathway between independent variables and fear of crime.

II. Methodology

2.1. Study Context

This study was conducted in a typical residential neighbourhood in Penang, Malaysia, that are predominantly occupied by middle-income residents. The study was quantitative in nature and involved asking the residents to answer a survey face-to-face. To capture the information on street type, on-site observations were conducted. The survey contained several sections aiming at ascertaining the background information of the respondents and their fear of crime. A sampling framework was developed from the list of all of the landed properties in the study area. The respondents were selected using a systematic sampling method with a random start. In all, 235 residents participated in the survey. Of these respondents, 100 were male (43%), and 135 were female (57%) with an average age of 54 years (*SD*=12.94). The survey further illustrates that 51% of the respondents were Malay, 39% were Chinese and 10% were Indian. The majority of survey respondents (64%) had a college/university education.

2.2. Measures

In this study, *road type* refers to the degree of road hierarchy (Shu, 2009) as defined by Public Works Department Malaysia (PWD). As indicated in **Fig. 2**, the PWD classified the road hierarchy in Malaysia based on six categories. This study did not consider expressway, as the focus is given to residential area. In this study, this variable consists of six categories, namely U1a (pure cul-de-sacs), U1b (leaky cul-de-sac), U2 (local streets), U3 (minor collector), U4 (major collector) and U5 (arterial).

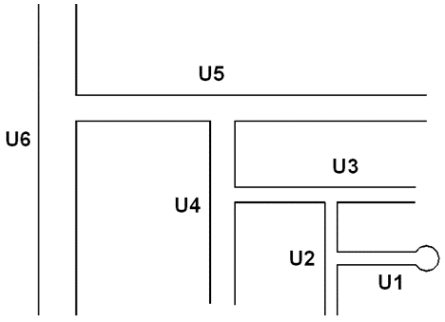


Fig. 2. Road hierarchy for urban areas in Malaysia

Source: The author (based on Arahan Teknik Jalan 8/86 (1989)

There is a complex relationship between neighbourhood conditions and fear of crime because fear of crime is affected by issues of conceptualisation and operationalisation (Lorenc et al., 2012). Fear of crime is the central concept for examining neighbourhood dynamics. In this study, we measured fear of crime to examine the impacts of gender and street type on fear of burglary and fear of violence. This variable was derived from the question: in your everyday life, how worried are you about the following situations? The items were: (1) having someone break into your house while no one is at home; (2) having someone break into your house while you are at home; (3) having your car stolen; (4) yourself or someone in your family getting assaulted; (5) being robbed or mugged on the street; (6) being attacked; and (7) yourself/someone in your family being sexually harassed (Abdullah et al., 2013, 2014; Foster et al., 2010; Swatt et al., 2013). The response categories ranged from 1, 'extremely not worried', to 7, 'extremely worried'.

Factor analysis was used to collapse individual indicators of worry about crime into themes. Fear of burglary included: (1) having someone break into your house while no one is at home; (2) having someone break into your house while you are at home; (3) having your car stolen (Cronbach's α=0.84). Fear of violence included: (1) yourself or someone in your family getting assaulted; (2) being robbed or mugged on the street; (3) being attacked; and (4) yourself/someone in your family being sexually harassed (Cronbach's α=0.94).

2.3. Plan of Analysis

Descriptive statistics were used to provide an initial description of the sample and to assess the distribution of key variables. This is followed by assessing the validity and reliability of the fear of crime indicators. The next test is to assess the equality of population means when the population is classified into groups. Statistical significance was analysed using analysis of variance and t-tests as appropriate. The common technique used to identify such equality is the independent samples t-test for two groups and the one-way Analysis of Variance (ANOVA) for more than two groups under comparison. Bivariate correlations were also examined to provide information regarding the relationship between the variables.

III. Data Analysis

Responses to the seven-point Likert scales were aggregated to the household level as initial measures. The fear of burglary and fear of vio-

lence statements were examined for validity (using corrected item-to-total correlations) and reliability based on the index of Cronbach's Alpha (α). The results of the validity and reliability tests are illustrated in **Table 1**, indicating that each item had a corrected item-to-scale correlation above 0.3 (0.60 to 0.90). The Cronbach's α score for both fear of burglary and fear of violence were higher than the recommended 0.70 cut-off value (Nunnally & Bernstein, 1994) and indicated good scale reliability. The findings reveal that the three items were valid and reliable to measure the fear of burglary construct. Meanwhile, the four items contributed to measure the fear of violence construct.

The result from the bivariate correlations demonstrated a statistically significant positive correlation between fear of burglary and fear of violence (r=0.519, p<0.01). Consistent with theoretical expectations, we find that fear of burglary carries a significant relationship with fear of violence. Therefore, H1 is supported. Having determined the fear of crime variables, the next test is to examine the mean differences of these variables across male and female. The results of an independent sample t-test illustrated that there is significant mean difference between male and female respondents in their perceived fear of burglary (t(233)=-2.55, p<0.05), but not fear of violence (t(233)=-0.879, p>0.05). With regard to perceived fear of burglary, the mean score for the female respondents (Mean=15.13) is higher than for the male respondents (Mean=14.10). The female respondents were more likely than the male respondents to have higher levels of fear of burglary. A large portion of the literature have posited that gender influences the fear of crime, bringing forward that women probably perceive a higher risk compared to men (Allen, 2006; Ferraro & LaGrange, 1992; Fisher & Sloan, 2003; Hughes et al., 2003; Keane, 1998; Taylor & Hale, 1986). However, we found no significant effect of gender on perceived fear of violence. Although many studies have reported than women tend to be more fearful, there are some previous studies that expressed doubts regarding the strength of these findings.

Table 1: Reliability and item-total statistics for fear of burglary and fear of violence items (n=235)

Variable	Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	One-way ANOVA (Grouping variable: Street type)
Fear of burglary	Worry 1	.704	.782	6.598**, p<0.01
	Worry 2	.834	.643	
	Worry 3	.603	.872	
Fear of violence	Worry 4	.751	.955	0.491, p>0.05
	Worry 5	.886	.911	
	Worry 6	.890	.910	
	Worry 7	.904	.906	

*Note: **p*<0.01.

Table 2. Descriptive statistics for fear of burglary and fear of violence items (n=235)

Variable	(n=235)	Fear of burglary		Fear of violence	
	Groups	*Mean*	*SD*	*Mean*	*SD*
Road type	U1a	12.91	3.53	15.53	4.06
	U1b	16.38	3.16	16.51	4.02
	U2	14.09	2.52	15.51	1.88
	U3	14.30	2.89	16.20	3.53
	U4	13.81	2.74	16.19	2.60
	U5	15.55	2.68	16.08	3.75

Note: SD= Standard deviation; ***p*<0.01.

The next test is to examine the mean differences of these two variables based on different street types. The data were analysed using the one-way ANOVA to determine the significant differences in the mean of fear of crime variables. The results reveal that there are signifycant mean differences between street types in relation to fear of burglary (F(5, 229)=6.598, p<0.01), but not in relation to fear of violence (F(5, 229)=0.491, p>0.05). The mean values and the standard deviations of the fear of crime variables based on road types are presented in Table 2. The results further indicate that residents living in pure cul-de-sacs street pattern perceived the lowest level of fear of burglary, whereas those living in leaky cul-de-sacs and

arterials (through roads) perceived the highest level of fear of burglary. The findings of the present study indicate that respondents from the properties located on pure cul-de-sacs and local streets perceived lower levels of fear of burglary compared to those from the arterials and leaky cul-de-sacs. In line with Newman's (1972) idea, the result suggests that more permeable residential street networks are associated with higher levels of fear of crime than less permeable streets. Therefore, H2 and H3 were partially supported.

IV. Conclusions

The present work seeks to examine the validity of two fear of crime variables (i.e., fear of burglary and fear of violence) in a neighbourhood setting in Penang, Malaysia. The conceptualisation of fear of crime construct has received considerable attention among scholars. Nevertheless, most studies use indicators that only tap cognitive assessment of fear, failing to take into consideration the crime-specific fear indicators. This article tests whether there are conceptually and empirically distinct dimensions of fear of crime by comparing the two affective dimensions of fear, namely fear of burglary and fear of violence. Exploratory factor analysis was used to collapse individual indicators of crime-specific fear into themes. The results provide empirical evidence that the two constructs are quite distinct and there is a significant and positive correlation between them. Furthermore, the aim of this study is to assess the impact of road type and gender on fear of burglary and fear of violence. The positive correlation between fear of burglary and fear of violence demonstrates that high level of fear of burglary is associated with high level of fear of violence (Ferraro, 1996).

Regardless of the measurements used for measuring fear of crime, most studies found women reported higher levels of fear compared to men (Ferraro, 1996). This is mainly attributed to the increased feelings of vulnerability among women. In this study, the effect of gender is different across the two fear of crime constructs. Although the results indicate a significant effect of gender on fear of burglary, there is no significant effect of gender on fear of violence. Consistent with literature, the result of this study demonstrates that women are more likely to report higher levels of worry about burglary than men (Allen, 2006). Contrary to findings presented by Warr (1984) and Allen (2006), we found no gender difference in respondents' perceived fear of violence. One possible explanation for this finding could be traced to the fear of crime measures. For instance, respondents were asked how worried they are about "themselves or someone in their family getting assaulted". Therefore, similar proportions of men and women had high levels of worry about violent crime. However, the result shows that the effect of gender on fear of violence is still inconclusive and should be further investigated.

There is no doubt that neighbourhood characteristics contribute to the level of perceived fear among residents. In fact, the design of streets should help to reduce or increase the level of fear of crime. Jacobs and the proponents of New Urbanism claimed that the more permeable streets contribute to the number of effective eyes on the street and thereby, create a safer environment. By contrast, Newman advocates closed and impermeable environments, which brings an area under the control of its residents. Nonetheless, the question we face today lies in which combination of spatial circumstances is best for perceptions of safety and provides security for urban residents. Thus, if the street form can encourage or discourage perceptions of safety, then these patterns should differ among different road types.

It should be noted that relatively few studies have considered pure and leaky cul-de-sacs in their conceptual model. However, we have found that residents living in pure cul-de-sac street pattern perceived lowest levels of fear of burglary than their counterparts living in other road hierarchies. The finding of the present study contradicts the Jacobs' Eyes on the Street theory, but it is in line with Newman's defensible space concept. The pairwise comparison between pure and leaky cul-de-sacs shows a considerable mean difference between the two groups in relation to fear of burglary. Residents in leaky cul-de-sacs, among the six road types are at the highest level in perceiving fear of burglary, followed by those living in arterials. A considerable number of cul-de-sacs in the study area have been noted to be connected to footpaths. In agreement with a work of Poyner (2006), the present study also found that pure cul-de-sacs are associated with lower perceived fear, but when they are linked to a footpath they will tend to be associated with a high level of fear. Given the methodological differences between the two studies, the consistency of results adds strengths to our finding that residents in pure cul-de-sacs indeed perceived low levels of fear of burglary.

Some limitations and suggestions for future research are worth noting. Research has suggested fear of crime tends to be higher among

minority residents and the elderly. Our study does not include residents' background (especially ethnicity) in the analysis. Further investigation on the impact of social factors on fear of crime is warranted. Various recent developments in fear of crime literature suggested that fear of crime is a multidimensional concept, reflected by affective and cognitive dimensions (Fattah & Sacco, 1989). One possible recommendation for future investigation would refer to the multidimensionality of this concept.

Likewise, we are aware that there are many other physical factors (e.g., landscaping, the presence of commercial land uses, open space and playground) that could have some influences on the degree of fear of crime. Therefore, another aspect to be cautioned when interpreting the result is that, one should consider the whole spatial system of a neighbourhood layout. Although we took into account the type of road of each street segment, we had failed to consider the types of roads that are connected to each street segment. Future studies should address this matter by taking into consideration the types of roads that are connected to each particular street segment in order to assess the impact of the degree of permeability on fear of crime.

Despite these limitations, the current study extends the notion of crime-specific fear by measuring fear of burglary and fear of violence with specific focus on different road type. Findings suggest that gender and road type have differential effects on fear of burglary in comparison to fear of violence, thus providing further support of the multidimensional nature of fear of crime construct. The evidence suggests low fear of burglary on pure cul-de-sac street types than through roads. This is in line with Newman's defensible space concept, which brings an environment under the control of its inhabitants. However, such design, although very much disliked by international housing experts (particularly in the UK), in which "a historic commitment to the Newmanesque solution has recently been weakened" (Hillier, 2004, p. 32), was in fact conducive to the mitigation of fear among neighbours. One possible way to address this would be to avoid major roads which pass through the neighbourhood- a consideration that should be given by professionals in the design process of residential areas.

Acknowledgements

The authors would like to thank the Universiti Sains Malaysia (USM) for providing financial support for this study.

References

1) Abdul Mohit, M., & Hassan Elsawahli, H. M. H. (2010). Crime and housing in Malaysia: case study of Taman Melati terrace housing in Kuala Lumpur. *Asian Journal of Environment-Behaviour Studies, 1*(3), 25-36.
2) Abdullah, A., Hedayati Marzbali, M., & Maghsoodi Tilaki, M. J. (2013). Predicting the Influence of CPTED on Perceived Neighbourhood Cohesion: Considering Differences across Age. *Journal of Environmental Psychology, 36*(December), 54-64.
3) Abdullah, A., Hedayati Marzbali, M., Woolley, H., Bahauddin, A., & Maliki, N. Z. (2014). Testing for Individual Factors for the Fear of Crime Using a Multiple Indicator-Multiple Cause Model. *European Journal on Criminal Policy and Research, 20*(1), 1-22.
4) Adu-Mireku, S. (2002). Fear of crime among residents of three communities in Accra, Ghana. *International Journal of Comparative Sociology, 43*(2), 153-168.
5) Allen, J. (2006). *Worry About Crime in England and Wales: Findings From the 2003/04 and 2004/05 British Crime Survey*. UK: Home Office London.
6) Appleyard, D., & Lintell, M. (1972). The environmental quality of city streets: the residents' viewpoint. *Journal of the American Institute of Planners, 38*(2), 84-101.
7) Armitage, R. (2007). Sustainability versus safety: confusion, conflict and contradiction in designing out crime. In K. Pease, G. Farrell, K. J. Bowers & S. D. Johnson (Eds.), *Imagination for crime prevention: essays in honour of Ken Pease*. Monsey: Criminal Justice Press.
8) Austin, D. M., Furr, L. A., & Spine, M. (2002). The effects of neighborhood conditions on perceptions of safety. *Journal of Criminal Justice, 30*(5), 417-427.
9) Baran, P. K., Smith, W. R., & Toker, U. (2007). *The Space Syntax and Crime.* Paper presented at the 6th International Space Syntax Symposium, İstanbul.
10) Baumer, T. L. (1985). Testing a general model of fear of crime: Data from a national sample. *Journal of Research in Crime and Delinquency, 22*(3), 239-255.
11) Bevis, C., & Nutter, J. B. (1977). *Changing Street Layouts to Reduce Residential Burglary*. United States: Minnesota Crime Prevention Center.
12) Brantingham, P. L., & Brantingham, P. J. (1991). *Environmental Criminology.* (Second ed.). Illinois: Waveland Press.
13) Budd, T. (1999). *Crime in England and Wales 1999: Findings from the British Crime Survey and Police Recorded Crime*. London: Home Office Statistical Bulletin 4/99.
14) CNU. (2001). Charter of the New Urbanism. from Congress for the New Urbanism http://cnu.org/sites/files/charter_-english.pdf
15) Cozens, P. (2008). Crime prevention through environmental design. In R. Wortley & L. Mazerolle (Eds.), *Environmental criminology and crime analysis* (pp. 153-194). Devon, UK: Willan Publishing.
16) Farrall, S., Bannister, J., Ditton, J., & Gilchrist, E. (1997). Questioning the measurement of the'fear of crime': findings from a major methodological study. *British Journal of Criminology, 37*(4), 658-679.
17) Fattah, E. A., & Sacco, V. F. (1989). *Crime and victimization of the elderly*. New York: Springer-Verlag.
18) Ferraro, K. F. (1996). Women's fear of victimization: Shadow of sexual assault? *Social Forces, 75*(2), 667-690.
19) Ferraro, K. F., & LaGrange, R. (1987). The Measurement of Fear of Crime. *Sociological Inquiry, 57*(1), 70-97.
20) Ferraro, K. F., & LaGrange, R. L. (1992). Are older people most afraid of crime? Reconsidering age differences in fear of victimization. *Journal of Gerontology, 47*(5), S233 - S244.
21) Fisher, B. S., & Sloan, J. J. (2003). Unraveling the fear of victimization among college women: Is the shadow of

sexual assault hypothesis supported. *Justice Quarterly, 20* (3), 633-659.
22) Foster, S., Giles-Corti, B., & Knuiman, M. (2010). Neighbourhood design and fear of crime: A socio-ecological examination of the correlates of residents' fear in new suburban housing developments. *Health and Place, 16*(6), 1156–1165.
23) Franklin, C. A., & Franklin, T. W. (2009). Predicting Fear of Crime: Considering Differences Across Gender. *Feminist Criminology, 4*(1), 83-106.
24) Franklin, T. W., Franklin, C. A., & Fearn, N. E. (2008). A multilevel analysis of the vulnerability, disorder, and social integration models of fear of crime. *Social Justice Research, 21*(2), 204-227.
25) Gabriel, U., & Greve, W. (2003). The psychology of fear of crime. Conceptual and methodological perspectives. *British Journal of Criminology, 43*(3), 600-614.
26) Garofalo, J. (1979). Victimization and the fear of crime. *Journal of Research in Crime and Delinquency, 16*(1), 80-97.
27) Hale, C. (1996). Fear of crime: A review of the literature. *International Review of Victimology, 4*(2), 79-150.
28) Hillier, B. (1988). Against Enclosure. In N. Teymur, T.A. Markus & T. Wooley (Eds.), *Rehumanizing Housing* (pp. 63-88). London: Butterworths.
29) Hillier, B. (2004). Can streets be made safe? *Urban Design International, 9*(1), 31-45.
30) Hillier, B., & Shu, S. (2000). Crime and urban layout: the need for evidence. In S. Ballantyne, K. Pease & V. McLaren (Eds.), *Secure Foundations: Key Issues in Crime Prevention and Community Safety* (pp. 224-248). London: IPPR.
31) Hughes, P. P., Marshall, D., & Sherrill, C. (2003). Multidimensional analysis of fear and confidence of university women relating to crimes and dangerous situations. *Journal of Interpersonal Violence, 18*(1), 33-49.
32) Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.
33) Johnson, S. D., & Bowers, K. J. (2010). Permeability and Burglary Risk: Are Cul-de-Sacs Safer? *Journal of Quantitative Criminology, 26*(1), 89-111.
34) Kanan, J. W., & Pruitt, M. V. (2002). Modeling fear of crime and perceived victimization risk: The (in) significance of neighborhood integration. *Sociological Inquiry, 72*(4), 527-548.
35) Keane, C. (1998). Evaluating the influence of fear of crime as an environmental mobility restrictor on women's routine activities. *Environment and behavior, 30*(1), 60-75.
36) La Grange, R. L., & Ferraro, K. F. (1989). Assessing age and gender differences in perceived risk and fear of crime. *Criminology, 27*(4), 697-720.
37) LaGrange, R. L., Ferraro, K. F., & Supancic, M. (1992). Perceived risk and fear of crime: Role of social and physical incivilities. *Journal of Research in Crime and Delinquency, 29*(3), 311-334.
38) Lorenc, T., StephenClayton, DavidNeary, Margaret Whitehead, MarkPetticrew, Thomson, H., AdrianRenton. (2012). Crime, fear of crime, environment, and mental health and wellbeing: mapping review of theories and causal pathways. *Health and Place, 18*(4), 757–765.
39) McCrea, R., Shyy, T. K., Western, J., & Stimson, R. J. (2005). Fear of crime in Brisbane: individual, social and neighbourhood factors in perspective. *Journal of Sociology, 41*(1), 7-27.
40) Newman, O. (1972). *Defensible space; crime prevention through urban design* New York: Macmillan.
41) Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
42) Poyner, B. (2006). *Crime free housing in the 21st century*. London, United Kingdom: UCL Jill Dando Institute of Security and Crime Science.
43) Poyner, B., & Webb, B. (1991). *Crime Free Housing*. United Kingdom: Butterworth Architecture.
44) Rountree, P. W., & Land, K. C. (1996b). Perceived Risk Versus Fear of Crime: Empirical Evidence of Conceptually Distinct Reaction in Survey Data. *Social Forces, 74*(4), 1353-1376.
45) Schafer, J. A., Huebner, B. M., & Bynum, T. S. (2006). Fear of crime and criminal victimization: Gender-based contrasts. *Journal of Criminal Justice, 34*(3), 285-301.
46) Shu, C. F. (2009). *Spatial Configuration of Residential Area and Vulnerability of Burglary: Case Studies from UK and Taiwan.* Paper presented at the 7th International Space Syntax Symposium, Stockholm.
47) Shu, C. F., & Huang, J. N. H. (2003). *Spatial configuration and vulnerability of residential burglary: A case study of a city in Taiwan.* Paper presented at the 4th International Space Syntax Symposium, London.
48) Swatt, M. L., Varano, S. P., Uchida, C. D., & Solomon, S. E. (2013). Fear of crime, incivilities, and collective efficacy in four Miami neighborhoods. *Journal of Criminal Justice, 41*(1), 1-11.
49) Taylor, R. B., & Hale, M. (1986). Testing alternative models of fear of crime. *Journal of Criminal Law and Criminology, 77*(1), 151-189.
50) Warr, M. (1984). Fear of Victimization: Why Are Women and the Elderly More Afraid? *Social Science Quarterly, 65*, 681-702.
51) Warr, M., & Stafford, M. (1983). Fear of victimization: A look at the proximate causes. *Social Forces, 61*, 1033-1043.
52) Welsh, B. C., Farrington, D. P., & O'Dell, S. J. (2010). *Effectiveness of Public Area Surveillance for Crime Prevention: Security Guards, Place Managers and Defensible Space*. Stockholm: Swedish National Council for Crime Prevention.

Quasi-public Open Space in Superblock Area as Children's Play Space

Kezia Alyssa Sandy[1], Felia Srinaga[1]

[1] Department of Architecture, School of Design, Universitas Pelita Harapan, Tangerang, Indonesia

Abstract

The less compliance of children's need of a public open space as playing activities has been a phenomenon in urban areas. This also occurs within the scope of quasi-public open space in superblock areas. Superblock area requires standards for quasi-public open space to fulfill the needs of children playing activities. Research on the standards of quasi-public open space as children's play space, is implemented using theories from Jan Gehl and others. Taking place in superblock area in West Jakarta and South Jakarta, this study seeks to find out how the two quasi-public open spaces can meet the public's need, specifically as children's play space. Findings have shown that there are seven criteria required for the quasi-public open space in a superblock area to fulfill the needs of children's playing activities. These are: Physical Condition of Space, Protection, Comfort in Activities, Pleasure, Space of Playing Activities, Attraction, and Environmental Context. The overmanagement of Tribeca Park results in an active space, while the undermanagement of River Walk results in dull space. The study cases show that beside those criteria, quasi-public open space also needs balance between management and freedom of activities to be an active and lively space for public.

Keywords: *quasi-public open space; superblock area; children's play space.*

I. Backgrounds

Urban realm consists of spaces with different degrees of public nature. Between "public" and "private" space, there is a degree of space which is technically private, functions as "quasi-public" realm, where the owner retain the right to regulate the behavior within. Therefore, this space is partially public. (Efroymson, et. al., 2009: 15)

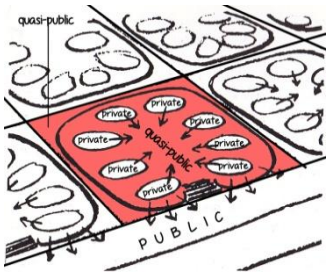


Diagram 1. Quasi-public Space in Urban Realm
source: Gehl, 2010, 62, with modifications

Kezia Alyssa Sandy
--- Student, Department of Architecture, School of Design, Universitas Pelita Harapan
E-mail: keziaalyssasandy@gmail.com
Felia Srinaga
--- Student, Department of Architecture, School of Design, Universitas Pelita Harapan
E-mai: felia.srinaga@uph.edu

In other words, the quasi-public space is the space whose degree is limited by the owner's authority. It doesn't have the quality of public space as a whole. One of places that has a quasi-public space is the superblock area.

Superblock is a design concept that became popular in the early and mid-20th century that originated from modern architecture. The superblock is a system block area in the urban space that integrates residential, commercial, education, and other functions in one block area in the city.

Superblock area as part of the urban realm should contribute an open space that can be enjoyed by public, which is quasi-public open space. It is expected to serve the needs of the public who is in it, one of which is the need of the age group play activities of children, mainly aged 6-12 years. Unfortunately, the need of children's playing activity is limited to the functional character of the modern city that does not provide means for spontaneous play activities.

"Twentieth century planning, with its over emphasis on functionality and order, sets apart segregated zones - playgrounds – for the un-

ruly activity of children's play. By their rigid and unimaginative character, playgrounds transform "play" into physical activity devoid of fantasy and experimentation." (Lennard, 2000: 117)

In this case, the quasi-public open space in superblock area sets an important role in providing space that can accommodate the need of playing activity, not only for the children who inhabit the superblock area, but also for the children in the community. Therefore, this research will examine the role of quasi-public open space of the superblock in Jakarta about the need for a children's play activities.

In this study, the author conducted a literature study of various sources to obtain the theory underlying the criteria of quasi-public open space as a children's play space. Theory learned includes:

1) Theory from Jan Gehl, Clare Cooper Marcus and William Whyte on public open space.
2) Theory of Marta Rojas del Alamo, Anita Rui Olds, and Joseph de Chiara (et.al) on the need for children's playing activities.

After that, the author analyzed two quasi-public open space as a precedent study, namely the Darling Quarter playscape (Sydney, Australia) and the Imagination Playground (Manhattan, New York City). Then, the author conducted a study of observation and analysis of two case studies, namely Tribeca Park (Podomoro City superblock area, West Jakarta) and the River Walk (Rasuna Epicentrum, South Jakarta).

II. Basic Theory and Precedent Study

2.1. Criteria of Quasi-public Open Space

To see the quality of the quasi-public space, the author studied the criteria of public space from Jan Gehl, Clare Cooper Marcus and William Whyte. The author used it in the context of the superblock area, where there are restrictions on the definition of "public" as well as the specific regulations set by the authorities or managers.

Jan Gehl, a Danish architect famous in his book "Life Between Buildings, Using Public Space" and "Cities for People" states that the issue of design and detail of quality of public open space is encapsulated in three main categories: 1) Protection, 2) Leisure, and 3) Pleasure. These qualities are summarized in the following diagram.

In this study, the author also used a formulation of the theory of the success of the plaza[1] by Clare Cooper Marcus and William Whyte. These criteria are: Location & Size, Natural Elements, Activity, Zoning, Circulation, Cityscape, and Complement. The author then drew on the success criteria of the plaza with the quality of open space according to Jan Gehl.

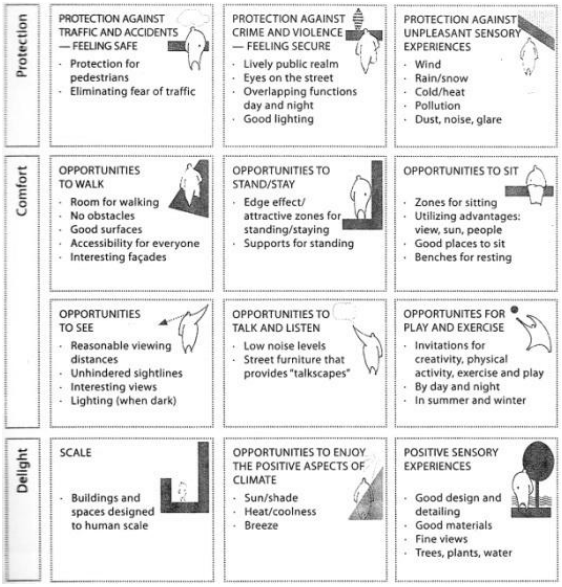


Diagram 2. Quality of Public Open Space
Source: Gehl, 2010, 239

Within the superblock, the degree of space that has been limited by the authority (in this case, the developer and manager) makes the scope of definition "public" is more limited, it is no longer on the entire urban community. However, the definition of "public" remains as a mix of all ages of society, including children.

2.2. The Needs of 6-12 Years Old-Children's Play Space

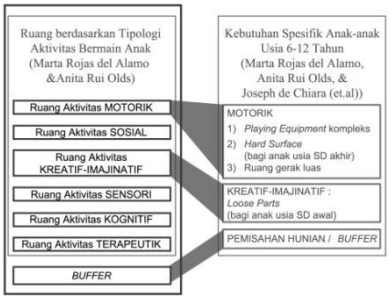


Diagram 3. The Needs of 6-12 Years Old-Children's PlaySpace
source: Marta Rojas del Alamo, Anita Rui Olds, and Joseph de Chiara (et.al), concluded by author

Children need space to perform various types of gaming activities. According to the book Design for Fun: Playgrounds and Child Care Design Guide, there are six games typology of activity, namely:

1) Physical Play (motoric)
2) Social Play
3) Creative-imaginative Play

4) Sensory Play
5) Cognitive Play
6) Therapeutic Play (for children with special needs).

Along with their age, the children show their development both physically and psychologically. These condition also affects the type of play activity and the need for their playroom. As for children of primary school age (6-12 years in Indonesia), they have a greater need of playing activity itself.

For the final step of literature study, the authors summarized the criteria of Quasi-Public Open Space and Needs of 6-12 Years Old-Children's Play Space. Therefore, the quality of a quasi-public open space as play space for children aged 6-12 years were determined by five main criteria, namely:
1) Physical Condition of Space,
2) Protection,
3) Comfort in Activities,
4) Pleasure, and
5) Space of Playing Activities.

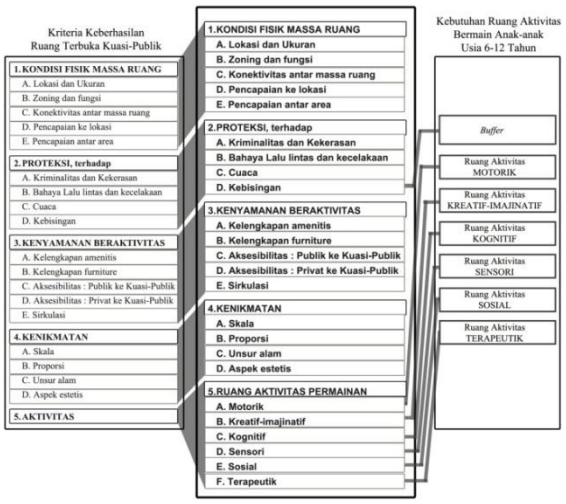


Diagram 4. Conclusion of The Literature Study
source: Clare Cooper Marcus, Willian Whyte, Jan Gehl,Marta Rojas del Alamo, Anita Rui Olds, and Joseph de Chiara (et.al), concluded by author

The five criteria that will be used to analyze the precedent study. As for the Achievement to The Location and the Inter-Area Achievement in Physical Condition of Space criteria, as well as two types of accessibility in Comfort in Activities, they are aspects from the results of the adjustment to the quasi-public condition.

2.3. Criteria Of Quasi-public Open Space As Children's Play Space

The author takes Darling Quarter Playscape and Imagination Playground as precedent studies. Both were chosen because, although not within the superblock areas, Darling Quarter Playscape and Imagination Playground act as quasi-public open space (both the user community and surrounding buildings) as well as children's play space.

From this table, the author obtained seven criteria required a quasi-public open space as children's play spcae. Each of these criteria has aspects to the definition of the earlier theories. These criteria are outlined in the following table.

The criteria will be used to analyze selected case studies the authors, namely Tribeca Park in Podomoro City superblock area and the River Walk in the Rasuna Epicentrum superblock area.

Table 1. Conclusion of Precedent Study

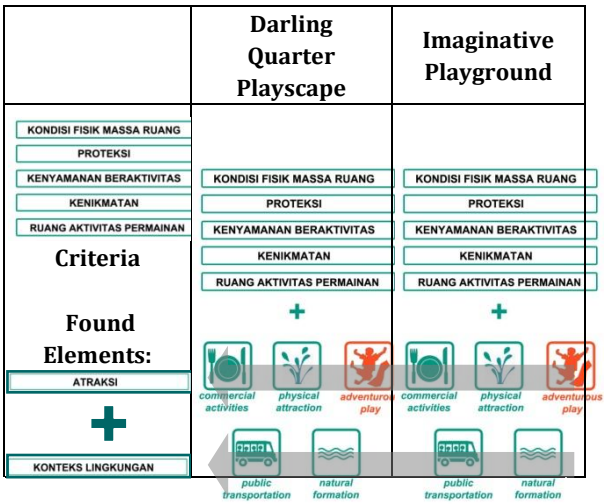


Table 2. Criteria of Quasi-public Open Space as Children's Play Space

KRITERIA	ASPEK
1. Physical Condition of Space	A. Location
	B. Zoning and Function
	C. Mass Connectivity
	D. Achievement to The Location
	E. Inter-Area Achievement
2. Protection	A. Criminality and Violence
	B. Traffic
	C. Weather
	D. Noise
3. Comfort in Activities	A. Amenities
	B. Furniture
	C. Public-to-Quasi-public Accessibility
	D. Private-to-Quasi-public Accessibility
	E. Circulation
4. Pleasure	A. Scale
	B. Proportion
	C. Natural Elements
	D. Aesthetic Aspect

5.	Space of Playing Activities	A. Motoric
		B. Creatif-imaginative
		C. Cognitive
		D. Sensory
		E. Therapeutic
		F. Social
6.	Attraction	A. Commercial Activities
		B. Physical Attraction
7.	Environmental Context	1) Public Transportation
		2) Natural Formation

III. Analysis of the Quality of Quasi-public Open Space

The results of observation were analyzed using the criteria that have been obtained from previous studies. The author will analyze the quality of the space Tribeca Park and River Walk, and how both meet the criteria of quasi-public open space as a children's play space.

3.1 Tribeca Park

Diagram 5. Podomoro City's Mass Connectivity
Source: podomorocentralpark.blogspot.com, with modifications

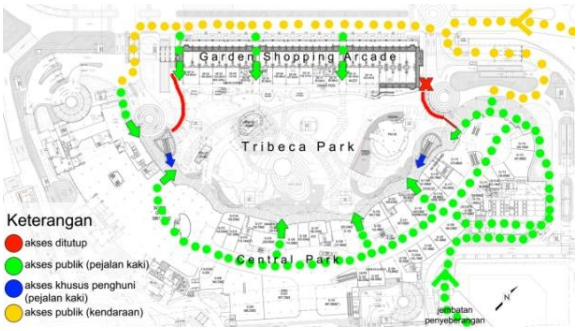


Diagram 6. Achievement to Tribeca Park

At the Central Park Mall complex, almost every mass is interconnected, while the residential zone has lower quality of connectivity. This is because the third block of the parking lots. The quality of connectivity between blocks of apartments with a Mediterania Royal Park in Tribeca is relatively high, because there are underpasses that connects the two areas.

Fig 1. Tribeca Park
Source: www.google.com

a. Physical Condition of Space

In general, the physical condition of space in Tribeca Park, Podomoro City superblock, has been very good. The most prominent quality is the Mass Connectivity, Achievement to Location and Interarea Achievement.

Mass Connectivity

The mass space of Podomoro City consists of two complex: Central Park Mall and apartment complex.

Achievement to Location

Visitors can reach Podomoro City through the bridge from Jl. Letjen. S. Parman. Residents can reach the residential area Tribeca Park, along the public or the occupants in the form of specific bands underpass connecting the escalator with the Tribeca Park residential area.

Inter-area Achievement

Diagram 7. Inter-area Achievement of Tribeca Park (source: author).

Tribeca Park has a pathway connecting the park as a circulation. During rainy season, there is only one form of canopy shade that connects Tribeca Park at Central Park Mall and GSA. The rest area only relies on the trees to provide shades.

b. Protection

Generally, the quality of protection contained in Tribeca Park in Podomoro City superblock area is rather good. The quality that is still needed is protection against weather and noise.

Weather

Tribeca Park utilizes elements of trees to provide shade from the excessive sunlight. In addition, there are elements in the form of shade canopy along the Central Park Mall, which is the formation of a balcony above it.

Fig 2. Shading Elements of Tribeca Park

Noise

There are four points of the generator exhaust decentralized in Tribeca Park, that potentially produce noise.

c. Comfort in Activities

In the aspect of Public Accessibility to the Quasi Public, author found many regulations implemented at the Tribeca Park:

1) Tribeca Park Hours: 10:00 to 23:00
2) Examination of luggage (security checking point)
3) One of the Garden Shopping Arcade access opens 24-hour with security check
4) Do not step on the grass
5) Smoking is only allowed in smoking area
6) Skateboarding and pets are only allowed in the Playland area
7) Circumference dealers, buskers and street people are banned from entering
8) Licensing of certain activities to the Management Office.

The most prominent quality is aspect of Private-to-Quasi-public Accessibility.

Diagram 8. Special Access for Podomoro City Residents

The Royal Mediterania Garden and the Mediterania Garden 2 occupants have special access in the form of underpasses, which are part of the Central Park Mall itself. The underpass connects the residential area directly to the two entry points at Tribeca Park (escalator).

d. Pleasure

Generally, the quality of the pleasures at Tribeca Park is very good, especially the quality of Natural Elements and Aesthetic Aspects.

Natural Elements

Fig 3. Natural Elements of Tribeca Park

Natural elements are embodied in the koi pond, trees, grass and rock textures on the pathway. Intensity of sunlight and the breeze in the area of Tribeca Park add to the quality of the natural elements in it.

Aesthetic Aspect

Tribeca Park have views of Central Park Mall building, GSA, Pullman Hotel, Central Park Office Tower and the tower-tower apartment Royal Mediterania Garden and the Mediterania Garden 2. During the evening, Tribeca Park obtain views of buildings decorated with lights.

Fig 4. Cityscape of Podomoro City

e. Space for Playing Activities

In general, the quality of Space for Playing Activities in Tribeca Park is good. The most prominent aspects is Motoric Play.

Fig 5. Motoric Play at Tribeca Park

Motoric activity also potentially occurs in the area of event space (the amphitheater). Elementary school age children tend to run around the musical fountain circle. They also can take advantage of architectural elements such as ramps, stairs, pools, pathways and so on to play.

f. Attraction

Generally, the quality of the attractions available at Tribeca Park in superblok Podomoro City area is quite well, because the quality of Commercial Activities and Physical Attraction is good.

Fig 6. Commercial Activities at Tribeca Park

Fig 7. Physical Attraction at Tribeca Park

Commercial activities takes the form of snacks and a pavilion tent houses that attract visitors, while the quality of physical attraction in Tribeca Park is manifested in the form of public art, musical fountain, and where events Amphitheatre show.

g. Environmental Context

Tribeca Park has an access to the pedestrian bridge that connects directly to the Busway stop S. Parman. It is easier for the public to directly access the Tribeca Park via the Busway, and is a good form of embodiment of public transportation aspect.

The quality of the environmental context in Tribeca Park still needs to be improved. The river near Podomoro City is not used as part of the Tribeca Park, but as a land boundary with Podomoro City and urban space. Nonetheless, Tribeca Park held a natural ele- ment in the form of a pool.

From the description of the analysis of the results of such research through observation, the quality of Tribeca Park is summed up in the following diagram:

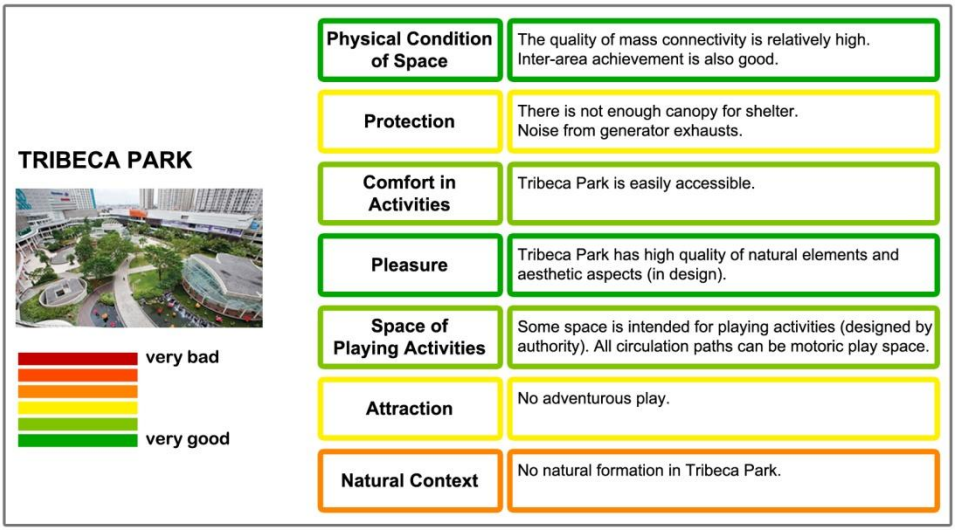


Diagram 9. Tribeca Park's Quality as Children's Play Space

In addition to the seven criteria, the authors found that the presence of system operating hours in effect at Tribeca Park also affects its quality as a quasi-public open space. Located in the commercial zone (Central Park Mall and GSA), it makes the existence of operating hours to be one important thing. With the operating hours, the quality can be enhanced protection against crime, and the convenience of the user activity can be maintained from passing the activity of loading and unloading of goods. On the other hand, the quality of public accessibility to it being less good.

Tribeca Park has quite strict activity and behavior management. One of them is a special zone called Playland. There, the children are free to do any motoric play, with the supervision of security personnel. Playland is usually used for skateboarding, dancing, playing with a pet dog, and pony ride (provided by the Central Park Mall). But, this program doesn't work as expected, it is quite a dull space. Children don't react to this space as a playspace, they use the entire space of Tribeca Park as play space with their perception.

3.2 River Walk

a. Physical Condition of Space

In general, the physical condition of the masses of space in the River Walk area in Rasuna Epicentrum superblock is not very good. The

quality that needs to be improved is the mass connectivity and the Interarea Achievement.

Fig 8. River Walk

Mass Connectivity

Mass space of Rasuna Epicentrum is split into three by Jl. H. Rasuna Said and Cideng River (Jl. Taman Rasuna North, River Walk, and Jl. Merdeka Bridge), the residential complex, and compound complex Epicentrumwalk Ferstival Market. Mass connectivity is shown in the following diagram.

Diagram 10. Mass Connectivity in Rasuna Epicentrum
Source: www.skyscrapercity.com, with modifications

Connectivity between the mass of the River Walk space is less good. This is caused by the lack of the bridge as connector (only two bridges, in the North and South sides of the River Walk).

Inter-area Achievement

River Walk has a pathway that broadly follows the formation Cideng river, with two bridges that far apart. There is a canopy on the River Walk. At the time of rain, there is no adequate connector.

b. Protection

The quality of protection against criminality is good, but protection against traffic accident, weather and noise is still to be improved.

Traffic

There are three zebra crosses on the West side of the River Walk, while the East side has two, with security guard there. Place River Walk, flanked by two road segment and the absence of restraint, makes the risk of traffic accidents is higher, especially for children.

Fig 9. Crossing Facility at River Walk

Weather

River Walk utilizes elements of trees as shade from the excessive sunlight. On the West side of the River Walk (**Figure 9a**), trees as shade functions properly. In contrast, vegetation in most parts of the East side of the River Walk (**Figure 9b**) is in the form of shrubs and tall palm trees, which can not provide enough shade. The condition causes the west side of the River Walk is more crowded than the east side. River Walk does not have a canopy, so there is no adequate shade to connect inter-area of the River Walk.

(a) (b)

Fig 10. Trees as Shade

Noise

Wedged between motor vehicles highway, The noise can still be heard clearly. It also quite affects visitor's comfort when talking on the River Walk.

c. Comfort in Activities

Generally, the quality of the comfort in activity found in the River Walk is good, although there is no special access for the residents in Rasuna Epicentrum. In the aspect of Public to Quasi-public Accessibility, public access to the River Walk is stairs and ramps.

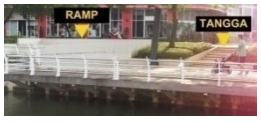


Fig 11. Public Accessibility to River Walk

On the other hand, River Walk as quasi-public open space has fewer regulation from the authority. This is because River Walk is located between two segments of the highway, so the River Walk is more public than the Tribeca Park. River Walk is accessible 24 hours for public.

There is no security checking point or luggage inspection.

d. Pleasure

In general, the quality of Pleasure in River Walk is very good, especially the quality of Natural Elements and Aesthetic Aspects.

Natural Elements

The element of water is expressed by Cideng river and artificial ponds found on the River Walk. There are vegetations like trees, bushes, grass, low shruba and flowers. The intensity of sunlight and breeze add quality to natural elements.

Fig 12. Natural Elements in River Walk

Aesthetic Aspects

Fig 13. Aesthetic Aspects in River Walk

River Walk have views of Cideng river, apartment buildings, Epicentrum Walk and Bakrie Tower. The design of River Walk supports the formation of river Cideng. There are railing surrounding the edge of the river, in unique design. The element of water in the ponds also improve the quality of this aspect.

e. Space of Playing Activities

The quality of Space of Playing Activities in the River Walk is spelled out rather well. Despite not having a special play area such as Tribeca Park and not having any sports fields, the most prominent quality is on the aspects of Motoric Play. Children can take ad- vantage of architectural elements to perform motoric play.

The location of River Walk affects the freedom of children aged 6-12 years there to explore their playing activities.

Fig 14.Motoric Play in River Walk

f. Attraction

The quality of the attractions at the River Walk in the Rasuna Epicentrum superblock area is bad, because it has neither aspects of Commercial Activity or Physical Attraction.

g. Environmental Context

The quality of the environmental context River Walk is spelled rather well, with high quality of Natural Formation aspect, because it utilizes Cideng river as a major element of the open space.

From the description of the analysis of such research through observation, the quality of the River Walk can be summarized in this following diagram:

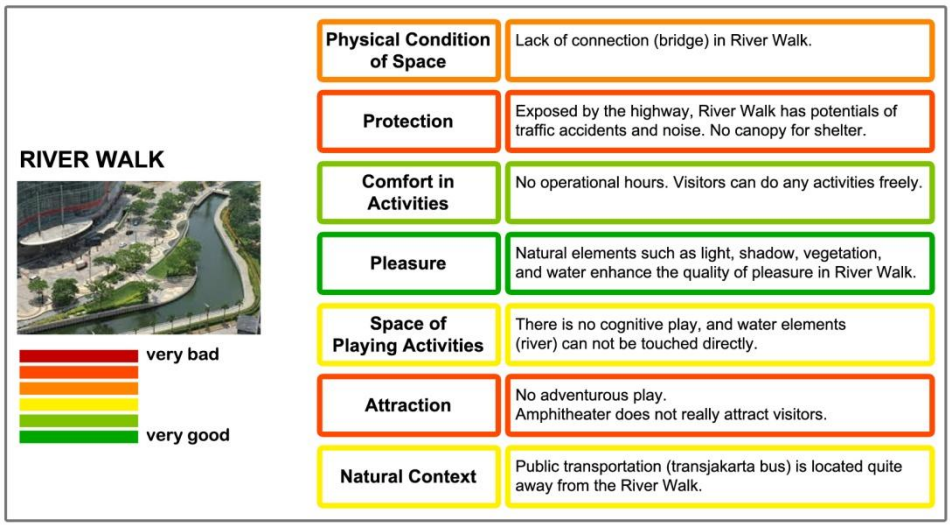


Diagram 11. River Walk's Quality as Children's Play Space

IV. Conclusion

Basically, this study aims to find criteria for quasi-public open space that can meet the needs of children's playing activities in the superblock area. From the literature study and the precedent that has been done, there are seven criteria for quasi-public open space that can meet the needs of children's playing activities in the superblock. These criteria are Physical Condition of Space, Protection, Comfort in Activities, Pleasure, Space of Playing Activities, Attractions, and Environmental Context.

Physical Condition of Space consists of five aspects, namely: Location, Zoning & Function, Mass, Achievement to Location, and Inter-area Achieve- ment. Protection criteria is consisted of Protection against Crime and Violence, Protection against Accidents Hazards, Protection against Weather and Protection against Noise. Comfort in Activities can be achieved by the fulfillment of the following five aspects: Amenitis, Furniture, Public to Quasi-public Accessibility, Private to Quasi-public Accessibility, and Circulation. Pleasure criteria includes the aspect of Scale, Proportion, Natural Elements, and Aesthetic Aspects. Criteria for Space of Playing Activities consist of space for Motoric Play, Creative-imaginative Play, Cognitive Play, Sensory Play, Therapeutic and Social Play. Attraction has two aspects, namely: Commercial Activities and Physical Attraction. The last criteria, Context Environment, can be achieved by the fulfillment of Public Transportation and Natural Formation.

The additional elements owned by Tribeca Park is the operating hours based on the applicable regulation or SOP, which is caused by the location of Tribeca Park (located in a commercial zone Podomoro City area). The system reinforces the degree of Tribeca Park space as an overmanagement quasi-public open space, not only the operational hours, but also the management of activities, such as smoking areas, shopping / commercial activities, certain rules, and "Playland" as the space only for skateboarding and horse riding. However, with the overly management of public behavior, Tribeca Walk suceeds in its function as active quasi-public space.

On the other hand, the River Walk which is exposed to the highway North Taman Rasuna does not have operating hours or any restricted rules. With no behaviour control, it can be said that River Walk is an undermanagement quasi-public open space. However, with lack of activity regulations from the authority, there are not many dynamics in River Walk.

It can be concluded that beside those criteria, quasi-public open space in superblock area in Jakarta needs balance between management and freedom of activities to be an active and lively space for public.

This research still needs to be deepened in the study of the activity of play space provision require- ments. If there is a follow-up study of this material, the authors hope the study will examine the quasi-public open space more thoroughly, with attention to the requirements of child-friendly environment for playing activities (for example: from Helen Tovey's book: *Playing Outdoors,* 2007, p. 58-81).

Foot Notes

[1] This theory is summarized by Addi Darmawan (2013) in his final project, entitled "*Kriteria Peningkatan Kualitas Ruang Terbuka Kota di Jakarta melalui Studi Tipologi (Studi Kasus: Plaza dalam Distrik Jakarta Kota)"*. Plaza is one of public open space form. The word "plaza" is drawn from the Spanish, it means "place" of activities. Therefore, the success criteria plaza as a "place of activity" is used, because this study wanted to examine the quasi-public open space that serves as a "place of activity", and has the character of a plaza in it.

References

1) Alamo, Marta Rojas del (2004), *Design for Fun*: *Playgrounds*, Links International, Barcelona.
2) Chiara, Joseph de, Julius Panero dan Martin Zelnik, (1984), *Time Saver Standards for Housing and Residential Development,* 2nd ed, McGraw-Hill Companies, Inc, Singapore.
3) Day, Christopher (2007), *Environment and Children: Passive Lessons from the Everyday Environment.* Elsevier—Architectural Press, Oxford.
4) Efroymson, Debra, et.al. (2009), *Public Space: How They Humanize Cities*. Health Bridge—WBB trust, Dhaka.
5) Gehl, Jan (1996), *Life Between Buildings, Using Public Space*. Arkitektens Forlag and Jan Gehl, Bogtrykkeriet-Skive.
6) Gehl, Jan (2010) *Cities for People,*Island Press, London.
7) Lennard, Henry L. dan Suzanne H. Crowhurst Lennard (2000), *The Forgotten Child.* Gondolier Press Book, California.
8) Olds, Anita Rui (2001), *Child Care Design Guides*. The McGraw-Hill Companies, Inc, Quebecor/Kingsport.
9) Darmawan, Addi (2013), *Kriteria Peningkatan Kualitas Ruang Terbuka Kota di Jakarta melalui Stud Tipologi (Studi Kasus: Plaza dalam Distrik Jakarta Kota),* Universitas Pelita Harapan, Tangerang.

Create Urban Catalyst to Blend Formal Informal Activities in City Centre

Wakhidah Kurniawati [1,2]

[1] Lecturer, Urban and Regional Planning Department, Faculty of Engineering, Diponegoro University
[2]Promotion, Architekture, TU Darmstadt

Abstract

City centre is a place where many activities mix. Formal activity coexists with informal activity in this place. Even though, the coexistence between these activities shows the disorder in arrangement. Furthermore, it generates visual degradation in the city centre. On the other hand, formal and informal activities are the dependent activities each others. Thus, a city centre needs urban catalyst to mix each other. Urban catalyst is an instrument to encourage public activities in the city. This instrument can be created as a compromised space. This compromised space could be divided in two forms, such as unity space and separated space. The unity space means a space with multi activities there. Instead, the separated space is a coexistence space in a clear edge or in linking step. Both of these spaces encourage blending formal and informal activities in city centre. The city centre of Semarang which is called Simpang Lima District will be explored to give an explanation about urban catalyst in Indonesian city. The comparative analysis with urban catalyst theory will be used as the analysis method in this paper. The result that could be concluded is the new design of Simpang Lima Semarang is a compromise space which is successful as a catalyst design. Based on this result, we could know that one of the appropriate urban catalysts in Indonesian city to encourage blending formal and informal activities in city centre is a 'compromise space' form.

Keywords: *urban catalyst, formal activity, informal activity, city centre*

I. Introduction

No life without chemistry, it is the common word for chemists. It is certainly true that city is a laboratory which has function to cook many activities reactions as a part of chemical substances to be a good blend arrangement. In addition, city centre is an important part in a city to flourish those activities happening there. We need an urban catalyst to foster the activities reactions.

Actually, there are two types' activities in Indonesian cities: formal and informal activities. Formal activities are official activities, which are regulated, organized, lawful and legalized in land use planning. On, the other hand, informal activities are part of unorganized activities, unlawful, unregulated, not afforded protection of the state, and sometime have intercomnection and continuity with the formal activities. They support each other to create balancing interaction between them.

Wakhidah Kurniawati
--- Lecturer, Urban and Regional Planning Department, Faculty of Engineering, Diponegoro University
E-mail: wakhidahkurniawati3@gmail.com; w4t1ek@yahoo.com; w.kurniawati@undip.ac.id

In order to optimize the function of the city as a laboratory, and to enhance urban fabric function as a tool of chemistry reaction, this paper will discuss about urban catalyst which could be an instrument to enhance city's activities.

II. Literature Review

2.1 Formal and Informal Activities as an Important Material in City Centre

Formal is 'following or according with established form, custom, or rule' or 'done in due or lawful form''. Meanwhile informal is 'not according to the prescribed, official, or customary way or manner; irregular; unofficial. Whereas, activities has meaning as 'the condition in which things are happening or being done' or 'a thing that a person or group does or has done'. It has synonym words with pursuit, occupation, venture, undertaking, enterprise, project, scheme, business, job, affair, task, campaign. So, based on the reference, this article can conclude that formal activities has means lawful task / project / business, whether informal activities has definition as unofficial task / project, business.

Yet, in Public Places Urban Spaces, Gehl in Carmona (2003, 107) said that there are three type outdoor activities which are using a space, such as: necessary activities, optional activities, and social activities.

Necessary activities are more or less compulsory activities, such as going to school or work, waiting a bus etcetera. Optional activities are voluntary activities when time, space, and weather possible. The examples of optional activities are walking for breathing fresh air and stopping for coffee in café street. On the other hand, the social activities are spontaneously activities which are occurred because of presence of others and high quality of space. If the quality of space is poor, it just could invite necessary activities. The examples of social activeties are greeting, conversation, communal activities and others. (Gehl in Carmona, 2003, 107).

Table 1. Type of Outdoor Activities

Outdoor activities	Inducement & Influence of Physical Environment	Character & Example
Necessary activities	Obligation, necessity; Minimal influence	Functional; Going to school or work, waiting a bus
Optional activities	Free choice; Big influence	(Mostly) Recreative; Walking for breathing fresh air, stop for coffee in café street
Social activities	Spontaneous; Indirect influence	Interactive; Communal activities, greeting, conversation

Source: Gehl in Carmona (2003, 107); http://www.bwk.tue.nl

Necessary activities create a functional space which is tending to be formal function of space, such as school, transit stop, formal economic places, and others. Whereas, both optional and social activities could create formal and informal space depends on the legitimacy of the space. Activities in plaza could be formal if the activities legitimate by government, but it could be informal if just legitimate by community but not by the rule.

The social activity is the benchmark of using a space. So, for the next discussion, this paper will use social activities as one point to analyze.

Beside social (socio-cultural) activities, there is another activity that we call it as economic activities. Economic activities could be formal if they already written in master plan and city regulation, whereas some of them are informal because of not stated in master plan. Both of them need each other. One-third employees in formal activity need support from informal activity. Formal and informal economic activities are dependency each other.

City centre is a place where many activities mix. Formal activity coexists with informal activity in this place. Even though, the coexistence between these activities shows the disorder in arrangement. Furthermore, it generates visual degradation in the city centre. On the other hand, formal and informal activities are the dependent activities each others. Thus, a city center needs urban catalyst to mix each other in order to make it harmony and do not disturb each other. The formal and informal activities have a special time in practice like daily or eventually. See **Table 2**.

2.2 The Importance of Urban Catalyst

Catalyst is a substance that increases the rate of a chemical reaction. The other meaning state that catalyst is somebody or something that makes a change happen or brings about an event. So, based on this definition, urban catalyst is something that could change happen in the urban area.

Logan and Attoe (1992) said that urban catalysis in urban centre should bring a vision for the new urban center. City centre should be modest and incremental, but their impact should be substantial, in contrast to the large visions that have been the rule, with their minimal or catastrophic impact. In another statement, Logan and Attoe (1992) said that: '*We find the chemical / catalytic analogy to be more useful and versatile. An urban catalyst might be a hotel in one city, a shopping complex in another, a transportation hub in a third. It could be a museum or theater. It could be a designed open space or, at the smallest scale, a special feature like a colonnade or a fountain*'.

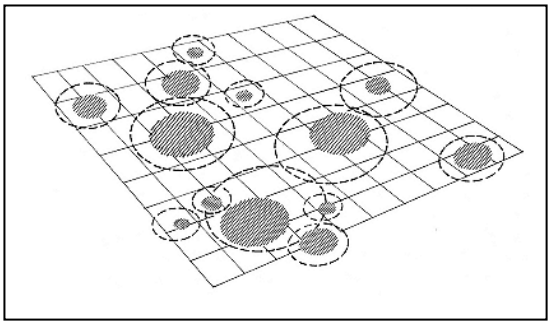


Fig.1. The Style for Urban Catalyst.
Source: Logan and Attoe in Watson, 2003

One of successful example of urban catalyst in America is in Milwaukee. The Grand Avenue Project in downtown of Milwaukee created not only better historical retail space, but also could attract investment from public and private interest (Logan and Attoe in Watson, 2003).

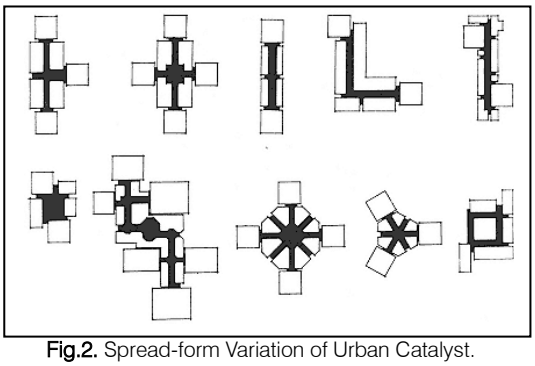


Fig.2. Spread-form Variation of Urban Catalyst.
Source: Logan and Attoe in Watson, 2003

The main principles that must be considered in implementation of urban catalyst program are stated as below by reference of Grand Avenue case study (Logan and Attoe in Watson, 2003):

1. The new element modifies the elements around it;
2. Existing elements are enhanced or transformed in positive way;
3. The catalytic reaction does not damage its context;
4. A positive catalytic reaction requires an understanding of the context;
5. Not all catalytic reaction are the same;
6. Catalytic design is strategy;
7. A product better than the sum of ingredient;
8. The catalyst can remain identifiable.

Based on the main principles above, we could know that urban catalyst process and strategy are very importance to enhance good impact project into larger space especially in city center.

Table 2. Example of Formal and Informal Activities in City Centre

Type of Activities	Social Activities	Economic Activities	Explanation
Formal Activities	Routine agenda	Mall, shop, cafe	Could be daily or eventually
Informal Activities	Skateboard etc	Hawker etc	(Mostly) daily, weekly

Source: Analyze, 2014

III. Methodology

The objective of this article is to understanding about urban catalyst implementation in enhancing blending process between formal and informal activities in Simpang Lima Semarang. Based on comparative analysis, this article will compare the theory of urban catalyst in public space and the implementation of urban catalyst in Simpang Lima Semarang. After that, this article will conclude about how is the implementation of urban catalyst in Simpang Lima Semarang.

The steps of this research are: 1) Identifying the characteristics of formal and informal activities in research area; 2) Comparing the theory of urban catalyst in public space and implementation of urban catalyst in Simpang Lima Semarang; 3) Discussing the urban catalyst model in Simpang Lima Semarang ; 4) Conclude the result.

The focal point of this study is the great public space in Semarang City as a new alun-alun that located in Simpang Lima Semarang. Simpang Lima is the most attractive public space in Semarang, Central Java Province, Indonesia.

IV. Discussion: Creating the Appropriate Urban Catalyst in Indonesian City

Semarang, as a capital city of Central Java Province has city centre which we call it as 'Simpang Lima'. Simpang Lima is a commercial area which has a big square that we call it as - Lapangan Pancasila and commercial strip around the square.

The history shows that Simpang Lima Plaza (Lapangan Pancasila) built in 1969 as new city centre in Semarang and replaced the function of 'alun-alun Semarang' in the old city area. In the first time, the square was surrounded by gymnasium, mosque, and school. At that time, Simpang Lima Plaza became a center of socio-cultural and transit point.

Fig.3. Simpang Lima Semarang and Lapangan Pancasila
Source: http://id.wikipedia.org

Day by day, the commercial strip such as Ciputra Mall, Matahari Supermarket Plaza and other formal economic activities replaced the socio-cultural building there. The function of Simpang Lima Area changed into Central Business District in Semarang. Meanwhile, the function of Simpang Lima Plaza still survive as center of socio-cultural and economic activities point.

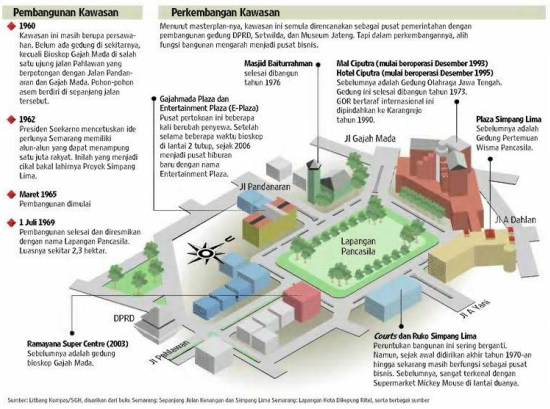


Fig.4. The Growth of Simpang Lima Semarang
Source: www.skyscrappercity.co.id

4.1 Identifying the Characteristics of Formal and Informal Activities in Research Area

Fig.5. Formal economic activities in Simpang Lima Semarang
Source: http://id.wikipedia.org

Fig.6. Informal economic activities in Simpang Lima Semarang
Source: http://semarangmenyapa.blogspot.de; https://mulaidaria.wordpress.com

The existence of Simpang Lima Plaza attracted people there and invited the informal activities/sector. Every week, Simpang Lima Plaza had new function as a place for bazaar activities. The plaza was insurgent because of hawkers and extended activities. The visual quality mixed between 'chaos' because of hawkers and 'interesting' because of lots of people there. At that time, formal and informal activeties/sectors stood by their self. It was like dualistic model. There was no integrated design between formal building and informal sector/ activities in Simpang Lima.

Table 3.
Type of Formal Informal Activities in Simpang Lima Semarang before Rearrangement

Type of activity	Form and Characteristic	Explanation
Formal Activity	Trading activities in Ciputra Mall, Matahari Building, Super Economy Building, Gajahmada Plaza; Education activity in SMK 7, and Religious activity in Baiturahman Mosque	Occur in building. Have a specific time from morning until afternoon and night. The independent design with no integration with the informal activities.
Informal Activity	Hawker, community activity in public space (daily, weekly, event)	Occur in public space (pedestrian ways and plaza), insurgent and chaos public space and sometimes create visual degradation in hawker area.

Source: Analysis, 2014

Fig.7. Shelter arrangement in Simpang Lima Semarang
Source: Simpeda Kota Semarang, was accessed on 24/07/2014

Rearrangement of Simpang Lima Plaza occurred from January-August 2011and opened to the public on December 30, 2011 (Putri, 2013). The hawker tents were replaced by neat and orderly shelters. Each shelter is divided into five blocks; each block is occupied 10-20 merchant.

The rearrangement created the different number of hawkers that located in this place. Below is presented the number of street vendors before and after the rearrangement in this area.

Table 4.
The Number of Hawker Before and After Rearrangement of Simpang Lima Semarang

Location	Hawker before rearrangement	Hawker after rearrangement
E Plasa	21	29
Plasa Telkom/ SMK N 7	25	12
ACE Hardware	16	12
Pertokoan Simpang5	43	30
Plasa Simpang5	41	22
Total	146	105

Source: Putri, 2013

4.2. Comparing the theory of urban catalyst in public space and implementation of urban catalyst in Simpang Lima Semarang

Fig.8. Formalized informal economic activities in Simpang Lima Semarang
Source: wisata.kompasiana.com; seputarsemarang.com

Now, the new design creates compromise space between formal building and informal sector which is formalized by local government. It could be say as formalized by local government because of registered hawkers by local government (105 hawkers (Source: Putri, 2013)), they have fix tax/retribution to local government (Rp 800/m^2 (Source: *Suara Merdeka, 17 January 2012 on Putri, 2013*)), they have semi permanent tents (shelter), and they have uniform furniture, and then so forth.

This rearrangement is likely urban catalyst in Semarang city centre. The design is not only give great impact in upgrade better visual aspect in city centre, but also enhance better investment from informal economic activities actors. Besides, the socio cultural of community becomes more organized.

Table 5. Comparative analysis

No	Principles of Urban Catalyst	Empirical Condition in Simpang Lima Plaza
1	The new element modifies the elements around it	The new stand for hawker in special path is already built
2	Existing elements are enhanced or transformed in positive way	The selling place for hawkers already exist but in arrangement.
3	The catalytic reaction does not damage its context	The design of new place for hawker enhances the visual quality of pedestrian ways and also do not disturb building façade.
4	A positive catalytic reaction requires an understanding of the context	The hawker space become a compromised space which could blend formal and informal activities there.
5	Not all catalytic reaction are the same	Not all design can coherent with the formal building behind. But mostly, there is a symbiosis mutualism between formal and informal sector there.
6	Catalytic design is strategy	The design become strategy to overcome dualistic problems in city centre
7	A product better than the sum of ingredient	The result of design could give lots of impacts: better visual quality, order arrangement, regulated hawkers, attract investment, attract people and tourism.
8	The catalyst can remain identifiable	The new design become the new landmark in Simpang Lima Semarang

Source: Analyze, 2014

4.3 Discussing the Urban Catalyst Model in Simpang Lima Semarang

Related to urban catalyst reaction, the design is an instrument to encourage public activities in the city. This instrument in Simpang Lima Semarang can be created as a compromised space. This compromised space could be divided in two forms, such as unity space and separated space. The unity space means a space with multi activities there. Instead, the separated space is a coexistence space in a clear edge or in linking step. Both of these spaces encourage blending formal and informal activeties in city centre.

Now, there is a strong relationship between formal and informal activities in Simpang Lima. Formal activities/sector provide a little electricity, water, parking lots for informal customer, and also place to keep the thing (bicycle, *becak* etc) for informal sector. There is a symbiosis mutualism. It is different with the past condition. At that time, there was no relationship in design. Both of them are near in location; coexist, but no catalyst space. So, based on the analyzing above, we could conclude that redesign of Simpang Lima Semarang is successful as urban catalyst in blending formal and informal activities there.

In order to redeem about the explanation above, herewith the new design in Simpang Lima Plaza.

Fig.9. Compromised design in Simpang Lima Semarang
Source: bkreatif.co.id

Beside encourage informal economic activities, the new design of Simpang Lima Plaza also could create new social activities for children and teens, such as play skateboard, roller skates, basketball, football, cycling and another sports activities. These activities create induced informal economic activities there, namely roller - skate course, bicycling rental, food stall, drink stall, and others equipment stall there.

Fig.10. Induced social activities in Simpang Lima Semarang
Source: kotawisataindonesia.com; wisatasemarang.com; seputarsemarang.com; log.viva.co.id; backpacolgy.me

V. Conclusion

5.1. General Conclusion

This paper argues that formal and informal activities in city centre are the main material in the process of chemistry reaction in city cen-tre. The new design is an urban catalyst which could accelerate the reaction coherently.

The appropriate design in blending formal and informal activities in city centre is a compromised space which is could be divided in two forms, such as unity space and separated space. The unity space means a space with multi activities there. Instead, the separated space is a coexistence space in a clear edge or in linking step. Both of these spaces encourage blending formal and informal activities in city centre.

Fig.11. Before and After Rearrangement in Simpang Lima Semarang
Source: Analyze, 2014

5.2. Spesific Conclusion

The new design in Simpang Lima Semarang is a good catalyst in blending both formal and informal activities there. The form of the new design is a compromised space.

Acknowledgment

This research is funded by Directorate General of Higher Education (DGHE), Ministry of Education and Culture, Indonesia.

References

1) Carmona, Matthew et all (2003), *Public Places Urban Spaces, The Dimension of Urban Design,* Architectural Press, Oxford.
2) Logan, Donn and Attoe, Wayne (1992). *American Urban Architecture, Catalyst in the Design of Cities*.University of California Press. Berkeley-Los Angeles-Oxford.
3) Putri, Erleine Rastiani Utami (2013), *Dampak Penataan Kawasan Simpang Lima Kota Semarang terhadap Pendapatan Pedagang Makanan*, Unpublished Final Task, Faculty of Economic and Bussiness, Diponegoro University, Semarang.
4) Watson, Donald et all (2003), *Time Saver Standart in Urban Design.* Mc Graw Hill, Massachucet, USA
5) http://www.bwk.tue.nl http://www.merriam-webster.com /dictionary/formal
6) http://id.wikipedia.org/wiki/Simpang_Lima_Semarang
7) http://dictionary.reference.com/browse/ informal
8) http://www.urbandictionary.com/define.php? term=catalyst
9) https://www.google.de/?gfe_rd=cr&ei=AFGPU6fSG4uI8Qe 7wIHYCQ&gws_rd=ssl#q=activity+definition
10) http://semarangmenyapa.blogspot.de
11) https://mulaidaria.wordpress.com
12) www.skyscrappercity.co.id
13) Simpeda Kota Semarang
14) wisata.kompasiana.com
15) wisatasemarang.com
16) Kotawisataindonesia.com
17) Log.viva.co.id
18) Bkreatif.co.id
19) backpacology.me

Finding Children's Playing Place in Lae-Lae Island, Makassar

Ria Wikantari[1], Rahmi Amin Ishak[1], Nurmaida Amri[1], Imrianti[1]

[1]Lecturer, Architecture Study Program, Architecture Department, Faculty of Engineering, Hasanuddin University - Indonesia

Abstract

This paper examines children playing places in terms of functional and spatial features in Lae-Lae Island, an about 22-hectare small island located at about 1.2-kilometre off-shore of Makassar. Population consists of 431 households with 598 children aged 0-14. The objectives are: (1) to identify the functional and spatial features of playing activities, and to find out features that are significantly correlate with the formation of places. Data were collected through extended field observations and questionnaire surveys. Samples consist of 21 units of playing activities involving 92 children who were chosen through accidental sampling. We find that: (1) Traditional game coexists with contemporary one; Players tend to form large group mode rather than couple or solitary; Outdoor place is dominant i.e. streets, paths, bale-bale benches, seawater, boats, boat pier, embankments, sandy beaches, public yards, school yard, tree branches, rather than indoor place i.e. siring space, front and side terraces, stairs of houses. (2) Strongest correlations occur between playing configuration with location, and with area size, also between playing orientation with area size and with spatial scale. We conclude that children instinctively adapt various types of spaces to serve as places for informal playgrounds, in which playing configuration and orientation, also location, area size, and scale of the places are the most significant features.

Keywords: *children's playing place, traditional game, small island settlement, functional feature, spatial feature*

I. Introduction

Current urban and architectural developments indicate greater tendency of unawareness towards accommodation of children's play activities in public places. Insufficiency of play places appears to have compelled children to easily choose playing electronic games that need fewer spaces rather than traditional ones. Rapid flourish of indoor game centres and playing spaces nowadays has increased accessibility and affordability of electronic games for children in urbanized environments. Virtual games resulted from technological advancement have indeed encouraged cognitive excellence with varied and strongly imaginative, emotional, and creative explorations. However, such electronic games apparently tend to be played in solitary modes in artificial environments that necessitate less bodily motions.

There is also anxiety of parents and educators towards contents of the electronic games that some may include certain degree of violence that could psychologically harm children. Meanwhile, children activities to play traditional games tend to have been decreasing. This may due to less opportunities and lack of play spaces in urbanised environments, or, may partly due to stronger fascination towards electronic games that are considered to be more modernized and advanced. Traditional games are usually played in natural environments involving various sizes of groups of children with rich bodily motions. These games have actually been also encouraged cognitive, imaginative, emotional, and creative explorations in their own way, in addition to strong social interactions.

Playing various games is an essential part of children life in accordance with growing stages of psychological and physical developments to become a smart and creative social being. On one hand, there have been increasing tendency of children preferences toward artificial-electronic game types rather than natural-traditional ones. Decreasing availability of formal and informal places that provide opportunities for playing traditional games has occurred in urban settlements, particularly in densely popu-

Ria Wikantari
---Senior Lecturer, Architecture Department, Faculty of Engineering Hasanuddin University, address: Kampus Unhas Tamalanrea, Jln. Perintis Kemerdekaan Km.10 Makassar Indonesia 90245
E-mail: wikantaria@yahoo.com

lated area such as the inner city and the waterfront of Makassar. On the other hand, we realise the importance of waterfront environments including adjacent small islands to highlight the urban façade. Accordingly, we intend to search for the significant features of children's playing places in Makassar's waterfronts where traditional games have still been played.

With the densely populated Lae-Lae Island acts as a living laboratory for our examinations we question: (1) What kind of architectural features - in terms of functional, spatial, and player - that form children playing places in densely-populated urban space such as Lae-Lae Island? (2) Which features significantly correlate with in the formation of the places?

II. Theoretical Basis

Tendency of changes in games preference and playing behaviour among children has also been taken place in many places globally. Bishop and Curtis (2005) [1] affirm similar situation has occurred particularly among elementary school. Children tend to forget traditional games and choose to play new ones in dominantly solitary manner. Bishop and Curtis argue that the situation has been due to the lack of playing facilities such as playgrounds that encourage children gatherings, interactions, and free motions.

Arge (2006: 60) [2] identifies that traditional games played by Makassarese children widely vary, such as the followings. *Cincing Banca*: a game with hand fingers and hands; *Dende-dende*: a game of steps and jumps with a certain pattern drawn on the ground; *Lambasena*: a game of rope jumping; *Cincing Pene'*: a game of stone or pebble hiding; *Boom* or *enggo jaga*: a game of guarding a pole; *Boi*: a game using a paper ball and a pile of stones; *Jangang-jangang*: a game of hide and seek in *sarung* cloths; *Cangke'*: a game of hitting short wood stick with long wood stick; *Beklang*: a game using bouncing small rubber ball with a set of 4 or more sea shells (usually played by girls); *Asing*: a game of safeguarding and defending a set of square areas; *Santo-santo*: a game of hitting a pile of stones in a distance with a stone; *Buang-buang karet*: a game of throwing rubber bands on small containers; *Kacang-kacang panjang* or *dames*: a game of drawing choices using hands that in other places known for examples as *hompimpang* or *'jangken-kenpong'*; *Simsim*: a game of singing songs with hand moving; 0x0: a game with a checker board; *Gandrang bulo*: a game of rhythmic dancing by striking bamboo drums of various sizes.

Children's traditional games that are frequently played in Lae-Lae reflect both social system and physical culture of Makassar. They show seven features comprise: type of the game, spatial configuration for playing, instrument used for playing, time or duration, number of the players, age of the players, and the players' gender type.

Regarding space, place, and children Tuan (1977:31-32) [3] argues that in any environment children's emotional attachment to space always occurs. Children spatial experiences in the environment generate at least 3 emotions, namely the feelings of: (i) A need to be in space which is influenced by awareness of their own scale, e.g. comfort to be in spaces of children scale; (ii) Existence in space which is influenced by cognition on characteristics of certain place, e.g. whether the place is natural or artificial, large or small, spacious or tight, and so on; and, (iii) A strong sense of property towards certain space as a personal place which is influenced by perception on compatibility of a space to self being and the possible activities to be done. Tuan also asserts that wherever children are they immediately feel attachment to the environment where they are and where they conduct activities. Such a strong place attachment enables children to enact free motions, active movements, and frequent interactions in physical spaces.

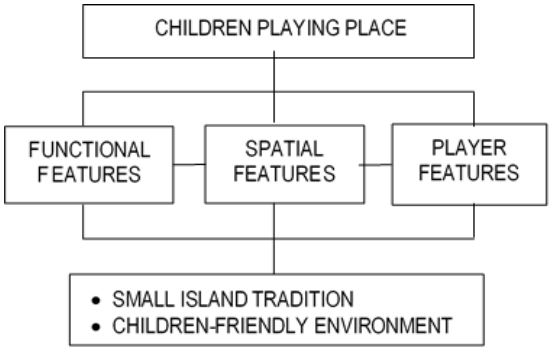


Fig. 1 Conceptual Framework

This implies that places for children play activities tend to be flexible and adaptable, depending on the spatial, functional, and players' features. In spatial flexibility, spaces facilitate and stimulate various types of activities. Places are determined by dynamic activities of players stimulated by available spaces. In this case, the places tend to be constant, whereas activities, spaces, and players are variable. In place adaptability, spaces adapt to various needs of players' activities. Spaces are dynamic, facilitate and accommodate various needs of players' activities, whereas activities are cons-

tant and determine the spaces to facilitate and accommodate them. Thus, spatial, functional, and players' features are independent variables for the formation of children-friendly playing places.

III. Method

This research is descriptive based on quantitative and qualitative data that were collected through field surveys in Lae-Lae Island. It is a densely populated small island located adjacent to waterfront of Makassar at about 1.2-kilometre off shore. It is an about 22-hectare island, a part of Spermonde Islands that spread over Makassar Strait. As a part of the about 1.4 million population of Makassar city the Lae-lae inhabitants are 1563 people of 431 households, with the density of 7.105 people per square kilometre.

Fig.2a Lae-Lae Island & Its Adjacency to Mainland Makassar *(Source: Google Earth, 2013)*

Fig.2b Densely Populated Lae-Lae Island *(Google Earth, 2013)*

Population of this research is 598 children aged 0-14. Samples were chosen through non-probabilistic accidental sampling method, consisting of 21 units of playing activities involving 92 children aged 2-14 who were actually playing at the time of field surveys. The unit of analysis is group of children playing rather than individual child. The number of children found in a playing unit varies from solitary 1 to group of 7. Primary data were collected through extended field observations and questionnaire surveys carried out in 2 weekdays and 2 weekend days.

Data analysis consisted of two stages. Initially, descriptive-explanative analysis were carried out for the purpose of answering the research questions about architectural features that form children playing place. Subsequently, correlation analysis using SPSS program were undertaken tin order to find out features that significantly correlate with in the formation of the places.

4. Result and Discussion

4.1 Playing Activities

Figures below describe play activities conducted by children in Lae-Lae. **Fig.3** shows that traditional game types are still frequently played with a proportion of 38.1%.

Furthermore, Fig.4 shows diversity of the game types, in which cycling (19.0%) and digital game boy (9.5%) dominate the modern type, while hide-n-seek, swimming, and catching small fishes dominate the traditional (9.5% each). Few other traditional games are *kelereng* i.e. hitting small glass balls by means of certain finger motions, and sit-n-chat (4.8% each). The rest of the games includes soccer, pretend-to-be school, pretend-to-be home, robot, tamiya car, and chess.

This clarifies that the traditional game types here are also common in other places. Unfortunately, those are not as specific to Makassar as listed by Arge (2006). However, some games are specific to the nature of waterfront environments and island settlements, namely swimming and small-fish catching.

Fig. 3 Proportion of Game Types: Modern & Traditional

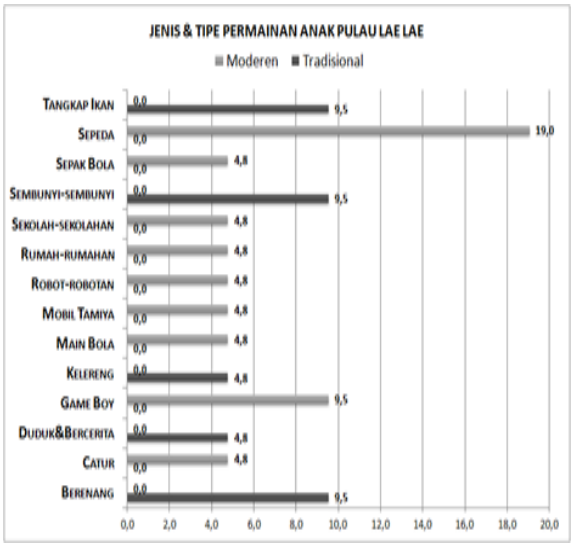


Fig. 4 Diversity of the Game Types

The following **Fig.5** shows that playing activities are usually in groups of 2 and more children (85.7%), however solitary playing is still found (14.3%). The most common are small groups of 2 (28.6%), medium of 3-4 (23.8%) and large ones of more than 7 (19.0%).

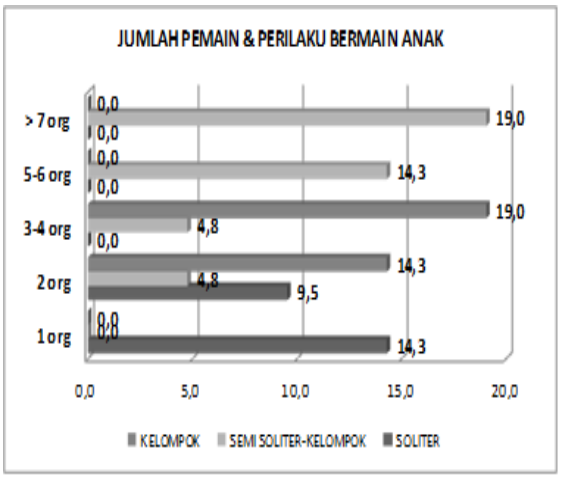


Fig. 5 Players' Grouping: Large Group, Small Group, Solitary

This demonstrates that fortunately children in small island settlement enjoy gatherings and intense interactions in active motions during their playing activities. Few solitary activities are cases of playing using portable digital devices. This kind of pocket-size electronic gadgets has been popular in urbanised areas including Makassar in accordance to the growing technology and production of digital games since around late 1980s. Children in Lae-Lae also have acquaintance with this digital game type, apparently due to its affordability, in addition to the lack of electronic game centres in the island.

However, children's interest in solitary game type seems not as flourishing as in main land Makassar. This indicates that children in Lae-Lae prefer other game types that require company of peer friends.

The following **Fig.6** exhibits that the most common configuration features of children playing place in Lae-Lae are irregular form (33.3%) with mostly spreading and semi-spreading orientation. The dominating irregularity for a tendency of dominating spreading seems to have been influenced by the availability of fast spaces of sandy beaches under tree shades that fortunately are still well conserved quite abundantly in the island. In addition, narrow access spaces such as lanes and alleys, also boat mooring areas and beach embankments prove to have been enjoyable for children for conducting their playing activities. Children have been capable to utilise their living environment and take its advantage by conducting free modes of playing such as cycling and hide-n-seek. They play while at the same time finding out and making their own places of informal playgrounds.

The second common configuration is rectangular form (28.6%) for mostly centralised gathering and semi-spreading orientation. This feature indicates the opposite of the other dominant configuration mentioned before. For the purpose of playing games that impose certain rules such as *kelereng* and soccer children commonly find out or utilise or make by their own a dominating rectangular form of play space for a dominating centralised-gathering orientation.

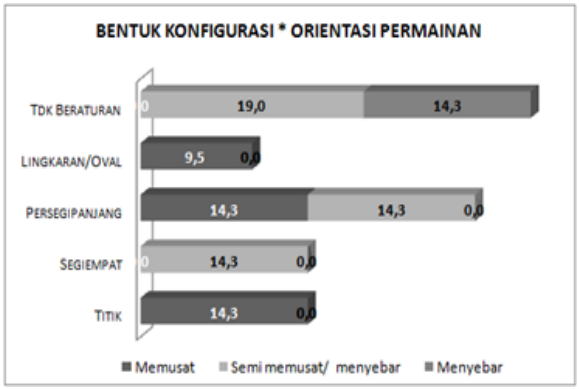


Fig. 6 Playing Orientation: Centralised-gathering, Semi-spreading, Spreading; and Formal Configuration: Point, Square, Rectangular, Circle/Ellipse, Irregular

Fig.7 below shows that children playing activities demonstrate strong tendency of active and semi-active characters (81%). The active are mostly by player groups of 2 children and of more than 7, while the semi-active are mostly by

groups of 3-4 and partially of 2. The active character occurs since the frequently played games involve bodily motions and movements i.e. small-fish catching, cycling, hide-n-seek, nd swimming.

Passive solitary mode take place in cases where the player just sit down all the time at a certain place. The semi-passive solitary cases occur when the player sometimes move and change places, such as from house yard to the beach embankment along access lanes or alleys, and later to a *bale-bale*. Change place sometimes also happen from *bale-bale* to moored boats, or from house terrace to sandy beaches, or others.

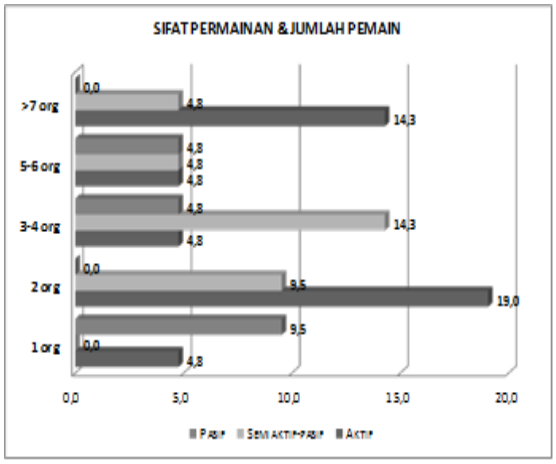


Fig. 7 Game Character & Grouping: Passive, Semi-active, Active

4.2 Playing Places

Fig. 8 and **9** below demonstrate the dominance of outdoor playing places (66.7%) utilised by children, consisting of house yards, lanes and alleys, public open spaces, beaches, and the seawater. Features of the outdoor places include embankments, breakwater piers, boat pier, *bale-bale* benches, tree branches, moored boats. However, children seldom play in existing formal open spaces. This may due for instance to sizes that are over or too large for children, lack of trees that yield shaded areas, lack of formal features that fit with children scale for sitting, leaning, or standing.

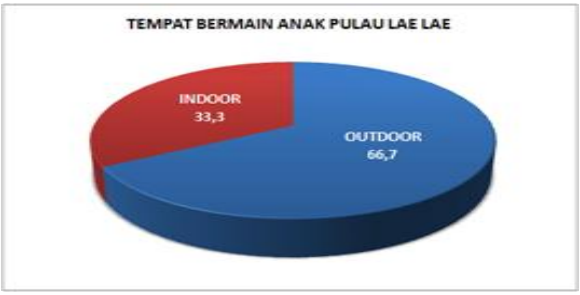


Fig. 8 Play Places: Indoor & Outdoor

Children less utilise indoor places (33.3%) for playing, including house terraces, living rooms, stairs, and spaces underneath stilted houses (*siring*). This may due to the fact that indoor spaces tend to impede free motion and active movement. Features of the indoor places include flat floors, sheltered spaces, low walls, doors and windows.

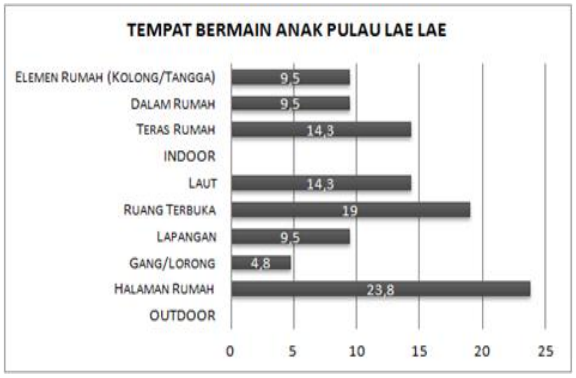


Fig. 9 Diversity of the Play Places

4.3 Correlations of Playing Activities and Places

The next **Fig. 10** and **Table 1** show correlations between variables of play places (Y) and play activities (X). These are to find out significant correlations between sub-variables the play places and activities leading to the verification of significant functional, spatial, and players' features that determine children playing places in Lae-Lae Island.

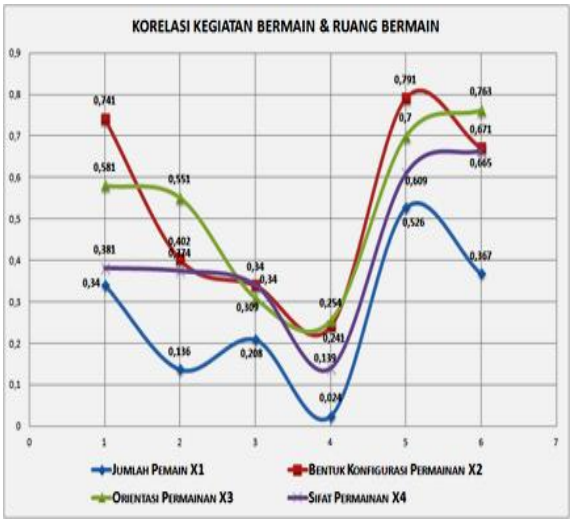


Fig.10 Correlations of Activities (X) and Places (Y)

The sub-variables of play places (Y) consist of: location of play spots (y1), play site (y2), distance of play place to children houses (y3), zone of play spots in the island (y4), area size of play space (y5), and spatial scale of the play spots (y6). The sub-variables of play activities consist of: players' number (x1), formal configu-

ration of the game (x2), orientation of the game (x3), and characteristics of the game (x4).

We verify positive and negative correlations with various degrees of significance as depicted in the following Fig.10. We also identify four degrees of significance which are indicated with different degrees of tone darkness. The darkest tone represents the most significant or very high significance, the dark tone for less high significance, the lighter tone for low significance, and the plain white represents very low significance that could almost be ignored.

Fig. 10 Degree of Corrrelations Among Sub-Variables of of Play Activities (X) and Play Places (Y)

		Location of Play Spots	Play Site	Distance of Play Place to Children Houses	Zone of Play Spots	Size of Play Place	Spatial Scale of Play Spots
		y1	y2	y3	y4	y5	y6
Players' Number	x1	0.340	0.136	0.208	0.924	0.526	0.367
Formal Configuration of the Game	x2	0.741	0.412	0.340	0.241	0.791	-0.671
Orientation of the Game	x3	0.581	0.561	0.309	-0.254	0700	-0,763
Characteristics of the Game	x4	0.381	-0.374	-0.340	0.139	0.609	0.665

The description is as followings. First, the most significant correlations occur in 2 sub-variables of play activities (X), namely: between game configuration (x2) and area size of the play space (y5: 0.791) also location of the play spots (y1: 0.741); and, between game orienttation (x3) and spatial scale of the play spots (y6: -0.763) also area size of the play space (y5: 0.700).

Secondly, significant correlations take place in 4 sub-variables of play activities (X), namely: between game configuration (x2) and spatial scale of the play spots (y6: -0.671) also play site (y2: 0.402); between play characteristics (x4) and spatial scale of the play spots (y6: 0.665) also area size of the play space (y5: -0.609); between game orientation (x3) and location of the play spots (y1: 0.581) also play site (y2: 0.551); and, between players' number (x1) and area size of the play space (y5: 0.526).

Thirdly, less significant correlations take place also in 4 sub-variables of play activities (X), namely: between play characteristics (x4) and location of the play spots (y1: -0.381), play site (y2: -0.374) also distance of play place to children houses (y3: -0.340);

Between players' number (x1) and spatial scale of the play spots (y6: 0,367), location of the play spots (y1: 0.340), also distance of play place to children houses (y3: 0,208); between game configuration (x2) and distance of play place to children houses (y3: 0.340) and zone of play spots in the island (y4: -0.241); and, between game orientation (x3) and distance of play place to children houses (y3: 0.309) also zone of play spots in the island (y4: -0.254).

Finally, the least significant correlations that could be ignorable occur in 2 sub-variables of play activities (X), namely: between play characteristics (x4) and zone of play spots in the island (y4: 0.139); and, between players' number (x1) and play site (y2: 0.136) also zone of play spots in the island (y4: 0.024).

Photo 1 A group of 5 male children playing traditional *kelereng*, while other group of 3 playing soccer at background

Photo 2 A group of 4 male children playing *swimming & floating* using old car tires and old suitcases

Photo 3 A group of 5 female children playing paper folding at front terrace of a house

Accordingly, based on the above description, we deduce significant features required for the formation and the making of children play place in Lae-Lae Island. Formal configuration of the game (x1) and orientation of the game (x3) reveal to be the strongest determinant for place formation. The former correlates with location of the play spots (y1) and size of play spots (y5), while the latter correlates with size of play spots (y5) and spatial scale of the play spots. Thus, formal configuration, orientation, location, size, and scale are determining features.

Photo 4 A male child playing *game boy*, sitting alone on a stair of beach embankment

Photo 5 A group of 3 male children playing semi-passive digital *game boy* at front of a home-based small shop

Photo 6 A group of 4 male children playing card game sitting on a *bale-bale* bench at sandy beach

Photo 7 A groups of >7 male children playing bicycle, while another group of >7 male children playing soccer

Photo 8 A group of 2 male children playing cards on a moored boat

4.4 Discussion

In Lae-Lae Island traditional game types have coexisted with the modern ones. Players tend to form large-group mode rather than couple mode or solitary. Characteristics of the games are dominantly dynamic, appear to have taken advantage of the abundantly available outdoor spaces.

Traditional game types tend to form spread patterns in expansive scale by large group of players in at least 20 m2 area size. Modern game types tend to be centralized in normal scale by couple or solitary players. Traditional game types tend to be active whereas modern types tend to be passive or semi-passive. Both traditional and modern games tend to utilise public spaces.

Places for playing traditional games tend to be on the beach and seawater zones notwithstanding located in quite a far distance from players' houses. These places are dominantly outdoor type with irregular pattern. On the opposite, modern games tend to be played in the inner zone of the island, both in outdoor and

indoor types of places. Their formal configuretion are linear or rectangular patterns. These places have usually been located adjacent to players' houses.

Outdoor spaces in the island almost all the time appear to have served children as informal playgrounds, particularly after school times. These open spaces consist of lanes, narrow alleys, paths, *bale-bale* benches, seawater, moored boats, boat pier, lane and beach embankments, sandy beaches, public open spaces, school yard, and tree branches. Frequent large scale games tend to occur on the beach and seawater;

Indoor spaces have been less utilised by children playing activities. These spaces are limited to *siring* space underneath the main floor of stilted houses, front and side terraces, entrance stairs of houses. Moreover, the users of indoor spaces have mostly been female children in addition to toddlers aged 1-4 year.

Children tend to have mixed preference towards the utilisation of their playing places. The playing places range from abundantly spacious space of main access lanes, open beaches, and seawater areas, to large variation of diverse cozy spaces of alleys and paths, stairs and slopes, hard embankments and soft sandy beaches, house yards and boat mooring places, *bale-bale* benches and trees branches.

Lae-Lae Island provides various features of play places as expressed in the 6 sub-variables of play places and 4 sub-variables of play activities. Such a situation enables children to freely and intuitively choose, find, modify, create, and make use of the places in flexible and adaptive manners. Moreover, children appears to cunningly use various available things found in their surroundings to utilize them as playing instruments wherever and whenever they do, despite possible impending or stimulating characteristics of the 6 features of play places and the 4 features of play activities.

Children conduct their playing activities by choosing, finding, modifying, creating, and making use of the available spaces and any instruments to fulfil the need for playing places that enable nurture of rich emotion and cognition (Tuan, 1977), primarily awareness of their own scale, cognition on particular characteristics of each place, and a strong sense of property towards both personal and interactive places.

Five most significant features of children play place in the living environment of Lae-Lae Island are verified. Two are features of play activities, namely: (i) formal configuration, and (ii) game orientation. The rest three are features of play place, namely: (iii) location of play spots, (iv) size of play place, and (v) spatial scale of play spots. These 5 most significant features are considered compulsory to the formation and utilisation of children's playing place that are expected to nurture the distinctive context of island nature and culture. In addition, three significant features in lesser degree can also be included, comprises: (vi) characteristics of the game, (vii) play site, and (viii) players' number.

Planners and architects would better put these five most significant features and the significant three features forward in future planning and design of both traditional and contemporary play places. Planners and architects should indispensably be aware of children characteristics, particularly in terms of scale and safety. Future design and planning of children play place should also respect the site in terms of architecture and landscape. This would accordingly foster the future creation of children-friendly environment, while at the same time respecting and sustaining local nature and culture.

V. Conclusion

We conclude that:

(1) Determining features of children play place in densely-populated urban space such as Lae-Lae Island can be derived from 3 variables i.e. functional, spatial, and players' features, resulting in 6 features of play places and 4 features of play activities. The former comprises: location of play spots, play site, distance of play place to children houses, zone of play spots in the island, area size of play space, and spatial scale of the play spots. The latter comprises: players' number, formal configuration, orientation, and characteristics of the game.

(2) Five features that most significantly correlate with the formation of children play place are: formal configuration, game orientation, location of play spots, size of play place, and spatial scale of play spots. Three other features are significant in a lesser degree: characteristics of the game, play site, players' number.

We also come to an understanding that:

(1) Play place in densely-populated urban settlement such as Lae-Lae Island are dominated by outdoor and semi-outdoor spaces. This is in accordance with insufficient indoor spaces due to building density and activity crowding.

(2) Children can ingeniously find and form their play place by making use of available spaces, landscape features, and game ins-

truments, both the natural and the man-made.

Finally, we suggest that future planning and design of children play place should refer to the five most significant plus three significant features, while keep considering concepts of scale, safety, and site from the children viewpoints.

Acknowledgement

This paper is based on initial part of a Research Report supported by 2013 Research Grant from DIPA Hasanuddin. The research titled 'Typomorphology of the Architecture of Children's Playing Places in Small Island Environment' was conducted as collaborative work by the Laboratory of Theory and History of Architecture & Environment and the Laboratory of Housing in Architecture Study Program. The authors would like to thank students who assisted in field surveys: M. Yani, Septo Mawengkang, Sudharisman Yahya, Muh. Adli, Ratnasari, Amalia Paramitha, Suciati, Ulfa Fitriana, Besse Evianti, Nur Mutmainna.

References

1) Bishop, J.C. & Curtis, M. 2005. *Permainan Anak-Anak Zaman Sekarang di Sekolah Dasar* (Children's Games at Present Era in Elementary School). Jakarta: Grasindo Widiasarana Indonesia
2) Arge, Rahman. 2006. *Kehidupan Masyarakat Asli Makassar* (The Life of Native Makassarese). Makassar: Global Publishing
3) Tuan, Y.F. (1977), Space and Place. Cambridge, Mass: MIT Press.
4) Zulkifli. 1986. *Psikologi Perkembangan* (Developmental Psychology). Bandung: Remaja Rosdakarya.

Makassar City Tour Planning Concept

Syahriana Syam[1], Slamet Trisutomo[1], Muhammad Muqarrabin Ari[2], Syahrianti[3]

[1] Lecturersof Architecture Hasanuddin University
[2]Student, Of Hasanuddin University
[3]Lecture of Sosiologi IAIN

Abstract

The City of Makassar, is the heart of development in the Eastern Indonesia with its strategic location. It has a number of variations of tourism and tourism destinations with its own uniqueness in its potential and its tourism attractions from each of the variations of tourism and tourism destinations there. Transportation system is directly will have impact on the distribution pattern of tourists' flow to the tourism destinations that will lead the flow to reach the tourism objects. The main objective of transportation means is to relocate people and things from their origins (tourists' home) to the destination (tourism attractions). The accessibility from the tourists' initial departure point is connected by street networks, and by the Makassar City transportation means facilities; in form of transportation modes (public transportations and rent vehicles) and the transportation infrastructure itself (harbour, station, and air port). Guidelines in the Makassar city tour strategies, emphasizing the synchronization of the tourism objects which is fussed in two basic strategies: programmed city tour which applying shuttle bus system in its master plan, and independent city tour which applying other transportation modes such as decorated-tourism pedicabs, bicycles, rent vehicles, or even by walking. The output of this planning is the series of peripheral trips to the tourism objects that located within Makassar City and supported by means of tourism transportation facilities, thus will be united in terms of one package of Makassar city tour.

Keywords : *City Tour, Tourism, Acsesibilty, Transportation, Line Road, Tourism Attractions*

I. Introduction

Tourism doesn't stand alone as an activities and has connection that builds a networks. It as an industry has elements that can be seen as an independent sector but still has a connection with a tourism itself. Tourism has a synergetic power because it has a connection with the other sectors, such as transportation, telecommunication, human resources, environment, etc.

Transportation is one of the most important thing on tourism. It also has a function to increase the service quality and the chance of tourism improvement.

Makassar, with its strategic location as a vital part of East Indonesia has a numbers of tourism places that has their own characteristic and potention to gain a visitor from each type of places.

With a numbers of tourism places with total about 31 objects in Makassar, has a big potention for the optimalization the use of objects with a good transporation to increase the mobility and service for the visitors.

Syahriana Syam
--- Lecturers of Architecture
Hasanuddin University
E-mail: sary_archi@yahoo.com

II. Theoretical Study

2.1 Theory of Tourism

The definition of tourism can be explained as, according to World Tourism Organization (WTO) (Yoeti, 2008)Tourismis an activity to take a trip or stay in a place other than their hometown, not more than a year, for fun business, or other purpose.

Visitor can be divided into two categories, tourist and excurcionist. Tourist is someone that do a tour activity, leaving their own place more than 24 hours and less than 6 months with a purpose except for gaining money. (Warpani, 2007).

Excurcionist is a visitor that just staying for one day in a place without spend a night there. This including cruise passanger. However, people that legally not entering a foreign country; for example, an airplane passanger that have to transit in the airport, are not included.

2.2 Tourism Potention

A trip destination has some condition that has to be fulfilled, such as :

a) Something to see, for example a beautiful scene or landscape, an archeological remains, an exhibition.
b) Something to do, like recreation, sports, research, etc.
c) Something to buy, like fancy items or souvenirs .
d) Something to enjoyed, for example a fresh air that pollution-free
e) Something to eat, like food from specific country.

2.3 City Tour

A word 'Tour' based from Jewish word 'Torah', means studying and researching. Tornus (latin) means a tool to draw a circle. Tour (old France) means go around a circle. A Tour is a combination of elements from a trip that being sold or coordinated for a group or personal and being composed in an itinerary from daily activity. TourOperator is a professional agency that arrange a tour for a group's trip. City tour is a combination of a tour that oriented by a tour object in a city that it purpose being synchronized with a city transportation networks that builds tourist's mobility to reach their destination.

2.4 Transportation System Builds Mobility And Tour Service

Transportation is a must for a tourism. Direct transporation will affects the pattern of a tourist's trip to their destination. The main function of transportation is to transport a person or a luggage from their old place to the new place. One of trip characteristic is to make a journey, so we can say that without a transportation service, tourism will be lack of something. In other words, transportation placed on a vital spot as a must, dominant factor and something that builds a good tourism networks.

2.5 Harmonization Between Transportation System and Destination Object

Most of touring activity has to do with different method repetitively, and always including an administration area. Tourists enter a country from a port or airport. And in purpose to visit some places, they need to take a domestic flight or bus or train or taxi. Mobility services and network system between countries or national, regional, and local is the key to attract more visitor to a specific destination point.

2.6 Planning Method

Planning is one of the universal activity, a basic skill in life related to a consideration of the results prior to the election among the various alternatives available. As well as planning method. Planning method is closely related with all tourism aspects, all thing that related with tourism. Thus the scope of tourism planning network includes all activities concerned with tourism, a comprehensive planning process (comprehensive), inter-disciplinary and multi-disciplinary (Warpani, 2007).

The importance of planning in the development of tourism as an industry is no other tourism industry development managed to achieve the desired goals. (Yoeti, 2007).

Location and Planning Object

1. Planning location is located in Makassar's administrative area, which the location including tourism object in Makassar.
2. This planning object including various type and tourism object and object, transporttation method, and road.

Planning Analysis Method

Problem Identification 1

In purpose to identify potention and the characteristic of each tourism object in Makassar, using descriptive analysis method and analyzing photo mapping.

Problem Identification 2

a. Transportation system analysis as a support of mobility and tourism service.
b. Alternative tourism path analysis
c. Marketing analysis

III. Result and Discussion

3.1 Potention and Tourism Object Attraction Analysis in Makassar

1. Maritime Tourism Object. (Samalona Island)
2. Littoral Tourism (Akkarena Beach, Losari Beach)
3. Shopping Tourism (Ratu Indah Mall, Makassar Trade Centre (MTC), Panakukang Mall, Somba Opu Souvenir Centre, Trans Studio Mall Makassar, Karebosi Link)
4. Historical Tourism Object (a. Graveyard of Raja Tallo, Graveyard of Pangeran Diponegoro, City Museum, Fort Roterdam, La Galigo Museum, Klenteng Agung, Mandala Monument, Paotere Port, GedungMulo, Societe De Harmon, Korban 40.000 Jiwa Monument).
5. Culinary Tourism Object (Paotere Restaurant, Mie Titi, Coto Nusantara, Sop Konro Karebosi, Makassar Culinary Area, Coto Gagak)

6. Other Tourism Object (Al-Markas Al-Islami, Karebosi Court, Mattoangin Court, Somba Opu Heritage)

3.2 Transportation analysis system as a mobility support and tourism

1. Mode of Transport, Numbers of motor vehicles in 2009 are 21.219, which 4.804 of them are bus, 1.687 passanger car, and 4.885 truck. Compared to in 2008 which numbers of motor vehicles increased 6,97% in 2009. Shown in graph below.
2. Road/Accessibility, Generally, infrastructure condition of road in Makassar still on a good condition. There's some that aren't, but it can still do its role on Makassar's city traffic. The priority of Makassar's accessibility about the build of primary collector road, secondary collector, local primary, local secondary and secondary arterial are included in road widening program.
3. Land, Ocean and Air Port, Terminal (airport, harbor, station, and bus terminal) are the first interaction that tourists had with their destinated place. Terminal hold a primary function, such as :
   a) Offers an access to vehicles that moving into a particular line.
   b) Places and easiness to change or transfer into different transportation mode from vehicles from particular line to other one.
   c) Traffic node, places of traffic consolidation.
   d) Supportive function as a shopping centre like on an international airport, first and last place for someone for shopping.

Sultan Hasanuddin International Airport administratively located between Makassar and Maros. This Airport coordinated in 106°37'59"-106º41'08" east longitude and 06º06'18"-06º 08'54" south latitude. We can access airport from Ir. Sutami toll road from west side, and from Perintis Kemerdekaan road from the south side. The airport is about 19 km to the North-east of Makassar and 11.3 km south-east of the Toll Road Through Ir. Sutami.

Soekarno-Hatta Harbor located on the west side of Makassar. This harbor is the busiest harbor in East Indonesia, serving both passanger using PT Pelni ship or Ferry, to luggage with tanker ship or other luggage caring ship.

Terminal located on the north side of Makassar, and a center point of transportation between provincies and districts. Daya regional terminal provides a transportation facility like an exclusive bus to standard bus. There's also a public car transportation that serves a transportation between districts. This terminal serves a transporation that leading to north direction leaving Makassar.

Terminal characteristics, regarding capacity, facilities, and service system. Handling and care of all matters which may be slow in terminal constraints and reluctance tourists visit DTW. Conversely, excellent service (friendly, neat and comfortable) with the ad itself became a huge influence and be supporting a tourist attraction. All can be done if the capacity of the terminal facilities and systems and services meet the international quality standards.

Terminal infrastructure in Makassar start from Sultan Hasanuddin International Airport as an air transporation point, Soekarno Hatta Harbor, Pulau Kayangan and Kayu Bengkoang Local as ocean transporation point, Daya and Malengeri regional terminal as land transportation point, are more than enough tomeet the spatial dimensions and extensive service.

Sultan Hasanuddin international airport and Soekarno Hatta harbor placed on a wide service area that has a thousand Ha dimension. These concerns service that connect not only inside Makassar and South Sulawesi, but all across Indonesia even to few other countries. Daya and Malengkeri regional terminal placed on a wide area that has a hunded Ha dimension that connects South Sulawesi and its surrounding to Makassar.

3.3 Tourism path planning analysis

The results of the city tour planning is the tourism paths consisting of tourism objects in Makassar City and are directly connected with the road network in Makassar City. The tourism path determination consist of two kinds of path, the first path is programmed tour path that is the path using transportation mode, tour bus which is programmed for visiting available tourism object and travel through the road network in Makassar City.

The second path is independent tour path that is the tourism path is free to be chosen by tourists in order to enjoy the tourism objects in Makassar City. The same as the programmed path, this free path pass through the road network in Makassar City but for the tourism transportation mode using several alternatives start from walking, tourism and regular pedicab / becak, bicycle, chartered vehicle, and pete-pete as public transportation of Makassar city.

This analysis uses scoring analysis or point to determine the ideal path as the final result of the planning. The following are awarding point Indicators.

Table 1 awarding point Indicators on tourism path

No	Indicator	Point
1	Applying tourist attraction terms on tourism objects that will be visited on the determined path alternative	1
2	Potency and different tourist attraction on every object that is visited.	1
3	Ideal travel time which is used to start and end the trip (no more than 8 hours)	1
4	Pass through a route in accordance with regulations and traffic signs of the road network in Makassar City	1
5	Pass through the city centers of Makassar	1
	Total	5

About the first indicator about application of the terms of tourist attractions on the tourist objects to be visited is determined according to the following indicators:

a) Something to see, something which can be seen, such as natural scenery, archaeological heritage, shows;
b) Something to do, something that can be done such as recreation, sport, research, etc.
c) Something to Buy, something that can be bought, such as fancy items or souvenirs.
d) Something to enjoyed, something that can be enjoyed, such as fresh air that pollution-free, special service;
e) Something to eat, something that can be eaten, such as traditional food and beverage.

3.4 Programmed tour path

Programmed tourist path is tourist path which is programmed specially for tourists so they can reach one tourist object and others. Determination of programmed tourist path is made by making one tourist object and other tourist objects connect each other with the road network and transportation mode which has been provided. The road network referred is the road network which connects all available tourist objects.

Transportation mode used is tourist bus which is made especially for mobilization service for tourists. For the tourist bus using shuttle bus system which will be programmed to follow tourist path will be planned on this path planning.

Transport work system which is used for this programmed path is as follows:

The tourist shuttle bus is programmed to connect one tourist object to another tourist object according to the determined path on this program.

The tourist shuttle bus goes around the path have been programmed continuously and stop by to get and drop passengers on the tourist object every 30 minutes.

Special for tourists from Sultan Hasanuddin International Airport by using airport shuttle bus and it is programmed to drop the tourists at Fort Rotterdam to continue the tour by using the tourist shuttle bus.

The shuttle bus is attempted don't charge any cost in use and service of the bus for the tourist.

The following is the analysis of the determination of programmed tourism path alternatives.

a. Fort Rotterdam and La Galigo Museum – Potere Restaurant – Pelra Paotere – Graveyard of Raja Tallo – Korban 40.000 Jiwa Monument – Al-Markaz Mosque – Panakukkang Mall – Gedung Mulo – Losari Beach
b. Fort Rotterdam and La Galigo Museum – Societe De Harmoni – Karebosi field and Karebosi Link – Konro Bakar Karebosi - Mandala Monument – Ratu Indah Mall – Mattoangin Court - Trans Studio and Trans Studio Mall – Akarena Beach
c. Samalona Island - Fort Roterdamdan La Galigo Museum – Klenteng Agung – Mie Titi – Graveyard of Pangeran Dipenogoro – Karebosi Court dan Karebosi Link – Mandala Monument – Somba Opu Heritage – Losari Beach

IV. The Analysis of Marketing of Tourism Product

Tourism marketing basically is a process which there is promotion and marketing itself and it keeps spinning. Marketing is a way in doing business that more focusing on costumer than the tourism product itself. An interesting accommodation service, a fascinating scenery, cultural item as a souvenir, the pleasure that the tourist gets is one of the form of service that the tourism provides.

V. Planning

5.1Planning Referrals

The available tourism objects is located on some points of Makassar City and for accessibility accomplishment from tourist departure starting point is connected by the road network and transport facility (public transportation and chartered transportation) and transportation infrastructure itself (port, station, and airport).

Referrals on City Tour planning of Makassar City count heavily on synchrony of the available tourism objects is combined into two basic

planning that is Programmed city tour and independent city tour. By this planning referrals, it is expected to have relationship between tour planning and spatial of Makassar City.

5.2 Planning Concepts

As the capital of the province, Makassar is an accumulation spot of various ethnics which have various custom and culture. The culture diversity of Makassar City should be packaged into a tourism product which can be sold or become attraction for international and local traveler.

Makassar City is a transit area for the tourists before continuing their trip to Tana Toraja, Bira, or other tourism objects in South Sulawesi. Thus on city tour planning, it applies some concepts to maximize the use of tourism objects by the tourists who visit to Makassar City.

Here is the planning concept which will be applied on the city tour planning.

1. The city tour concept is a one day city tour in Makassar with the duration to enjoy the tourism object and the trip maximum 8 hours.
2. The output of the planning is tourism paths which have been analyzed based on the type and the object of tourism, distance, travel time and transportation mode used.
3. Applying tourism principle

Considering determination tour path planning, that is:

   a) Something to see, something which can be seen, such as natural scenery, archaeological heritage, shows;
   b) Something to do, something that can be done such as recreation, sport, research, etc.
   c) Something to Buy, something that can be bought, such as fancy items or souvenirs.
   d) Something to enjoyed, something that can be enjoyed, such as fresh air that pollution-free, special service;
   e) Something to eat, something that can be eaten, such as traditional food and beverage.

4. Using transportation mode such as tourism bus, tourist and regular pedicab, Chartered vehicle (taxi, chartered Pete-pete, tour bus, chartered car), and walking.
5. Applying tour shuttle bus on programmed path planning to maximize service on the tourist mobility to reach the designated tourism objects.
6. The connection between public transportation routes which is made as efficient as possible so it can reach one location to another on determined time.

5.3 The Final Planning

Planning is a universal action, the basic ability in life which relates to the consideration of result before determining the choice among some alternatives. It is the same situation as tourism planning especially on the city tour of Makassar City planning, which consists of some tour path alternatives. They are divided into two basis such that is programmed city tour and independent city tour. Some alternatives has become consideration for patenting as final planning on the final planning of the city tour.

a. Programmed City Tour

Determination of the programmed tour path by making a tourism object and other tourism objects connect by the road network and the transportation mode provided.

The used transportation mode is tour bus which is specialized for mobility service towards the tourist. The tour bus uses shuttle bus system which will be programmed to follow the tour paths which will be planned on this path planning.

Transport work system which is used for this programmed path is as follows:

a) The tourist shuttle bus is programmed to connect one tourist object to another tourist object according to the determined path on this program.
b) The tourist shuttle bus goes around the path have been programmed continuously and stop by to get and drop passengers on the tourist object every 30 minutes.
c) Special for tourists from Sultan Hasanuddin International Airport by using airport shuttle bus and it is programmed to drop the tourists at Fort Rotterdam to continue the tour by using the tourist shuttle bus.
d) The shuttle bus is attempted don't charge any cost in use and service of the bus for the tourist.

There are three alternatives route on this programmed path planning. Each has their potency and obstacle. However the final planning retains all of the alternatives, as the final path planning. Here are the final planning path :

a) Fort Rotterdam and La Galigo Museum – Potere Restaurant – Pelra Paotere – Graveyard of Raja Tallo – Korban 40.000 Jiwa Monument – Al-Markaz Mosque – Panakukkang Mall – Gedung Mulo – Losari Beach
b) Fort Rotterdam and La Galigo Museum – Societe De Harmoni – Karebosi field and Karebosi Link – Konro Bakar Karebosi - Mandala Monument – Ratu Indah Mall – Mattoangin Court - Trans Studio and Trans Studio Mall – Akarena Beach

c) Samalona Island - Fort Roterdamdan La Galigo Museum – Klenteng Agung – Mie Titi – Graveyard of Pangeran Dipenogoro – Karebosi Court dan Karebosi Link – Mandala Monument – Somba Opu Heritage – Losari Beach

b. Independent City Tour

This Independent tour path is not bound with the programmed path. This path uses the available transportation mode and free to choose by the tourists. The alternative paths are the routes which is made for the pedestrians, pedicab, Pete-pete, and chartered vehicles (chartered pete-pete, taxi and tour car) by calculation of the maximum attainment is 30 minutes between one tourism object to another. Besides the duration used for visiting the object is 30 minutes per object with the tour time used maximum 8 hours.

1. Pedestrian

The pedestrian path is a path which applied especially for the pedestrian with the distance not more than 500 meters from every objects and the travel time not more than 15 minutes. There are three alternatives on the planning that is:

a) Fort Rotterdam and La Galigo Museum – Klenteng Agung – Karebosi Court – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe (Traditional food).
b) Fort Rotterdam and La Galigo Museum – Coto Nusantara – Societe De Harmoni – Somba Opu Handy Craft Centre – Losari Beach and Pisangepe
c) Fort Rotterdam and La Galigo Museum – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – Konro Bakar – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe

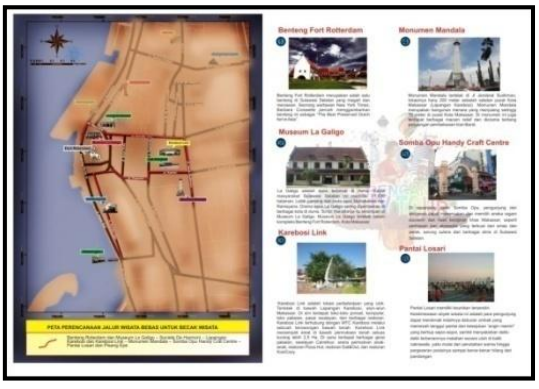


Image 1. The map of independent tour path planning for pedestrian (Analysis 2011)

Based on the highest amount, it has been decided that the second path as a special path for pedestrian with 5 total point, while for first path and third path only has 4 total point.

2. Tour Pedicab

The pedicab in Makassar City is categorized as a no motorized regular vehicle which serving passenger without bound with the trip route but still follow the available road network. The pedicab in Makassar City is located at the point of Makassar, in residential areas or in down-town area such as Fort Rotterdam and Losari Beach. The pedicab in Makassar City is also used as tourism pedicab by several five-star hotels in Makassar, it still doesn't have any route but the pedicab may pass some path which shouldn't be allowed for the pedicab.

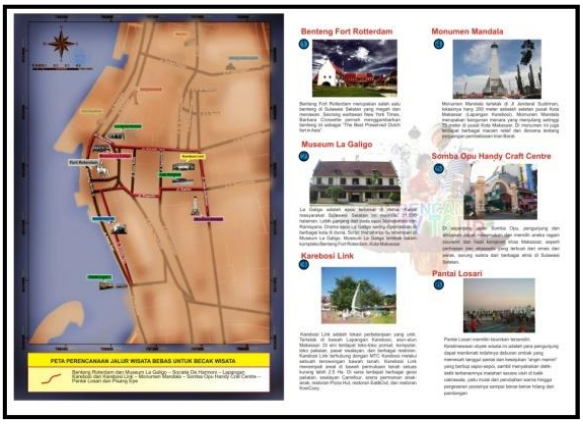


Image 2 the map of independent tour path planning for Tour Pedicab (Analysis 2011)

On the pedicab path, it has been decided a route for the tourist pedicab. For the other regular pedicab which is not programmed on this path, is still able to carry the tourist but they cannot pass through the road which has been forbidden fo the pedicab. The pedicab is planned to be decorated in such way for more interesting look and is given label marker as Makassar city tour vehicle. Tour pedicab is specialized for the guest or tourist. They use them to go around the city or visit the tourism places in Makassar city.

There are three alternatives on tour path by pedicab planning:

a) Fort Rotterdam and La Galigo Museum – Klenteng Agung – Societe De Harmoni – City Museum - Karebosi Court and Karebosi Link – Mandala Monument – Gedung Mulo – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe
b) Fort Roterdam and La Galigo Museum – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – Mandala

Monument – Somba Opu Handy Crat Centre – Losari beach and Pisang Epe.

c) Fort Roterdam and La Galigo Museum – Klenteng Agung – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe

Based on the highest amount, it has been decided that the second path as a special path for pedestrian with 5 total point, while for first path and third path only has 4 total point.

3. Bicycle

Bicycle path consists of three alternatives, that is :

a) Fort Rotterdam and La Galigo Museum – Klenteng Agung – Mie Titi – Graveyard of Pangeran Diponegoro – Karebbosi court – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach
b) Fort Rotterdam and La Galigo Museum – Societe De Harmoni – Makassar Trade Centre – KonroBakar – Karebosi Court – Mandala monument – Soba Opu Handy Craft Centre – Losari Beach
c) Fort Rotterdam and La Galigo Museum – Societe De harmoni – Karebosi Court – Karebosi Link – Mandala Monument – Gedung Mulo – Lae-Lae Restaurant – Losari Beach

For bicycle path, all of the alternatives is become the final planning because bicycle can reach all of the road which available on the alternatives and points. Besides bicycle has the ability to discover all of the objects in a few time that is 15 minutes travel time.

4. Chartered Vehicle

The chartered vehicle is a vehicle which is rented for tourism interest without bound with some public transportation routes. There are some types of chartered vehicles such as tourist car, taxi, rental car, and chartered pete-pete. There is other type of the chartered vehicle such as a bus which is facilitated by the government of Makassar City which can be used for tourism activities.

There are three alternatives for the chartered vehicle path, that is:

a) Fort Rotterdam and La Galigo Museum – Paotere Restaurant – Pelra Paotere – Graveyard of Raja Tallo – 40,000 Jiwa Monument – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe
b) Somba Opu Heritage – Losari Beach – Fort Rotterdam and La Galigo Museum – Coto Nusantara – Klenteng Agung – Pelra Potere – Graveyard of Raja Tallo – 40,000 Jiwa Monument
c) Somba Opu Heritage – Fort Rotterdam and La Galigo Museum – Coto Nusantara – Klenteng Agung – Graveyard of Pangeran Diponegoro Karebosi Court – Mandala Monument- Somba Opu Handy Craft Centre – Losari Beach and PisangEpe

For these planning, the third path gets the highest scorefive points, first path gets four points, and second path gets three points.

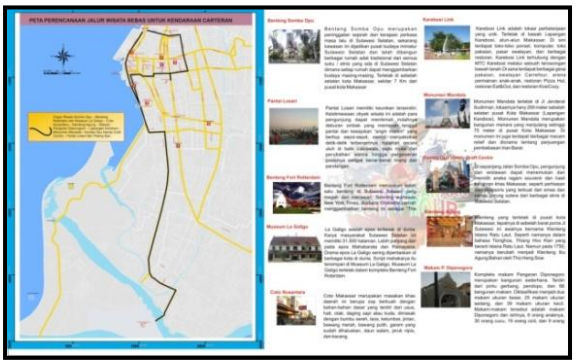


Image 3.the map of independent tour path planning or chartered vehicle (Analysis 2011)

c. The marketing planning of tourism products

Tourism marketing is an attempt to identify needs of the tourist and also offers the tourism product which is appropriate with the tourist's needs so that the tourism business can give maximum service for the tourist. (Muljiadi, 2009).

The planning of Makassar city tour counts heavily on synchronicity of available tourism object combine into two basis planning (city history tour and the city tour according to the route of public transportation) by the transportation route and the road network of Makassar City. The synchronicity of these two aspects later on will become a benchmark and a comparison on the planning of tourism marketing. Besides the availability of tour facility which concerns marketing such as promotion media, digital media, print media, internet etc will be adjusted with the condition, strategic location and the availability of the marketing facility itself.

The types of marketing on the Makassar city tour is promotion on the facility of station, port, and airport, the main roads network of Makassar city, public space, and mass media (newspaper, local TV station and internet) such as poster, brochure, banner, billboard, and documenter movie. Besides, the planning of the Makassar city tour s also applied by promotion

on accommodation facilities of Makassar City for examples hotel, inn etc.

References

1) Altman, I dan Low, S. (1992). Place attachment. New York: Plenum Press.
2) Ashworth, G., Page, S.,J., (2010). Urban Tourism Re-search: Recent Progress and Current Paradoxes. Tourism Management, doi:10.1016/j.tourman.2010. 02.002.
3) Bramwell, B., Lane, B., (1993), Sustainable Tourism: an evolving global approach. Journal of Sustainable Tourism, vol.1, no.1, p. 1-5.
4) BPS. (2011). Kota Madya Dalam Angka Tahun 2011. Makassar: Pemda Tk. II Kota Makassar
5) Dinas Kebudayaan dan Pariwisata Kota Makassar, 2011. Buku Petunjuk Pariwisata Kota Makassar, Makassar
6) Dinas Kebudayaan dan Pariwisata Propinsi Sulawesi Selatan, (2004), Pengembangan Promosi dan Pema-saran Pariwisata, Makassar
7) Edwards, D., Griffin, T., Hayllar, B., (2008), Urban tourism research. Developing an Agenda, Annals of Tourism Research, Vol. 35, No. 4, p. 1032–1052.
8) Fainstein, S. dan Gladstone, D. (1997). Tousism and urban transformations: interpretations of urban tourism, in O. KALLTORP, I. ELANDER and O. ERICS-SON (Eds) Cities in Transformation—Transformation in Cities. pp. 119–135. Aldershot, UK: Ashgate Pub-lishing Limited.
9) Jansen-Verbeke, M. (2010) Transformation from Historic Cityscapes to Utban Touriscapes. Rivista di Scienze del Turismo. http://www. Ledonline/ Rivista_Scienze_Turismo/allegati/Rst1-2-3-Jansen-verbeke.pdf diakses 21 Mei 2012.
10) Law Christopher M. (1996). Urban Tourism: Attract-ion Visitors to Large Cities. London: Mansell , publishing limited Oxford.
11) Lawson, F. dan Baud-Bovy, M. (1977). Tourism and Recreation Development: A handbook of physical planning. London: The Architectural Press Ltd.
12) Lynch, K. (1960). The image of the city. Mass: MIT Press.
13) Muljiadi AJ.; (2009), Kepariwisataan dan Perjalanan, PT Raja GrafinfoPersada, Jakarta
14) Tim Proyek Peningkatan Pemasaran Wisata, 2002. Rencana Pemasaran Pariwisata Daerah, Deputi Bidang Pemasaran dan Kerjasama Luar Negeri Kementrian Kebudayaan dan Pariwisata, Jakarta
15) Warpani, Suwardjoko, 2007 Pariwisata Dalam Tata Ruang Wilayah, Penerbit ITB, Bandung.
16) Yoeti.Oka A., 2008.

Social-Cultural-Behavior Context

First Session Parallel Notes
Moderator: Djoko Wijono

K1 Room 2nd Floor
10.30 – 12.30

Presenter	:	**Agam Marsoyo (Universitas Gadjah Mada)**
		Wahyu Kusuma Astuti (Universitas Gadjah Mada)
Title	:	**The Prospect of Poor Home-Based Enterpises in Yogyakarta**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENT
Background

This research is a three-term period research in Yogyakarta
First year : The Role of Home-Based Enterprises in Poverty Alleviation in Yogyakarta
Second year : The Exploration of Home Based Enterprises in the Context of Urban Poverty Alleviation
Third year : Model of Poverty Alleviation through Home-Based Enterprises in Yogyakarta

- Home-based enterprise is part of informal sector and defined as small-scale economic activity.
- Home-based entreprise have three angualiation aspect as follows: Family, Bussiness, and Housing.
- In family, HBE can use and employs family members.

Poverty and Home-Based Entreprise

- HBE as a strategy to alleviate poverty at household level.
- Home, plays role as a capital to initiate the enterprise without bearing tax to the government.
- Household can reduce unnecessary cost as workers wage.

Home-based Entreprise in Yogyakarta

- 91% of HBE in Yogyakarta exceed poverty line.
- Almost 50% of them do **only** by operating HBE.

Research Question

1. Why HBE is potential in poverty reduction, however, there is 9% of HBE which is considered poor?
2. What have been the challenges of poor home-based enterprises?

Methods

A set of questionnaire was tested in 306 respondents in 4 sub districts in Yogyakarta:

- Pringgokusuman
- Tegalrejo
- Wirogunan
- Sorosutan.

Qualitative Research: In depth interview to poor HBE (29 respondents) Interview with Social Department about the policy and framework in supporting poor HBE.

Results

Challenges for the future of poor HBE, as follows:

- Shelter Condition. Less space for business development.
- Income. Insufficient income to develop the business, or even to survive the daily basis.
- Age of Operator. Less power and motivation to perform the business.

- Age of HBE. HBE established between 1996-2005 shows lower extent of poverty, whereas those established before and after the mentioned period bears higher percentage of poverty.
- Networking. Related to consumers. Consumers are their neighbor and maybe family.
- Competition. The competition is very high.
- Location and Profitability. Local scale HBEs are not located in the main road, but in the middle of Kampung
  a. It serves only the local neighborhood
  b. It suffers from low profit
- Depedency to Government's Assistance

They can't revolved and can't improve the business.

Discussion

1. Is there any opportunity for poor home-based enterprise?

- National Program for Community Development
- Micro-economic-based empowerment
- Local Government's Assistance

1. KUBE-FM
2. USEP-KM

Partnership, inclusiveness, and entrepreneurship

- Connecting small enterprises in the same neighborhood (10-30 business) to revolve fund.
- 20% of the member is not poor (collective action).
- Beneficiaries have reached 490, with 70% has successfully thrived the enterprises.

Recommendation

Government's assistance is regarded as a support to informal activity and household resilience yet it is limited fund serves limited beneficiaries:

1. Dependency to government's assistance
2. Less ability to manage and revolve the fund

- Community development fund
- Triggering innovation through the usage of technology becase space is not limited to physical term, but also virtual
- Organized network

However, persisting HBE can possibly overburden the household, because:

1. Some skills are specific
2. Elder operators are unable to recruit workers
3. Priorities of household

Conclusion

Internal aspects:

1. Shelter condition
2. Income
3. Age of operator
4. Age of HBE

External aspects:

1. Networking
2. Competition
3. Location and profitability
4. Dependency to government's assistance

Some opportunities and recommendation may be in favor to the development of HBE in the future, i.e. government's assistance, CDF, technology application, and organized network.

DISCUSSION

Questioner : Nita (Institut Teknologi Bandung)
Question : How organisation network can improve the condition?
Such as what kind of the activity of the organization network.

Answer : HBE actually similar with bisniskelontong, the prospect ofthe organization is to expand the market, how to collect valuable goods, to sell services, and sharing to another HBE.

Presenter : Aldrin Abdullah (Universiti Sains Malaysia)
Title : The Impact of Road Type on Fear of Crime in Residential Neighborhood
Presentation Duration : 10 minutes

PRESENTATION CONTENTS

- Crime is a world's problem.
- One of the side effect of crime is effect the fear of crime.
- We suggest that there are more people who are being fearful is of being victims.
- Design in that has manification on crime, relationship in crime prevention can design prevent crime.
- How much the design help the Indonesian crime as a tool the implication and influence factors from crime prevention?
- The 3 factors that must be present for crime to occur? First is offender, second is victim, and then the location.
- These findings that residents who inhabit gated residential areas have a lower fear of crime when compared to those in residential areas thatdo not have fencing elements.
- Nevertheless, this difference in findings is believed to be linked with the application of the fencing element in itself.
- On the other hand, in this study, the application of the fencing element only involves individual residential lots alone, without any fencing element installation along the perimeter ofthe housing area.
- The lifestyle of an unmarried respondent influences the level of fear towards crime.

Conclusion

- The main objective of this study was to investigate the fear of crime in individual gated residences (IGR) and individual non-gated residences (INR).
- The findings of this study proves that within the context of gated and non-gated individual residences, respondents who occupy individual gated residential areas demonstrate a higher fear of crime when compared to their counterparts who live in non gate.

DISCUSSION

Questioner : Nita (Institut Teknologi Bandung)
Question : Of course, culdesac is save and it can prevent crime. But culdesac is just for the rich people because it's expensive. But, how about housing design such as facade design and design of window or door? For example In Indonesia, we usualy used iron tralis to prevent it.
Answer : When we talk about design, is easy to design for the rich. In Malaysia, we have the enclose guarded and gated communities, we have cctv and security guards, and so on. Of course, we have to consider to the poor at least of importants especially for design. In our study in which just one part of the case that we look into. And we are looking in to the drawer picture of crime prevention and looking and assessing the preptical application of the CPTEP (Crime Prevention to Environtment to Design Principal) and see how it can be related especially for designing for the poor and among the concept, so that concept include survaillanceteritoriality, accessibility, and so on. And all of this elements are important in the right way a good surbidance to reduce crime. And therefore, in

designing for the poor, we need to ensure how the orientation of the buildings are as you sure in early presentation by the keynote speaker in which you can see how the city arrangements whether they're inwards or outwards, have influence how people intract. The same rules for designing something against crime in which the orientation of the building is also important. We are also focusing on territoriality and personalisation you need to look at the cues of the houses and to see this how this affect chances of being victimized. For example we study the personalised items that we scope in front of the houses and we look at the risk of being victimized. These are the private things that crime is on the study need to be able to applied in places where the poor society where the elements in landscaping which involves prohibiting surveillances to prevent crimeImportant contribution especially in the design of a poor neighborhood.Important for the poor community especially to develop a good community by knowing one and another in this collective contribution in preventing crime. Although, this is not a design aspect, this is a social aspect, but design can be a role by faciliting this type of activities.

Presenter	**:**	**Kezia Alyssa Sandy (Universitas Pelita Harapan)**
Title	**:**	**Quasi-public open spacein Superblock Area as Children's Play Space**
Presentation Duration	**:**	**10 minutes**

PRESENTATION CONTENTS
Background

The quasi-public space is the space whose degree is limited by the owner's authority, where the owner retain the right to regulate the behavior within.

The criteria of quasi-public space as children play space is as follows:
1. Physical condition of space. Such as the location, zoning and function, mass connectivity, achievement to the location, inter-area achievement
2. Protection. Such as the tendency of criminality and violence, traffic, weather, and noise
3. Comfort in activities. Amenities, furniture, public to quasi-public accessibility, private to quasi-public accessibility, and circulation
4. Pleasure. Scale, proportion, natural elements, aesthetic aspect
5. Space of playing activities. Motoric, creative-imaginative, cognitive, sensory, therapeutic, social
6. Attraction (commercial activities, physical attraction, adventurous play). Commercial activity, physical attraction
7. Environmental context (public transportation, natural formation) Public transportation, and natural formation

The study case in this research is "Tribeca Park" which locationed in Podomoro City , West Jakarta. Tribeca park around comercial zone
1. Physical condition of space
   - The quality of mass connectivity is relatively high. It's directly to residential zone, commersial zone, and the park itself.
   - Achievement to the location is good for public access for pedestrians and vehicle but it also has private access from apartment block around the park.
   - Inter area achievement is also good.
2. Protection
   - The weather at tribeca park is good because there are many trees, but not enough canopy for shelter. But still has some enclosure because its sorrounded by buildings.
   - Noiseyat some point because of the generator exhausts.

3. Comfort in activities
   - Private to quasi-public accessibility
   - Public to quasi-public accessibility is controlled by some rules like, operational hours is from 10am till 11pm, security checking point, restricted access, some regulation, smoking area zone, permission for certain activities required (management office), and no hawkers and street musician.
4. Pleasure
   - Natural elements reflected by the existence of vegetation in some place, water, and materiality
   - Aesthetic aspect such as water element like fountain, public art, and vegetation
5. Children's Playing Activities
   - All circulation paths can be motoric play space.
   - No adventurous play there.
   - Comercial activities spread in some point.
   - Physical attraction by water attraction like fountain and pond, public art, and venue event near the fountain.
6. Environmental Context
   - Public transportation aspect reflected by the existence of transjakarta halte (S. Parman Transjakarta Halte) and other public transportation.
   - Natural Formation actually doesn't exist there.

So, this Tribeca Park actually over-managed because its regulation like control of access and control of activities and behaviour to keep the quality of Playland as children's playground. This Tribeca Park really attractive for public.

The second location of the study case is "Riverwalk" in Rasuna Epicentrum, South Jakarta

1. Physical condition of space
   - Inter area achievement is not good because lack of connection (bridge) there.
2. Protection
   - Potentials for traffic accidents and noise because exposed by the highway
   - Not enough canopy for shelter.
3. Comfort in activities
   - No operational hours. Visitor can do any activities freely.
4. Pleasure
   - Natural elements such as light, shadow, vegetation, and water enhance the quality of pleasure in River Walk.
5. Children's Playing Activities
   - Children's motoric activities limited and more static.
   - No cognitive play and the water elemnts, river can't be touched directly.
   - Physical attraction only the river.
6. Environmental Context
   - Public transportation is not exist over there and far from superblock.
   - Natural Formation only the river.

So, this "Riverwalk" is under-managed and for the quasi-public open spcae, it's too more public. And it's also not many dynamics activity over there so less interesting.

There are seven chriteria for quasi-public open space that can meet the needs of children's playing activities in the superblock is as follows:

1. Physical condition of space
2. Protection
3. Comfort in activities
4. Pleasure
5. Children's playing activities
6. Attraction
7. Environmental context

Conclusion

It can be concluded that beside those criteria, quasi-public open space in superblock area in Jakarta needs balance between management and freedom of activities to bean active and lively space for public.

Suggestion

1. To Developer:
   To improve the quality of each quasi-public area, and to exploreopen space with more attention to children.To consider the need of balance between management and freedom of activities to bean active and lively space for public.
2. To Government:
   The authors suggest that governments develop public open space that has been there and add it in place that does not exist. The reason is, however also the good quality of a quasi-public open space, existence of public space in a city can not be replaced by it.

DISCUSSION

Questioner : Doni (Institut Teknologi Bandung)

Question : In quasi-public open space you mention about environmental aspect, the question is what kind of thermal condition of that environmental aspect to the children? How about the thermal comfort?

Answer : The environmental aspect which mentioned before is actually more about the using of the public transportation and the natural formation. So in my case study, Tribeca Park, the public transportation really affect the environmental around there because it reduce private vehicle usage so it can reduce pollution and its give easiness for people from the outside residential area to go there. And it is also about the separation between the pedestrian and vehicle access, so the safety of the pedestrians is more guaranteed. That kind of environmental aspect directly affect the children to behave. They canrunning around freedomly and safely to play around there. But at the river walk, the children mostly played but more static, so they are not truly running around the riverwalk.
And the other environmental aspect, that is natural formation, it isabout how the developer or the designer enhance the natural formation that's already been there, for example like a river, or lake, or maybe a hill to impacts their design. So, in this aspect riverwalk is quite affective because the designer itself enhance the quality of the river and it become a plus point to attract visitors public in general range including children to go there and do their activities over there.

Presenter : Wakhidah Kurniawati(Universitas Diponegoro)
Title : Create Urban Catalyst to Blend Formal Informal Activities in City Centre
Presentation Duration : 10 minutes

PRESENTATION CONTENTS

The importance of urban catalyst to foster the activities reaction

Definition

- Urban catalyst is something that could change happen in urban area
- Formal activitiy is activities which following or according with established form, custom, or rule' or 'done in due or lawful form.
- Informal activities is activities which not according to the prescribed, official, or customary way or manner; irregular; unofficial

Theory

Logan and Attoe (1992) find that the chemical/catalytic analogy to be more useful and versatile. An urban catalyst might be a hotel in one city, a shopping complex in another, a transportation hub in

a third, a museum or theater. It could be a designed open space or, at the smallest scale, a special feature like a colonnade or a fountain'.

Methodology

Locus : Simpang Lima Semarang (located in CBD of Semarang, Indonesia)
Steps :

1. Identifying the characteristics of formal and informal activities in research area;
2. Comparing the theory of urban catalyst in public space and implementation of urban catalyst in Simpang Lima Semarang;
3. Discussing the urban catalyst model in Simpang Lima Semarang
4. Conclude the result

The characteristics of formal and informal activities in Simpang Lima

a. Formal activities : trading activities (Ciputra Mall, Matahari Building, Super Economy Building, Gajahmada Plaza); Education activity (SMK 7), and Religious activity (Baiturahman Mosque) that occur in building and have a specific time from morning until afternoon and night.
b. Informal activities : dominated hawker, community activity in public space (daily, weekly, event) that occur in public space, insurgent and chaos public space and sometimes create visual degradation in hawker area.

Comparing the theory of urban catalyst in public space and implementation of urban catalyst in Simpang Lima

a. P1 (Principle 1) : The new element modifies the elements around it
   Empirical condition : The new stand for hawker in special path is already built
b. P2 : Existing elements are enhanced or transformed in positive way
   Empirical condition : The selling place for hawkers already exist but in arrangement.
c. P3 : The catalytic reaction does not damage its context
   Empirical condition : The design of new place for hawker enhances the visual quality of pedestrian ways ; do not disturb building facade.
d. P4 : A positive catalytic reaction requires an understanding of the context
   Empirical condition : The hawker space become a compromised space
e. P5 : Principle Not all catalytic reaction are the same
   Empirical condition : Not all design can coherent with the formal building behind. But mostly→ a symbiosis mutualism between formal and informal sector there
f. P6 : Catalytic design is strategy
   Empirical condition : The design become strategy to overcome dualistic problems in city centre
g. P7 : A product better than the sum of ingredient
   Empirical condition : The result of design could give lots of impacts
h. P8 : The catalyst can remain identifiable
   Empirical condition : The new design become the new landmark in Simpang Lima Semarang

Conclusions

a. The new design is an urban catalyst which could accelerate the reaction coherently.
b. The appropriate design in blending formal and informal activities in city centre is a compromised space.
c. Spesific in Simpang Lima : The new design (blending activities between formal and informal) become a good catalyst in civic centre. →Urban catalyst success in Simpang Lima

Presenter	:	**Ria Wikandari (UniversitasHasanuddin)**
Title	:	**Finding Children's Play Place In Lae-Lae Island, Makassar**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Background

- Awareness that playing various games is an essential part of children life in accordance with growing stages of psychological and physical developments.
- Tendency of increasing fascination and preference towards electronic games.
- Tendency of decreasing availability of formal and informal playgrounds in public spaces.
- Necessity to find out features that form children playing places in limited and densely-populated urban areas.

Aims

- To identify architectural features that form children playing places in limited and densely-populated urban space
- To find out features significantly correlate with in the formation of children playing places

Conceptual Framework

3 variables for determining children playing place in small island : Functional, spatial, player feature

Method

- Descriptive and correlative analysis based on quantitative and qualitative data
- Location: Lae-Lae Island as a part of Makassar's urban facade
- Population: 598 children aged 0 – 14
- Sample: 21 units of playing activities involving 92 children aged 2-14
- Sampling technique: accidental

Lae-lae Island is about 22-hectare island. Adjacent to waterfront of Makassar at about 1.2-kilometre off shore and inhabited by 1563 people of 431 households, with the density of 7.105 people/km^2

Result

- Proportion of Game Type:
  a. Traditional game types (38.1%)
     Consist of :
     - Hide-n-seek, swimming, and catching small fishes (9.5% each)
     - Kelereng and sit-n-chat (4.8% each)
  b. Modern Game types
     Consist of :
     - Cycling and digital game boy dominate the modern type (19.0 and 9.5%)
     - The rest includes soccer, pretend-to-be school, pretend-to-be home, robot, tamiya car, and chess
- Players' Grouping
  - Playing activities are usually in groups of 2 and more children (85.7%)
  - Solitary (14.3%)
  - The most common are small groups of 2 (28.6%), medium of 3-4 (23.8%) and large ones of more than 7 (19.0%)
- Playing Orientation
  - Centralised-gathering, Semi-spreading, Spreading
  - Formal Configuration: Point, Square, Rectangular, Circle/Ellipse, Irregular
  - The most common configuration features in Lae-Lae are irregular form (33.3%) with mostly spreading and semi-spreading orientation
  - Rectangular form (28.6%) for mostly centralised gathering and semi-spreading orientation.

- Game Character & Grouping:Passive, Semi-active, Active
  - Active and semi-active characters (81%).
  - The active are mostly by player groups of 2 children and of >7, while the semi-active are mostly by groups of 3-4 and partially of 2.
  - The active character occurs since the frequently played games involve bodily motions and movements i.e. small-fish catching, cycling, hide-n-seek, and swimming.
- Playing Place
  - Outdoor (66,7 %)
    Consist of: house yards, lanes and alleys, public open spaces, beaches, and the seawater. Physical features of the outdoor places: embankments, breakwater piers, boat pier, bale-bale benches, tree branches, moored boats. Children seldom play in existing formal open space.
  - Indoor
    Consist of: house terraces, living rooms, stairs, and spaces underneath stilted houses. Features of the indoor places include flat floors, sheltered spaces, low walls, doors and windows.
- Correlations of Playing Activities (X) and Places (Y): Variable X (formal configuration, orientation), and variable Y (location, size, and scale)

Conclusion

a. Determining features of children play place in densely-populated urban space such as Lae-Lae Island can be derived from 3 variables of functional, spatial, and players' features, resulting in 6 features of play places (location of play spots, play site, distance of play place to children houses, zone of play spots in the island, area size of play space, and spatial scale of the play spots) and 4 features of play activities (players' number, formal configuration, orientation, and characteristics of the game.)
b. 5 features that most significantly correlate with the formation of children play place : formal configuration, game orientation, location of play spots, size of play place, and spatial scale of play spots.
c. Play place in densely-populated urban settlement such as Lae-Lae Island are dominated by outdoor and semi-outdoor spaces.
d. Children can ingeniously find and form their play place by making use of available spaces, landscape features, and game instruments, both the natural and the man-made.
e. The future planning and design of children play place should refer to the five most significant plus three significant features→wouldfoster the future creation of children-friendly environment and respecting and nurturing local nature and culture.

DISCUSSION

Questioner : Diananta Pamitasari (UGM)
Question : Is there a spesific spatial feature related to the spesific group of children because the range of respondents 2-12 is quite wide?
Answer : The place features are location of the play (Age 1-4 : near the house accompenied by family, 10-14 : the whole island), distance to the house less than 10 m, spatial scale of play spots depends on the accompany.

Presenter	:	**Syahriana Syam (Universitas Hasanuddin)**
Title	:	**Makassar City Tour Planning Concept**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Introduction

- The City of Makassaris the heart of development in the Eastern Indonesia that has a number of variations of tourism and destinations with its own uniqueness.
- Transportation system will directly have impact on the distribution pattern of tourists' flow to the tourism destinations.
- Utilization of attraction itself seems less than optimal due to the maximal service from every attraction.
- Knowing the potential and attractiveness of tourist attractions of the city of Makassar.

City Tour is a combination of activity-oriented tourism attractions that exist in an urban area utilization is synchronized with the city's transportation network to support the mobility of travelers can reach the attractions there.

Planning analysis method

Identifying potention and the characteristic of each tourism object in Makassar, using descriptive analysis method and analyzing photo mapping.

Independent City Tour

- **Tourist destination of city tour in Makassar :** Museum La Galigo, Pantai Akarena, Museum Kota, Somba Opu Handicraft Market Centre, Karebosi Link, Klenteng Agung Ibu Bahari.
- **Pedestrian**
  The distance not more than 500 meters from every objects and the travel time not more than 15 minutes. 3 alternatives of planning :
  a. Fort Rotterdam and La Galigo Museum – KlentengAgung – Karebosi Court – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe.
  b. Fort Rotterdam and La Galigo Museum – Coto Nusantara – Societe De Harmoni – SombaOpu Handy Craft Centre – Losari Beach and Pisangepe.
  c. Fort Rotterdam and La aligo Museum – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – KonroBakar – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe.
- **Pedicab**
  a. Fort Rotterdam and La Galigo Museum – KlentengAgung – Societe De Harmoni – City Museum - Karebosi Court and Karebosi Link – Mandala Monument – Gedung Mulo – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe
  b. Fort Roterdam and La Galigo Museum – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – Mandala Monument – Somba Opu Handy Crat Centre – Losari beach and Pisang Epe.
  c. Fort Roterdam and La Galigo Museum – KlentengAgung – Societe De Harmoni – City Museum – Karebosi Court and Karebosi Link – Mandala Monument – Somba Opu Handy Craft Centre – Losari Beach and Pisang Epe
- **Bicycle**
  a. Fort Rotterdam and La Galigo Museum – KlentengAgung – Mie Titi – Graveyard of PangeranDiponegoro – Karebbosi court – Mandala Monument – SombaOpu Handy Craft Centre – Losari Beach
  b. Fort Rotterdam and La Galigo Museum – Societe De Harmoni – Makassar Trade Centre – KonroBakar – Karebosi Court – Mandala monument – Soba Opu Handy Craft Centre – Losari Beach
  c. Fort Rotterdam and La Galigo Museum – Societe De harmoni – Karebosi Court – Karebosi Link – Mandala Monument – Gedung Mulo – Lae-Lae Restaurant – Losari Beach

For bicycle path, all of the alternatives is become the final planning (can reach all of the road which available on the alternatives and points)

Conclusions

- The concept of city tour in Makassar is a one-day city tour with duration of the trip and enjoy the attraction is a maximum of 8 hours.
- The output of this planning is the tourist paths that have been analyzed on the terms of the type and attractions, distance, travel time and mode of transport used.
- Using transportation such as buses, pedicab and regular tourist, chartered vehicles (taxi, pete-pete charter, tour bus, car rental), and on foot.
- The relationship between public transport routes are made as efficient as possible in order to reach the location of one and the other with a predetermined time.

The Concept of Space for Defence Activities of Social, Economic and Cultural in Chinatown Semarang

Jamilla Kautsary [1], A. Djunaedi[1], Sudaryono[1], Leksono P. Subanu[1]

[1]Gadjah Mada University, Yogyakarta, Indonesia

Abstract

The Chinatown area, one of the unique areas in Semarang, is shaped by ethnic and political factors. The region was formed by the Dutch by moving the Tionghoa Ethnic from Simongan to Semarang in 1740. This relocation was for the reasons of security and to ease the control of people after the Chinese rebellion in Batavia. As an area which was formed due to political and ethnic factors, the community in this region has a unique strategy to defense, as a way to adapt in a new environment. Through the inductive approach and descriptive empiri analysis, Kautsary, J found some facts of empirical space theme. The Empirical themes of space, such as spaces for livelihood, protection, getting blessings, expressing feeling and sharing among other. The result of abstraction of these empirical themes is that there was a concept of survival space in the social, economic and cultural activities. The concept was built by Community within five layers of society. The first layer begins by sharing the room in the building, clan protection, tribe organization, activity grouping and community organization.

Keywords: *Space, Defense, Chinatown*

I. Introduction

Semarang's Chinatown began to grow after the Chinese ethnic settlement moved by the Dutch from Simongan to Semarang in 1740. This afford was done for the reasons of security and to ease the control of people after the uprising of Chinese in Batavia. In 1741, the Chinese settlement relocated from the east to the west of Kali Semarang because of Dutch Settlement expansion to the southern (Liem TJ, 1931: 4).

The relocation of settlers was part of the Dutch political glassware. The political pressure led to the emergence of security of various community groups. It occurred because Dutch seated this ethnic as his right hand in running trading activities and tax collectors that it often burdened the natives. The political pressure continued in the New Era.

The society of Chinese ethnic is also known as society that is still strong in running ancestor tradition. It is seen from the activity of cultural and religious done this group. The tradition of the community affects function, meaning and preferences of the spaces that exist in the area. The function of spaces in China town, primarily the streets and Klenteng, often changed. The change of function is a community effort in running tradition and culture under the political/policy pressures.

Various political pressures above make the protection is very important for the life of Chinese community. This protection is not only related to the threat of bad eva (*sha*), or the security threats from the enemies, but also a threat to economic, social and cultural activity. Space for protection and survival can be considered as part of the process of space adaptation of e Chinese community to live in Chinatown

The combination between the needs of space for shelter and strong tradition of Chinese ethnic then creates a unique concept of space for defense. The needs of spaces for defense and survival can be seen from various phenomena like the variety of functions within one building, the emergence of tribal organization and grouping trading activities.

II. Literatur review and methodology

Coping strategy (reaction to environmental stress) is a variable to inhibit/prevent/mediation, defined as reactions associated with events that cause these reactions appear. This reaction

Jamilla Kautsary
--- Gadjah Mada University,
Jalan Grafika 2 Yogyakarta, 55281 INDONESIA
E-mail: j_kautsary @hotmail.com

involves the emotional component, behavior and psychological. Reaction of individuals or groups against stress is very diverse. It is influenced by psychological factors of individual and cognitive aspects of stimulant. Reaction to environment as the stressor is shown by the individual through behavior/actions go, refuse/ contrarian or compromise that accompanied by anger or fear (Bell et al, 2001: 116).

Some conception of the relation of architectural environment and behavior in the context of environmental problems in urban areas, according to Haryadi and Setiawan (1995: 42) can be more comprehensively understood through the issues that concerned to the pressure environment (environmental pressures, stress) as well as coping strategy.

The study of architectural environment and behavior, integrated in the dynamic relationship between environmental pressures, stresses and copes strategies. Environmental pressure is defined as the physical factors, social, economic as well as it can rise the feelings of dis-ease, uncomfortable, loss of orientation, or loss of viscosity to a certain place. If this is left as continuous environmental pressures it can cause stress.

Research on the concept of space is an exploration research so that the research methods which are used tend to be inductive qualitative. Through inductive qualitative approaches, the researchers can conduct a research dapperly to describe and analyze reality; social events and phenomena happened and uncover what lies behind the incident. This research process can be seen in the following **figure 1**.

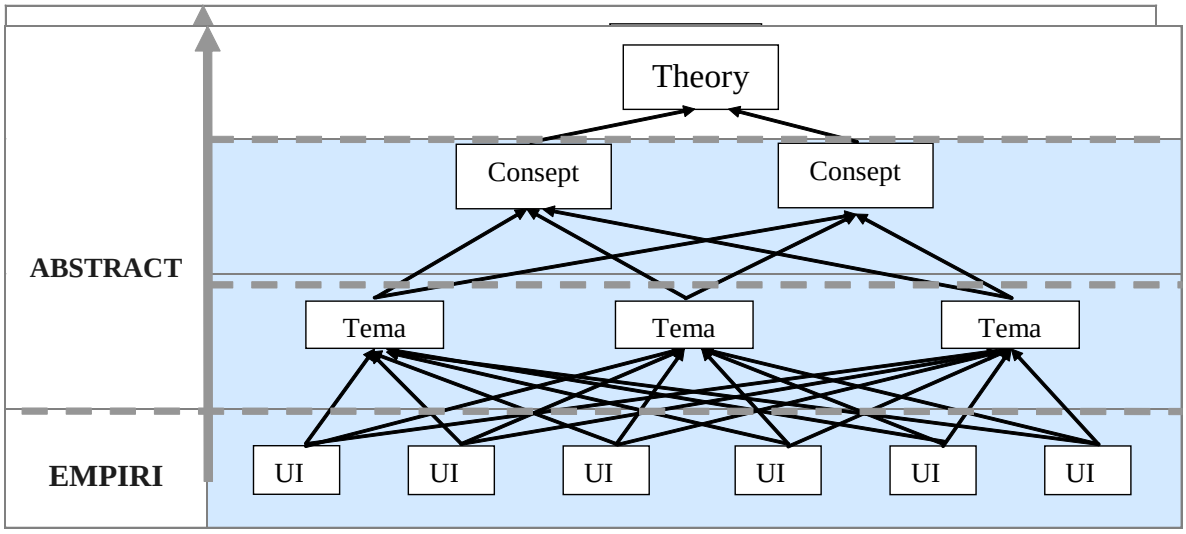


Figure 1. Research Process Diagram
Source: Sudaryono, 2003

III. Result and discussion

Concept of space to survive in a smaller scale can be seen in the spaces of streets and buildings. The spaces of the way in this area continuously change the function from morning to afternoon, from parking spaces to space for selling the food, and this space will be transformed into spaces for many people. Its utilization is also a complex of warehouse space to survive. In one shop can accommodate 3-4 activities of the family business. They share the space for survival and earn a better livelihood.

Meanwhile for the old people, and those who are far from relatives, or the poor ones, they do an activity called "*Ngalap Berkah*" or searching for luck and blessing (*Hokki*) at the shrine. They usually come in the morning and hang out on the porch of the temple room, sometimes until the afternoon. The seniors usually are not working. Most of them expect there will be visitors to the Temple who would share their wealth to support the poor people's life.

The right-wing temple building is also a space to sell needs for worship, such as joss sticks, candles, paper hu and vegetable oil. The front page, the right of the porch was used for selling birds (pipit, dara or otherwise), for the needs of the *cisuak*/waste *jiong* ceremony. Food sellers normally sell food in front of or below the tree Body. The distribution of places for economic activities in this space can be seen in the following image:

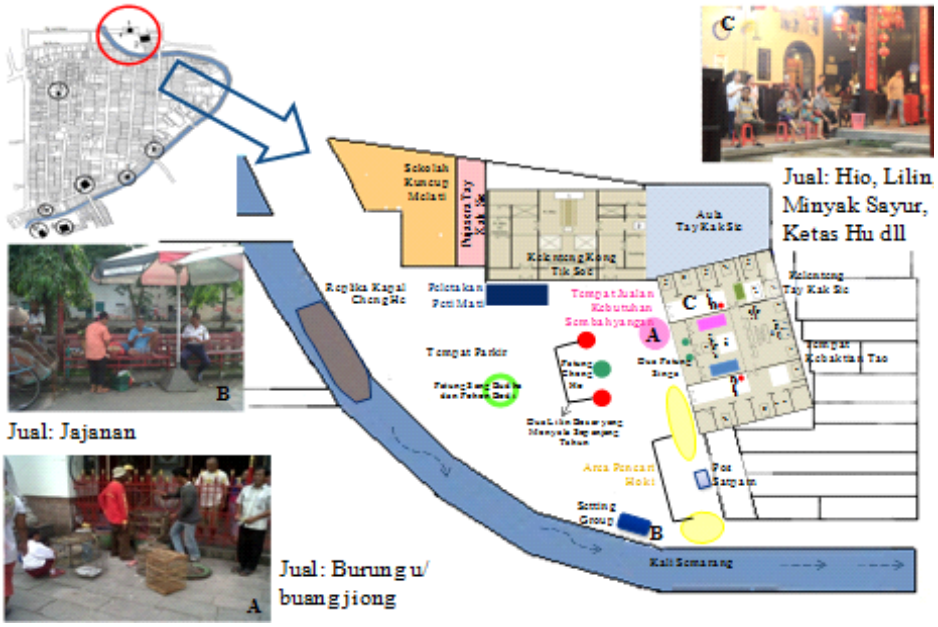


Figure 2. The place of economic activity in the Temple.
Source: Kautsary, J, 2014

Since the New Era, various kinds of gods/ goddesses of the three religions inside the temple have merged. In some temples, such as the great *Tay Kak Sie* temple (a Buddhist temple), there are some divisions of space to accommodate the needs of religious rituals and beliefs of the adherents of Buddhism, Confucianism and Taoism. The main deity of the Buddha School is placed on the main position performed worship space in the Middle, while the gods/deities are in the left and right wings of the main building. While the smaller temples that have only one tier building share a place for the altar of God. It is done in one space, next to the main deity's altar table in the left and right or on the left side only.

The limitedness of area and space, and many of limitation of activities held in public places since the new era enable the temples to have complex function. Recently temples are not only for doing prayer but also as the place where many activities can be done, such as searching for blessing and luck, the place to get along, to welcome the guests, to run business or economic activity and to hold the socio-cultural activities such as art performance, the handicraft exhibition and to practice *Wu-shu* martial art. the activities are usually held on the front terrace of the temple. the activities can be held at the same time among others although there is something contrary between doing prayer and singing aloud at the house of karaoke. the concept of space sharing between space for trading and space for praying is the example of the first layer defense concept.

The steadfastness of Chinese society in carrying out a program of devotion to both Tian (*Zhong*) and the ancestor (Xiao)makes them strong and able to endure the pressure. On the second-layer concepts of survival the parents usually teach the lesson about devotion to the family by honoring ancestors, the system of kinship and the tradition of having meal together especially on the eve of *Cia Cia*. On the eve of *Cin Cia,* event of having meal together is one of the media that retighten a separate family due to the presence of a new family member, as well as the rituals performed worship ancestors and *Cheng beng*. Through the act of homage and mainly conduct performed worship to ancestors a sense of fraternity can make them closer and feel secure because they will always be protected and it makes them survive. They believe if they practice filial piety to the ancestors and pray fervently, the ancestors and the gods will certainly return the favor by protecting them. The protection in a family (clan) is the form of the 3rd layer of protection.

Temple also serves a place for expression . The strong ties to the region of origin of Chinese society among the community have also caused bonds of tribal groups. Many bonds of tribal groups was established to protect and meet the needs of each of its members in a new place or to keep them in touch to his family in the region of origin. Some of the ethnic groups found in the Chinatown area are *Hakka*, *Hoklo, Chaozhou Hokchia* and *Kongfu.* There are also associations/organizations/foundations (Ho *Hap Hwee, Tji Lam Tjay, Kong THHK Soe*, Ict, etc.). The pro-

tection offered by tribal groups was a form of the 3rd layer of protection.

In the Chinatown area is also found indication of groupings of society based on appropriate merchandise or expertise, in running their life, most of them engaged in trading. This is because they come from different provinces and perhaps different tribes. The *Hokiens* (Min Nan) are expert in trading and they are dominant in trading crops. *The Kheks/Hakkas* usually had a grocery business for their living, the *Tio Cius* have restaurants, iron/iron stores first, the *Hokjas/Fu Qings* have the expertise in moneylenders (banking), or cloth store.

At the beginning, the agglomeration of trading was the way how they survive in the new environment. And nowadays, this form of activities also appeases as one of the concept of space for survival in the economic sphere. This agglomeration enables more and more buyers come, due to the various options. Among the Tionghoa community leaders the agglomeration is believed to be the form of the fourth tier defense.

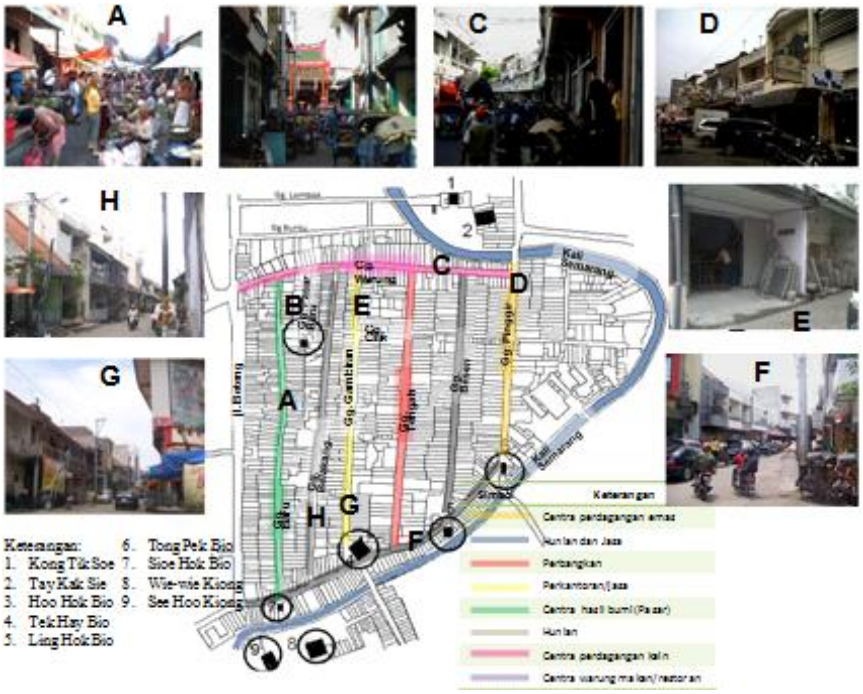


Figure 3. Grouping of activities as one of the forms of space for defense
Source: Kautsary, J, 2014.

The concept of space for survival in pecinan Semarang doesn't make any changes in the social, economic and cultural protection systems. There are a lot of traders coming from China and or Taiwan who trade in this area. In 2005, the number of foreign citizens in this area was 253 people, and in 2014 based on the data profile from kelurahan Kranggan, the numbers of foreign citizens are 238 peoples. Because of the sustain arrival of merchants from China one of Chinese Capten in the past peeped out the idea to establish a budget service organization in 1837. The organization was then named *Tjie Liam Jay*. The role of this organization in notes according to Liem TJ (1931: 102) is to provide information associated with various regulations, legal and other information to the community especially the newcomers.

In progress, the organization then spitted into two fields. The first field handled all problems related to licensing, legal, regulatory affairs and everything to do with the autorities. The second area maintained the affairs of religious ceremonies, death and other things related to the needs of the Chinese culture and rituals such as a large ceremony at shrine *Tay Kak Sie*.

Related to the social and cultural defense, large temples *Tay Kak Sie* memalui *Tjie Liam Tjay* also have a considerable role in terms of determining the calendar of cultural activities such as religious rituals performed worship and funerals or activities associated with other religious cultures. Calendar of activities in other temples usually refers to events calendar set by this great temple and this is not only true in shrine-shrine that existed in Chinatown but also to Semarang and surrounding areas.

The other important role of the major temples is to introduce and develop Chinese culture among the younger generations. This introduction is to foster a sense of loving toward ancestral culture containing high cul-

tural values and preserving Chinese culture in general and temples in particular. This introduction also attempts as a manifestation of Tri Dharma and in an effort to make the Chinese society have the next generation who are aware of the genuine culture as effort to preserve it.

The social organization in Chinatown is not just *Tjie Liam Tjay*. There are several similar organizations such as Tunas Harum Harapan Kita (THHK) or in English it means our fragrant buds expectations and *Tong Hian Boen* (Assembly of the sense of the Dharma). The Organization in THHK run various fields. Started from school that teaches the Chinese language, arts, dancing and writing with Chinese characters and the other formal schools from kindergarten to HIGH SCHOOL level. The Foundation also provides medical services and costs are relatively cheap to the Tionghoa society members.

While the community organization, *Boen Hian Tong* or *Rasa Dharma*, which was founded in 1876, is an organization founded by a group of artists. This organization was originally known as the men's Association of Chinese executives who were fond of playing *Lam Kwan* music (live music). Nowadays, various of art and culture performances are displayed in many buildings, including Gambang Semarang music practice. Gambang Semarang is the real example of cultural acculturation between Chinese musical instruments and Javanese Gamelan. Gambang Semarang is usually played by xylophone kids of SD. Kuncup Melati in every Wednesday. While the activities of the dancing and singing Mandarin song for the old age are done on Thursday. Some of the community organizations in Chinatown above still continue to exist, and also have an area of advocacy for the Chinese, among others are:

- PSMTI (Persatuan Sosial Marga Tionghoa Indonesia / Union of Chinese Social Clan Indonesia)
- INTI (Indosesia Tionghoa / Indonesia Chinese)
- PORINTI (Persatuan Organisasi Indonesia Tionghoa / Union of Chinese Social Organization Indonesia), Semarang
- Perkumpulan Sosial Rasa Dharma (d/h Boen Hian Tong), Semarang
- Sekolah Kuncup Melati, Semarang (d/h *Khong Khouw Hwee* / School of Kuncup Melati)
- Balai Pengobatan Sin Yu She, Semarang

These organizations, in their activities, are clearly visible in defending their existence and sustaining economic, social life and their culture in a new country with a strong political pressure especially in the Netherlands and rule the new order. Community organizations are part of Defense level or tier 5 (outermost).

IV. Conclusions

The result of the above description is that it is understood that the concept of space is one of the last things that is important in maintaining the cultural value system for the community of Chinese in Chinatown Semarang. The choices of life in a new country that has a strong political pressure made them use multiple strategies to survive. This last concept in Chinatown formed protection, livelihood, getting blessings, sharing and expression.

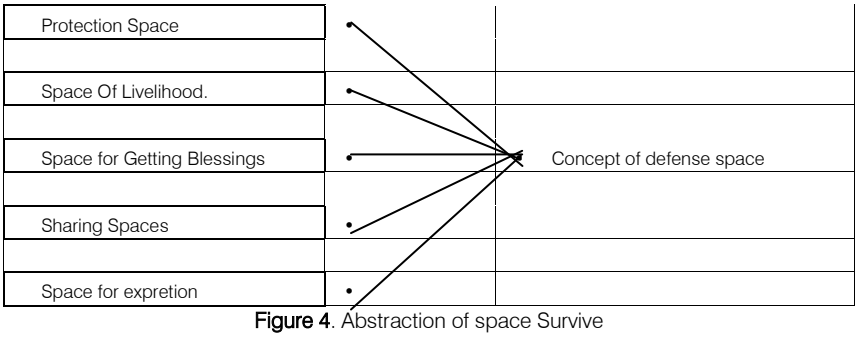


Figure 4. Abstraction of space Survive
source: researcher, December 2014

The concept of protection against social, economic and cultural progress in different levels/ layers:

- The first layer is clearly visible from the physical symbols used. It is The iron fence in each building or building design which are lack of ventilation/openings;
- The second layer, which is considered the most basic protection, is in the level of protection of the family or clan. In this level, efforts to preserve family honor is done by giving the name of the clan in a person's name.
- The third layer, the protection in the tribe level. Tribal bonds offer various forms of

protection related to the needs of Chinese citizens.

- Fourth Safeguard, in the form of agglomeration of activities, is to protect every activity. in one event there can consist of one or more ethnic groups;
- Fifth Safeguard or protection is the outset layer of protection from advocated social organization.
- This layers pattern can be seen in the following image:

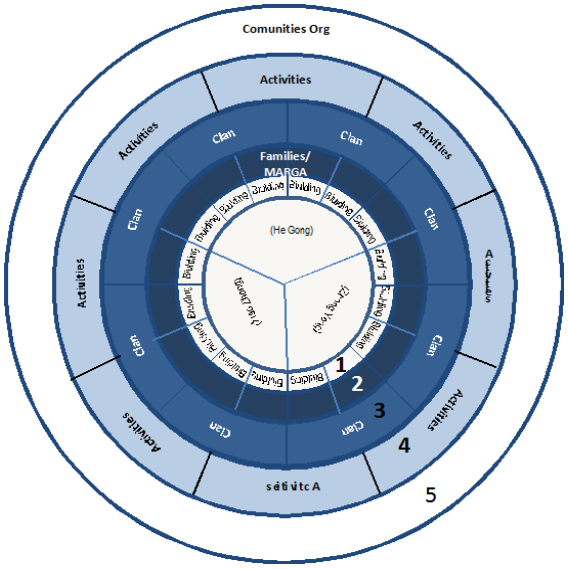


Figure 5. Coating Room Diagram Persist
source: Kautsary, J, 2014

Refereces

1) Bell et al., 2001, "Environmental Psycology., Holt, Rinehart, and Winston the University of Michigan.
2) Hariadi., dan Setiawan, B., 1995, "Arsitektur Lingkungan dan Perilaku. Pusat Studi Lingkungan", Dikti, Jakarta.
3) Kautsary, J., 2014, " Pelapisan Ruang berbasis Spiritual dan Kesejarahan Komunitas di Pecinan Semarang. Draft Desertasi. Sekolah Pasca Sarjana UGM, Yogyakarta (tidak dipublikasikan)
4) Kautsary, J.,Sudaryono S, Leksono P. Sabanu, 2008, " *Makna Ruang Pada pada Permukiman Tradisional Pecinan Semarang, Seminar Nasional Eco Urban Design, Universitas Diponegoro.*
5) Kautsary, J. Dan Sudaryono, 2008,"*Budaya dan Ruang pada Permukiman Tradisional Pecinan Semarang",* Sekolah Pasca Sarjana UGM, Yogyakarta (tidak dipublikasikan)
6) Liem T.J., 1931, "Riwajat Semarang dari Djamannja Sam Poo Sampe Terhapoesnja Kongkoan". Tjitakan Pertama, Boekhandel Ho Kim Yoe, Semarang-Batavia.
7) Sudaryono, S., 2003, "Metode Deduktif dan Induktif dalam Penelitian Arsitektur, Workshop of Architecture Research Method and Implementation, Diponegoro University, Semarang.

Understanding the transitions of social life in public spaces in Indonesian cities. A comparative study on the 'urban inversion' of the Integrated Retail Centres of Surabaya.

Manfredo Manfredini[1], Ross Jenner[1], Raja Jusmartinah[2], Paul Litterick[3]

[1]Senior Lecturer, School of Architecture and Planning, The University of Auckland, New Zealand.
[2] PhD Candidate, Urban Design, The University of Auckland, Auckland, New Zealand
[3] PhD Candidate, Architecture, The University of Auckland, Auckland, New Zealand

Abstract

The rapid numerical and dimensional growth of malls in Indonesian urban areas is having a deep impact on the social life of urban communities, providing new public spaces rich in amenities, safe and climatically comfortable. The success of these structures also relies on their effective provision of very attractive modern environments with clean, organized and controlled environments that offer an alternative to the traditional public open spaces of larger Indonesian cities, which have serious problems of air quality, acoustic pollution, walkability and thermal comfort. In the city of Surabaya – the second largest Indonesian conurbation – the construction of 28 large mall complexes during the last 10 years has profoundly changed the life of its main urban units: the kampongs. The new developments have also benefited from the support of both local and central authorities, through programmes like the 'Surabaya Shopping Festival,' an annual event organised by the Tourism Promotion Board of Surabaya. Investigating the urban condition of Surabaya, this paper seeks to understand the continuing transition of social life occurring in urban public space. It foregrounds the substantial shift of people's everyday practices from traditional publicly owned urban places of social aggregation (streets, open spaces, markets halls) to privately owned places of consumption (mall and entertainment complexes).The paper reports on the first phases of the research; the literature review and the preliminary analysis on the condition and development of malls in Surabaya. The analysis is a comparative research on a selected sample of malls that focuses on two aspects; the structural organization and spatial configuration. The investigation of structural organization of the selected malls is based on empirical research and speculates on the effects of the 'introversion' of the public space operated by the mall system. It considers structural factors like size, articulation and number of commercial and non-commercial activities, and availability of public services. The study of spatial configuration explores the morphological aspects of the urban inversion operated by the malls, elaborating information on the structure and syntax of the spaces of the selected complexes in relation to the city. In the final discussion, the paper proposes a critical interpretation of the occurring transition in the social life of public spaces, highlighting the most critical aspects emerging in the new architecture of 'enclosures.'

Keywords: *Public Spaces, Enclosures, Social Life, Malls, Spatial Analysis, Surabaya*

"So that the arcade is a city, a world in miniature, in which customers will find everything they need."
Walter Benjamin, The arcade project

I. Introduction

Indonesia, Southeast Asia's most populous country, has one of the world's fastest developing economies: its medium annual GDP growth rate was 5.6% during 2003-2013[1]. A consolidated political and economic stability and a quite advanced financial system offer attractive investment opportunities to global capital in various sectors[2]. Since the 1998 Presidential Decision to open Indonesia to foreign investors, the retail sector has drawn leading multinational companies into the country. Retail transactional value from 2011 to 2015 is estimated to have grown by 65%[3]. The most evident physical effect of this phenomenon is the development of large modern retail structures: more than 200 shopping malls were built in the last 10 years.

These malls are particularly concentrated in the largest urban areas on Java. The uneven

Dr. Manfredo Manfredini
---Senior Lecturer, School of Architecture and Planning,
The University of Auckland, New Zealand,
Phone +64 (0) 9 923 3909
E-mail: m.manfredini@auckland.ac.nz

geographical distribution of new malls is correlated to the distribution of the population, with Jakarta (9.6 mil inhabitants in 2010) hosting 130 structures, Surabaya (2.7 mil) 28, Bandung (2.4 mil) 15, and Semarang (1.6 mil) eight. That correlation does not show a linear function, but amplifies the difference between the cities, with Jakarta's malls having an average catchment of 74,000 inhabitants (the city hosts two malls ranked among the top twenty largest in the world), Surabaya's 96,000, Bandung 160,000 and Semarang 200,000. Cities in the rest of Indonesia have been less affected: the highest concentration is six malls in Medan for 2.1 mil inhabitants and an average catchment of 350.000 people; Batam has five malls, while Makassar and Pekanbaru each have two.

The rapid growth of malls has created a highly competitive retail environment, challenging owners to upgrade, expand and integrate new functions to attract enough visitors to keep tenants paying the rent. Iterating the model of adapting western paradigms in Asia, Indonesian malls are highly articulated structures with integrated activities beyond shopping that include entertainment, hospitality, culture, education, sport and recreation[4]. Indonesian malls offer an all-year-round climatised indoor environment that is more comfortable than the hot and humid tropical climate. This convenience makes it a preferred place for non-commercial activities, both social (e.g. dance classes for children, school performance, and blood donation) and government services (e.g. tax payment, ID card and driving license renewal). Shopping is no longer a primary goal to visit a mall. This pervasive mall expansion challenges the functions and practices of Indonesian's traditionally intense urban public spaces, generating a progressive migration of the public realm from them to the privately-owned shopping enclosures.

The research presented here aims to understand this peculiar transition of social life. The study focuses on Surabaya, the second largest Indonesian city, where social, economic and cultural life traditionally has been cantered in the public spaces, amenities and infrastructures of the *kampongs*, small semi-autonomous urban communities aggregated in the extended urban areas[5]. This paper addresses the spatial 'inversions' caused by the introduction of new shopping enclosures into traditional urban patterns. The village structure is not only physically redefined by those major building redevelopments, but also culturally and socially transformed. The shift of social life destabilizes and impoverishes activities occurring in streets, open spaces and market halls; at the same time it reframes the public dimension within the controlled spaces of the 'improved' environments of the integrated malls.

The research ask two main questions: what are the consequences of the migration of the Indonesian urban public realm to the new privately owned 'public' spaces on people's spatial practices and behaviours; and how are the new centres of public life transforming the urban form and structure of the larger Indonesian cities?

To answer these questions, the research explores two streams. The first aims to define an interpretation of the malls in Surabaya based on the Michel Foucault's theoretical framework of *heterotopia*. This allows evaluation of shopping enclaves in regard to their otherness, considering empirical data concerning extension and diversity of their commercial and non-commercial components. The second stream evaluates the spatial configuration of the integrated malls to describe the semantic and syntactic aspects of the urban inversion operated by the malls. This also elaborates information on structure and syntax of the spaces of the selected complexes in relation to the city. Evaluating the findings of both streams, the research elaborates upon an initial interpretation of the spatial aspects of the occurring transition in the social life of public spaces, highlighting the critical aspects emerging in the new architecture of 'enclosures.'

II. From malls to megamalls

The integrated megamall is a building type that emerged from the fundamental reorganization that characterizes the contemporary city, a process of both fragmentation and networking and of both decentrelization and convergence. It has been described by members of the Los Angeles School of Urbanism as characterized by social polarization and a substantial reterritorialisation, with the subversion of traditional hierarchic rules so that the hinterland now organizes the centre[6]. Megamalls are described by David Graham Shane[7] as large integrated structures (heterotopias) that dominate the city in the form of enclaves: bordered organizational devices organized around a single centre. These are connected by armatures: linear organising devices. These urban elements are disconnected from their environment; they cause a wide-ranging commodification of spaces, services and goods; they supplant the diffused systems of public urban amenities scattered throughout the territory of the traditional city.

Malls became a characteristic feature of the city in South East Asia in the 1990s[8], and changed both traditional urban shops and city structures. Malls were one of the key elements in the restructuring of urban space in South-East Asia, alongside high-rise offices, freeways and gated residential communi-ties[4]. The rapid growth of multiple urban centres coincided with movement from the city to the open land of the urban peripheral. Here developers introduced the *bundled city,* providing various facilities in complexes equipped with retail, recreation and hospitallity services.

The modern history of enclaves shopping facilities began in the USA in the first decade of the 20th century and developed during the 1920s and 1930s. The development of shopping facilities was predominantly focused on improving the social and civic life of communities through the incorporation of a wide range of public cultural, institutional and recreational functions[9]. They mainly served existing rural communities distributed over vast territories with little access to social amenities[10]. Later, they became a form of 'palace of consumption,' where the human need for recreation, socializing and public life is packed neatly in malls, combining pleasure and profit[11].

To understand the mall demands acknowledge of shape, geography and concepts of attracting consumers. Recently, mall definetion commonly considers some framework in developing a global classification of "mall" to generalize perception. Some criteria normally have been used such as size of the structure or land area, design, location, number of anchors or tenants and theme[12]. The other element to take into account is the concept, as Crawford[11] mentions of 'retail magic' that can be designated by marketing processes using the concept of 'adjacent attraction', to draw to the consumer by placing several different objects close to each other. The idea is to offering a variety of amenities as an initial stage to maintain consumer length of stay, giving them the opportunity for window shopping and purchase items seen interesting. This strategy also combines retail with social activities, recreation and tourism in one composite setting[13]. Moreover, in a geographical view, the location can create new different shapes of consumer lifestyle[14], which can perform the character and style of each mall.

The ambiguous needs of social space and retail space noticeably occur in a mall, even though the mall is in private ownership, it is used by the public[9]. Activities at the mall today are not only limited to shopping, but there are also social activities, education, pro-motion, and recreation[10]. Its spaces also offer high physical comfort and a kind of social ambience with regulated and 'harmonious' public life[15]. The comer- cial centre is set up with a detailed plan and an interesting theme to create the illusion of public space, a place showing a comfortable urban life[16]. The mall has remained the most favoured place as is indicated by the increasing of visit duration to mall from 20 minutes in 1960 to 3 hours today[11].

III. The Background of Surabaya City

Since the early 20th century, Surabaya has been the busiest port and largest city in the former Dutch East Indies colonies and has grown into one of the important trading port cities in Asia. Surabaya's metropolitan area includes towns – Gersik, Lamongan, Mojokerto and Sidoarjo – that are important satellites for the city and market centres for their own hinterlands[17]. The high potential and economic activity in the city attracts immigrants interested in business or work[18]. Between 2002 and 2011 East Java Province experienced economic growth of 7.22% when national economic growth was 6.46%, and Surabaya grew more than its province. The city's largest GDP contribution (31%) to the province in 2010 came from trade, hotels, and restaurants[19]. An estimated 18 million East Javanese bought goods in Surabaya in 1994[20]. Growth transformed Surabaya, both in its core city and in the periphery.

For its spatial development, Surabaya has a management strategy articulated in administrative districts. Surabaya's administrative structure is of districts, sub-districts and villages. The city's 5 districts, 31 sub districts and 160 villages cover an area of 330.48 sq. km and include a marine area of 190,39 sq. km[21]. The old city centre of Surabaya is now in the northern region while the modern centre is in downtown Surabaya. Despite having a small area and number of sub-districts, Surabaya's centre has a wide variety of urban facilities complex such as commercial, office, education, hotel and apartment. Unlike the northern and central areas the early growth of the city took place, the western, eastern and southern districts are the new area of urban expansion. There is a difference in the development of each district. While the southern part has grown along the main street connecting the major cities of Surabaya and Sidoarjo, the eastern and western districts have developed according to investment and land area. Although develop-

ment of the eastern is visibly enlarged, it has not expanded as widely as the western area due to the barrier of the water (Surabaya east coast), while the western region has a significant growth including malls and luxury real estate. The distribution of district and retail development as Surabaya administration zone is clearly shown in **Figure 1** below.

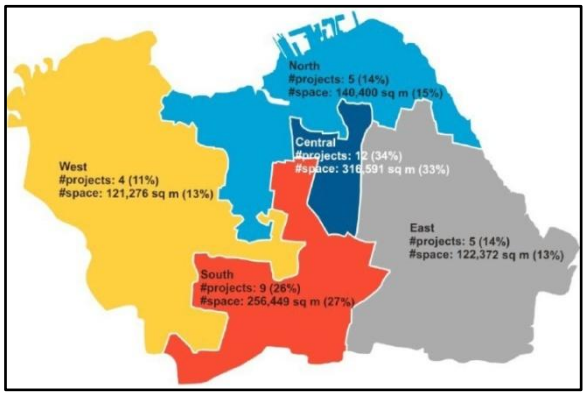


Figure 2. Surabaya district percentage of retail area
Source: Colliers, Source: Surabaya Market Report, 2013

IV. The emergence of malls in Surabaya

As the major business hub of East Java, Surabaya has become a major target for the investment in retail developments in Indonesia (a country rated by GIA among the top five important emerging markets for consumer and retail companies for 2012-2017[22]. From 2007 to 2012 the city's retail space supply expanded by 60% attracting leading global retail organizations such as Lotte, Sogo and Marks and Spencer.[23]This trend has led to a strong agglomeration of the businesses with the development of the more than 20 new shopping malls (whose revenues – mainly produced by retail, hospitality and parking businesses[24]– have made them the single largest contributor to Surabaya's tax revenues[19]) and is strongly supported by both the central and local authorities particularly focusing on their potential for tourism in both the business and leisure sectors. Accordingly, malls have become key venues of major events, such as the May celebrations of Surabaya's anniversary and the Surabaya Shopping Festival. They have also attracted a substantial portion the MICE (Meeting, Incentive, Conventional and Event) tourism sector [18]. The hotels, halls, convention centres, meeting rooms, events and exhibition spaces of the malls (particularly large are the ones in Tunjungan Plaza, Lenmarc, Pakuwon – Supermall, City of Tomorrow, Grand City and Ciputra World) have substantially contributed to the recent growth of this sector that in 2011 provided 80% of the entire tourist arrivals with an increase of 10% from 2010[25].

The malls' realm of consumption and spectacle progressively expanded its facilities devoted to recreation, entertainment and leisure to answer the needs for comfortable, safe and

Fig 1. Advertisement of Tunjungan City
Illustrating the 5th addition to the largest Surabaya's integrated retail centre, the first Superblock in Indonesia, consisting of a set of malls, office, hotel and residential towers located on a 76,974 sq. m site with 315,292 sq. m of GFA1 and 4,200 carpark lots.
Source: First1indopropertywordpress.com (acc. 24/06/2014)

clean public space that ease the difficulties of the often unsatisfactory public space of the kampongs. Physical well-being (avoidance of the discomfort of the tropical climate), practicality (accessibility and integration of manifold services and activities), security, safety and certainty (absence of uncontrolled and pedestrian unfriendly environments, permanent presence of authorities, elimination of the fraudulent practices of the traditional market) have made malls the most popular destination for everyday life of various Surabaya's social groups[26]. As observed by Kusumawidagdo *et al* [3], for Indonesians, the comfortable and pleasant environments of shopping centres have become the most desired destination to provide enjoyable experiences in leisure time. An inclination confirmed by the findings of a recent survey by AC Nielsen[27], revealing that 93% of Indonesians prefers shopping centres for their recreation.

V. The diffusion of malls in Surabaya and the creation of the Integrated Retail Centres (IRC)

In terms of spatial distribution, Surabaya's mall are clustered either in the central area of the city or along its main transport corridors (**Figure 3**). The malling of Surabaya began with the construction of Tunjungan Plaza in 1986, the first modern shopping centre located in the very centre of the city. The immediate success of this development encouraged the construction of other downtown shopping cen-

tres[18]. This led to the creation of a cluster with three new structures (Surabaya Plaza, Royal Plaza and Galaxy Mall) that complement four large wholesale trading facilities (Pasar Atum, Jembatan Merah Plaza, ITC Mega Grosir, and Pusat Grosir - Surabaya) located to the north, towards the port. During the next few years economic studies[28] indicate that the CBD will continue to be the main location for commercial growth. However, the expansion of malls will continue to proliferate along the main radial circulation axes, both east and west– inaugurated by the Galaxy Mall and the Supermall, and the Pakuwon Trade Centre – and south – as the City of Tomorrow, Royal Plaza, Darmo Trade Centre, Central Point and Maspion Square. It is expected that the number of malls will continue to growth. By the end of 2011 there were 24 operating malls[29] and in 2013, 28, notwithstanding some problems that led to the closure of one mall (JS Plaza) and three management changes (BG Junction, Darmo Trade Centre and World Trade Centre).

Tomorrow Plaza Surabaya

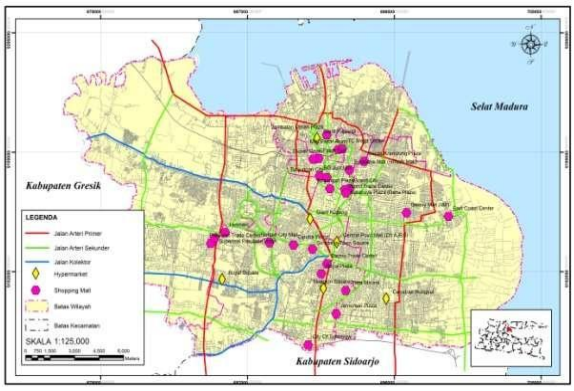


Fig.3. Surabaya mall distribution

Source: Raditya, Sari & Sutikno, 2013

During the last decade, the range of functions, services and amenities provided by the malls has progressively expanded from basic retail, tourism, recreation and leisure, leading to the creation of the current large IRCs. This resulted from the combined effect of Surabaya's problematic processes of urban redevelopment, the insufficient mobility infrastructures, and the highly competitive environment in the fast-growing retail sector. The new integrated mixed-use developments include office parks, residential complexes and a range of commercial urban amenities such as private education facilities, exhibit- ion halls, and entertainment, sport and wellness centres (particularly renowned being the Marina Plaza sports centre and the Grand City exhibition hall).

Multifarious civic elements are also embodied in the IRCs, including institutional and cultural amenities that satisfy most of the daily needs of the resident population and encourage customers to visit them frequently.

Wandering through the leased commercial spaces of the arcades it is indeed possible to find public service amenities (e.g. offices and counters for ID card, driving license and local authority services), spaces for informal performances (e.g. stages, dedicated corners and rehearsal rooms), mobile street vendor markets, and facilities for culture, health, exercise and fitness. Moreover, most of Surabaya's shopping malls accommodate a variety of places for informal and community group led social interaction as shown in **fig. 4 and 5**.

The spatial migration of many civic and community-based activities from the public space of the kampongs to the integrated systems of the shopping malls (sometime dissimulated with semi-open building concepts as in Surabaya Town Square) is impacting heavily on the spatial practices of the people of Surabaya, provoking deep changes in their social, economic and cultural life. Criticism of the social degradation caused by the expansion of malls in urban spaces in Surabaya has emerged and authors like Dick W. Howard[30] who that developers have built an artificial environment only for the few and the middle-class has shifted its social life into private places that only offer "what money can buy" (p. 412). These critics highlight the risks of mall expansion which include not only the loss of the traditional markets and of the commercial streets with independent traders. The shift towards 'modern' lifestyle and consumerism can also hit the human capital of the city heavily, obliterating entire traits of the local material culture, fragmenting historically consolidated communities, posing severe limitation on forms and modes of individual expression, erasing consolidated institutions of the everyday collective life, hindering spontaneous interaction generated through casual encounters, and eliminating the

peculiar spirit of '*gotong-royong*' (the mutual assistance based on com- mon humanity and equality – inherent in *Kampongs* society) as it has already been observed by several scholars[31].

The consequent shift in people's everyday practices is indicated by the continuously increasing number of visitors to IRCs', especially at weekends and holidays. According to the Indonesian Shopping Center Management Association (APPBI), in East Java the increase of visitors varied in number from 15 to 40 percent according to the specific conditions of each shopping centre and its tenant occupancy rate.

VI. Towards an index of enclosure and 'other-ness': the empirical research for an heterotopic index

This paper reports the results of a cursory exploration of the key characteristics of the Integrated Retail Centres (IRC) in Surabaya to provide evidence of spatial discontinuity and encapsulation of these urban enclosures. It aims to outline a preliminary interpret- tation of the inversion of the urban public space produced by these structures developing a method to measure the intensity of the shift of the 'public' to the privately owned, managed and controlled interiors and of the corresponded marginalisation ('externalization') of the exterior urban public space.

Fig 5. Iftar with orphans held at Grand City Mall, usually held in orphanages and mosques

To measure this 'shift' the study first identified the key spatial determinants of the spatialities of IRCs' pseudo-public spaces using the theoretical framework developed by Shane[7] to describe the "reverse cities" characterising the contemporary urbanism. This framework – that relies on K. Lynch's urban models and M. Foucault work on heterotopias – offers powerful theoretical and methodological instruments for the interpretation of the radical alternative proposed by the IRCs complex. Elaborating on the notion of 'heterotopia of illusion,' it lets us disentangle the articulated constitutional logics of these commercial structures. These are the logics that, governing the construction of the multiple compressed duplications and repetitions of the spatial body of the city, have been developed during the modern history of the western shopping mall and introduced in Asian countries during the last decades of the 20th century. Shane's framework, focusing on post-modern networked cities, is particularly useful to understand the Asian implementation of those logics as describes the exact system of "enclaves" and "armatures" that characterises the peculiar local adaptation of the imported models. The contemporary urbanism based on the development of 'patches' that – as Manuel Castells[32] observed - are globally connected and locally disconnected required and expansion of scale and complexity of the enclosed commercial structures, developing a system of multifaceted 'othernesses' that supplants the traditional genuine spatial manifestation of the public sphere in the public space.

Elaborating the adopted framework, to introduce specific adaptations to match Surabaya's current conditions, was therefore possible to establish effective criteria to analyse and interpret the new form of 'production of space' occurring inside and around the highly accessed yet physically disjoined IRCs of the city. Accordingly a set of basic parameters that measure the 'heterotopic' degree of these spatial enclosures were defined and the allied homogeneous available data collected. A corresponding set of indices, synthetizing the main spatial characteristics of the 'inversion' of the 28 Surabaya's IRCs, was eventually created.

The results can hopefully shed some light on the mechanisms introduced by those virtual public spaces where both the dimensions of real and imaginary (everyday and symbolic life) are transposed through carefully scripted and centrally controlled tactics of redundancy and surprise. They can then show how, in the core of Surabaya - an historical and densely populated networked city in rapid social, cultural and economic transition - these 'public' domains orchestrate apparatuses that possibly compromise any chance of a citizen's taking part in production of 'real' natural and social worlds. Domains which - as Lefebvre[33] observed with paradoxical subconscious appearances reflect their domination by "the worst of abstractions, the abstraction of power."

The measures of the IRCs 'excessive' spatial, social and cultural dimensions offer an insight into Surabaya's metamorphic urban laboratory for the construction of new socialities, communities and localities. This can – as Arjun Appa-

durai[34] noted observing the new spaces offered by technology – provide insight into these places that are steadily "rebuilding the fabric of reality itself" being perhaps harbinger of new social ways of 'experimenting' with the modifycation of life. The new IRCs are enclaves that, speculating on individual desires for comfort, safety, self-gratification and socialization, respond to the contemporary 'cultural' demand of a society increasingly orientated to the 'pleasure of experience', offering over-determined and controlled realms of social interaction, where the political and consumerist dimensions are recombined to maximise corporation profits.

This empirical 'validation' is the first phase of the practical research and includes two analyses that use available information on the IRCs development in the urban area of Surabaya. The collection of data concerns basic structural aspects and primary qualitative articulation of the extended IRCs' developments (i.e. including all the integrated commercial, residential, productive and institutional parts of the developments). The retrieval and elaboration of data concerning IRCs' basic structural aspects include the quantification of three main elements: size and ratio of retail and non-retail areas, number of organisations and of specialised clusters/zones, and quantity and ratio of anchors and small business units. The retrieval and elaboration of data concerning the IRCs' basic primary qualitative articulation regards the following: quantification and ratio of structural (profitable) and superstructural (non-profitable) components, measurement of the diversity (mix of uses) of both macro areas (retail, non-retail business and commercial, productive, residential, public and quasi–public) and of the main retail zones (retail and non-retail activeties, number, typology and concentration of both retail and non-retail activities). Moreover, this study utilizes the classifica- tion on the type of mall according to DTZ standard[1] of size and diversity of retailing[35], equipped with a number of non-retail facilities to determine the availability of public facilities.

The analysis of the relative values at the IRCs' level and the comparative study of the data on basic structural aspects and primary qualitative articulation of the IRCs offer an initial insight on the 'heterotopic' capacity of the structures. The indices, correlating pure quantitative values and qualitatively weighted values, allow one to outline a provisional description of the specific aspects concerning the self-containment of the different structures (diversity, functional integration and independency) that contribute to the construction of the summative measure of potential otherness or, using Foucault's framework, heterotopia.

The results confirmed our hypothesis, showing that the pure quantitative structural data (retail and overall area size, number of retail and non-retail activities, number of retail units and 'anchors') are only partially contributing to the "spatial inversion'. This resulted particularly evident for the set of 'specialised' malls (i.e. those mainly devoted to either wholesale or technology sector), which summative index values resulted much lower than the quantitative ones.

The second phase (not reported here, but fundamental for the development of the first phase) observes the IRCs' spatial configuration, exploring the morphological aspects of their urban inversions, elaborating information on structure and syntax of the spaces of the selected complexes in relation to the city. It elaborates data on the structure and syntax of the selected complexes in relation to the immediate surroundings (IRC natural catchment) and the city as a whole. It also provides basic information for the critical interpretation of the transition in the social life of public spaces addressed in the final discussion of this paper, offering references on the spatial configuration of this new architecture of extra-large urban enclosures.

6.1 Structural Organization

Twenty-eight malls in Surabaya are investigated to explain the relationship between retail and non-retail activities. Several indicators are considered: size, retail mix and articulation, as well as diversity of retail and non-retail activeties. Each indicator illustrates the relationship of both activities as a combination of public and commercial activities: as Dovey[15] observed 'Malls and their hybrids are an invasion of public space by private interest'. Based on the DTZ standard, Surabaya malls were classified into five of eight specific types. The highest type is the niche mall / destination retail type: eleven malls located mostly in the centre and north of the city. Seven regional malls were built in the central, eastern and southern district, and six super-regional centres / megamalls in all districts except the north. Three hypermarket type malls and one lifestyle type are located in the southern district. The summary of the classification is presented in **Table 1**.

6.2 Mall Size

Larger malls provide more space for diverse types of stores and a comfortable environment

for visitors to linger[36]. Therefore, the size of the mall has a direct impact on market share[37] and the larger retail area generates more sales per square foot than in smaller malls[38]. Comparisons were made using Gross Floor Area (GFA) for each centre. The three Type A malls in Surabaya have the widest gross floor areas: Pasar Atum Mall (39,000 sq. m), Super Mall-PTC (30,000 sq. m), and Tunjungan Plaza (25, 3187 sq. m)

6.3 Retail mix and articulation

Retail mix or tenant variety is one of the most influential factors in motivating consumers to stay longer and come again[39]. Retail mix,"the combination of retail establishments occupying space in the [shopping] centre" [40] may extend the time spent longer in the mall. The quantitative analysis of the retail mix addresses the numbers of tenants in each mall. The three with the most shops – Pusat Grosir Surabaya (2300), Pasar Atum Mall (2000) and Plaza Surabaya/Hi-Tech Mall (1100) – are categorized in niche / destination retail type or the wholesale mall, which provide a variety of goods for resale. Their diversity makes these malls destinations for visitors from outside Surabaya, even outside East Java region

Table 1. Surabaya Mall Characteristic

No	Surabaya's Mall	Total GFA (ha)	No of shops	No of non-retail clusters	District	Type (DTZ)
01	Delta Plaza	9	250	6	C	B
02	Tunjungan City-TEC	3.5	400	1	C	C
03	Tunjungan Plaza I-IV	25.3	550	7	C	A
04	BG Junction	15.2	483	2	C	B
05	Grand City	8.1	278	3	C	B
06	ITC Mega Grosir	15.4	1000	1	C	C
07	DupakGrosir	3.1	900	1	C	C
08	PusatGrosir Surabaya	5.9	2300	1	C	C
09	World Trade Centre	2.8	600	1	C	C
10	PasarAtum	39	2000	1	N	A/C
11	JembatanMerah Plaza	7.9	750	1	N	C
12	Surabaya Mall/Hi-Tech	3.1	1100	1	N	C
13	Galaxy Mall	17	480	2	E	A
14	East Cost	5.5	233	5	E	B
15	KapasKrampung Plaza	3.2	780	1	E	C
16	Royal Square	10.4	250	2	E	B
17	Ciputra World	8.9	283	7	S	A
18	Darmo Trade Centre	4.5	1000	1	S	C
19	Maspion Square	2.6	125	2	S	E
20	Royal Plaza	10.7	450	2	S	B
21	City of Tomorrow	12	1319	6	S	A
22	Marina Plaza	4.1	220	4	S	B
23	ManggaDua Square	13.2	800	1	S	C
24	Golden City	4.7	252	4	S	E
25	Central Point	5.2	118	2	S	E
26	Surabaya Town Square	5.8	120	4	W	D
27	Lenmarc	17.1	225	5	W	A
28	PTC-Supermall	30	600	6	W	A

Typology (DTZ standard):
A) Super – Regional Centre / Mega Mall,
B) Regional Centre,
C) Niche / Destination Retail,
D) Lifestyle centre,
F) Hypermarket

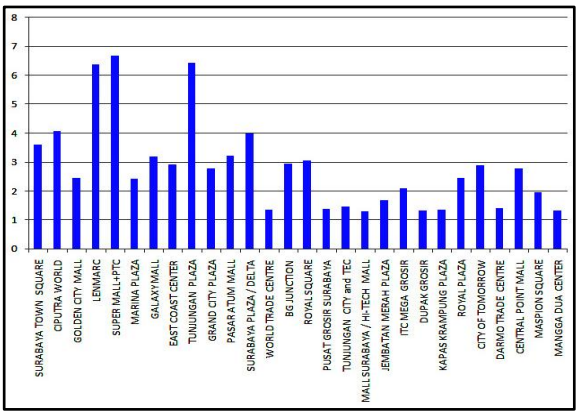


Fig.6. Summative index of IRCs in Surabaya's composed by three indices: Relative size, Mix of use and Diversity.

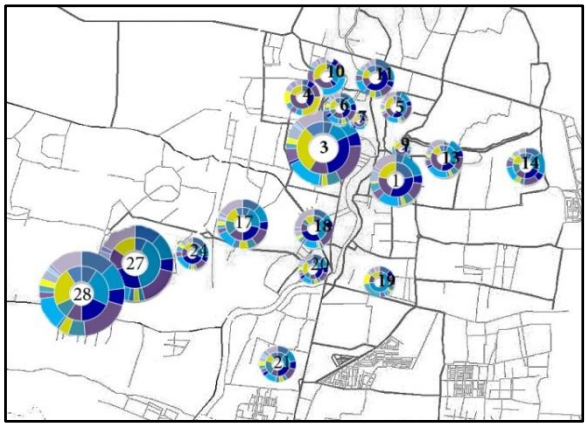


Fig 7. Map of Surabaya circle graphs representing relative values of the Diversity and mix of use indices. The internal rings show the values of the structural components, the external the super-structural ones.

VII. Diversification of Non-Retail Activities

Data was collected on the number of non-retail activities (hotel, exhibition/performance hall, office, cinema, education and sport centre) in the IRC. Most malls have at least one group of non-retail facilities; Tunjungan Plaza and Ciputra World have seven groups. In Surabaya's governance, since both urban planning and urban design have major considerations in identifying shopping centres urban integration[9] the city's development strategy includes the urban amenities present in the malls[21].

VIII. Integrated Heterotopic Index Analysis in Mall and Public Space combination.

Three indices (Size, Retail Mix and Non-Retail Activities) were calculated to show the structural organization and spatial configuration in relation to the combination of public activities and trading. Three malls have the most available places for public activities: Tunjungan Plaza, Supermall-PTC and Lenmarc. These shows the higher value of non-retail combination is in line with the availability and ability of a mall to accommodate public activities.

IX. Conclusion and Further Research

The emerging spatial pattern in the fast-growing Surabaya's fragmented cityscape produced by the increasing penetration of large all-encompassing IRCs has been studied to provide an interpretation of the changes in social life correlated with the spatial discontinuity and encapsulation produced by these enclosures in the urban environment (most of these malls are not even adequately supported by public transport, especially in the west and east as Supermal - Pakuwon and East Cost Centre). The aim of the research to interpret and describe the shift of the spatialities of the city, focusing on both the migration of the 'public' realm towards the privately owned, managed and controlled interiors of the IRCs and on the corresponding marginalisation of exterior urban public spaces.

This paper reports the initial phase of the research and discusses the preliminary results of the comparative empirical investigation that provides a preliminary assessment of the degree of integration and selfsufficiency of the 28 IRCs of the city, with the aim of contributing to understanding the emergence of the new and hybrid dimensions of the public realm.

Our hypothesis is that there is a strong consistency in the relationships between, first, the different spatial aspects of the transition in public space catalysed by the pervasiveness of the controlled spatial frameworks of the new 'cities' of consumption and spectacle (i.e. the IRCs mega-blocks) and, secondly, the contemporary changes in the physical, social and psychological spatialities that contribute to the construction of identity, spatial and historical cognition, and the free relational life of our cities. Consequently, we have initiated the examination and discussion of the specific physical and perceivable spatial characteristics res- ponsible of the successful production of spatial 'othernesses' –i.e. heterotopic deterritorialised, illusive and dislocative realities – using a design framework.

The investigation draws upon studies of public spaces in contemporary society that underline how the shift towards a more and more immaterial, contingent and displaced dimension is accompanied by fundamental changes in the meaning and practices of the physical public space. It uses a composite theoretical framework defined using Kevin Lynch (urban design), David Shane (urbanism) and Henri Lefebvre (sociology) and Michel Foucault (philosophy) interpretations and descriptions of the peculiar emersion of the new spatial form of heterotopia: a simulated heterogenetic reality characterised by redundancy and excess, cellulated enclaves, ambivalence and ambiguity.

Looking at Surabaya's urban condition, this study therefore focuses on the interpretation of the structural characteristics of the spaces of consumption, leisure and spectacle in the rapidly expanding fragmented cityscape of giant enclavic assemblages, analysing the most prominent institutions: the 28 IRCs. Examining the architectural and urban design aspects of Surabaya's system of heterotopic public space, this study addresses the increasing complexity and disorder occurring in the new urban landscape

of the new large urban enclosures of consumption and spectacle. It analyses the peculiar assemblage of spaces and places of the IRC's mini-cities to evaluate the design-related aspects that contribute to the exacerbation of the social life fragmentation caused by sudden globalization and access to new means of digital communication. Its focus is on the incipient heterotopic conditions of the new spatial frameworks characterized by measured and predetermined openness (provided through the integration of fundamental elements of both traditional and everyday life) that emphasize effects of 'immediacy', 'presence' and 'authenticity'. This condition, however, simultaneously aggravates and counteracts the fundamental fragmentation of the urban environment, providing a continuous displacement and re-territorialization of people's social environments. The disruption and reframing of the consolidated social networks based on the *kampong* communities is also affecting fundamental Indonesian cultural and social values as the spirit of '*gotong – royong'*.

To describe this phenomenon, the study found confirmation in the preliminary empirical research conducted on the spatialities of the IRCs. Through the construction and implementation of three basic and one composite index regarding both structural and primary quailtative aspects of the extended IRCs' developments, it was possible to confirm the initial hypothesis, showing that the pure quantitative structural data only partially contribute to the "spatial inversion'. They allowed us to formulate a provisional 'ranking' of the heterotopicness of Surabaya's IRCs to inform the following research phase that will address fundamental urban design aspects (accessibility, diversity, *mixité*, character and integration) of a selected sample of the 28 structures. This will eventually inform the third phase of the research, which is devoted to the investigation of spatial aspects of the problematic relationship between individual and society (particularly focusing on inequality and segregation issues), actors and networks, and users and infrastructure of this consolidated urbanity currently undergoing a profound metamorphosis.

Acknowledgement

This study was supported by the University of Auckland, New Zealand and the Directorate General of Higher Education, Indonesia.

Footnotes

[1] "Formal shopping centre typologies have either been developed or are under consideration by industry associations in the U.S, Australia and a number of other countries. In Asia, DTZ Debenham Tie Leung) has recently compiled draft definitions of various shopping center types in Malaysia, Singapore, Indonesia and Thailand" (Omar & Baker, 2009).

References

1) United Nations (2012), World Economic Situation and Prospects 2012. Retrieved from: www.**un**.org/en/develop ment/desa/policy/wesp/wesp.../**2012**wesp.pdf
2) McKinsey Global Institute (September, 2012), The Archipelago Economy: unleashing Indonesia's potential
3) Kusumawidagdo, A., Sachari, W.(2011), Shoppers' Perception on Physical Condition of Shopping Centres' Atmosphere at Different Lifecycle. International Research Journal of Business studies ISSN: 2089-6271 Vol. 5 | No. 2 / 87 – 100
4) Dick, H., W., Rimmer, P., J. (1998), Beyond the Third World City: The New Urban Geography of South-east Asia. Urban Studies. 35(12)2303-2321 doi: 10.1080/0042098983890
5) Rahmi, D., H., el al. (2011), Rukun and Gotong Royong: Managing Public Places in an Indonesian Kampung, in Public Places in Asia Pacific Cities, Dordrecht, Kluwer Academic Publishers 119-134.
6) Dear, M. & Flusty, S. (2004), Postmodern Urbanism. Annals of the Association of American Geographers, 88: 50–72,DOI: 10.1111/ 1467-8306.00084
7) Shane, D., G. (2005), Recombinant Urbanism: Conceptual Modeling in Architecture, Urban Design and City Theory.Wiley.
8) Mutebi, A., M. (2007), Cities Regulatory Responses to Large- format Transnational Retail in South-east Asian. Urban Studies, Vol. 44, No. 2, 357– 379, DOI: 10.1080/00420980601136604
9) Southworth, M. (2005), Reinventing Main Street: From Mall to Townscape Mall, Journal of UrbanDesign, 10:2, 151-170, DOI: 10.1080/13574800500087319
10) Gillette Jr., H, (1985), The Evolution of the Planned Shopping Center in Suburb and City, Journal of the American Planning Association, 51:4, 449-460 http://dx.doi.org/10.1080/01944368508976833
11) Crawford, M. (1992), The world in a shopping mall. In Variations on a theme park: The new American city and the end of public space, ed. M. Sorkin, pp. 3-30. New York: Hill and Wang.
12) DeLisle, James R. (2009). Toward the Global Classification of Shopping Centres. The International Council of Shopping Centers (ICSC)
13) Goss, Jon (1993), The "Magic of the Mall": An Analysis of Form, Function, and Meaning in the Contemporary Retail Built Environment, Annals of the Association of American Geographers, 83:1, 18-47, DOI: 10.1111/j.14678306.1993.tb01921.x
14) Abaza, M. (2001), Malls, Consumer Culture and the Reshaping of Public Space in Egypt. Theory Culture Society, 18: 97. DOI: 10.1177/02632760122051986
15) Dovey, K. (1999), Framing Places: Mediating power in built form, New York: Routledge.
16) Banerjee, Tridib T. (2001), The Future of Public Space: Beyond Invented Streets and Reinvented Places, Journal of the American Planning Association, 67:1, 9-24, DOI: 10.1080/0194436010897 6352
17) Ford, D., J. & Smith, J., D. (1978), Trend planning, an Indonesian case study, Planning Outlook, 21:1,5-11. Retrieved from http://dx.doi.org/10.1080/00320717808711549
18) Surabaya Tourism Board (2011), http://www.surabaya tourism.com/ about_sby.php
19) Surabaya In Figures (2011), Retrieved from http://www.

surabaya. go.id/dinamis/?id=3381
20) McMichael, H. (1997), South East Asia, East Java and Australia: Promoting the business partnership. Retrieved from https:// crawford.anu.edu.au/pdf/wp97/ sea971.pdf
21) Surabaya Structure Plan 2009-2029. Retrieved from: www.suraba ya.go.id/files.php?id=766
22) Global Intelligence Alliance (2012), Business Perspectives on Emerging Markets 2012-2017 Report.
23) Hong Kong Trade Development Council (2014), Hong Kong Trader, 30 April , 2014 http://www.hktdc.com /info/mi/a/hkthk/en/1X09XE8M/1/Hong-Kong-Trader-Hong-Kong-Edition/Upscaling-Indonesian Retail.htm# sthash. rNbtARFe.dpuf)
24) eminggu SSF (2008), Mampu Dongkrak Pajak.Jawa Pos, 9 May. Surabaya Siap Jadi Kota MICE (2011), Surabaya Pagi, 29 January, Retrieved from http://www.surabaya pagi.com/index.php?read=Surabaya-Siap-Jadi-KotaMICE
25) Atmawidjaja, E., S. (2009), Masihkah Kota Kota Di Indonesia Butuh mall? Buletin Penataan Ruang (January-February).
26) Colliers International Indonesia (2013), Surabaya Retail Market Report.
27) AC Nielsen, Marketing Mix (2009), cited in Kusumawidagdo et al.
28) Susilawati, Connie, Yakobus, Sutoto, Sulistyawati& Lenny (2002), The influence of travel time and size of shopping centre towards the frequencies of visiting customers in shopping centers in surabaya. In: PRRES Conference Proceedings, 21-23 January 2002,Christchurch, New Zealand.
29) Raditya, D., P.,Sari, S.,Sutikno, F., R., (2013), Wisata Belanja Kota Surabaya Berdasarkan Persepsi Pengunjung, Planning for Urban Region and Environment, 2 (2), retrieved from: http://jpurepwk.ub. ac.id/files/ jurnal/ 01_Dimas%20Pandu.pd
30) Dick, H.W. (2002), Surabaya, City of Work: A Socio-economic History, 1900–2000. Athens, OH: Ohio University Press.
31) Peters, R. (2009), The assault on occupancy in Surabaya: Legible and illegible landscapes in a city of passage. Development and Change, 40 (5), pages 903–925. doi: 10.1111/j.1467-7660.2009. 01588.x
32) Castells, M. (1996), The Rise of the Network Society (The Information Age: Economy, Society and Culture, Volume 1). Malden, MA: Blackwell Publishers.
33) Lefebvre, H. (1991), The Production of Space, Trans. Donald Nicholson-Smith, Blackwell, Oxford.
34) Morley, D., Appadurai, A. (2011). Decoding Diaspora and Disjuncture, New Formations, 73, 44-55
35) Omar, U. S., Baker, M. (2009), First step toward a shopping centre Typology for South East Asia, Asia Pasific and beyond. DTZ Debenham Tie Leung (Malaysia).
36) Ooi, J. T. L. & Sim, L. (2007). The magnetism of suburban shop- ping centers: do size and Cineplex matter? Journal of Property Investment & Finance, 25 (2) pp. 111-135. DOI 10.1108/ 14635780710733816
37) Huff, D. L., (1963), A Probabilistic Analysis of Shopping Center Trade Areas, Land Economics, 39:1, 81–90
38) Eppli, M. J., and J. D. Shilling, (1996) Large-Scale Shopping Center Development Opportunities, Land Economics, 71:1, 35–41.
39) Wakefield, K., L. & Baker, J. (1998), Excitement at the Mall: Determinants and Effects on Shopping Response, Journal of Retailing Vol. 74, No. 4
40) Brown, S. (1992), Tenant Mix, Tenant Placement and Shopper Behaviour in a Planned Shopping Centre. The Service Industries Journal, 12:3, 384-403 http://dx.doi. org/10.1080/026420692000 00046 http://dx.doi.org/ 10.1080/02642069200000046

Creating Effective Public Spaces for Children In Lenteng Agung, South Jakarta

Margaret Arni Bayu Murti [1], Ashri Prawesthi D[1], Diptya Anggita[1]

[1]Lectures of Architecture Department, Technique Faculty Pancasila University

Abstract

Lenteng Agung Village, Jagakarsa District, South Jakarta is one of a settlement area that has population density about 24.322 people per km^2 (Jagakarsa District in Figure, 2013). Based on observation, we found that small neighborhood (Rukun Tetangga) 11, one part of RW 08 have not space as play ground for children. Thus, children were playing on the street, ground lot of Wali Songo Islamic Foundation, and rent internet counter. Position of RT 11 is between Lenteng Agung Barat Street and Lenteng Agung Timur Street, thus the shape looks like an 'island'. This shape caused parents never permit their children to play out from 'the island'. The study is designed by considering qualitative method to examine effective public space for children. To enhance the qualitative information, interview guidance for stakeholder and residents (mother who has children) were conducted. Interview guidance contained the view from residents about public space for children. Therefore we analyze by comparing between the residents' view and theories. As a result, we figured the design concept of effective public spaces for children (preschool and aged 6-12) by roof garden that will build above Kompos Street which is connected to Lenteng Agung Timur Street. The bridge and ramp will connect to houses that planned in second floor thus children can access easily. Besides, the first floor will be use as parking spaces. On the roof, we provide mixed use functions those are play ground and socialize space for mothers.

Keywords: *effective, public space, children, roof garden*

I. Introduction

Urban public spaces offer obvious health benefits insofar as city residents and workers can get fresh air and exercise in them. This requirement for healthy spaces accessible to urban residents and workers is becoming critical in the light of increasing levels of heart disease and obesity, resulting from more sedentary lifestyles (National Heart Forum et al 2007, Ward Thompson and Travlou 2007). There is also a suggestion that they can promote mental health and wellbeing too (see for example Guite et al 2006, Greenspace Scotland 2004). Possibly as a result of our evolutionary heritage, humans seem to need both social contact with others and some access to greenery in order to maintain psychological balance (see Wilson 1984, Kellert and Wilson 1993), both being provided by good public spaces. This is presumably why people go mad when held in solitary confinement and why this is used as the cruelest form of punishment. There is a growing view that the success of good social policy should not be measured by economic gains but by improvements in wellbeing and happiness of citizens (Layard 2005). Finbar Brereton and colleagues at University College Dublin, have found that 'environmental and urban conditions' are critical to people's sense of wellbeing: 'Location specific factors are shown to have a direct impact on life satisfaction' (Brereton et al 2006 p2).

Outdoor space is hugely important for children's development (Moore 1986). It is important for their health and display lower levels of hyperactivity, and it is potentially one of the most exciting places for them to play (Plumpton et al, 2000 & Thaver, 2000 in Andre et al, 2002; See **Fig.1** and **Fig.2**). We say *potentially* because we often provide them with stultifying environments which offer very little delight, adventure or scope for them to exercise their imagi-

Margaret Arni Bayu Murti
---Lecture of Architecture Department Technique Faculty Pancasila University Jl. Srengseng Sawah Jagakarsa, 12640 Ph: (021) 7864730 ps 106
E-mail: arni.margaret@gmail.com

nations. According to the theories above, definition of effective public spaces for children is free of charge open play ground that build between housing thus they reach the space easily.

Lenteng Agung Village, Jagakarsa District, South Jakarta is one of a settlement area that has area 2,28 km^2 and population 55.454 people. Based on that information, population density in Lenteng Agung village is 24.322 people per km^2 (Jagakarsa District in Figure, 2013). One of area with densely populated settlement is Neigh-borhood (*Rukun Warga*) 08, Lenteng Agung Village. Based on DKI Jakarta Spatial Planning 2030, Lenteng Agung Village which is a part of Jagakarsa District have been planned to be a green area thus community should develop roof garden or maximize green open space. The land use area is dominated by settlement; however some of them are used for commercial, such as stores and college students rent housing (See **Fig.2** and **Fig.3**).

Fig.1. Children playground in urban settlement in Bintaro
Source: Documentation, 2014

Fig.2. Children playground in urban settlement in Kemang
Source: Documentation, 2014

Fig.3. Commercial Area in RT 11 RW 08
Source: Observation, 2014

Based on observation (May-June, 2014), we found that small neighborhood (*Rukun Tetangga*) 11, one part of RW 08 have not space as play ground for child-ren. As a result, children were playing on the street, ground lot of Wali Songo Islamic Foundation, and rent internet counter. Position of RT 11 is between Lenteng Agung Barat Street and Lenteng Agung Timur Street, thus the shape looks like an island. Maps of study area are explained in **figure 8, 9, and 10**.

Number of children in RW 08 around 640 people and spread in 14 small neighborhoods (RT) (Interview with Informant A, 2014). Based on observation, there were some types of children's game. Types of their game were bicycle (**Fig.4**), climbing (**Fig.5**), swinging (**Fig.6**), and online games (**Fig. 7**).

Fig. 4 Bicycle in Kompos Street
Source: Observation, 2014

Fig. 5 Climbing Steel in Wali Songo's Lot
Source: Observation, 2014

Fig.6 Online Games in Kompos Street
Source: Observation, 2014

Fig. 7 Swinging Seat in Wali Songo's lot
Source: Observation, 2014

Fig. 8 Map of Jakarta
Source: DKI Jakarta Spatial Planning 2030

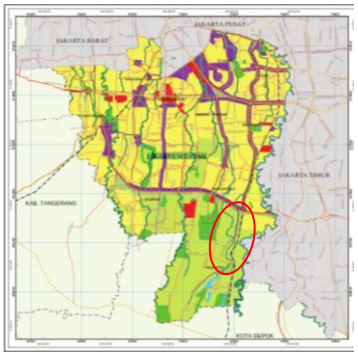


Fig. 9 Map of South Jakarta
Source: DKI Jakarta Spatial Planning 2030

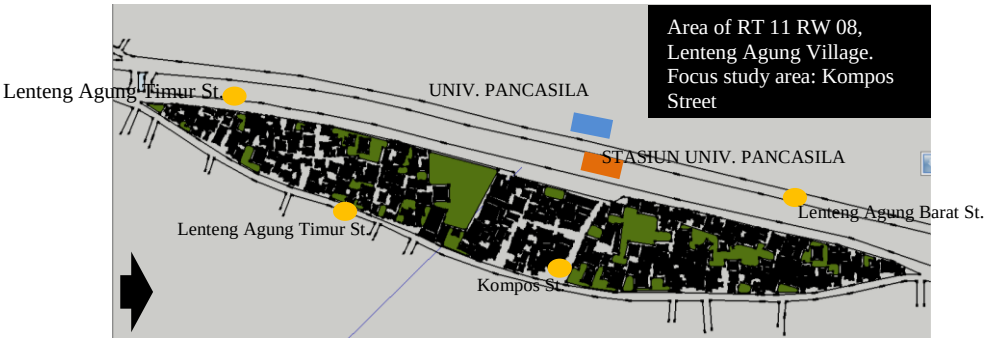


Fig. 10 Map of Study Area
Source: Google Earth, reprocessed, 2014

In this study, we divided children into two parts, first is aged 0-5 years old (preschool); second is aged 6-12 years old (Elementary school). Aged of 0-5 years is the golden period that parents have to take care carefully of their children (INSAN Vol. 12 No. 02, August 2010, accessed June 15, 2014). Besides, aged of 6-12 years is the most important period of basic education for students (Dinamika Pendidikan No.1/Th. XIV/May 2007, accessed June 15, 2014).

1.1 Practical Review

Creating public spaces for children, must concern in many aspects. Some of them are listed below:

a. Integration with the surrounding environment

Children and parents/guardians prefer to play in line with the location where their activities. It is therefore likely that a child's playroom would be better used if the space is part of the environment.

It can also create a more vibrant place for all. Examples in Krakow (See **Fig. 11**) benefit parents and children, as well as creating a lively scene for passers-by. In the example of Amsterdam (See **Fig. 12**), part of the road has been reclaimed as a special playroom; with only used for emergencies or special access to vehicles are allowed.

Fig 11. The space is part of the environment in Krakow
Source: http://www.eltis.org/index.php

Fig 12. The space is part of the environment in Amsterdam
Source: http://www.eltis.org/index.php

b. Mixed use

The playground example also highlights the value of having facilities for adults as well as children. This will usually consist of seating with a cafe or picnic tables (See **Fig.13**).

Fig 13. The playground consist of seating with a café or picnic table in Krakatau Juction, Indonesia
Source:http://belongtorahma.blogspot.com/2013_09_01_archive.html

c. Natural materials

Children are more likely to play with the elements of nature, such as water, sand and wood. This seems to allow them to be more creative, which is after all, should be a valuable outcome of the play. In Germany (especially in Freiburg and Berlin), provider playroom prefer a more naturalistic materials, rather than using the shiny metal or rubber surfaces, such as that cha-racterize many places to play in England (Shaftoe, 2008). In Edinburgh, a new play area created in the green space within the city is known as 'The Meadows' have combined to play the traditional fixed attraction with lots of sand, pieces of bark and water channels. In Indonesia, many outdoors playrooms also created in the green space with lots of sand and water. The playroom has proven to be very popular among children, adolescents and their parents (See **Fig. 14** and **Fig. 15**).

Fig 14. Created in the green space with lots of sand and water in Ciganjur
Source: documentation, 2014

Fig 15 Created in the green space with lots of sand and water in Rawakopi
Source: documentation, 2014

d. Unpredictable use

Some experts write that will be getting the most out of that expected if given adequate facilities. This should always be encouraged or at least allowed for more creativity can lead generated. An example might be children playing with sand or soft bark that has been provided as a surface material. Furthermore, the children will grasp the opportunity to play even in an environment that is not explicitly defined as a playroom. This may be one way to take advantage of the corners of every city hall to be sewn into pattern pieces where children play more naturally. At least, there needs to be a person who is appointed to manage a child's playroom in the following urban services in the event of risk insurance.

The public spaces for preschool and aged 6-12 years old have different characters. Marcus et al (1998) stated that space for preschool should:

- Be located tot lots well away from streets
- Be easy on bare feet
- Arrange some benches to permit socializing among parents
- Provide sand under play equipment

Spaces for aged 6-12 should:

- Leave some area of the space undersigned and natural
- Flat grasses area are needed for sports
- Provide climbing nets, swinging bridges, swinging balance beam

II. Method

The study is designed by considering qualitative method to examine effective public space for children. To enhance the qualitative information, interview guidance for stakeholder and residents (mother who has children) were con-

ducted. Interview guidance contained the view from residents about public space for children. Based on observations and interview, the condition of existing public space for children was analyzed. Data analyses were conducted by research questions (Alwasilah, 2002: 158). Therefore we analyze by comparing between the residents' view and theories. Here is the table about informants:

Table 1. Informants

Informants	Interview Date/Time
A,Vice Manager of Neighborhood (*Rukun Warga*) 08	June, 3, 2014/11.00-11.30 PM
D, Food Seller	June, 5, 2014/16.00-16.23 PM
IH, Housewife	June, 5, 2014/16.30-16.40 PM
H, Housewife	June, 5. 2014/16.00-16.23 PM
D1, Housewife	June, 5. 2014/16.00-16.23 PM

Source: Interview, 2014

III. Discussion

Since outdoor space is hugely important for children's development and display lower levels of hyperactivity, and it is potentially one of the most exciting places for them to play (Moore 1986; Plumpton et al, 2000 & Thaver, 2000 in Andre et al, 2002), our informants had similar opinion with this theory. They wanted their children played in a safe play ground to spend their free time. Informant D said that around 2009, children played on a park near Lenteng Agung Timur Street. Since that location had been owned, there was no more play ground. Then they have been played bicycle on Kompos Street that connected between Lenteng Agung Timur Street and Lenteng Agung Barat Street. The condition of this street was narrow, some cars or motorcycle were passed by to residential or rent housing.

Wali Songo Islamic Foundation's lot has been used as play ground. Children could play swinging seat and climbing steel at the park. Informant A said that the park is private but the owner permits children to play there. Thus he did not know about the con-tinuity of the utilization. Informant IH, H, and D1 said that Wali Songo Islamic Foundation's lot was a good place to play for their children however the equipment were slightly. This was caused some preschool children queued for one swinging seat. Based on observation, there was not separation between the play ground for preschool and aged 6-12. According to Marcus et al (1998) each aged have special character thus the planning of play ground in RT 11 RW 08 should divided into two places.

The position of study area which looks like an island became a crucial problem. Informant D1 said that parents in RT 11 were afraid because Lenteng Agung Timur Street and Lenteng Agung Barat Street are crowded therefore they never permit their children to play out from 'the island'. This condition made some children bored and found another play area. Informant D and A said that some children aged 6-12 chose online games in rent internet rooms to spend their free time. Based on observation and interview, mothers always accompanied their children. This was a potential habit to grow up the children, especially preschool. To enrich that potential habit, neighborhood and city manager should provide the public space for children which they needed most.

Fig 16. Site Plan of Kompos Street
Source: Design Concept, 2014

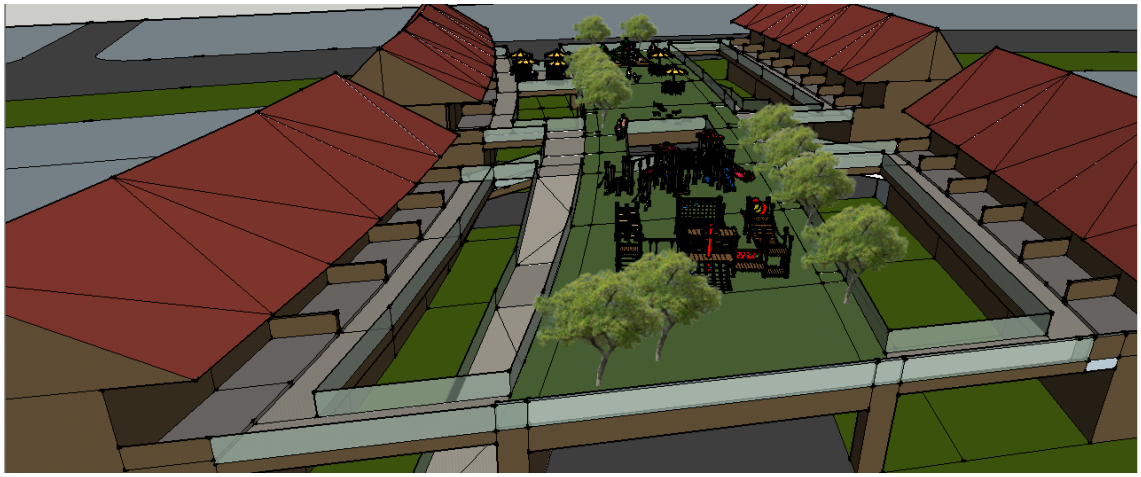


Fig 17. Bird Eye View of Kompos Street
Source: Design Concept, 2014

Fig 18. Mixed Use: Preschool Play Ground and Café
Source: Design Concept, 2014

3.1 Design Concept

We designed the effective public spaces by using the existing space that children have been used: Kompos Street. Since there were no unoccupied lots, we analyzed that roof garden is the best way to provide the play ground for preschool and aged 6-12. Based on DKI Jakarta Spatial Planning 2030, Jakagarsa District should maximize green open space thus RT 11 RW 08 could implemented this planning. We have been chosen 'green city' as concept for this area because it is suitable with the program of Jagakarsa District. The play ground designed as roof garden, above on Kom-pos Street (See **Fig.16**). The play ground will be connected to the houses that planned in second floor. Besides for the first floor will be used as parking spaces. Based on City Planning, Kompos Street's area have been planned as park housing with Building Coverage Ratio 20%, Floor Area Ratio 0,2, and two storey.

The design tries to implement Shaftoe's theory (2008) that play ground should integrate with the surrounding environment, mixed use, and have natural materials.

The bridge and ramp will connect to the houses in front of Kompos Street thus other houses that built back side of Kompos Street can access easily (**Fig.17**). Mixed use refers to other function on the roof play ground, such as café for parents who accompany their children. This place as 'socialize space' to housewives in RT 11 RW 08 (**Fig.18**). Natural materials refer to vegetation such as trees, grass, and green bench as protection for children.

IV. Conclusion

In the future, urban settlement will increase and we have to realize that unoccupied land is a rare thing to find. As a result, roof play ground should be the alternative way to provide public open space for children. As we know, location of RT 11 RW 08 that looks like island will make

children hardly to play in another place. Thus, this is an urgent space to build. The stakeholder should arrange the planning seriously because we believe that other neighborhoods need public space for children. This public space will bring a hope that our children will be safe from online games threat.

V. Future Research

This study is a preliminary research and focused in field and social condition. Future research should be focused in technical design of roof play ground and land ownership in this area.

References

1) Alwasilah, Chaedar A (2002), Pokoknya Kualitatif, PT. Kiblat Buku Utama, Jakarta
2) Andre, Erik et al (2002), Daylighting by Optical Fiber, Department of Environmental Engineering, Division of Water Resources Engineering
3) City Policy of Province DKI Jakarta No. 1/2012 about Spa-tial Planning in 2030
4) Dinamika Pendidikan No.1/Th. XIV/May 2007 [Available at http://eprints.uny.ac.id/5006/1/PENTINGNYA_PENDIDIKAN_MORAL.pdf] [Accessed June 15, 2014]
5) INSAN Vol. 12 No. 02, August 2010 [Available http://journal.unair.ac.id/filerPDF/5-12_2.pdf] [Accessed on June 15, 2014].
6) Jagakarsa District in Figure 2013 [Available at http://jakselkota.bps.go.id/?hal=publikasi_detil&id=11] [Accessed on 15 June, 2014].
7) Marcus&Francis (1998), People Places Design Guidelines for Urban Open Space Second Edition, John Wiley & Sons, Inc, USA.
8) Moore R (1986), Childhood's Domain: Play and Place in Child Development, Croom Helm, London.
9) Shaftoe, Henry (2008), Convivial Urban Spaces, Creating Effective Public Places, Earthscan, London.
10) Tibbalds F (1992), Making People-friendly Towns, Longman, Harlow, Essex.

The Creation of Social Interaction in Flats Housing: Between Formal Space and Kampong Habits

Deva Fosterharoldas Swasto[1]

[1] Lecturer and Researcher, Department of Architecture and Planning , Faculty of Engineering, Gadjah Mada University

Abstract

Flats housing has been built in many cities in Indonesia. This kind of building is used usually to rehouse people from low-rise housing or urban kampong. The flats are equipped with facilities to accommodate people' needs. Although the room size is relatively small, there are standardised facility, good sanitation utility and related-housing infrastructure, such as social space. This social space is provided to be used as interaction media among the residents and with surrounding neighbours. However, the provision of this facility is not used as always as it is intended. Sometimes, certain formal social spaces, as provided by the builders, remain unused because the residents do not utilise it. On the other hand, people create and use 'informal-communal' space as alternative to the former, which is not planned from the beginning. Based on this situation, it is interesting to discuss what kind of social space that is used or created by the flats' residents. This paper would like to explore this curiosity. The background argument is that people will adapt or adjust their circumstance in living in flats housing. In addition, they cannot release their experience from previous situation. If they live in a kampong before, the same expectance or condition will also follow. The characteristic of the residents will also affect this social space or the social dynamics. The discussion is brought to the neighbourhood level in the walk-up flat development in Yogyakarta as a case study. The descriptive-qualitative approach was used. The findings are expected will be useful to understanding people' needs towards flats facility and providing better alternative options for the flats provider.

Keywords: *social interaction, flats housing, formal-informal social space, kampong habits*

I. Introduction

Along with cities development, it is a fact that there is inadequate housing supply compared to its demand. In addition, many people cannot afford to purchase or even just to rent decent houses. As a consequence, usually they just live in a substandard accommodation. In Indonesia, there is a housing policy such as slum upgrading and urban renewal for improving this kind of condition. Many approaches have been taken in this framework, such as kampong improvement program (KIP), walk-up flats housing, and so on.

Generally, living in vertical situation is merely an option in Indonesia. There are still many housing units offered in form of landed house or low-rise building. The high price of land in urban situation, due to its limitation, is tricked by expanding the housing development to sub-urban areas. In addition, in many big cities, apartment unit is built by private developer and targeted to middle-higher income people. Parallel to that, the government provides alternative to accommodate urban low-income group in form of walk-up flats housing. The government considers that the sub-urban landed house will be insufficient to house people and unaffordable related to its high cost for transportation. While apartment provision has its own market-based circumstances, the walk-up flat has its own challenge, in which the target has financial limitation. Therefore, if there is almost no difficulty for potential middlehigher income resident to live in apartment situation (and they have option to do so or not), the challenge faced by prospective dweller from low-income group in walk-up flat is relatively greater. These people are used to live in low-rise housing although in relatively sub standard situation. Thus, this landed house culture, particularly in kampong situation must now be adjusted when people move to vertical or walk-up flat housing.

It can be said that in this flats' situation, spaces are formed vertically, which were formerly hori-

Deva Fosterharoldas Swasto
--- Lecturer, Department of Architecture and Planning
Faculty of Engineering, Gadjah Mada University,
Jalan Grafika 2 Yogyakarta, 55281 INDONESIA
E-mail: devafswasto@yahoo.com

zontal. As a consequence, the residents must adapt with this new experience. In low-rise situation, people use horizontal space for their activity, such as in the yard or garden. In the flats, the circumstance is different. There are inadequate spaces compared to living in previous low-rise situation.

In addition, although the flats buildings are equipped with related facilities to accommodate people' needs, the size of the room is relatively small. Related to these inadequate spaces in the flats, the same situation also applies for the open space. This social space is provided to be used as interaction media among the residents and with surrounding neighbours. However, the provision of the social space is not as always as it is expected. Sometimes, certain formal social spaces, as provided by the builders, remain unused because people do not utilise it. On the other hand, people create and use 'informal-communal' space, which is not planned from the beginning as alternative to the former.

II. Methodology

Based on previous background, it is interesting to discuss the kind of social spaces which are created to conduct social activity as the lessons from walk-up flats housing in Yogyakarta. Generally, this paper is developing the findings of 'creative spaces' by the community, taken from bottom-up view in several flats (Swasto, 2008 and 2010). The research was developed by exploring the daily situation of walk-up flat cases in Yogyakarta Special Province, by looking at three flats along Code Riverbank in Yogyakarta City (Cokrodirjan / Code, Jogoyudan / Gowongan and Juminahan / Tegalpanggung walk-up flats), and other three flats in Sleman Regency (Gemawang, Mranggen and Dabag / Pringwulung / Condongcatur / Seturan walk-up flats).

The case study research approach was used to narrow down its focus (Yin, 2003), in which quailtative method became the main tool (Tashakkori and Teddlie, 1998). This paper also limits itself in focusing on the aspect of social activity and social spaces in walk-up flats housing.

III. Conceptual Framework

3.1 Walk-up flats housing as a new living experience

Living in different circumstance does also mean having different experience. This situation also occurs in walk-up flats housing. People, who are considered low-income and usually live in a low-rise situation or landed house and equipped with a quite minimum infrastructure, now move to vertical housing with different standard, both physical and social. This new situation also endorses their habit to adapt to the new situation of occupancy and dwelling process. There is also a concept of people adaptation and housing adjustment or modification.

McCallum and Benjamin (1985) summarised that housing is a composite good that provides a heterogen- eous mix of services. They quoted further from Grimes (1976) that housing covered more than living space and shelter, since its nature and value are determined by various services it offers, such as neighbourhood amenities, access to education and health facilities, and security. In addition, Bratt (2002) stated that housing is critical to family well-being even if the house they live in is not owned by the resident themselves. The same issue also applies in walk-up flats housing.

In later developments, although the walk-up flats housing has several positive sides, not all parts of the community do like or wants to live in this housing unit (Yudohusodo et al, 1991: 352). Most people still prefer to live in ordinary landed or low-rise houses for various psychological and socio-cultural reasons. They still want to live in a landed house that directly connect with the ground or garden to grow crops, nurture pets, and to play with kids. They need to be close with the yard surrounding the house. In addition, they also do not like to be bounded too much by several rules that apply for living in flats.

3.2 Formal and informal social spaces: planned and unplanned

The term 'formal' social spaces is characterised by its existence which is designed or planned from the beginning by the builder or provider and constructed along with the development of flats housing. On the other hand, the term 'informal' social spaces is characterised by its unplanned creation. It can be produced by the residents themselves or even just utilised as the 'social spaces' for conducting social activity. This space can be generated after the completion of the flats building or being continuously utilised from previous usage, such as by using existing kampong infrastructure.

The formal social spaces can be in a form of space which is open (yard, garden, outdoor sports activity, and so on) or closed (multi-purpose unit, indoor sports area, and so on). In flats housing, the general outdoor social spaces provided by the builder is in the form of yard or garden which is also constructed along with other infrastructure such as parking area. The indoor social space is for example multi-purpose unit, which is usually located in the ground floor. This space can be used for conducting a meeting (among the residents or for religious purpose), as an educational facility (for pre-school lessons learning) or even for sports activity (i.e. table tennis, *karambol* or table-coin billiard and others). Both these outdoor and indoor

spaces are mainly dedicated for the flats' residents. However, the surrounding neighbourhood, mainly in kampong area, can also use it by asking flat's manager permission or at least acknowledged by the residents during its usage.

The informal social spaces can be in a form of any places which are utilised by the residents as a social media among them or with surrounding neighbourhood. The common characteristics of this space are 'agreed' by the residents to be used as social interaction place, generally utilised frequently, and the residents felt convenient in using it. In addition, this kind of space is not necessarily large or sophisticated.

3.2.1 Kampong habits

Kampong in Indonesia can be described as a landed area in which people gradually build their house and become a neighbourhood area. The characteristic of kampong can be seen from the densely situation, narrow alleys, the blended of private and social space, and so on. The spirit of living in kampong is a spirit of togetherness or to live in harmony. In walk-up flats housing, it is assumed that 'kampong value' is still being used by people while moving in as the spirit to 'survive' as well as to live in a harmony. The big difference between living in horizontal and vertical situation conform to kampong spirit to be 'adaptable' and vice versa, the kampong spirit adjust the social norms.

3.3 The connection between residents and dwelling process

In order to examine residents' experience in dwelling the walk-up flats housing, there are several concepts that can be used. Riemer (1943) pioneered the idea by distinguishing two approaches of architectural means and social ends. In architectural aspect, he pointed out the limited economic means which lead to compromise between privacy versus space, distance versus proximity and equipment versus total space. In social aspect, he stated the formulation of variety housing needs based on time (for example everyday life and special occasions, weekly and daily rhythm of home activities, seasonal fluctuations and social change) and family type and composition (for instance family cycle, social status, personal traits, and patterns of dominance).

Based on concept and standard by Bratt (2002), there are at least three ways in which housing may have impact to family well-being, particularly in improved housing from deprivation conditions. The similar issue also occur in walk-up flats situation due to enhancement objective (by the government) and new life-practice faced by the residents while shifting from horizontal (low-rise building or landed house) experience to vertical housing. Firstly, it is through its physical attributes and availability, including quality and safety. Secondly, it is through the way in which it relates to its occupants, such as whether it provides sufficient space (so that the family is not overcrowded), whether it is affordable, whether it provides opporp tunities to create a positive sense of self and empowerment, and whether it is stable and secure, as well as its tenure situation (whether the unit is owned or rented). The third key attribute of housing is neighbourhood conditions, including the safety and quality of the neighbourhood in which the housing is located and the accessibility it provides to employment, school opportunities, and other services.

3.4 Adaptation and adjustment

According to Berry (1976), the term of adaptation implies to a relationship between behaviour changes with the environment that usually leads to a reduction of dissonance (mismatch) in a/an (environment) system to enhance the harmony of a series of variables that interact. Basically, the process of individual 'suitability' to the environment occurs in two directions which are adaptation and adjustment. Bell (2001) stated that the suitability process between the individual and his environment is known as adaptation. In this condition, a person changes his behaviour to suit with circumstance conditions (especially social situation). On the other hand, the process of suiting environmental conditions on the individual is known as adjustment. In this situation, a person tries to change his physical environment.

Soemarwoto (2001: 45) argued that adaptation is an effort by organism to adjust his living with the environment. In addition, he argued that adaptability have survival value. The definition of adaptation, according to Wohlwill in Sarwono (1992: 63), is the adjustment of the response to stimuli. The adjustment made in the adaptation is aimed to change behaviour in order to fit to the environment. Furthermore, according to Wohlwill in Sukmana (2003: 46), adaptation is a change of quantity in the distribution of assessment or ratings or effective response to the unity of the stimulus, as a function of continuous stimulation. Based on above understanding, it can be concluded that adaptation is an adjustment effort upon living in the environment by changing behaviour, based on responses to a stimuli. The adjustment itself is distinguished from 'adaptation' as external conformation, which is related to physical modification towards surrounding environment as argued by Berry (1976). He stated that the mechanism or action taken by individuals in efforts to reduce dissonance can be divided into 3 types of adapt-

ation, which are: (1) adaptation by adjustment (an action to reduce 'conflict' by doing self-adjusting in order to achieve harmony between the individuals and environment), (2) adaptation by reaction (an action to reject or resist toward the environment by making changes to the physical environment in order to enhance harmony between individuals with the physical environment), and (3) adaptation by withdrawal (an action to reduce environmental pressures by doing migration or moving to another place). The behavioural adjustment of residents on such a settlement environment is an effort to reduce discrepancy in an environmental system, to add better harmony or achieve homeostasis condition, as said further by Berry (1976).

IV. Setting

4.1 Urban vertical housing in Indonesia

The initiation of vertical housing in Indonesia dates back in the 1950s by building 4 floors flat in Jakarta (Yudohusodo, 1991: 345). The form of this residential unit is a low-cost apartment or walk-up flats which is formerly known as flats. Nowadays, the flat can be distinguished by its ownership into owned walk-up flat or walk-up flat for sale and rental walk-up flat or rental public housing. The target group of the flat for sale is the middle class society, while rental public housing is targeted for low-income people.

The development of flat was then recognized to be provided by National Housing Enterprise, appointed by Central Government, in the 1990s. The developments were located in many big cities in Indonesia. In the era of the 2000s, the walk-up flat development was constructed by Ministry of Public Works and Ministry of Public Housing, which then become the main actors of the provision of vertical public housing.

4.2 Characteristic of the flats housing for low-income people in Indonesia

The flats for low-income people or walk-up flats can be described as a multi-storey building, which consists of units that can be dwelled separately by respective resident and equipped with sharing social unit, land and infrastructure. The characteristic of walk-up flat can be distinguished from other typical multi-storey houses of not having vertical movement equipment except stairs or there is no lift. This condition is arranged to press the tight budget by having optimal outcome. The height of walk-up flat is four to five storeys which may up to 6 floors, considering humanity concern or easiness factor of walking up and down regularly as well as affordability issue for the potential occupants. The delivery of walk-up flat is quite advantageous regarding the reason of low maintenance, especially in avoiding energy cost for operating elevator.

The renting system is conducted as the current approach, while the amount of rent per month is various. Usually, the higher the floor, the cheaper the rent is. The maximum period of occupation or renting is only short term, i.e. 3 years. Based on renting regulation, this period can only be extended to another 3 years. The renters or tenants are encouraged to improve their capacity in finding better accommodation or follow-on housing.

4.3 Flats housing in Yogyakarta

Yogyakarta Special Province has an area with size about 3,185.80 km^2, and inhabited by more than 3 million people (greater Yogyakarta). The urban-rural situation blended in (urban) kampong situation in Yogyakarta City, as well as in the other regencies although with different intensity. There are not so many tall (or even medium-rise) building in Yogyakarta Special Province, in which the maximum height is 7-8 floors, considering its Adisucipto International Airport location, situated within the Yogyakarta City. The land limitation, particularly in the city (Yogyakarta City) in the centre, causes the development to be expanded to surrounding regencies or to be constructed to vertical situation. However, the existence of medium-rise building for residential purpose is only a few and most of the vertical buildings have been built within 2-3 floors (low-rise building). Only currently do the medium-rise buildings become trend in Yogyakarta, with the development of hotels.

The development of walk-up flat in Yogyakarta was initiated in 2004 by constructing the Cokrodirjan or Code walk-up flats in Code riverbank. Within the year 2004 - 2012, the Provincial Government of Yogyakarta has built 26 low-cost vertical housing or walk-up flats that consist of 13 units for low-income people and 13 units for students (more popular with the term dormitory). These low-cost vertical housings are spread located in Sleman Regency (12 units in 5 locations), in Bantul Regency (6 units in 4 locations), in the City of Yogyakarta (6 units in 6 locations and in Kulon Progo regency (2 units in 1 location). Only Gunungkidul Regency has not built walk-up flat due to several reasons such as location, demand and availability of land. The total number of unit is 2,306, in which 1 building (twin block) usually consist of 68-96 unit respectively. All of the walk-up flat is developed by Ministry of Public Works and Ministry of Public Housing.

The walk-up flats in Yogyakarta City were built along Code River as part of upgrading program, considering this area as the most densely populated neighbourhood, compared to other two river-

banks (Winongo and Gadjahwong). There was also a reason of finding the most suitable land and 'idle space' for constructing the walk-up flat building, while social acceptance also became important consideration. Almost similar reason of finding 'idle space' was the walk-up flats development in Sleman Regency. The village saving land (or *tanah kas desa*) became the most possible and affordable option for doing construction. However, different to Yogyakarta City walk-up flats cases, the walk-up flats development in Sleman Regency was not 'strongly' focused on 'upgrading' program or dedicated to surrounding area (like those cases in Code riverbank). As a consequence, the (potential) walk-up flat residents in Sleman cases come from various places as well as their characteristic backgrounds, unlike those in the Yogyakarta City (except in Juminahan or Tegalpanggung walk-up flat).

V. Findings

Generally, the walk-up flats housing in Yogyakarta Province were built in a strategic location near city centre or accessible from main city roads. Additionally, the range to other city infrastructure is very easy. Based on its occupancy, the residents of walk-up flats are usually mixed of 'native' people (from the existing kampong residents) and non-native people (from outside kampong) that were included in the project. Because of that, the relationship among its resident is relatively quite dynamic.

In addition, usually the walk-up flats housing can be accessed easily from local alley within the kampong. As a result, there is no difficulty in doing social interaction between the surrounding neighbourhood and the flats residents, since they can pass each other and chat at anytime.

Based on exploration in walk-up flats housing in Yogyakarta, the creation of social interaction can be discussed as follows.

5.1. Formal spaces for conducting social activity in individual unit

This social activity space is generally located in front of each resident's unit or in terrace. However, the term 'individual' is not clearly defined since the terrace is also functioned as a public corridor. There are flats housing which specifically designate this terrace such as in the Dabag flats, while the others only provide a relatively wider corridor, without specific function. This corridor can be functioned as a multipurpose space. Beside as a movement path, the residents usually use this hallway as a place to dry their clothes, as a narrow playground and as a chatting place among neighbours.

Figure 1. Social space in front of individual unit in the Cokrodirjan flats (previous figure) and the Dabag flats (latter figure)

This social space is also used by individuals as a strategy to expand the unit. This condition occurs because the residents consider that their unit is relatively small (between 21-27m2). Therefore, the residents decide to usually host their guest outside their unit or in this terrace or corridor. In addition, the residents generally place temporary furniture such as plastic chair, bamboo bench, or even sofa bench to this terrace, along with other amenities such as plants pot and rack. This action becomes also a strategy to express their identity of unit ownership.

5.2. Formal spaces for conducting social activity in the blocks of flat

This social activity space is generally located in the ground floor of walk-up flats building. However, there can be also formal space which is designed in every floor and dedicated for communal purpose. This space is usually in form of open or relatively wide space and situated in the centre or end of the corridor, or together with the stairs. The formal spaces for conducting social activity in the blocks of flats housing in Yogyakarta can be found in a form of multi-purpose unit, yard or sport yard, garden, and open space.

Figure 2. Social interaction in planned space (multi-purpose unit) in the Mranggen flats (previous figure) and in the yard in the Jogoyudan flats (latter figure)

The use of formal social spaces in flats housing in Yogyakarta is quite dynamic. It can be said that not all of this facility is utilised by the residents. There is certain formal space which is frequently used, but there is also rare utilisation in the others. The reason for this occurrence is various. For the frequently used formal social space, the obvious reason is because the residents require it and the space conform to their need. In order to take turn in using this facility, the residents usually create an agreeing time-table. For example, in a certain time, the children will use it as a learning facility while at the other time the teenagers will use it as a meeting or sports facility (such as table tennis). However, this action is not necessarily formalised.

On the other hand, the rarely used formal social space is not utilised since the residents do not feel enjoy in using it. In addition, there is also a reason of finding other alternative or more convenient space as a replacement for this formal one. As a consequence, the use of this formal space is not optimal and sometimes it is just ignored by the residents or shifted to other purpose such as a communal storage.

5.3. Informal spaces for conducting social activity within the buildings of flat

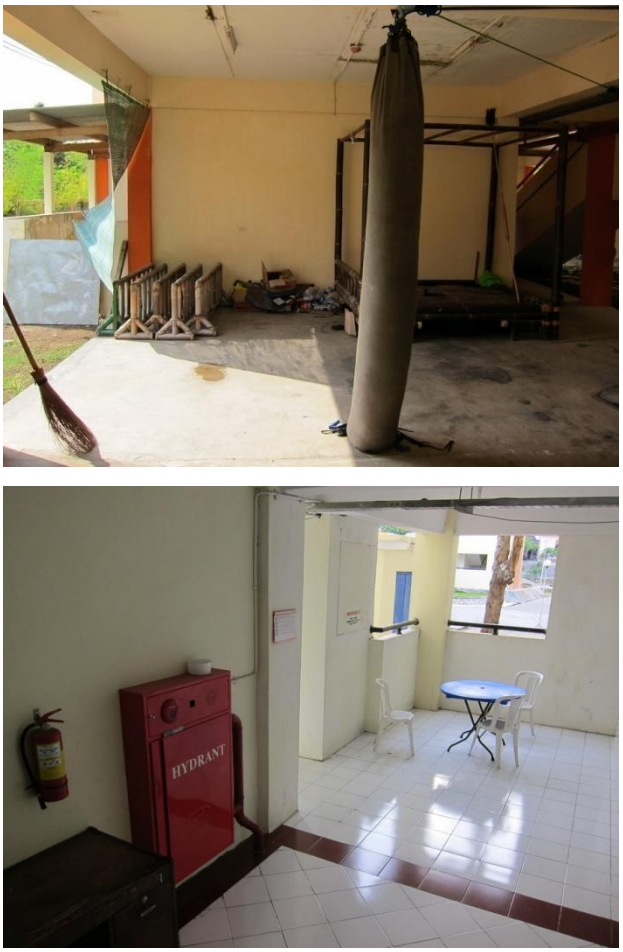


Figure 3. Unplanned social space located in the ground floor (for gym activity) in the Gemawang flats (previous figure) and in the end of the corridor in the Dabag flats (latter figure)

Within the buildings of flat, the social activity space can be located in any places, such as in the ground floor or in other floors. In the ground floor, the social activity usually occupies space which is close to the entrance, around individuals' unit or close to other communal facility, such as an indoor parking area. It can also use certain area in which the characteristic is open and does not belong to individual unit.

In the other floor, the social activity usually occupies space in the end of the corridor, around the stairs and even on the resting step of stairs. The characteristic of this area is the same with the space in the ground floor which is open and does not belong to individual unit. In order to use this place, the residents usually put certain removable furniture such as a plastic chair, light table and even sofa bench.

It can be said that this informal or unplanned social space is created by the residents as a consensus space for doing communal activity. This action is conducted since the formal social space is

considered not enough in accommodating residents' social interaction. The further reason can be because it is not convenient or enjoyable, too far or tiring (i.e. because the residents have to walk up and down through the stairs) or even too sophisticated.

5.4. Informal spaces for conducting social activity outside the buildings of flat

Figure 4. Temporary social space created by the residents (previous figure) and social interaction in unplanned space (spaces between buildings) in the Cokrodirjan flats (latter figure)

Outside the buildings of flat, the social activity space can also be located in any places. It is not necessarily a space which is close to the entrance or other communal facility (i.e. parking area). Sometimes, it is a place which has been utilised before the flats construction or it belongs to kampong facility, such as guard post (*pos ronda*). On the other hand, it can be a merely temporary meeting or chatting space or a location between buildings.

The characteristic of this area is that it is agreed by the residents to be a social activity place and they enjoy in using it. Therefore, it is not necessarily an open or closed space.

There is also a reason of cohesiveness, in which the cause of the creation of this informal space is not because the formal facility is not suitable for the residents. It is the characteristic of the residents which determine the use of this social space. If the flats housing is located in the existing or same kampong as the potential residents, people tend to continuously use the existing facility that has been used frequently. The residents are relatively attached with the existing social space facility from the beginning. In addition, the residents originated from the same kampong or have similar interest also tends to have more dynamics social activity because they are attached to each other.

This situation shows that there is a creation of mutual benefit between the flats' residents and the surrounding neighbourhood. As a consequence, there is a pushing factor to have good interaction between the two communities. It can be seen that the residents and surrounding blend together in doing many social activities. The survey tells that the blended social activity can be in form of chatting, playing game (i.e. chess) and sports.

VI. Conclusion

From the findings, it can be summarised that living in vertical situation do not obstruct the residents' social activity. People have created their way in adapting the new situation which has shifted from low-rise houses to vertical unit or from horizontal situation to vertical. In general, they have no difficulty in doing social activities in relatively limited size and situation.

However, the use of formal social spaces is quite various. The utilisation depends on the residents preferences whether they enjoy using the facility. The creation of informal social spaces occurs when the residents consider that they require having it instead of the formal facility. This informal social spaces or consensus spaces can be created in any places, depends on residents agreement. In this research, there are 4 phenomena with regards to the creation of social interaction in the flats housing in Yogyakarta:

6.1 Formal spaces for conducting social activity in individual unit

This social space is used by individuals as a strategy to expand the unit because they consider that their unit is not large enough. This action becomes also a strategy to express their identity of ownership.

6.2 Formal spaces for conducting social activity in the blocks of flat

The use of these formal social spaces is quite dynamic. The reason for the frequently used formal social space is because the residents require it and the space conform to their need. On the opposite, the rarely used formal social space is because the residents do not feel enjoy in using it, while there is also a reason of finding other alternative or more convenient space.

6.3 Informal spaces for conducting social activity within the buildings of flat

The characteristic of this space is open and does not belong to individual unit. This informal or unplanned social space is created as a consensus space for doing communal activity, due to the reason that the formal social space is considered not enough in accommodating residents' social interaction. There is also a reason that the existing or formal facility is not convenient or enjoyable, and sometimes also considered too sophisticated.

6.4 Informal spaces for conducting social activity outside the buildings of flat

The characteristic of this area is that it is agreed by the residents and they enjoy in using it as a social activity place. There is also a reason of cohesiveness, in which the cause of the creation is the characteristic of the residents that determine the use of this social space.

It can be said that generally there is always a consensus space for doing communal activity in every walk-up flats housing. Usually, every flat have other 'informal' communal space in addition to the formal one. This action is conducted since the formal communal space sometimes is considered not enough in accommodating resident social interaction. The use of wide corridor, parking area, resting step of stairs, and so on, for chatting and or playing is commonly happen. This communal space can be located both indoor and outdoor, mainly based on resident need and behaviour. In addition, there is also an action of taking turns in using social or communal space in flats housing.

References

1) Anonymous (2007) Law / Undang-undang Republik Indonesia Num. 16 Year 1985 concerning *Vertical Housing (Rumah Susun)*, Transmedia Pustaka, Jakarta
2) Anonymous (2007) Law / Undang-undang Republik Indonesia Number 4 Year 1992 concerning *Housing and Human Settlement (Perumahan dan Permukiman)*, Transmedia Pustaka, Jakarta
3) Anonymous (2007) *Rumah Susun*, I-Arch Indonesia Architecture Magazine 9th issue 2007, PT. Grasindo Mediatama, Jakarta
4) Bell, Paul A., Thomas C. Greene, et al. (2001, 5th Edition) *Environ- mental Psychology*, Thomson Wadsworth.
5) Berry, John W. (1976) *Human Ecology and Cognitive Style: Comparative Studies in Cultural and Psychological Adaptation*, New York Sage Publications
6) Bratt, Rachel G. (2002). "Housing and Family Well-being" *Housing Studies* 17(1): 13-26.
7) Grimes, Orville F. (1976) *Housing for Low-Income Urban Families: Economics and Policy in the Developing World*, Washington, World Bank Research Publication.
8) Herlinawati, Nurwi (2010) *Code of Conducts at Rusunawa Jogoyudan, Gowongan, Jetis Subdistrict, Yogyakarta*, Thesis post graduate planning program, Department of Architecture and Planning, Gadjah Mada University, Yogyakarta, Indonesia
9) Komarudin (1997) *Menelusuri Pembangunan Perumahan dan Permukiman,* Yayasan Realestat Indonesia - PT. Rakasindo.
10) Kuswahyono, Imam (2004) *Vertical Housing Law: Introduction (Hukum Rumah Susun: Suatu Bekal Pengantar Pemahaman)*, Bayumedia, Malang
11) Kuswartojo, Tjuk (2005), *Housing and Human Settlement in Indonesia: Effort for Sustainable Living Development (Perumahan dan Permukiman di Indonesia: Upaya membuat Perkembangan Kehidupan yang Berkelanjutan),* Penerbit ITB, Bandung
12) Mccallum, Douglas And Stan Benjamin (1985) "Low-Income Urban Housing in the Third World: Broadening the Economic Perspective" *Urban Studies* 22: 277-287.
13) Morris, Earl W. And Mary Winter (1975) "A Theory of Family Housing Adjustment" *Journal of Marriage and the Family* 37(1): 79-88.
14) Riemer, Svend (1943) "Sociological Theory of Home Adjustment" *American Sociological Review* 8(3): 272-278
15) Rosadi, Meta G.M. (2010) *The Effectiveness of Affordable Vertical Housing in Enhancing Slum Area: Case Studies of Rusunawa Gemawang, Jogoyudan and Cokrodirjan (Efektivitas Pembangunan Rusunawa dalam Penanganan Lingkungan Permukiman Kumuh),* thesis, post graduate planning program, Department of Architecture and Planning, Gadjah Mada University, Yogyakarta, Indonesia
16) Sarwono, Sarlito W. (1992) *Psikologi Lingkungan*, Jakarta, Gramedia Widiasarana
17) Seek, N. H. (1983) "Adjusting Housing Consumption: Improve or Move" *Urban Studies* 20: 455-469
18) Soemarwoto, Otto (2001) *Ekologi, Lingkungan Hidup dan Pembangunan*, Jakarta, Djambatan
19) Sukmana, Oman (2003) Dasar-dasar Psikologi Lingkungan, Malang, Banyu Media dan UMM press.
20) Swasto, Deva F. (2008) *Creative Spaces on Affordable Vertical Housing (Rusun): A Sharing Experience*, Proceeding of International Seminar "Artepolis 2", Bandung Institute of Technology (ITB), Bandung, August 8-9
21) Swasto, Deva F. (2010) *Adaptability and Creation of Creative Spaces on Affordable Vertical Housing (Rusun) and Its Surrounding: Case of Yogyakarta*, Proceeding of International Seminar "Artepolis 3", Bandung Institute of Technology (ITB), Bandung, July 22-24, 2010
22) Swasto, Deva F. (2012) *Towards Sustainability: The Creativity of Managing Rental Walk-Up Flats in Yogyakarta, Indonesia,* Proceeding of International Seminar "Artepolis 4", Bandung Institute of Technology (ITB), Bandung, July 5-7, 2012
23) Tashakkori, Abbas And Charles Teddlie (1998) *Mixed Methodology: Combining Qualitative and Quantitative Approaches*, California, SAGE Publications.
24) Towers, Graham (2000) *Shelter Is Not Enough: Transforming Multi-Storey Housing*, The Policy Press.
25) Wulansari, Maulina (2006) *Low Cost Vertical Housing in Yogyakarta: Integration between Residential and Commercial Area (Rumah Susun Sederhana di Yogyakarta: Integrasi antara Hunian dengan Area Komersial)*, thesis, under graduate architecture program, Department of Architecture and Planning, Gadjah Mada University, Yogyakarta, Indonesia
26) Yin, Robert K. (2003, 3rd edition) *Case Studies Research: Design and Methods*, Sage Publications, Inc.
27) Yudohusodo, Siswono (1991) *Housing for All (Rumah untuk Seluruh Rakyat)*, INKOPPOL

Social-Cultural-Behavior Context

Second Session Parallel Notes
Moderator: Dwita Hadi R

K1 Room 2nd Floor
15.00 – 16.00

Presenter	:	**Jamilla Kautsary**
Title	:	**The Concept Of Space For Defense Activities Of Social, Economic And Cultural In Chinatown Semarang**
Presentation Duration	:	**13 minutes**

PRESENTATION CONTENTS

- Early Chinese settlement was originally loacated around the estuary of Kaligarang.
- These location move from east Kalisemarang to West Kalisemarang.
- There are so many legacy from orde baru era like a temple.

Conclusion

The concept of protection against social, economic and cultural progress in different levels/layers:

- The first layer is clearly visible from the physical symbols used. It is the iron fence in each building or building design which are lack of ventilation/openings;
- The second layer, which is considered the most basic protection, is in the level of protection of the family or clan. In this level, efforts to preserve family honor is done by giving the name of the clan in a person's name.
- The third layer, the protection in the tribe level. Tribal bonds offer various forms of protection related to the needs of Chinese citizens.
- The fourth safeguard, in the form of agglomeration of activities, is to protect every activity. in one event there can consist of one or more ethnic groups; the fifth safeguard or protection is the outset layer of protection from advocated social organization.

Presenter	:	**Manfredo Manfredini**
Title	:	**Understanding the transitions of social life in public spaces in Indonesian cities, A comparative study on the 'urban inversion' of the Integrated Retail Centres of Surabaya**
Presentation Duration	:	**12 minutes**

PRESENTATION CONTENTS

- More than 300 new shopping centres in the last 100 years with 200 in Java.
- There is so many shopping centers in Surabaya.
- We can recognize some public facilites and non comercial activities.
- 30% of indonesian people go shoopping for recreation.

These research using theoritical framework and methodology

- Research conducted in 28 shopping centres in Surabaya
- Analize the diversity of commercial area

Conclusions
- The different spatial aspects of the transition in public space catalysed by the pervasiveness of the controlled spatial frameworks of the new 'cities' of consumption and spectacle (i.e. the IRCs mega-blocks)
- The contemporary changes in the physical, social and psychological spatialities that contribute to the construction of identity, spatial and historical cognition, and the free relational life of our cities.

Presenter	**:**	**Margaret Arni Bayu**
Title	**:**	**Creating Effective Public Spaces for Children in Lenteng Agung, South Jakarta**
Presentation Duration	**:**	**13 minutes**

PRESENTATION CONTENTS

Background
- urban public spaces offer obvious
- Children need outdoor spaces
- LA located in Jagakarsa DIstrict, South Jakarta, population is the most density than the other.
- Based on Jakarta planning 2030 LA will made the open space.

Problem
- Small neighborhood 11, one part of 08 have no outdoor space for childern
- Parents seldom give permit to let their children play at outside area

Method
- Qualitative
- Informants: vice manager of the neighborhood

Discussion
- Parents want their children play in a safe play grounds

Design context
- Concept: grren sity
- Roof garden
- Effective public space by using the existing spaces

Conclusion
- In the future urban settllement will increase
- Roof play ground should be the alternative

Presenter	:	**Deva Foster Haroldas**
Title	:	**The Creation of Social Interaction in Flats Housing: Between Formal Space and Kampong Habits**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Background

- The development of flats housing in many sities in indonesia
- 250 million flats housing coorporation
- 15-20 million housing shortage
- Vertical housing
- Government now try to rehouse people to flats housing

Formal and informal social spaces : planned and unplanned

- Formal is characterised by its existence which is designed or planed from the beginning. Open/outdoor spaces, or closed/indoor spaces
- Informal: any other places than above that

Kampong habits

Finding and analysis

- Generally located in front of residents unit as a multi-purpose space
- Social interaction the the yard's flat

Informal space

- Unplanned social space located in the ground floor (for gym activity and playground)
- At the end of the cooridor in Debag Flats
- People also use the surrouunding area

Conclusion

In general, there is always a consensis space for doing communal activity in every walk uo

DISCUSSION

Question : Since we need the space, what is the icon space. Is it an outdoor space or something maybe?

Answer : For now, we cannot say there is outdoor space for public facility but for the public space. Shopping mall is a public activity but privat owner. So for me it just like a suggestion.

Question : About informal social interactions, what social interaction in kampong area

Answer : An official regulation come from Indonesian governance, which is for the area for certain numbers, at least 300 people , requirement for you to buit a playground in your area. Those playground are functioned as a place where the interaction between people can happen there.

Planning Context

Planning Context

Peter Kellet

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 08.30 – 10.00
Moderator	: Ikaputra
Presentation Duration	: 30 minutes

PRESENTATION CONTENTS

To make a city more Sustainable, planners and designers should have understand the concept, ideas, and how to practice. Some indicators to 'set up'the sustainable city are:

- Identify key global
  Climate change, disasters in the last century
- Focus on housing perspective
- Lessons from Europe
- Increasing population
- A rapicly urbanising world
- Urban growth predominantly in the south
- New megacities
- Increasing informality, poverty, and inequality
- There is so many study case about increasing people in the world

Beside that, there is a social perspective: people as key resources

- Beyond technical colutions
- Acceptability by communities
- Participation/engagement/involvement/ownership

Lessons from Europe

- Large multi-storey housing project since 1970
- Addressing high housing deficit
- Alternative approach
- Density neighborhood built in 19th
- Its important to learn neighborhood connection and values

The informal city: ethnographic

- Mostly independent of official regulation
- 1984: temporary construction
- We have to improve the place where we live which we feel real affection for it

What we need to bring it to the reality is

- Some nnovation about informality
- Explore more about overlap

Mainstreaming Development Strategies for Independent Small Island: Case study of Poteran Island, Madura

Adjie Pamungkas[1], Aries Sulisetyono[1], Zainul Hidayah[2], Andrie Kisroh Sunyigono[2]

[1] Lecturer, Surabaya Institute of Technology
[2]Lecturer, Trunojoyo University

Abstract

Poteran Island is one of the underdeveloped small islands indicated by its low infrastructure services, education levels and wealthfare. Moreover, its proximity to the main land causes strong interaction among them. Unfortunately, the backwash effects is stronger than the tricle down effect escalating the development issues in the island. Therefore, a mainstreaming development strategies in the future is needed to make the small island independent. To determine the appropriate strategies, we conduct SWOT Analysis with prioritised factors via AHP. Within SWOT analysis, the EFAS and IFAS have been formulated based on content analysis and secondary analysis. Moreover, the AHP is covering a participatory approach by considering nine key stakeholders among governance, civil society and private sectors. Based on the analysis above, we conclude that the strategies are generated from the top five combination between strengths and opportunities. Consequently, the small island should be used their strengths to maximise the opportunities. Develop the farmers' groups and sustainable use of unique biodiversity to get more export values and tourismattractions are the main focus for future mainstream strategies to make Poteran Island independent. Those strategies should be backed up by optimalising government asistance to the farmers.

Keywords: *small island; development strategies; independent island; SWOT and AHP.*

I. Background

East Java Province has446 small islands. Sumenep is one of the municipalities that has 126 small islands (Bappeda Sumenep, 2011). Poteran Island is one of the islands in the municipality.

Poteran Island has potential resources in agriculture, fisheries, forestry and mining. However, due to limited infrastructures and skilled human resources, many processing industriesare located outside Poteran. It indicates that economic outflow is higher than internal value added from any economic activities in the island. Consequently, the development has not yet made Poteran Island independent. Moreover, these effects make the development gap between Poteran with other islands getting bigger (Bappeda Sumenep, 2011). To uncover the gap, new strategies to make independent island in Poteran are needed. Those strategies should be a new mainstream for development processes in the future. Mainstreaming those types of strategy can swicth the development process and make poteran an independent small island.

Adjie Pamungkas
--- Lecturer, Researcher at Marine Research Center, Regional and City Planning Department
Surabaya Institute of Technology
Tel: 031 5922425 Fax: 5922425
E-mail: adjie.difi@gmail.com

Independent small island has five criteria in development including various local basic sectors for economic development, mutual benefit of partnership with other islands, resilience to disasters, preserve its unique biodiversity and culture and participatory centered development (Pamungkas et al, 2014). The concepts direct the island to utilize resources productively to improve their own lives.

In a previous study entitled: "Indicators for Independent Small Island: Poteran Island Case Study", the island has been seen as dependent small island. All the five criteria of independent island have not yet been met particularly for resilience to disasters (Pamungkas et al, 2014).

Therefore, this paper will focus onmainstreaming development strategies via the five criteria. These strategieswere developed through stakeholders' involvement in an effort to mainstreaming the concept of independent small island in Poteran Island, Sumenep Municipality.

II. Methodology

This research was conducted using a research and development approach (Borg and Gall, 1989). The approach considers problem solutions with actions. Therefore, this study fomulates first the theoretical and empirical characteristics related to the strenghts,

weaknesses, threats and opportunities. Then, generalization of the results on those four characteristics is directed to draw the conclusion on which policy should be prioritized.

SWOT analysis combined with Analytical Hierarchy Process (AHP) is the core analysis in this study. The techniques are conducted by organizing the characteristics (strengths, weaknesses, threats and opportunities) to determine the priority of alternatives strategies based on rational perceptions. The perceptions are obtained by interviewingnine key stakeholders from the local governments, civil society and private sectors. Secondary analysis and content analysis are also used to give a comprehensive understanding on the current development in the island.

III. Results and Discussion

Pamungkas et al., (2014) finalised five criteria for independent small island. Those criteria consider the island to have their own local product, to increase the added value of local product, to have better responses to disasters and to preserve their uniqueness. Independent island also means that the island will not be an exclusive island but will have a mutual-benefit partnership to other islands with a participatory development process. Those criteria are;

1) Various local basic sectors for economic development (Tahir, 2010; Hoyle 1999; Mayer, 2000; Kakazu 1994; United Nations Economic and Social Council 1987; Poirine 1994; Briguglio, 1995; Velde et al, 2006).
2) Mutual benefit of partnership with other islands (Poirine 1994; Hoyle 1999; Mayer 2000; Kakazu 1994; United Nations Economic and Social Council, 1987)
3) Resilience to disasters (Pelling and Uitto (2001); Briguglio, 1995; Mc Lean, 1980)
4) Preserve its unique biodiversity and cultural values (environmental and cultural) (Tahir, 2010; United Nations, 1987).
5) Participatory centred development (Briguglio, 1995; Dahuri, 1998).

Based on those criteria, secondary data and interviews were conducted to formulate the island's internal factors (strengths and weaknesses) and external factors (threats and opportunities). This formulation is assisted by SWOT analysis by utilizing the content analysis results of the interviews and secondary analysis on secondary data. **Table 1**. shows the results of SWOT to develop an independent small island.

In assessing appropriate strategies, SWOT was carried out and then confirmed to various stakeholders. A serial weighting assessment is conducted to every internal and external factor. We also use rating scale to indicate the existing performance based on the stakeholders' perceptions. Moreover, the relative weight from one factor to others is determined by AHP analysis techniques. The AHP assesses every pair wise factor. It is performed to nine key stakeholders representing the three elements stakeholders namely; government, civil society and private sectors.

Table. 1. SWOT for Independent Small Islan in Poteran

IFAS *(Internal Strategic Factor Analysis Summary)*	
STRENGTH	WEAKNESSES
1) Productivity in primary sector. 2) Suitable topography for farming. 3) Comprehensive institution. 4) Unique biodiversity. 5) Strong social network	6) Traditional technologies. 7) Unsustain mining practises. 8) Low human resources quality. 9) Poor infrastructures quality 10) Dominant outmigration.
EFAS *(External Strategic Factor Analysis Summary)*	
OPPORTUNITIES	**THREATS**
a) Government assistance b) Export market. c) High demand in tourism	d) Dependence on electricity supply. e) Outside processing Industries. f) Natural disasters g) Trawling use from outside fisherman.

Source: Author, 2014

The first step in AHP is to create a hierarchy to determine the objectives, criteria and alternatives (Saaty, 2000). The objective in this research is determining strategies to develop independent small island in Poteran. To achieve the objective, we set criteria as strengths, weaknesses, opportunities and threat scategorizations. While alternatives on every criterion is a set of relevant points for developing independent small island. In this context, we use factors to represent alternatives. Figure 1 shows a hierarchy in the AHP analysis.

The next step is weighting criteria and factors through pairwise compilation. This assessment uses a likert scale from 1 to 5 in expressing opinions (Budiaji, 2013). For the interpretation of the scale will be elaborated as on the table below.

Table 2. Likert Scale

Nilai	Keterangan
1	Factor Ais equally importance to factor B
2	A is slightly more important than B
3	A is more important than B
4	A is strongly more important than B
5	A is absolutely more important than B

Source: Author, 2014

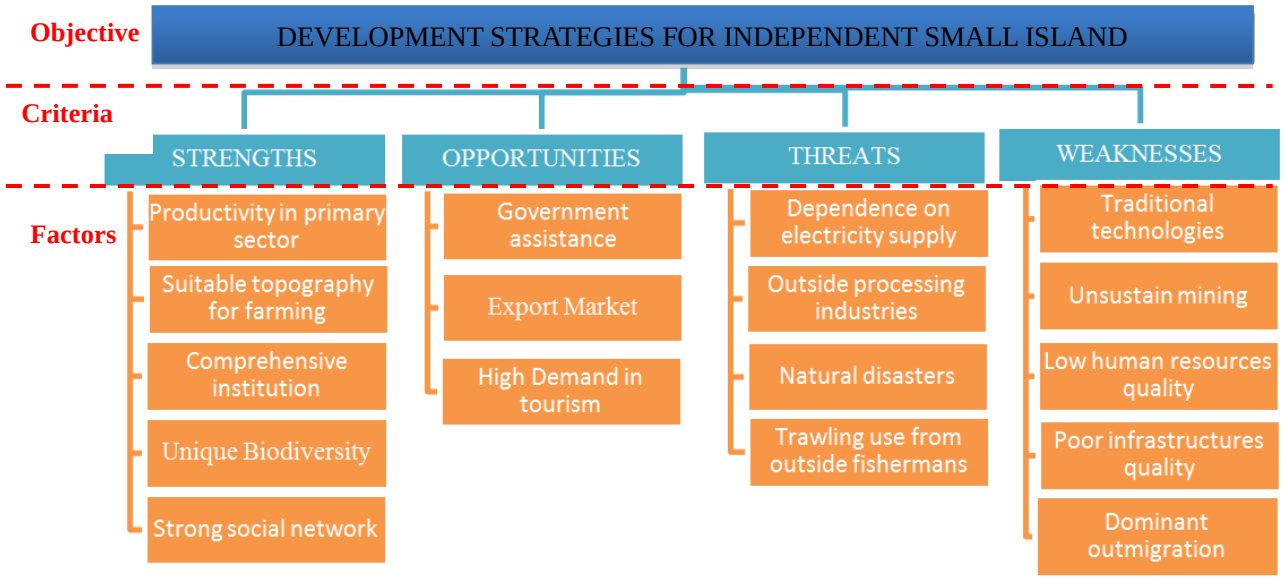


Figure 1. Analytical Hierarchy Process

Source: Author, 2014

3.1. Weighting Criteria

In weighting criteria, we prioritize four criteria by comparing one to the other. **Table 3** is one of questionnaire filled by the stakeholders. After collecting this comparison to the nine stakeholders, we analyse the result using expert choice software v.11.

Table 3. Weight of Criteria

Factor A	A more important than B				Equal Importance	B more important than A				Factor B
	5	4	3	2	1	2	3	4	5	
Strength				v						Strength
Strength						v				Opportunities
Strength					V					Threat
Weakness				V						Opportunities
Weakness					V					Threat
Opportunities				v						Threat

Source: Author, 2014

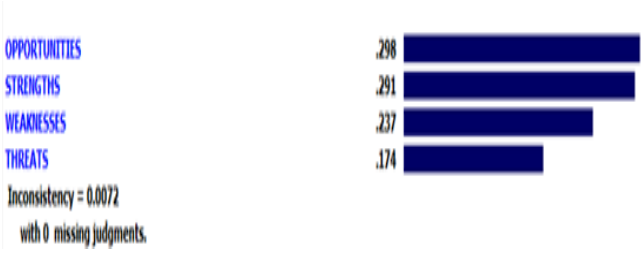


Figure 2. Expert Choice Priorities Result with Inconsistency Index 0,0072

Source: Author, 2014

Figure 2 shows the output of the weigth for every criteria. The opportunity is the highest criteria (0.298) of all following by strength, weaknesses and threat. It means that stakeholders prefer to utilise opportunities first to develop Poteran. Moreover, stakeholders are quite convidence for future Poteran since they value opportunity and strength as the two first priorities for future development in Poteran.

3.2. Weighting Factors

Based on the same step in weighting criteria, **Figure 3** shows that the export market (0.256) is the most important external factor. The potential export market includes fishery and agricultural products. The fisheries products have been marketed from the Island to Madura (main land), Surabaya, Brondong, Semarang, Jakarta, Tuban and Japan. As for the agricultural sector, their products are marketed to Sumenep and Sidoarjo. (Directorate-General of Marine Affairs, 2010; Bappeda Sumenep, 2011).

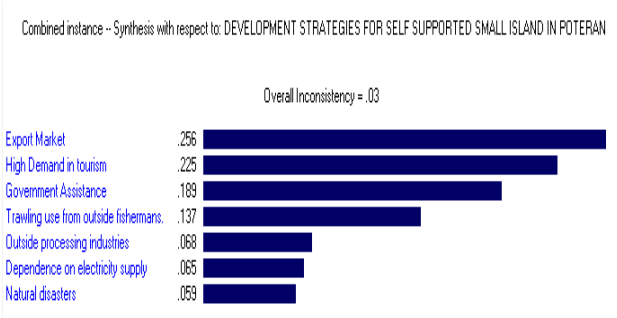


Figure 3. Expert Choice Priorities Result for EFAS Criteria with Inconsistency Index 0,03

Source: Author, 2014

As for natural disasters factor (0.059), it is not a priority factor since it rarely occurred in the Island (Bappeda Sumenep, 2011). In addition, the victims affected by the disaster are also very few (interview to imam, 2013). This perception make Poteran has no instruments for disaster risk management.

"Natural disasters are very rare on the Poteran Island. There may be once a year. Victims also very rare in here"
(Imam, 2014)

Figure 4 illustrates that strong social network among farmers (0.157) is the most important factor. Stakeholders believe that the development of a region depends on the quality and competence of its people. Furthermore, the increases on the capacity and skills of the group may boost the economic performances particularly in agriculture and fisheries (interview to Joko Suwaeno, 2014).

"The group of farmers and fishermen in Poteran arevaluable. Many of the groups received an award from the government. If thesegroups increase, the potential of natural resources will also be increase"
(Joko Suworno, 2014)

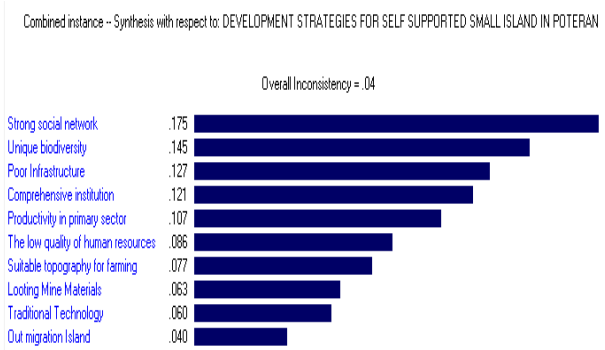


Figure 4. Expert Choice Priorities Result for IFAS Criteria with Inconsistency Index 0,04
Source: Author, 2014

Unlike social network, outmigration (0,040) is the lowest priority for poteran development. Based on the interviews, stakeholders analyze that the outmigration can be decreased by utilizing the opportunities and strengths to develop the island. Having a growth in economy, the out migrants can be minimized (Interview, 2014).

Weighting factors also need to be done by looking at the level of criteria weights. Considering the weight in the criteria can be completed by multiplying the weigth in every factor to the weight in every criterion. **Table 4** shows the results of the multiplication for EFAS.

Table 4. Weight of Factors and Criteria for EFAS

	EFAS	FACTOR	CRITERIA	FACTOR X CRITERIA
OPPORTUNITIES	Government Assistance	0.19	0.30	0.05632
	Export Market	0.26	0.30	0.07629
	Development of Tourism	0.23	0.30	0.06705
THREATS	Electricity Supply dependency	0.07	0.17	0.01131
	Processing in the Outer Island	0.07	0.17	0.01183
	Natural Hazards	0.06	0.17	0.01027
	Fishing with Trawl Tiger	0.14	0.17	0.02384
	TOTAL			0.26

Source: Author, 2014

If we compare **Table 4** with **Figure 3**, we can observe that the priority for external factors in Tabel 4 is the same with Figure 3.Conversely, the weigths for factor and the criteria on the threats and opportunities have differences. It is due to all the weigths in opportunity factors and criteria are greater than in the threat.

Table 5. Weight of Factors and Criteria for IFAS

	IFAS	FACTOR	CRITERIA	FACTOR X CRITERIA
STRENGTH	Natural Resources	0.11	0.29	0.03114
	Topography Condition	0.08	0.29	0.02241
	Comprehensive Institutional	0.12	0.29	0.03521
	Unique Biodiversity	0.15	0.29	0.04220
	The number of Farmer Groups	0.18	0.29	0.05093
WEAKNESSES	Traditional Technology	0.06	0.24	0.01422
	Looting Mine Materials	0.06	0.24	0.01493
	The low quality of human resources	0.09	0.24	0.02038
	Poor Infrastructure	0.13	0.24	0.03010
	Migration Out Of Island	0.04	0.24	0.00948
	TOTAL			0.27

Source: Author, 2014

If we compare **Table 5** with **Figure 4**, we can examine that that there is a little difference in priority for internal factors such as poor infrastructure quality. Figure 4shows the infrastructure factor isin the third rank while Table 5 has it in the fifth rank. One of the reason to oversee this data is;the factorweight for infrastructureis very high while the criteria (weakness) is low. Therefore, the multiplications of those values result the infrastructure into low weight. Perceptions from stakeholders also support these phenomena as follows;

"Infrastructures in Poteran are very less. Just up the road near the port are good. While other driveway is badly damaged"
(Imam, 2014)

Apart from the infrastructure factor, natural resources, low human resources quality and suitable topography for farming are some factors that experience changes in prioritization stage.

3.3. Assessment on Poteran Performancesbased on every factor

In the last part of assessment, the stakeholder is asked to rate the factor with the scale rate from 1 to 4. Value of 4 means the factor is in very bad condition; 3 means bad; 2 means good and value 1 means very good condition. Here are the results of factors' performances based on the nine stakeholders' perceptions.

Table. 6. Perceptual performance on every factor.

	FACTOR	PERFORMANCE
STRENGTH	Productivity in primary sector	1.89
	Topography Condition	1.67
	Comprehensive Institutional	2.44
	Unique Biodiversity	1.89
	The number of Farmer Groups	2.00
WEAKNESSES	Traditional Technology	2.78
	Looting Mine Materials	3.11
	The low quality of human resources	3.00
	Poor Infrastructure	3.22
	Migration Out Of Island	3.11
OPPORTUNITIES	Government Assistance	2.11
	Export Market	2.11
	Development of Tourism	2.11
THREATS	Electricity Supply dependency	3.00
	Processing in the Outer Island	3.11
	Natural Hazards	2.44
	Fishing with Trawl Tiger	3.11

Source: Author, 2014

Table 6 describes that topography has thebest condition compared with other factors in Poteran Island. It is inline with the small percentage of topography slope around the island with a height less than 500 meters. This type of landscape is suitable for land farming (Bappeda Sumenep, 2011).

The lowest performance factor in the island is infrastructure. It is supported by data from local government indicating 80% of households with no electricity (Bappeda Sumenep, 2011). Poteran Island also relies on underground water supply due to no water pipelines from government (Bappeda Sumenep, 2011). In addition, most of the roads on the Poteran Island is in bad and damaged conditionswith limited sections accessed by car (Bappeda Sumenep, 2011).

3.3. Multiplying Performances and Weights on every factors

Multiplying performance rateand weights on every factor is the next step to get the final value of factors. Performance rateswhich are obtained in Section 3.3 is multiplied by the weightvaluesin Section 3.2. The result of the multiplication can be seen in Table 7 for both EFAS and IFAS. STD BR value is standardized values to have range values at 0-1.

Table. 7. Weight of Performance and Factor Criteria for EFAS

	EFAS	FACTOR X CRITERIA	PERFORMANCE	WEIGHT	STD BR	Factor's Codes
OPPORTUNITIES	Government Assistance	0.06	2.11	0.12	0.20	A
	Export Market	0.08	2.11	0.16	0.27	B
	Development of Tourism	0.07	2.11	0.14	0.24	C
THREATS	Electricity Supply dependency	0.01	3.00	0.03	0.06	D
	Processing in the Outer Island	0.01	3.11	0.04	0.06	E
	Natural Hazards	0.01	2.44	0.03	0.04	F
	Fishing with Trawl Tiger	0.02	3.11	0.07	0.13	G
	TOTAL			0.59	1.00	

Source: Author, 2014

Table. 8. Weight of Performance and Factor Criteria for IFAS

	IFAS	FACTOR X CRITERIA	PERFORMANCE	WEIGHT	STD BR	Factor's Codes
STRENGTH	Natural Resources	0.03	1.89	0.06	0.09	1
	Topography Condition	0.02	1.67	0.04	0.06	2
	Comprehensive Institutional	0.04	2.44	0.09	0.14	3
	Unique Biodiversity	0.04	1.89	0.08	0.13	4
	The number of Farmer Groups	0.05	2.00	0.10	0.16	5
WEAKNESSES	Traditional Technology	0.01	2.78	0.04	0.06	6
	Looting Mine Materials	0.01	3.11	0.05	0.07	7
	The low quality of human resources	0.02	3.00	0.06	0.10	8
	Poor Infrastructure	0.03	3.22	0.10	0.15	9
	Migration Out Of Island	0.01	3.11	0.03	0.05	10
	TOTAL			0.64	1.00	

Source: Author, 2014

3.4. Matrix EFAS and IFAS.

In determining the appropriate strategy, bench-marking between EFAS and IFAS matrix can be conducted as on **Table 9**. This matrix is made by multiplying the value of each factor in pairwise manner. The results of this multiplication are then sorted as a reason informulating appropriate strategies for independent small island in Poteran based on bottom-up approaches.

Based on the matrix, prioritization is done by sorting the pairwise values in the matrix. From the sequencing results, the top five combinations as follows:

Table. 9. Matrix EFAS and IFAS

EFAS \ IFAS			STRENGTH					WEAKNESSES					TOTAL
			1	2	3	4	5	6	7	8	9	10	
			0.09	0.06	0.14	0.13	0.16	0.06	0.07	0.10	0.15	0.05	1.00
OPPORTUNITY	A	0.20	0.0185	0.0118	0.0271	0.0251	0.0321	0.0125	0.0147	0.0193	0.0306	0.0093	0.2010
	B	0.27	0.0251	0.0160	0.0368	0.0340	0.0435	0.0169	0.0198	0.0261	0.0414	0.0126	0.2723
	C	0.24	0.0221	0.0140	0.0323	0.0299	0.0382	0.0148	0.0174	0.0230	0.0364	0.0111	0.2393
THREATS	D	0.06	0.0053	0.0034	0.0077	0.0072	0.0092	0.0036	0.0042	0.0055	0.0087	0.0027	0.0574
	E	0.06	0.0057	0.0036	0.0084	0.0078	0.0099	0.0039	0.0045	0.0060	0.0095	0.0029	0.0622
	F	0.04	0.0039	0.0025	0.0057	0.0053	0.0068	0.0026	0.0031	0.0041	0.0065	0.0020	0.0424
	G	0.13	0.0116	0.0073	0.0169	0.0157	0.0200	0.0078	0.0091	0.0120	0.0191	0.0058	0.1254
TOTAL		1.00	0.0586	0.1350	0.1250	0.1598	0.0620	0.0729	0.0959	0.1522	0.0463	1.0000	1.0000

Source: Author, 2014

Table. 10. Combination Priority Achievement

Priority	Code (EFAS,IFAS)	Priority of Achievement
1	B5	0.0435
2	B9	0.0414
3	C5	0.0382
4	B3	0.0368
5	C9	0.0364

Source: Author, 2014

Based on table above, a combination of factors B-5 is the highest priority. The following table discusses the rational basis for suggesting strategies based on the priority level.

Based on the SWOT and AHP results, we can examine that independent small Island in Poteran in Poteran should be initiated by utilizing the opportunity in export market. Empowering the farmer groups and fishermen in the business of production, processing -

Table. 11. Strategy Priority and The Explanation

PRIORITY	CODE	FACTORS	REASON	STRATEGIES
1	B	Export Market	Priority development of export markets was held because Poteran Island has potential on export markets. On the other hand, majority of export products are still raw material causing low added value for Poteran island. Empowerment and increased participation of farmers and fishermen groups in terms of the production, processing and marketing to capture the export market. Therefore, the added value of Poteran's products can be increase to improve people's welfare.	1) Establish the institutions related to farmers and fishermenorganizations. 2) Provide empowerment and capacity building in terms of production, processing and marketing of products 3) Assist the provision of capital and technology of farmer and fishermen groups to be able to increase productivity and capture export market opportunities.
	5	Strong social network among farmers and fishermen		
2	B	Export Market	The high export market opportunities, especially for agriculture and fisheries sector is not supported by adequate infrastructure. There are many households doesn't have electricity or clean water connection. Most of the roads in this island were damaged. Therefore, to be able to win export opportunities, accessibility infrastructure must be provided first.	1) Improveroadsperformance to increase public accessibility. 2) Increase the electricity performance to support manufacturing processes on agricultural and fisheries products. 3) Built water channels, irrigation or reservoirs to be provide water. 4) Increase the telecommunications infrastructure to support the marketing for tourist attractions.
	9	Poor infrastructures quality		
3	C	High demand in tourism	Tourism in religious or cultural characteristic is still not well managed in this island. Level of social welfare is also very low, especially farmers and fishermen. Therefore, the contribution of farmers and fishermen groups in tourism development is needed. As a result, the benefits are not only in the tourism sector but also in the agriculture and fisheries sector.	1) Empower farmers and fishermen groups to create tourist destinations with new innovation, unique and integrated with agricultural and marine sectors. (example: blue tour development and agro tourism) 2) Develop the unique tourist attraction, with natural and cultural potential. 3) Empower farmer groups and fishermen to produce handicrafts and their processed products. 4) Empower stakeholders related to tourism in marketing integrated with agriculture and fishery products.
	5	Strong social network among farmers and fishermen		
4	B	Export Market	Export market development can be supportedby the comprehensive institutions both from government and non government organisations. Development of planning agency, the Department of agriculture, department of marine and fisheries, industry and commerce departments and other relevant agencies should work together to analyze what products are suitable to be used as an export commodity. In	1) Increase government and private sectors capacity in order to utilise export opportunities for Poteran Island 2) The Government shall establish a basis commodity to be developed as an export commodity. 3) The government and non government bodies
	3	Comprehensive institution		

PRIORITY	CODE	FACTORS	REASON	STRATEGIES
			addition, the agency should also be able to determine which areas will be used as a potential market of the products produced by PoteranIsland.	shall assist private sectors to win the export market.
5	C	High Demand in tourism	Tourism development will not succeed without adequate infrastructures. Poor infrastructure conditions in the Poteranisland should be prioritised. Infrastructure development will be directed to the vital infrastructure that can be used for the development of a tourist attraction located on the island of Poteran.	1) Perform infrastructure development as described in the previous point for combination factors among export market and poor infrastructure quality.
	9	Poor infrastructures quality		

Source: Author, 2014

and marketing can fulfill this opportunity. In addition, infrastructure development in Poteran Island is also required in order to maintain the island's economic productivity. The exports value can also be increased by maximizing government institution assistance particularly in processing the raw material product before exporting. Thus, the economic benefits will be mainly for the residents in the island. Therefore, the level of welfare in Poteran Island will be increase.

In addition, tourism development is also aimed todevelop agro-cultural-tourism. Current tourist destination which focus on visiting the tomb of Sayyid Yusuf can be connected to the local products on fisheries and farmings. Therefore, the tourists can spend more money in the island and then creating higher multiplier effects to the island. In supporting this idea, development the infrastructure and em-powering the farmer groups and fishermen are the first priority.

IV. CONCLUSIONS

Based on AHP analysis process combined with SWOT, we conclude that there are 5 combinations of the most appropriate strategies to make Poteran Island as an independent small island. The combination of optimizingpotential export and empowering strong social network among farmers and fishermen groupsbecome the first priority. In addition to capturing external opportunities, the development in Poteran can also be directed to the agro-cultural-tourism development. The tourism is a combination among cultural values of the island with the products of agricultural and fisheries. As a result, export market in farming and fisheries, social capital, infrastructures, tourism and supported institutions are the fivepillars for independent small island in Poteran.

Acknowledgement

The article is part of our research entitled "Penge-lolaan Sumberdaya Pulau Kecil dengan Konsep Pulau Kecil Mandiri: Studi Kasus Pulau Poteran, Sumenep". All the writers express our gratitude to DIKTI for funding the research via EPI UNET scheme.

References

1) Bappeda Kabupaten Sumenep. 2011. Profil Wilayah Kepulauan Kabupaten Sumenep. Badan Perencanaan Pembangnan Daerah Kabupaten Sumenep. Sumenep.
2) Bappeda Kabupaten Sumenep. 2011. Kecamatan Talango dalam Angka 2011. Badan Pusat Statistik Kabupaten Sumenep. Sumenep.
3) Budiaji, Weksi. 2013. Skala Pengukuran dan Jumlah Respon Skala Likert. Universitas Sultan Ageng Tirtayasa. Banten.
4) Briguglio, Lino. 1995. Small Island Developing States and Their Economic Vulnerability. World Development. Vol.23 (9): 1615.
5) Dahuri, R. 1998. Pendekatan Ekonomi -Ekologis Pembangunan Pulau-Pulau Kecil Berkelanjutan. Prosiding Seminar dan Lokakarya Pengelolaan Pulau-Pulau Kecil di Indonesia. Jakarta: Dit. Pengelolaan Sumberdaya Lahan dan Kawasan, TPSA BPPT, CRMP USAID.
6) Hoyle, B and Biagini. E. 1999. A critical Political Economy of The Small Island Developing States. London
7) Kakazu, Hiroshi. 1994. Sustainable Island Tourism: The Case of Okinawa. University of The Ryukyus. Japan
8) Mayer, Peter C. 2000. Realibility Economies of Scale for Tropical Island Electric Power. *Energy Economics* 22(2000) 319-330. USA.
9) McLean, R.F. 1980. Spatial and Temporal Variability of External Physical Conttrols on Small Island Ecosystems. UNESCO. French.
10) Pamungkas A., Sulisetyono A., Hidayah Z., and Sunyigono A.K., (2014) (on progress), Indikator Kemandirian Pulau kecil: Studi Kasus Poteran Sumenep, Jurnal Penataan Ruang.
11) Pelling, M and Uitto, J. 2001. Small Island Developing States : Natural Disaster Vulnerability and Global Change. *Environmental Hazards* 3 49-62
12) Poirine, Bernard. 1994. Rent, emigration and unemployment in small island: The MIRAB model and the Fench Overseas Departments and Territories.
13) Saaty, Thomas. 2000. The Fundamentals of Decision Making and Priority Theory with the Analytical Process
14) Tahir, Amiruddin. 2010. Formulasi Indeks Kerentanan Lingkungan Pulau-Pulau Kecil. Tesis. Sekolah Pasca Sarjana Institut Pertanian Bogor.
15) United Nations, 1987. Report of the World Commission on Environment and Development (the Brundtland Commission) report: Our Common Future.
16) Witaradya, Kertya. 2010. Community Development. Bandung. http://kertyawitaradya.wordpress.com/2010/01/26/tinjauan-teoritis-community-development/. Diakses pada 7 april 2014.
17) Velde, M Van Der, et.al. 2006. Sustainable Development in Small Island Developing States: Agricultural Intensification, Economic Development, and Freshwater Resources Management on The Coral Atoll of Tongatapu. New Zealand.

Dimension of Landscape Aesthetic-Ecology in Rural Spatial Planning

Dina Poerwoningsih [1,2], Antariksa Sudikno[3], Amin Setyo Leksono[4], Abdul Wahid Hasyim[5]

[1] School of Environmental Science and Technology, University of Brawijaya
[2] Department of Architecture, Engineering Faculty, University of Merdeka
[3] Department of Architecture, Engineering Faculty, University of Brawijaya
[4] Department of Biology, Mathematic and Science Faculty, University of Brawijaya
[5] Department of Urban and Spatial Planning, Engineering Faculty, University of Brawijaya

Abstract

Indonesian territory has a very wide diversity of natural resource, biodiversity and their ecological complexity. Characteristics of such a huge resource can be seen in the rural landscape. Nevertheless rural landscape is one of spatial objects planning that get less attention. It could threaten the sustainability of the resource and the benefit values of rural landscape. Landscape architecture planning and design has a major challenge in integrating sustainability aspects of the rural landscape. In some parts of Indonesia, rural landscape has demonstrated the importance and success in integrating the functions of social, economic and ecological. However if viewed from the vastness of Indonesia territory with a diversity of potential, only a small part of region may called as a resource. Most of other part is not yet fully have the function and value of social, economic and ecology. This paper seeks to provide a better understanding for future Indonesian rural landscape, especially as the object of planning and design. The first part of this paper emphasizes on describing reality of rural landscape in potential and challenges in the future. The second part of this paper offers several conceptual frameworks or systems that includes dimension of landscape aesthetic-ecology. The third section tries to examine the extent of control strategies in spatial planning has been done in optimizing the resource potential of the rural landscape. In this section a content analysis is conducted by taking the case of spatial planning in Batu City, East Java, Indonesia. Landscape aesthetic-ecological models is expected to be the power to protect and enhance the ecological objectives of Indonesian rural landscape. This paper also conveys that dimension of landscape aesthetic ecology could address the needs to develop ecosystem services concept of rural spatial planning.

Keywords: *landscape aesthetic-ecology, sustainable rural landscape, aesthetic resource management*

I. Introduction

Landscape architectural planning and design has a big challenge in integrating sustainability of rural landscapes. In some parts of Indonesia, the rural landscape has demonstrated the importance and success in integrating functions of social, economy and ecology. However, if viewed from the vast area of Indonesia with a diversity of potential, only a small portion of the area can be referred as a resource. On the other side, the enactment of legislation rule about rural number 6th of 2014 could be an opportunites for better and comprehensive rural spatial planning. Common problems of spatial planning particularly in rural areas is the lack of ecological considerations in planning and design decisions. It could bring to huge implications for rural landscape changes. Implementation of spatial planning process often leads to physical infrastructure development that actually interfere the ecosystem. Construction of buildings or basic infrastructure such as roads and bridges, drinking water, irrigation should consider the ecosystems stability. Processes and products of sustainable planning still require improvements to integrate social, economic, and ecological aspect.

The effectiveness of development strategy based on tourism is very commonly found in several spatial planning documents including the rural landscape. Potential areas of natural scenic beauty are often easily considering to develop tourism activities and fascilities in the region. However, there are less of using assessment methods to assess the quantity and quality of natural scenic beauty. So, this lack of depth would cause in-consistent in the planning until implementation of development. Ecosystem services valuetion of aesthetic culture in rural landscape is very often studied but it is difficult to apply formally within the scope of ecosystem services concept. In contrast to the ecological and economic aspects, aesthetic judg-

Dina Poerwoningsih
--- School of Environmental Science and Technology, University of Brawijaya
--- Department of Architecture, Engineering Faculty, University of Merdeka
E-mail: dinatatatiti@gmail.com

ment can not be easily based on quantitative information.

Approach to environmental resources, biophysical approach to visual architectural and ecological (Gold, 1980; Aviziene et al., 2007) can be used in planning and designing area that has environmental conservation issues including rural landscapes. Hale et al. (2005) stated that aesthetic landscape planning can solve the rural landscape management problem. Through the planning approach, the scenery performance (scenic beauty) as a valuable resource can underly planning purposes to improve the ecological and cultural quality of landscape.

The first part of this paper emphasizes on the reality of rural landscape potency and challenge in the future. The second section of this paper offers a conceptual framework that includes dimensions of landscape aesthetics-ecology. The third part tries to examine the extent to which controlling strategies in spatial planning has been done in optimizing resource capability of the rural landscape. This section takes a case of spatial planning in Batu, East Java, Indonesia.

II. The role and challenge of rural landscape in ecosystem stability

Rural landscapes in tropical countries, including Indonesia are seen as a source of biodiversity that play a role in stability of the earth's ecosystem. The rural landscape is often seen as an area that is dominated by a green area with a slightly different to the urban landscape. Rural landscape is usually dominated by activities and functions of agriculture and forestry. Green open spaces availability of farmland and forestry plays a role in maintaining the ecosystem stability. Some of them are protecting soil and water, controlling global and micro climate, storing carbon, and saving biodiversity resources. Clean air and water availability in urban areas are highly dependent to efforts of forest and agricultural maintaining for ecosystems that are mostly located in the rural area. Therefore rural landscapes shows the relationship between nature and humans are characterized by land management activities as agriculture, horticulture, and forestry. (Jacobsen, 2007; Rogge, 2007; Winchombe, 2004).

Rural landscape provide ecosystem services which include rural scenic beauty, wildlife habitat, open space agricultural and forest green, as well as cultural activities of rural facilities (Sznajder, 2004; Domon, 2011). Rural landscape can be a driving force in restructuring of rural areas. In developing countries, including Indonesia, the rural landscape can be a valuable facility for developing tourism activities such as agro-tourism and eco-tourism. Rural landscape in some modern countries has become an special area in planning scope. New Zealand gave great attention to the role of the rural landscape. One part of the environmental management framework that issued by the environment ministry puts the rural amenity values of as the focus of the planning (Goodwin et al, 2000). Countries within and outside the European Union give great attention to the conservation implications of an ecological network. They agreed to promote agroforestry policy in rural landscape preservation that is defined in EU Regulation 1257/99. One of the strategy is conservation agroforestry network planning and designing. It is supported by geographic information systems. These countries believe that there is important for taking into account the community values of non-market aspects such as scenic beauty to maximize resources allocation in rural landscape management. Agroforestry network has implications on the socio-cultural or socio-economic on the landscape. Agroforestry network has capability of linking function and structure of landscape in ecological perspective. (Franco et al., 2003)

One of the biggest issues faced by the rural landscape as one of the providers of ecosystem services is the rapid pace of scarcity. As an example of the exploitation of the natural beauty of Bali followed by utilization competition of land and water. It is threatening environment ecosystems preservation (Rai, 2011). The issue of scarcity is not only faced by the rural landscape that has famous scenic values. Rural environments in where people life are highly dependent on the natural resource availability also undergone a process of natural scarcity. The rural landscape in the urban fringe rural areas often experience greater pressure from land use change, for example for agricultural infrastructure itself, tourism, housing, and other facilities (Soini, 2012; Lokocz, 2011). In addition, a natural scenic beauty of a region will trigger a lot of activities that could potentially disturb landscape surface, even would decrease the beauty and amenity value of landscape. This phenolmenon will continue every time and need to be set and anticipated through spatial planning. It such sensitive environments need visual resource management policies. Mc Harg (1969) mentions the importance of visual quality of landscape as an approach to manage areas with highly sensitive characteristics.

Rural landscape have demonstrated the functionality and benefits as service providers. Therefore rural landscape have attracted attention of world community (researchers and practitioners) towards the rural landscape preservation includes spatial planning community. Rural landscape is a space that has dimension to explain the relationship between environmental ecosystem aspects. Academic study and empirical practice of cultural services show nonmaterial benefits ofecosystems such as spiritual and beauty benefits. The concept of ecosystem services have become an important model in linking the functions of ecosystems and human well-being. This concept is helpful in explaining the various issues that rural landscape benefit are largely non market. Rural landscape has environmental assets, ecosystems, and

biodiversity are open characteristics, do not have a formal market so it is undervalued.

Rural planning should be a means of control in the preservation of ecosystems. However, efforts to integrate the functions and structures in the landscape ecology perspective. Especially in Indonesia are still faced to many obstacles. One of the most fundamental is the gap between knowledge and theory of landscape ecology and how its application in landscape planning and design. Ahern (2006) stated that the substantive theories in planning and landscape design is not yet a solution to the biodiversity crisis.

2.1 Agroforestry System

The role and challenge of rural landscape in ecosystem stability can be explain through agroforestry issues. Agroforestry system is an example that has dimensions for making up the visual aesthetic performance space. Research conducted in various countries of agroforestry asserts that the concept of ecologically stable but still difficult to implement in the planning and landscape design. Indonesia (Mahendra, 2009) even has a variety of local knowledge examples in agroforestry systems that have utilized the space vertically and horizontally in order to preserve the ecosystem and biodiversity. However several modern countries have implemented a network of agroforestry as a strategy for rural landscape conservation in planning formulation. Therefore by taking valuable lessons from the practices environment conservation, agroforestry systems could be integrated for producing a visual performance architectural as well as supporting ecosystem services functions.

Figure 1. Visual performance of agroforestry
Source : Poerwoningsih, 2013

Agroforestry systems on a landscape prove the relationship between landscape function and structure in landscape ecology perspective. The practice of agroforestry systems also demonstrate the impact of socio-cultural or socio-economic. Therefore, very clearly shows the human role in the changing landscape. Agroforestry systems also prove that socio-cultural and socio-economic process can be described and analyzed with a landscape ecology approach. This can be an opportunity for planners and designers to utilize agroforestry systems widely. Therefore, the challenge for planners is to assess how landscape structure with the use of agroforestry systems can affect the aesthetics of the landscape. The next challenge is also necessary to verify whether the effort and application of agroforestry system in planning can influence on people's appreciation of landscape. Social aspects of people's appreciation of the landscape is critical in optimizing environmental conservation efforts. This optimizing means in a comprehensive manner in the perspective of ecology, agronomy and aesthetics. According to Franco (2003) if these challenges can be tackled, the agroforestry system can be means of social democratic processes and efficient approach to spatial planning in rural areas. Implementation of a system should be in a simple procedure requiring planning, rapid (automatic) and reliable for large areas (Bishop and Hulse, 1994). One obstacle in the speed of the evaluation procedure is the economic constraints, particularly in the case of large areas evaluation. In that case the procedure should be used many times.

2.2 Greenway Concept

Another example of linking the function and structure of the landscape is the greenway concept. Ideally, greenways are corridors in the form of land and water that are designed for multiple purposes, such as nature conservation, recreation, prevent flooding, protection of scenery to improving quality of life. Greenways sometimes known as green infrastructure. It is an interconnected network of green space to preserve the natural ecosystem values and benefits associated with the human population. Greenway network in Europe known as ecological networks are connected together in a nature reserve.

The concept is very relevant theoretically to be applied as a strategy for preservation of rural ecosystems that have watershed. In rural areas, riverside corridor area, surface water catchment areas, agricultural areas can be targeted for conservation. The riparian corridor has the characteristics of water, soil that is moist and fertile. These characteristics cause the vegetation is well growed so it has a complex and multi-layered function. Riparian ecosystems are very important for rural landscape conservation. The ability to stabilize the riparian system, buffer, or control processes in the ecosystem in turn to improve the water quality all are very necessary in a healthy landscape. Riparian vegetation is very important for wildlife (aquatic and terrestrial), which is usually the most numerous and most diverse in this corridor. Therefore riparian corridor is very attractive for a wide range of human activities. They are often used for transportation and agriculture. Environmental river flow is also greatly appreciated recreation area. (Hellmund et al., 2006)

Figure 2. Visual performance of riparian corridor
Source : Poerwoningsih, 2013

2.3 Ecovillage Concept

This paper discussed eco village concept because it is assumed able to clarify the relationship between function and structure in the landscape ecology perspective. Eco village could be a rural communities who seeks to integrate a social environment in ways of living by an environment low impact. That such way of life is applied in a lifestyle that includes a variety of aspects. That ways are include the utilization of ecological design, permaculture, ecological building, green production, alternative energy and community development practices. (The Global Ecovillage Network, 2005)

Inoguchi et al. (1999) emphasized the importance of the environment social aspect. Environmental problems require approaches to social, economic, and political in what they are problems root of environmental degradation. Sustainable environment is not only emphasize the physical changes but must also include the social system. Trainer suggested the existence of a global change in development at the community or village level. Global change at the community level can be measured on achieving quality of life with patterns of lower resource consumption.

Gilman (1991) said eco village is a settlement that integrates human activities with nature. According to Gilman eco village characteristics can be summarized as follows: human-scale, full-featured settlement, integrate human activity with natural environment, supports human healthy development, and manages to maintain sustainability in the future.

Eco village could also mean a sustainable community that is currently intense is a global movement that gives people the opportunity to live in a community that ensures the well-being of living sustainably. Flora et al (2004) describe the concept of a sustainable community in several different ways. Community and social activities typically located in a community that has no geographical boundaries is therefore not easy to determine the properties of a community. On the one hand, the community is defined as a place or location where a community interact with each other. On the other hand togetherness as a social system or organization. As long as there are spatial and landscape issues in the development process, spatial planning should still continue to take part in integrating function and structure of landscape.

Figure 3. Performance of Kampung Naga as a sample of Eco village
Source : Permukiman Warisan Karuhun, 2002

III. Spatial Planning of Bumiaji District (Case Study of Aesthetic Ecology Landscape Issues)

Agroforestry, greenway and ecovillage are examples of the environmental protection concept that should continue to be developed in the planning and design practice. This paper proposes one of the areas in Batu City where can be a good example in the development of these concepts.

Batu City Planning has been very good in structuring spaces. One of the results of the structuring is Bumiaji included in the urban area region III (BWK III). BWK III is a regional development of agrotourism and Agropolitan with Punten village as service center. BWK III Bumiaji covers an administration area of Pandanrejo Village, Bumiaji Village, Bulukerto Village, Gunungsari Village, Punten Village, Tulungrejo Village, Sumbergondo Village, Giripurno Village, and Village Sumberbrantas. Batu City Planning has very considered the physical characteristics Bumiaji that very close to the environmental buffer functions. Therefore, efforts should be made to fulfill the Batu City Planning by implementing design concepts and landscape areas that are adequate to preserve the environment ecosystem.

The geographical position of Bumiaji Districts in the basin area and being bounded by some mountains makes the area has ecological function as catchment areas. Listyarini (2011) in her research recommendation states that tourism development is expected to synergize with the conservation area as a buffer

area zone of Bumiaji Forest Park Raden Soerjo (Tahura). Bumiaji District of Batu City is seen as a suitable model in addressing community participation, strategic program of tourism development, intensive farming areas, as well as areas that have sensitive to the issue of environmental conservation (forests, land, water, ecosystems and biodiversity). Related to this case, is very relevant to implement agroforestry systems in areas that have close character relationship between people and forest protected areas.

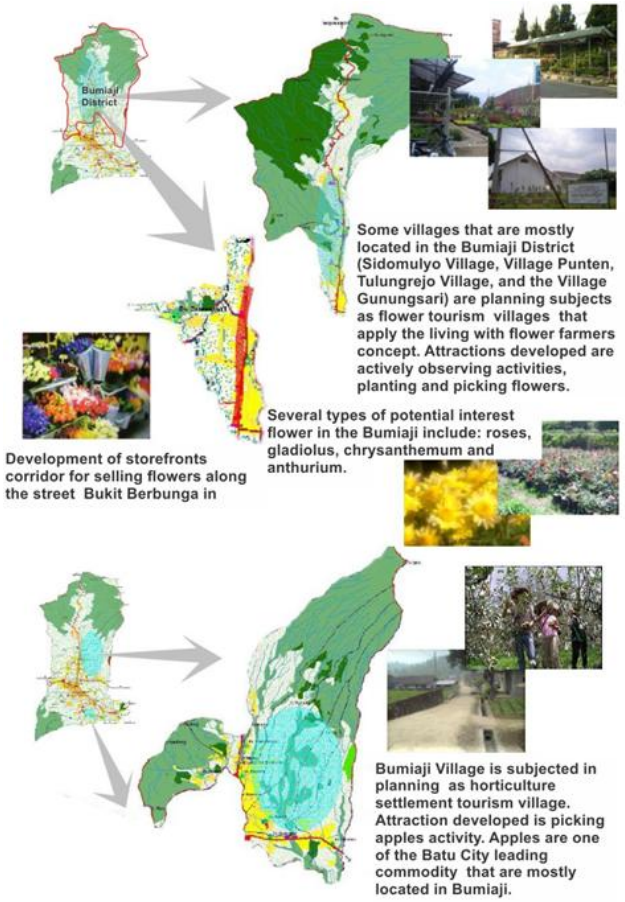


Figure 4. Several villages in the district Bumiaji as subjects of planning in Batu City tourism strategic area.
Source: Batu City Spatial Planning 2010-2030

Potential scenic beauty on the landscape that drives the dynamics of the city through tourism activities become interesting issue as the study site. Agricultural landscape existence of flowers and vegetables, fruit plantations create features that are expected to draw landscape scenery trigger functions such activity homestay tour, picking fruit, nature trails, outbound, and so on. Bumiaji District faces the challenge of the real problems that formally expressed as a Strategic Area Featured Tourism Sector in the general framework of the Strategic Growth Areas (Batu City Spatial Planning of 2010-2030).

Batu City Spatial Planning has set some parts of the Bumiaji District as a tourism sector strategic area. This is a strategy that is loaded with landscape issues. Such planning requires action and effort in controlling space utilization. Controlling must be addressed to balance the aesthetic and ecology aspects.

One of policy control effort is a low-density housing that is named with Agropolis Housing or Agropolis Residential. Agropolis residential area is rural residential area with dominant patterns of agriculture economic activity. So agropolis residential area is also agricultural production area. Agropolis residential area in a agriculture rural areas is the housing that spread around the farm *(farm village type)*. Agropolis housing is developed to support tourism activities with people living in agropolitan. Agropolis residential areas are planned independently. Agropolis residential areas are planned include of several village of Bumiaji District. There are Sumber Brantas Village, Tulungrejo Village, Sumbergondo Village, Punten Village, Gunungsari Village, Bulukerto Village, Bumiaji Village, Sidomulyo Village, and the Sumberejo Village (Batu City Spatial Planning, 2010-2030). Associated with this plan, ecovillage design concepts is very closed to be developed.

Bumiaji has issues of buffer zones and of ecosystem preservation zones. One of Batu City spatial planning policy is area protected preservation to strengthen the role of Upper Brantas River for another regions. The policy not only has ecological impact but also has charge of maintaining the aesthetic and amenity of scenic mountain area. Bumiaji is part of the city which has an area of 127.98 km2, low density and agricultural areas (Batu City Spatial Planning , 2010-2030). The presence of longitudinal Brantas River in the middle region of Bumiaji has a very important ecosystem buffer function. Therefore greenway design concept could be a suitable alternative to be developed in the area along the river Brantas.

Bumiaji physical characteristics is distinguish from the whole Batu City that is surrounded by mountains along the east side (Welirang Mt., Twin Mt., and Arjuno Mt.) and west side (Anjasmoro Mt., Pretong Mt., Orange Mt. and Kerubung Mt.). Bumiaji topography is dominated by a fairly steep slope with a distribution as follows: the upper slopes of 42% 40o, 25o - 40o by 24%, 15o - 25o by 17%, 8o - 15o by 9%, and 0o - 8o with only 8% (Dina et al., 2013). Mountains and topography of Bumiaji is the basis for determining the protected forests function as in most Bumiaji areas. Protected forest areas are located in the of 5197.40 ha of the City of Stone, by 3764.40 hectares located in Bumiaji. Batu City is located in the upper Brantas River as a catchment area that has many springs used as a water source A total of 83 springs in Stone, 46 of which are in Bumiaji. They are as a water resources that serve the city and even to another region surround Batu City.

Bumiaji has many resources for challenges in spatial planning and controlling. For academic reasons, Bumiaji is a model that is very comprehensive for identifying the dimensions of aesthetic ecology

landscape. Bumiaji is a valuable laboratory in the development of spatial planning that raised rural landscapes issues. Consistency in solving that such landscape issues would clarify the efforts of sustainable rural development.

IV. Final remark

The concept of ecosystem services opened up opportunities in the environmental component that functions in accordance with the human perception and understanding of the rural landscape. The concept of ecosystem services according to Daniel et al. (2011) is a formal approach to describe and categorize the relationship between ecosystems (ecosystem) and social structure (society).

Social structure is built on attitude base on people perceptions and preferences to their natural systems. Ecological aesthetic experience of the mind, senses and emotions in understanding and appreciating the natural systems can lead to the ecological environment of choice and attitude(Gobster et al., 2007).

When ecological and aesthetic preferences have lead in the landscape, design and knowledge interventions can be a tool to change the values and preferences. These interventions include increasing public knowledge about the ecology, encouraging people to be active in the ecology-oriented activities, and encouraging people to be creative in the development of visual and spatial patterns that involve elements of cultural and natural elements. The intervention was ultimately intended to improve ecological functions.

Landscape design can be a means to describe and explore viable alternatives to integrate ecology and aesthetics. Normative aesthetic ecology asserts that human aesthetic experience is definitely in line with the ecological landscape structure subject to the right. On this basis, the planners and landscape designers are challenged to bring together ecology and aesthetics in order to be socially acceptable and easy to use. (Klein, 2013)

Acknowledgements

This paper is a part of our process during post graduate study funding by BPDN. So, the authors would like to thank Higher Education General Directorate, Ministry of Education and Culture for this supporting.

References

1) Ahern, J (2005), *Integration of landscape ecology and landscape architecture: an evolutionary and reciprocal process*, In J. A. Wiens, & M. R. Moss, Issues and Perspectives in Landscape Ecology (pp. 311-319), Gambridge University Press
2) Aviziene, D, Palkanis, R, Sendzikaite, J (2007), P*reservation, Assessment and Management of Scenic Landscape in Lithuania*, Man in The Landscape Acsoss Frontiers, (pp. 8-19)
3) Daniel, T C, A Muhar, A Arnberger, et al. (2011), *Contribution of Cultural Services to the Ecosystem Services Agenda* in B.L. Turner (ed) PNAS Early Edition, Arizona State University, 1-8
4) Domon, G (2011), Landscape as resource: Consequences, challenges and opportunities for rural development, *Landscape and Urban Planning* 100: 338–340
5) Franco, D, Franco, D, Mannino, I, Zanneto, G, (2003), The impact of agroforestry networks on scenic beauty estimation-The role of a landscape ecological network on a socio-cultural process, *Landscape and Urban Planning* 62: 119–138
6) Gilman, R (1991), *Ecovillages and Sustainable Communities*, Report for Gaia Trust by Context Institute,
7) Gobster, P. H, Nassauer, J. I, & Daniel, T. C (2007), The shared landscape: what does aesthetics have to do with ecology? *Landscape Ecology*, 22, 952-972
8) Gold, S.M (1980). *Recreation Planning and Design*, McGraw Hill, New York, 134-144
9) Hale, B. W, Adams, M. M, Predick, K, & Fisher, N (2005), Ecological conservation through aesthetic landscape planning: A case study of the lower Wisconsin State Riverway, *Environmental Management*, 35, 381-395
10) Hellmund, P.C, Smith, D.S (2006), *Designing Greenways: Sustainable Landscape for Nature and People*, Island Press, Washington
11) Inouguchi, T, Newman, E (1999), Introduction : Cities and the Environment Towards Eco-partnerships, United Nations University Press, Tokyo
12) Klein, R.L (2013), *Quantifying Relationship Between Ecology and Aesthetics*, Dissertation
13) Lokocz, E, R.L. Ryan, A.J. Sadler (2011), Motivations for land protection and stewardship: Exploring place attachment and rural landscape character in Massachusetts, *Landscape and Urban Planning* 99: 65–76
14) Mahendra, Fidi (2009), *Sistem Agroforestri dan Aplikasinya, Graha Ilmu*, Yogyakarta
15) Mc Harg, Ian L (1992), *Design with Nature*, McGraw Hill, New York
16) Rogge, E, Nevens, F, Gulinck, H (2007), Perception of rural landscape in Flanders, *Landscape and Urban Planning*, 82, 159-174
17) Padma, A, et al (2001), *Kampung Naga-Permukiman Warisan Karuhun, Foris*, Bandung
18) Poerwoningsih, D, Kakino, Y (2013). *Visual quality assessment of rural landscape in Bumiaji district, Batu city, Indonesia*, Asia Pacific Conference Proceedings, Ritsumeikan Asia Pacific University
19) Soini, K, Vaarala, H, Pouta, E (2012), Residents' sense of place and landscape perceptions at rural-urban interface, *Landscape and Urban Planning*, 104, 124-134
20) Sznajder, M, Przezborska, L (2004), Identification of rural and agri-tourism products and services, *Roczniki Akademii Rolniczej w Poznaniu-CCCLIX*, 165-177
21) Winchcombe, J, G. Revell. 2004. *Farm Forestry and Landscape Architecture – A Feasibility Study*. RIRDC. Nedlands WA.
22) -, (2011), *Rencana Tata Ruang Wilayah Kota Batu 2010-2030*

Study on the change of city space structure by urban restoration project -As an example of Cheonggye-cheon restoration project of the city of Seoul, Korea

Kyungmin Kim[1], Tamiyo Kondo[2],

[1] PhD candidate, Department of Architecture, Graduate School of Engineering, Kobe University.
[2] Associate Professor, Department of Architecture, Graduate School of Engineering ,Kobe University ,Dr.Eng.

Abstract

The objective of this paper is to the clarify 1) the changes of urban structures 2) the changes of space use 3) evaluation on satisfaction of merchants in Cheong-gye river after restoration the Cheong-gye river restoration by Seoul metropolitan local government of Korea. The methodology of this research 1) To compare the urban structure basic plan of Seoul city in years 2001 and 2013 and examined the changes of space structures. 2) To understand the importance and changes of space with S3 Axial Analyze program. 3) To evaluate on the satisfaction with space use changes and business activities changes of merchants through interviews and questionnaires. As a result of the analysis, 1) 4 new road types were discovered through the correlation of building changes and road changes. 2) According through the result of S3 Axial Analyze was confirmed that the importance of the old Cheong-gye road moved to each areas and the space using were increased.3) In the evaluation of the effects of the changes of the space structure on merchants' business activities and satisfaction, Even if living and culture were evaluated positive result but the parking problems and traffic jam were seriously pointed out.

Keywords: *Cheong-gye River Restoration, Sustainable Development, Highway Removal, Urban regeneration project*.

I. Introduction

1.1 Background and purpose of the study

The paradigm shift of the sustainable development through the balance of development and conservation is going along all over the world. The sustainable development means the city planning of the urban image in which the human is focused as well as the nature and humane coexist. The city of Seoul tried to improve economic value of the city accompanying the urban restoration project under the goal of environment and ecology conservation and conducted the Cheonggye-cheon 1 restoration project (hereinafter, restoration project) in 2005 under the goal of the improvement of city structure vitality, etc. The restoration project was the project restoring the Cheonggye road (8-lane) and the overpass (4-lane) built on Cheonggye-cheon by the influence of industrialization in 1960s to the stream. The goals of the project were safety securing by deterioration, decrease of maintenance expense, recovery of historicity, balanced development of the city of Seoul, etc. However, the large scale commercial area has been formed around Cheonggye-cheon as the center from the industrialization period to current. Particularly, Cheonggye-cheon is located at the center of Seoul, and the important institutions such as traditional markets, financial institutions, government offices, etc. are gathered around here. Additionally, it has played a role as a strategic point supporting the entire small and medium businesses and manufacturers in Korea. With the restoration project as a momentum, the city of Seoul is processing the redevelopment based on the S&B method to solve the several problems such as building deterioration, a slack of commercial function, public security problems, etc. It is thought that the Cheonggye-cheon restoration project and the redevelopment project greatly influenced on the space of Cheonggye-cheon commercial area.

The purpose of this study is to clearly verify the change of the city space structure after the Cheonggye-cheon restoration project. The second purpose is to define the problem of using the space occurring from the change of space structure through the interview with the merchants.

Kyungmin Kim,
--- PhD candidate, Department of Architecture,
Graduate School of Engineering, Kobe University 657-8501,
1-1 Rokkoudai Nada-ku Kobe Hyougo-ken, Japan
Tel: +81 90-4291-1048 e-mail: 2km830@gmail.com

1.2 Research subject range and spatial characteristic of the area

a. Selection of the research subject area

The research subject area was the area around Cheonggye-cheon with [Sewoon shopping district],

the symbol of Cheonggye, as the center in which electricity/electron/tool businesses are concentrated.

b. Status of the research subject area range

The district/zone forthe purpose of the research subject area was assigned as the general commercial area. In the status depending on the purpose, A space: electricity/illumination, B space: electricity/electron, C space: manufacturing/electricity, and D space; machine/metal manufacturing are concentrated. E space is the Cheonggye-cheon road in 2011 and the Cheonggye-cheon restoration area in 2013 (**Figure.1**).

1.3 Difference between the past studies and this study

Park（2011) introduced the restoration project performed by the cooperative leadership of the Mayor of Seoul, Myung-Bak Lee focusing on the process of the Cheonggye-cheon restoration. Hwang (2006) traced in detail the process adjusting the interest of the merchants around Cheonggye-cheon to realize the restoration project. Jung (2010) analyzed the correlation about revitalization factors of the redevelopment project by the deregulation of building coverage ratio and floor area ratio of the residential area securing in the surrounding area of Cheonggye-cheon shopping district.

However, there are no studies showing the change of the surrounding area space by the Cheonggye-cheon road demolition and the evaluation of the merchants about the change of the space use. Therefore, there is the originality in this study because it verified the space change by the urban restoration project and the change of space use in the viewpoint of the merchants.

1.4 Research method

1) We conducted the fieldwork of the investigation area by using the Seoul land registration map from June to August 2012.
2) We collected the data about the Seoul city restoration project, progress situation of Cheonggye-cheon restoration project, and future plan by conducting the interview with the administrators (1 person from two people from the Seoul City Hall, four people from the Seoul Housing Corporation, 2 people from Seoul Housing Corporation) from June to August 2012.
3) We conducted the interview with 20 merchants around Cheonggye-cheon about the use and evaluation of the space after the Cheonggye-cheon restoration from the last ten days of June to the middle ten days of July 2012.
4) We analyzed the change of space structure through the Space Syntax S3 Axial Analyze by using 2001 and 2013 Seoul land registration map.

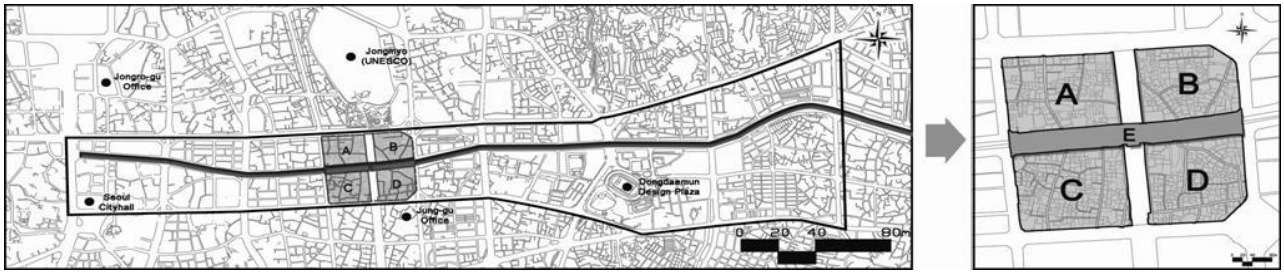


Fig.1. Restoration project and Research subject area

II. City planning and restoration project of Cheonggye-cheon space

2.1 The Seoul city basic planning and the city center management planning

The Seoul city planning is classified into the integrated city basic planning including space of the city and environment / society / economy and the city center management planning to perform the concrete business according to the former planning. The [2011 City Basic Planning] and the [City Center Management Basic Planning (2000)] do not include the urban restoration project and carry no legal binding force. Therefore, we tried to clearly define the urban restoration project in [2020 City Basic Planning] and [City Center Development Planning (2005)] and add the planning about the restoration project and the redevelopment project around Cheonggye-cheon after the project. (**Table 1**)

Table.1. The Seoul city basic planning and the city center management planning

Subdivision		Period
City Basic Planning		「2011 City Basic Planning」 Notice(1997) Enforcement of policy（2000） Attainment（2011） 「2020 City Basic Planning」 Notice（2005） Enforcement of policy（2010） Attainment（2020）
city center management planning		「City Center Management Basic Planning (2000)」 Enforcement of policy（2000） Attainment（2011） 「City Center Development Planning (2005)」 Enforcement of policy（2010） Attainment（2020）
The urban restoration project	Restoration project	Plan（2002） Start（2003） Completion（2005）
	Redevelopment project planning	Plan（2002） Start（2006） Completion（2020）

2.2 Planning of Cheonggye-cheon restoration project

The restoration project is very famous as a successful example of the urban restoration considering the natural environment and humans. The Cheonggye-cheon restoration area is 5.8km, and it was open to traffic through two-year construction for restoration from July 2003 to October 2005. This was the project to restore Cheonggye-cheon by demolishing Cheonggye- cheon covered by the influence of industrialization in 1960s, the road of two-way eight-lane, and the overpass constructed above there (**Figure 2**) Cheong- gye-cheon restored in this way was made in three axes including history (tradition), culture (present), and nature (future). The Cheonggye-cheon restoration was realized in short period of time term by the decision and the power of execution of the Mayor of Seoul, Myung-Bak Lee[1)]

▲ before ▲ Restoration project ▲ Cheonggye-cheon

Fig.2. Restoration project of process [6]

2.3 Redevelopment project planning of Cheonggye-cheon shopping district

The redevelopment project of the surrounding Cheonggye-cheon area is fixed by [City Center Development Planning (2005)]. The average floor area ratio 270% of the city center is relaxed to 400~420% so that the business value increases; it is the large scale redevelopment by the scrap and build method7). The surrounding area of Cheonggye-cheon is divided into 22 blocks; by considering the characteristics of each block, the project is performed by dividing into four zones including characteristic conservation zone, autonomous renewal zone, redevelopment zone, and integrated maintenance zone. However, this planning is discontinued due to the lack of budget of Seoul (**Figure 3**).

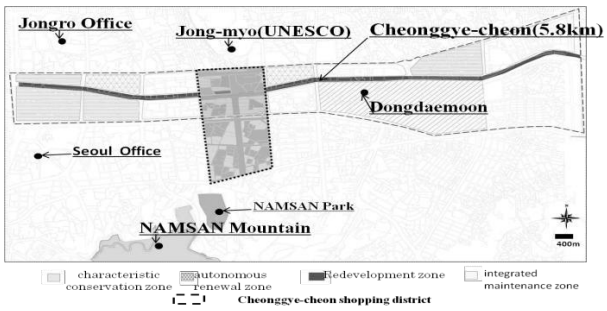


Fig.3.Redevelopment project planning of Cheonggye-cheon shopping district

2.4 Changes of Cheonggye-cheon space before the restoration

Cheonggye-cheon has played an important role as a living steam of the city center from Joseon Dynasty (13th century) to the time of enlightenment (19th century). However, it was planned to cover the stream to move distributions in Modern Age (early 20th century). The plan divided into three parts started its first construction between 1937 and 1942; after that, the second and third plans were canceled due to Korean War. After the ceasefire of Korean War, the refugees resided around Cheonggye-cheon that was the city center stream. By the influence of it, the stream was polluted by living drainage, and the communicable diseases were prevalent. Additionally, in the rainy season, the river flooded; the wooden houses densely located were damaged by the fire; therefore, the city of Seoul designated the area around Cheonggye-cheon as "vulnerable zone to diseases and disasters" in the late 1950s.

The covering plan was processed to solve this chaos and to pursue the economic growth of Seoul; the Cheonggye road overpass was constructed from 1955 to 1977. According to this, in the area around Cheonggye-cheon road overpass, the important functions including electron/electricity commerce, fashion industry, etc. were located as the large size commercial area and formed as the economic strategic point of Seoul.

III. Analysis of space change

3.1 Change of road

First of all, the Cheonggyero and the overpass (hereinafter, the old Cheonggye-cheon road) were located at the center in 2011 (**Figure 2**. left side); however, the old Cheonggye-cheon road was demolished in 2013, and Cheonggye-cheon and green belt were created in that space; additionally, two-lane road of the new Cheonggye road was created (**Figure 2**. right side).

Next, as shown in **Figure 4** and **Figure 5**, many new roads were created in the A~D spaces. The old Cheonggye-cheon road played a role as an arterial road connecting the main areas of Seoul. In 2013, by demolishing the old Cheonggye-cheon road, the characteristic of the arterial road changed into the auxiliary arterial road in 2013.

Lastly, the 43% of increase/decrease ratio of the entire road area decreased between 2001 and 2013. However, depending on each space, in E space where the Cheonggye-cheon road was demolished, there was 75% of decrease; however, there were increases in the roads of A~D spaces (Table 2).

3.2 Change of buildings

As building characteristics of research area, there were many low-rise building (average five stories). Additionally, the inside of each store had a space as narrow as 7.9 ㎡. The reason of this was its structure

Table.2. Change of the area in 2001 and 2013

	2001's			2013's			increase/decrease %
	Entire area ㎡	Site area ㎡	Open space area ㎡	Entire area ㎡	Site area ㎡	Open space area ㎡	
A	41,174	37,716	3,458	41,174	37,048	4,126	+19
B	35,055	32,055	3,000	35,055	30,673	4,382	+21
C	45,220	40,486	4,734	45,220	40,075	5,145	+9
D	40,198	35,073	5,125	40,198	34,555	5,643	+10
E	32,512	0	32,512	22,992	14,300	8,692	-73
total	194,159	145,330	48,829	184,639	156,651	27,988	-14

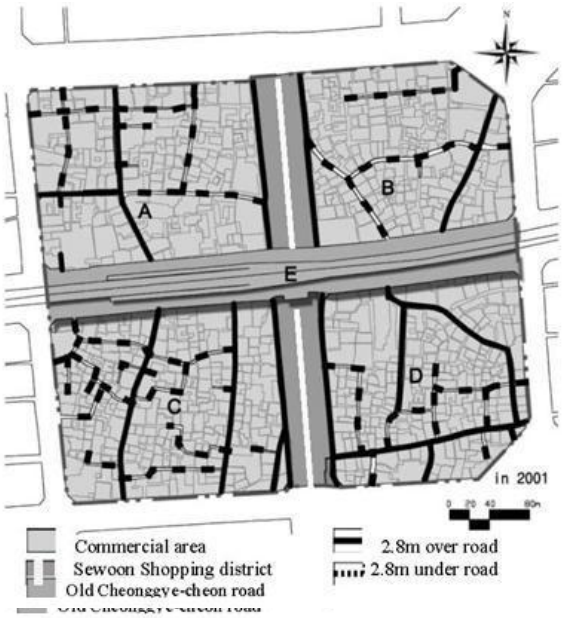


Fig. 4. Research subject area of the road in 2001

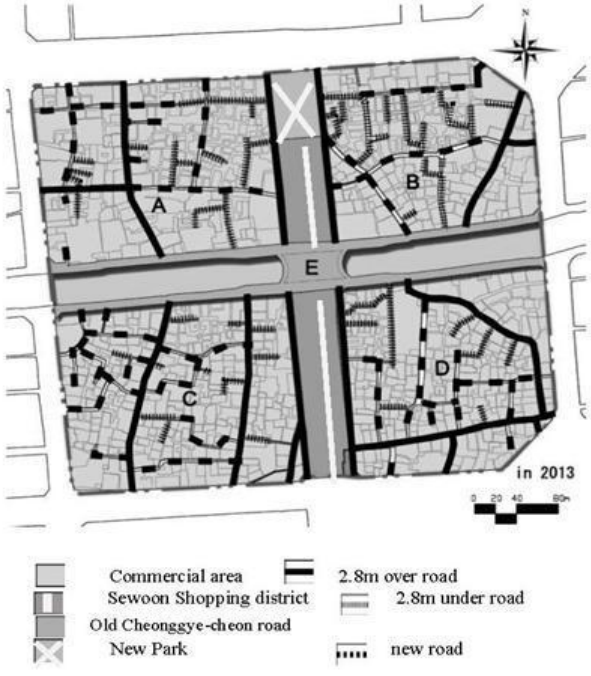


Fig. 5. Research subject area of the road in 2013

in which the product samples were displayed in a store, and the products were directly shipped from the warehouse to the customer after the customer ordered (**Figure6**). The characteristic of the inside of building was not changed because there was no change in sales/shipping system after the restoration. However, three patterns appeared in the process of establishing new building. The pattern 1 was the form of demolishing one large building and constructing small building (**Figure 7 Type 1**). The pattern 2 was the form of demolishing the existing building (**Figure 7 Type 2 & type 3**). The pattern 3 was the form of constructing a couple of buildings in one large building (**Figure 7 Type 4**).

Fig. 6 Building characteristics

3.3 Correlation analysis of the building change and the road change

We understood the types of road area increase through the correlation analysis of the change of building and the change of road. In addition, we showed its process through the interview with the administrators and the merchants (**Figure 7&8**). Type 1 was the pattern led by the land owner and the building owner. The land value increased after the announcement of the restoration project and the redevelopment planning of the surrounding commercial area in 2002. This pattern occurred because the owner decided that the profit rate would be higher when selling the stores by dividing into a small size rather than one large building. As a result of this, the road was created around the buildings.

Type 1 often appeared in A space. The reason of this was that electric tool wholesalers, component factories, etc. were gathered in A space; here, one store had 3~5pyeong of narrow space characteristic, and the application level was higher in low-rise building rather than high-rise building. Type 2 was the pattern led by the city of Seoul. The multipurpose building was constructed by demolishing the building under the goal of recovering the city center restoration and creating the green belt. The method of business process was the form of dividing profits between the city of Seoul and the private enterprise after processing the development first by purchasing the ownership from the building owner.

Type 2, the road was created on the space created by demolishing the building after paying the compensation for 3 months of business to the merchants who rented the store and letting them move to the other area.

Type 3 was also the pattern led by the city of Seoul. However the different thing from Type 2 was that the area of the road originally existed was secured by demolishing abandoned building and unlicensed building on the road originally existed.

Type 4 was the pattern led by the private enterprise. This pattern was developed as a large building after demolishing the small building. The warehouses/ churches/ factories were built, and the roads were created after the development.

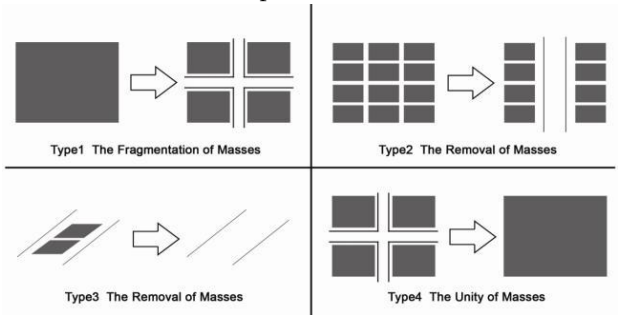


Fig.7. Chang of the building and road

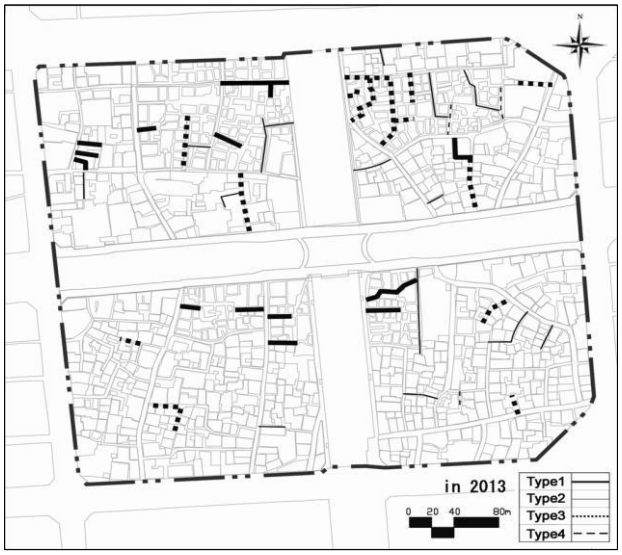


Fig. 8. 2013's new road

IV. Analysis of space structure change

4.1 Concept and purpose of space syntax theory

The Space Syntax methodology was developed from the theory suggesting the importance of each space with the numeric value and analyzing the space structure at the Space Syntax research center of Professor Hillier in London University between 1980 and 1990. Therefore, to make the importance change of the space in the research area into the numeric value, the Axial Space Line analysis of SS analysis was conducted.

4.2 The model built method of SS

To analyze the space structure by using Space Syntax, the data is input based on the open space system of the analysis subject area. This is called as Axial Maps. The Axial Maps are the line including the space of analysis target area based on the accessibility in the city space.

4.3 Definitions of basic terminologies

The terminology definitions are necessary to read the result from the analysis of the Axial Maps. Although the total of seven result analysis is possible, these are defined in the standard of the necessary four values in this study.

a. Space depth

The space depth means the minimum number of axial line passed through when moving from the specific axial line space to the other axial line. This is the concept such as a moving difficulty level (direction change) in the moving accessibility evaluation and can be used as an indicator estimating the accessibility of each space.

b. Connectivity

The connectivity means the number of surrounding unit space adjoining the specific unit space. For example, the connectivity is '3' when three spaces adjoin around the specific space. This is the selective numeric value showing the possibility of moving from the current space to the specific space.

c. Control Value

The control value means the value showing the influence of the space on other neighboring spaces.

d. Integration

The integration means the numeric value calculated by the space depth from the current axial line to the other axial line as the standard. The integration is the numeric value showing the accessibility from the outside to the inside of the research area. When the average value of integration (Int.V) is higher than 0.6, it means that the moving efficiency of the entire interpreting area is higher.

In other words, the increase of connectivity/control value/integration (hereinafter, the numeric value of space structure) numeric value means to become the important space in the area by easy accessibility to the destination.

4.4 Axial line analysis model built explanation in 2001 and 2013

For the numeric value of space structure change, the change of surrounding area after the Cheonggye-cheon restoration project was analyzed through the axial space line analysis.

As a base map corresponding to the analysis in this study, the scale of 1/1000 Seoul land registration map was used. For the building purpose, the purpose data of each floor by urban planning basic investigation was used. The center standard of research area location was the range of Cheonggye-cheon on the horizontal axis and Sewoon shopping district on the vertical axis. The standard of axial space line was analyzed focusing on the more than 2m of road where the distribution moving was possible (Figure 9&10).

As a result, while the number of road in 2001 was 46, two times of roads as 89 were created in 2013. The number of district was 34 in 2001 and 53 in 2013 because many small roads were created. In the axial space line, 70 axial lines were formed in 2001, and 132 axial lines were formed in 2013.

Fig. 9. SS analysis model in 2001

Fig. 10 SS analysis model in 2013

4.5 Axial line analysis result

As a result of axial space line analysis, the numeric value of space structure in E space where the Cheonggye-cheon road was demolished decreased, and the numeric value of space structure increased because the new roads were created in each inside space. When comparing Figure 11 and Figure 12, it is shown that the one road (e) in E space separated into two roads (e1, e2) in 2013. As a result, the numeric value of space structure decreased by separating the center space. Next, in the change of other each space, the numeric value of space structure increased. As a result of the analysis in Chapter 3, the reason of it can be explained as the numeric value of space structure increased because the new roads were created in each of the inside. In addition, while the connectivity of road (e) in 2001 changed from 14 to 11, the road (c) increased from 10 to 12; therefore, the numeric value of space structure in C space. This means that the important space in research area moved from E space to C space (**Table 3**).

Table.3. the numeric value of space structure

Space (Line)	Subdivision	2001	2013	Increase Decrease
E (e1・e2)	Connectivity	14	11	Decrease
	Control Value	4.89	2.96	
	Integration	2.65	2.23	
A (a1・a2)	Connectivity	6	11	Increase
	Control Value	2.61	4.66	
	Integration	1.76	1.81	
B (b1・b2)	Connectivity	8	8	Increase
	Control Value	2.28	2.55	
	Integration	1.70	1.77	
C (c1・c2)	Connectivity	10	12	Increase
	Control Value	4.33	5.59	
	Integration	2.11	2.32	
D (d1・d2)	Connectivity	11	12	Increase
	Control Value	4.89	5.54	
	Integration	1.54	1.73	

Fig. 11 SS analysis result in 2001

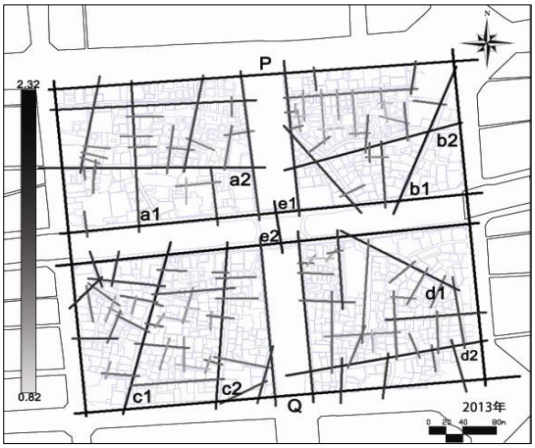


Fig. 12. SS analysis result in 2013

V. Opinions of merchants about the space use

5.1 Interview outline

The merchants were asked about the satisfaction related to 1) function of freight transportation, 2) traffic increase, 3) traffic jam, and 4) urban restoration expected from the change of space structure. The interview with merchants (30min/person) around Cheonggye-cheon was conducted from June 20, 2012 to the middle of July. Many business owners of this area were in their fifties; as characteristics, the size of rental store was 3~5pyeong; the business period was between 16 years and 20 years.

5.2 Change of space use

For the answer about if there were any changes in freight transportation, 63.5% of merchants answered [Yes]. 87.3% among them answered that it was [Difficult]. The merchants explained that they had been able to enter the main roads and the expressways without passing the downtown of Seoul but they had a problem such as traffic jam since they had to pass the complex road of the downtown after the demolition.

For the question about if the traffic increased, 83.7% of them answered [Yes]; for the question about if there was traffic jam, 76.3% answered [Yes]. The merchants explained that the traffic passing the inside road of each space increased after the old Cheonggye road was demolished. They also explained that the space use became uncomfortable because the traffic jam problem occurred by the traffic increase and illegal parking. Next, in the item evaluating the satisfaction about the urban restoration project, 78.4% answered [dissatisfaction]. In opinions about dissatisfaction, many of them evaluated that the business activities were interrupted due to the problems including serious lack of parking space, speeding vehicles, traffic jam, etc. as the vehicle moving increased in the inside of each space after the old Cheonggye-cheon road was demolished. On the other hand, the merchants explained that traffic noise, pollution, etc. decreased after Cheonggye-cheon was restored.

VI. Discussion

The results by analyzing the change of space structure are as follows: 1) The old Cheonggye road that had undertaken the distribution was reduced as 2-lane and changed into the auxiliary arterial road. 2) The new road was created in the inside of each space. 3) The numeric value of space structure of each space increased. 4) The important space position moved from E space to C space.

Through these results, it was expected to have the problem of functional decline of freight transportation role undertaken in E space through the numeric value decrease of space structure and the problem of traffic increase and traffic jam by the increase of space use.

About the problems of space use expected by the change of space structure, as the results by interviewing with the merchants, 78.4% of merchants answered [dissatisfaction] because the freight transportation became worse, and the traffic increase and traffic jam of each space occurred. But, the city of Seoul counteracted the problems expected by the urban restoration project through the soft actions such as traffic system change, traffic decrease by road control, etc. Nevertheless, the problems of traffic increase, traffic jam, etc. of the inside of each space occurred; therefore, these problems badly influenced on the satisfaction level of merchants about the urban restoration project. In this case, the traffic problem is to be prolonged, the disadvantage of merchants operating activities affected. In addition, the inconvenience of customers using Cheonggye-cheon commercial area linked, operating income decreased due to decreased customer occurs. This is a large commercial area of Seoul, the decline and destruction to point out that the risk is high. For successful completion of the sustainable urban restoration project, it is recommended that the city of Seoul needs to establish the countermeasures about freight transportation function, traffic jam problem, etc.

Next research on the change of the business activities in the Cheonggye-cheon commercial area after the construction for restoration and to consider the task of Cheonggye-cheon restoration project based on the merchants' satisfaction level about the restoration project.

Footnote

[1] Cheonggte-cheon meaning is Cheonggte-creek. Cheong-gte is the name of this area, and cheon is Korean means creek.

References

1) C. P Park (2011). Regeneration history of Seoul Cheonggye creek and environment and a vision of city Kamajima- Publishing house.
2) K.Y Hwang (2006). Seoul-citizen conflict, The Nikkan Kensetsu Kogyo Shinbun Company.
3) S.H Jung (2010). A study on roadside area redevelopment project`s stimulating factor due to the city highway removal in C.B.D, Journal of Architecture and Planning.655, 2165～2173.
4) Seoul Development Institute (2000). Seoul City Basic Planning, Seoul metropolitan government.
5) Seoul Development Institute (2004). City Center Develop- ment Planning, Seoul metropolitan government.
6) Seoul museum of history (2011). Cheonggye-cheon (Creek) Museum, Cheonggye-cheon(Creek) Museum.
7) Seoul Development Institute (2004). Cheonggye-cheon area of management planning, Seoul metropolitan govern- ment.
8) D.K Jo (2006). Revival of relocated shopping district and efficient management plan, Seoul Housing Corporation.
9) M. L Park (2004). Research on complication management process of the Cheonggye-creek restoration by Seoul City, University of seoul.
10) Seoul metropolitan government (2006). A restoration white paper, Seoul metropolitan government.
11) Hillier, B. and Julienne Hanson (1984). The Social Logic of Space, Cambridge University Press
12) Hillier, B (1993). The hidden geometry of deformed grids-or why space syntax works, when it looks as though it shouldn't, Environment and planning B、Planning and Design, Vol.26、pp.169～191
13) Hillier, B (1996). Space is the machine a Configurationally theory Of architecture, Cambridge University Press

Planning Context

First Session Parallel Notes
Moderator: Deva Fosterharoldas Swasto

K5 Room 2nd Floor
11.20 – 11.40

Presenter	:	**Adjie Pamungkas**
Title	:	**Mainstreaming Development Strategies for Independent Small Island: Case Study of Poteran Island, Madura**
Presentation Duration	:	**18 minutes**

PRESENTATION CONTENTS

Poteran is one of 126 islands in Sumenep Municipality. There are no water supply from government, and villagers still use traditional equipment for fishery. Those facts are the background of these research.

The criteria for successful independent small island
- Has a diverse economic sector and locally based
- Have a mutually benefits in cooperation with other island
- Has resiliency to disasters and climate change
- Involves community in development
- Preserve the typical characteristics

The researchers using SWOT analysis to knowing more about the Poteran Island. These are some SWOT

Strength
- Productivity in primary sector
- Suitable topography for farming
- Comprehensive institution
- Unique biodiversity
- Strong social network

Weakness
- Traditional technologies
- Unsustain mining
- Low human resources quality
- Poor infrastructure quality
- Dominant outmigration

Opportunities
- Government assistance
- Export market
- High Demand in Tourism

Threats
- Dependence on electicity supply: submarine electricity cable
- Outside proseccing industries
- Natural disasters
- Trawling use from outside fisherman

All the SWOT analysis are be keyed to analytical hierarchy project and gives us the conclusion that:

- There are 5 combinations of factors for the most appropriate strategies to make Poteran Island as a independent small island.
- The combination of maximizing the potential export and empowering strong social network among farmers and fishermen groups become the first priority.
- To capturing export opportunities for fisheries and farming, the development in Poteran can also be directed to the tourism development.

DISCUSSION

Question : How to find the unique with the swot?
Answer : We try to divide the strengths, the uniqueness we didn't get from swot but from the secondary data

Question : How this problem can be solved?
Answer : We include the wattersupply to the infrastructures

Question : Who is the respondency of your research? Who is the staff government or any other?
Answer : From the government, they are Bappeda, Sumenep Municipalities. They are some people working in fisheries, farming. Based of the compotition i think we are already to fulfill

---

Presenter : Dina Poerwoningsih
Title : Dimension of Landscape Aesthetic Ecology in Rural Spatial Planning
Presentation Duration : 14 minutes

PRESENTATION CONTENTS

- Rural landscape gets less attention as an object of spatial planning.
- Common problem of landscape scenic beauty as an ecosystem service of a rural landscape is more attached to non-market values and become undervalue.
- Rural spatial planning should be a controlling tool for ecosystems preservation by based on landscape perspective, from this perspective we learn both aesthetic and ecology dimension.
- Rural spartial planning should be controlling tool for ecosystems preservation by based on landscape perspective.

Lesson from landscape planning

- Agroforestry blends agriculture and forestry to enhance productivity, profitability, and environmental stewardship.
- Agroforestry system could be a way to address climate change, food shortages, poverty, and biodiversity loss.

DISCUSSION

Question : How agroforestry can accomodate state the landscape and spatial planning?
Answer : Agroforestry is a agriculture science, a very popular system, they not include only material of plant, they also concern how community involved to realize agroforestry. In this case farming is the activity which more concern to the economic development. Agroforesty system in spatial planning are more easy to create.

Question : What do you think about the cemetery?
Answer : Cemetery has a part of open space. This is a system to concern the ecosystem, not about the cemetery.

Presenter : Kyungmin KIM, Korean (Kobe University)
Title : Study on the change of city space structure by urban restoration project – As an example of Cheonggye – cheon restoration project of the city of Seoul, Korea
Presentation Duration : about 11 minutes

PRESENTATION CONTENTS

Introduction and Background

- Cheonggye Cheon restoration project was conducted as the sustainable urban restoration project in 2005. In this project, the 5.8km overpass and Cheonggye road were demolished and restored as the stream. This restoration project was highly evaluated form the foreign countries
- In the surrounding area of Cheonggye-cheon where the restoration project was being performed, people do not know well the fact in which this area has been developed as the commercial area.
- Environment conservation, balanced development, improvement of city center's economic value. This restoration project was highly evaluated from the foreign countries

Research purpose

- The purpose of this study is to clearly verify the change of the city space structure after the Cheonggye-cheon restoration project.
- The second purpose is to define the problem of using the space occurring from the change of space structure through the interview with the merchants.

Research Method

1. Fieldwork
2. Interview
3. Space syntax S3

City planning and restoration project of Cheonggye-Cheon space

1. The Seoul city basic planning and the city center management planning
2. Planning of Cheonggye-cheon restoration project

Analysis of space change

1. Change of Road
2. Correlation analysis of the building change and the road change(some pattern show)
3. Axial line analysis model built explanation in 2001 and 2013
4. Opinions of Merchants about the Space Use
5. Discussions(This result by analyzing the change of space structure are as follows). Occur Problem : City of Seoul counteracted the problems expected by the urban restoration project. This is a large commercial area of Seoul, the decline and destruction. For Successfull completion of the sustainable urban restoration project.

DISCUSSION

Questioner : Felia, UPH (Universitas Pelita Harapan)
Question : The city center not only merchens commercial area, but related to the pallace, tourism area. In this presentation just see related by commercial area. How do you see the related commercial area, pallace, tourism

Answer	:	This commercial area are very important for Korea. But nobody want to know the history about this area. Considered to be a sustainable commercial area.
Questioner	:	Adjie Pamungkas, ITS (Institut Teknologi Surabaya)
Question	:	Space Syntax. How to operated the space syntax, how powerfull the space syntax to analyzed this observation.
Answer	:	Space syntax, is the relation within many point of place. With numberest place, so it can get the relation. Just used the program and enter the number, it found the analyzed.
Questioner	:	Tarina Iqlima, UGM (Universitas Gadjah Mada)
Question	:	Space syntax have a big risk, its have a local resident. How civilans can agree with this project? And how to make them satisfied with this programs/project?
Answer	:	Fair, because is a small area commercial area not to get this project. In my opinions, there is insentive and disentive to local people. So it can grow up people income.

The Possibility of Transportation Demand Omotenashi (TDO) Works in the City Centre of Malang City

Imma Widyawati Agustin[1], Hisashi Kubota[2]

[1] Lecture at Department of Urban Regional Planning, Faculty of Engineering, Brawijaya University
[2]Professor at Graduate School of Science and Engineering, Department of Civil Engineering, Saitama University, Japan

Abstract

Recently in general, the strategy to reduce traffic congestion has merely focused on the provision of infrastructure and transportation modes without sufficient control toward the demand of transportation. The sites of Tugu, Alun-alun, and MOG are parts of the city centre in Malang city embodying unique characteristics and able to attract asignificant flow of movement. Traffic densities in the namely sties have resulted in many problems in the city centre such as daily traffic jams, air pollution and noise pollution especially during peak hours. Admittedly, an increasing number of motorcycles and cars in Malang city has not been adequately accommodated with the contruction and improvement of infratructure in the past five years. It is therefore important for this research is to examine the possibility of Transportation Demand Omotenashi (TDO) works in the city centre of Malang. TDO is an application of the concept of Transportation Demand Management (TDM) with omotenashi highlighting the uniqueness of the region based on three variables: hospitality, warmth, and familiarity. This research used Customer Satisfaction Index (CSI) to analize the satisfaction of public transport users toward public transport services and the Analytic Hierarchy Process (AHP) to analyze the strategic priorities. The results showed that the characteristic of the traffic, based on three variables: hospitality, warmth, and familiarity, needs to be improved especially the design of street and pedestrian-way, street performance, the design of on-street parking, and the satisfaction of public transport users to the public transport services. Furthermore, this research suggested six strategic priorities which are the provision of parking management and carpool (21.70 per cent), the improvement of public tranport services and the provision of public tranport lane (20.47 per cent), the enforcement of law (20.45 per cent), the management of employee and student travels (17.13 per cent), the improvement of pedestrian-ways and bike-ways (10.49 per cent), and finally the raising of the public awareness (9.75 per cent).

Keywords: *traffic; TDO; CSI; AHP*

I. Introduction

During this time, the organization of transport focuses on the provision of infrastructure. This was done to anticipate the vehicle volume in the future and to increase the attractiveness of public transport modes to be more efficient. TDM is a transportation management strategy that is not only restrict the movement but also manage the movement that does not happen at the same time or in the same place (Rahman and Ahmadi, 2010).

Omotenashi is an excellent service mindset of Japanese style. It is a concept that consists of hospitality, warmth, and familiarity (Kubota, 2006). Transportation Demand Omotenashi (TDO) as part of the implementation of TDM strategies is expected to highlight the uniqueness of the area and provide encouragement for local residents to use public transport, transit, and pedestrian paths for walking. TDO has been applied in Japan at the commercial and tourist areas in order to maximize the satisfaction of all tourist. Omotenashi also has the meaning hospitality, that is the concept of friendliness in service, where the optimization of the transport system oriented to pampering customers or users. TDO is trying to control vehicle traffic in order to improve environment and pedestrian activity (Kubota, 2006).

Location of Malang City is close to Batu City and the other tours in Malang Regency, so it is often used as a transit by the tourists (Nugroho, 2013). Tugu Site, Alun-alun Site, and MOG Site has unique characteristics and it is located in the city centre. It is able to attract the movement of people and vehicles fairly large every day.

Imma Widyawati Agustin
--- Lecture, Department of Urban Regional Planning, Brawijaya University
Jl. MT. Haryono 167 Malang City, East Java, 65145
Tel: 081333128894 Fax: 0341-551430
E-mail: immasaitama@ub.ac.id

The increase of the number of vehicles in the City of Malang is not balanced with infrastructure development. The growth of the vehicle of 1.3 per cent during the last 5 years, in contrast the addition of a new road only 0.26 per cent based on secondary data (Surya online, 2012). Traffic density is highly at the some point in the study area has led to the potential for congestion especially during peak hours. A total of 73 per cent of land use in Jalan Semeru to Jalan Kahuripan in the City of Malang is not able to accommodate the parking needs based on attraction movement, so that the parking of vehicles using the effective traffic. This resulted into a poor level of service of street (Wiyanti and Agustin, 2013).

There are some problems in the city centre which makes people feel uncomfortable such as full crowded, air pollution, noise, and unhealthy environment for children and elderly people (Agustin and Kubota, 2013). This research was conducted to examine the possibility of TDO works in the city centre of Malang City especially in the Tugu site, Alun-alun site, and MOG site to address the emergence of a large attraction in the next future.

II. Method

The research used qualitative and quantitative methods. It was started by analyzing the traffic characteristics based on street geometric and pedestrian way geometric, street performance, the characteristics of on-street parking, pedestrian way performance, the interaction of the public transport passengers and the passenger satisfaction on the performance of public transport. It also analyzes the uniqueness of each site. Then, try to formulate an alternative strategies of TDO based on the analysis of existing conditions. It was given to the respondent experts to assess priorities with AHP method. These results ultimately in the form of network design and strategic priorities.

Street geometric and pedestrian way geometric were analyzed by cross-sectional and photo analysis of existing conditions of each segment. Street performance is analyzed by calculating LOS based on Manual Kapasitas Jalan Indonesia (MKJI).

$$\mathbf{Q = QLV+(QHVxempHV)+(QMCxempMC)...(1)}$$

Q = Traffic volume(smp/hour)
QLV = LV volume (car/hour)
QHV = HV equivalent of passenger cars
empHV = HV equivalent of passenger cars
QMC = MC volume (car/hour)
empMC = MC equivalent of passenger cars

$$\mathbf{C = C_O \times FC_W \times FC_{SP} \times FC_{SF} \times FC_{CS} .....(2)}$$

C = Capacity (smp/hour)
C_o = Basic capacity (smp/hour)
FC_w = Faktor penyesuaian lebar jalan
FC_{SP} = Separation direction adjusment factor (only for undivided road)
FC_{SF} = Side friction adjusment factor (kerb)
FC_{CS} = City size adjusment factor

$$\mathbf{DS = Q/C.....(3)}$$

DS = Degree of saturation

Degree of saturation values show the street performance from A to F.

Characteristics of on-street parking analyzed by the determination of unit parking spaces (SRP) and geometric evaluation of the existing parking lot (**Table1**).

Table 1. Determination of unit parking space (SRP)

No.	Type	Unit Parking Space (m^2)
1	Passenger cars I	2,30 x 5,00
2	Passenger cars II	2,50 x 5,00
3	Passenger cars III	3,00 x 5,00
4	Bus/truck	3,40 x 12,50
5	Motorcycle	0,75 x 2,00

Source: Decision of Director General of Transport No. 272/HK.105/DRJD/96, 1996

The level of service (LOS) of pedestrian facilities can be calculated based on pedestrians flows at 15 minutes intervals (HCM, 1985).

$$\boldsymbol{Q_{15} = \frac{N_m}{15\,WE}} \text{ .....(4)}$$

Q_{15} = Pedestrians flows at 15 minutes (people/meter/minute)
N_m = Total of pedestrians at 15 minutes intervals (people)
WE = Efektive width of pedestrian way (meter)
WE = WT – B
WT = Total of the width of pedestrian way (meter)
B = The width of pedestrian way obstruction that can not be used for walking (meter)

Passengers satisfaction to the performance of public transport is calculated by Customer Satisfaction Index (CSI) that is compiled from the questionnaires of public transport passengers. Attributes of the performance of public transport services based on the Decree of Directorate General of Land Transportation No. 687/AJ.206/DRJD/2002. Determination of the number of samples of public transport passengers using Bernoulli formula.

$$\mathbf{n = \frac{\left[\frac{Z_\alpha}{2}\right]^2 . \, p\,(1-p)}{E^2}} \text{ .....(5)}$$

n = Total of minimum sample
Z = Normal distribution

α = Significance level
e = Error
p = proportion of the number of questionnaires that are considered properly
q = proportion of the number of questionnaires that considered false

The number of samples that must be distributed is 196 respondents, significance level of 0.95 and an error rate of 0.05. The proportion of the questionnaires were considered properly amount of 85% and 15% were considered false. CSI calculation steps are as follows:

1. Mean Importance Score (MIS)

$$\mathbf{MIS} = \frac{\sum_{i=1}^{n} Y_i}{n} \quad \textbf{.....(6)}$$

n = Total of passenger as respondent
Yi = Satisfaction value of Y attribute to i

2. Wight Factors (WF)

$$\mathbf{WF} = \frac{MIS_i}{\sum_{i=1}^{P} MIS_i} \textbf{ x 100\% .....(7)}$$

p = Importance attribute

3. Weight Score (WS)

$$WS_i = WF_i \textbf{ x MSS .....(8)}$$

4. Customer Satisfaction Index (CSI/IKP)

$$\mathbf{CSI} = \frac{\sum_{i=1}^{P} WS_i}{HS} \textbf{ x 100 \% .....(9)}$$

p = Importance attribute
HS = Highest Scale

If CSI scores is over 50 per cent, it can be concluded that the passengers are satisfied, otherwise if the CSI scores is under 50 per cent then the passenger has not been satisfied. CSI scores are divided into five criteria: from the dissatisfied to very satisfied (**Table 2**).

Table 2. Criteria of CSI scores

CSI Value	CSI Criteria
0,81 – 1,00	Very satisfied
0,66 – 0,80	Satisfied
0,51 – 0,65	Fairly satisfied
0,35 – 0,50	Less satisfied
0,00 – 0,34	Dissatisfied

Source: Insani, 2005

Public transport passengers ever interaction with the others analyzed based on statistical analysis from the the results of the questionnaire of public transport passengers.

TDM strategies are formulated based on the guidelines and best practice model. The strategy also resulted in network design of Tugu site, Alun-alun site, and MOG site. Priority of TDM strategies carried out with the Analytic Hierarchy Process (AHP). The number of experts is five expert respondents. Data processing using Expert Choice 11, it generates a priority of TDO strategy to be applied in the study area.

III. Results and Discussions

Tugu site, Alun-alun site, and MOG site is located in the city centre of Malang City, East Java, Indonesia. Malang City is the second most populous city in East Java with a population of 820,243 inhabitants. Population density of approximately 7453 inhabitants/km^2 in 2012. Study sites located in Klojen subdistrict which has the largest population density in the City of Malang. The total area of Klojen subdistrict is 8.83 km^2 and it has a population of 105,907 inhabitants in 2012 (**Figure 1**).

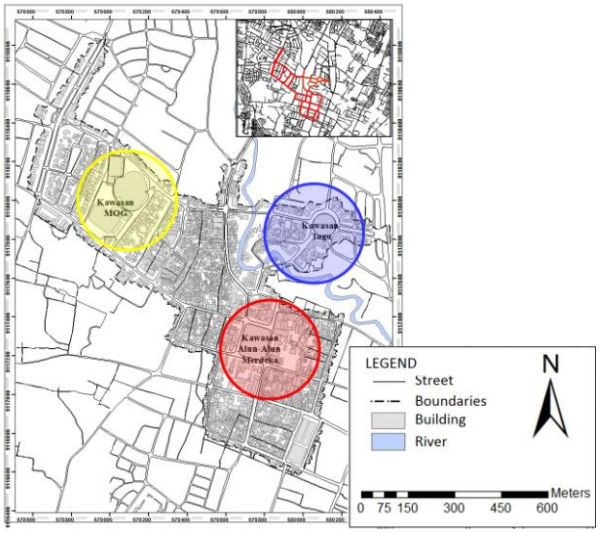


Fig.1. Study Area.
Source: analysis, 2013

3.1 Uniqueness of the Site

Tugu site, Alun-alun site, and MOG site has aroused a great attraction movement, because it has a unique area associated with the physical attractiveness, social attractiveness, and historical attractiveness (**Table 3**).

Table 3. Uniqueness of the Site

No	Site	Physic	Social	Historical
1	Monument site has colonial architecture and a beautiful view at 'round park' as a physical attraction. There are also social attractiveness that is 'Alun-alun Tugu' as a family recreation facility (Ekafitrawan, 2005).	√	√	√
2	Square site has street corridor with the some relics of the colonial buildings around it. It	√	√	√

No	Site	Physic	Social	Historical
	formed a unique physical attractiveness. There are also social attractiveness that is 'Alun-alun Merdeka' as a family recreation facility (Ekafitrawan, 2005).			
3	MOG site previously contained 'Balai Kartini' and 'Bozem', in addition there are also some buildings that retained its shape at Ijen area. There is a social appeal of sports fields and stadiums, as well as a weekly event CFD (Car Free Day) (Ekafitrawan, 2005).	√	√	√

The attractiveness of Tugu site, Alun-alun site, and MOG site has been capable fulfill the criteria of warmth, so that it supports the concept of omotenashi in the City of Malang. Therefore, it still requires an integrated transportation management to support the uniqueness of the site (**Figure 2**).

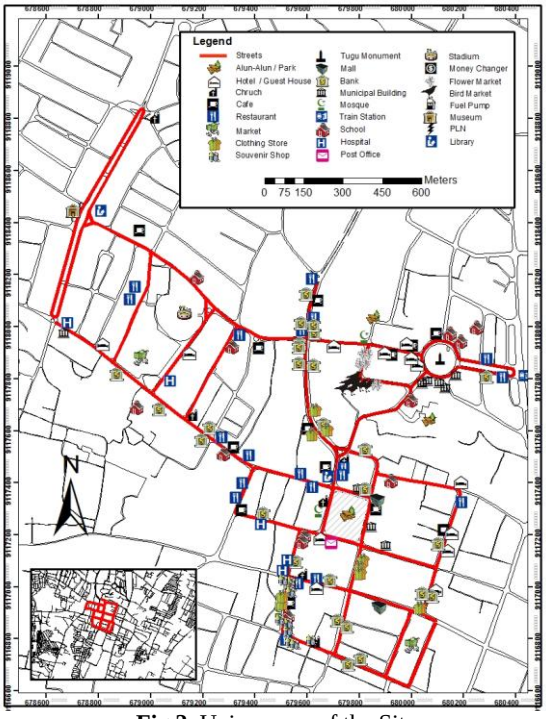


Fig.2. Uniqueness of the Site.
Source: analysis, 2013

3.2 Traffic Characteristics - Street Geometric and Pedestrian-way Geometric

Geometric Analysis of street and pedestrian way conducted on 46 segments. Geometric Analysis presents a cross-section of street and pedestrian way, and photo analysis. One of the results of the analysis of the geometric is shown at Jalan Pasar Besar (**Figure 3** and **Figure 4**).

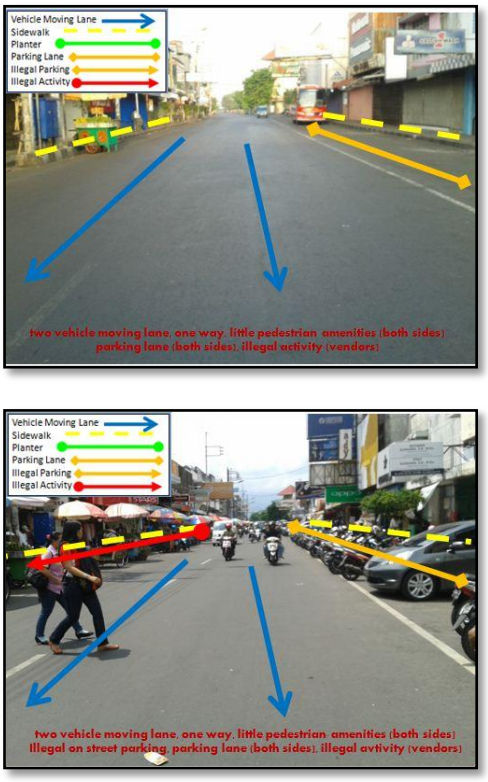


Fig.3. Photo Analysis of Jalan Pasar Besar.
Source: analysis, 2013

Fig.4. Cross-section of Jalan Pasar Besar.
Source: analysis, 2013

A total of 40 segments of 46 segments have pedestrian way with the different heights level with the street pavement. A total of 6 segments did not have a pedestrian way on either side. A total of 2 segments only have pedestrian way on either side. A total of 16 segments showed the presence of street vendors, which is 12 segments with the street vendors at pedes- trian way and 4 segments with the street vendors on the street. A total of 14 segments have holes in the street pavement. A total of 27 segments have illegal on-street parking lot.

3.3 Street Performance

Street performance analysis conducted by calculating the volume and street capacity. **Table 4** shows the highest LOS during peak hours on weekdays and weekend.

Table 4. Level of Service (LOS)

No	Segment	Q	C	LOS
	Tugu Site			
1	Jl. Kahuripan (Segment 1)	2292,40	3203,05	C
2	Jl. Kahuripan (Segment 2)	2035,25	3433,67	C
3	Jl. Kertanegara	835,85	6129,55	A
4	Jl. Brawijaya	134,00	1038,06	A
5	Jl. Tumapel	102,50	2827,95	A
6	Jl. Majapahit	1694,40	3543,25	B
7	Jl. Basuki Rahmat (Segment 1)	3095,55	5251,07	C
8	Jl. Basuki Rahmat (Segment 2)	3320,55	5422,30	C
9	Jl. Basuki Rahmat (Segment 3)	3929,40	6365,30	C
	Alun-alun Site			
10	Jl. Merdeka Utara	3048,00	5896,28	C
11	Jl. Merdeka Timur	3491,00	3768,93	E
12	Jl. Merdeka Selatan	366,00	2948,14	A
13	Jl. Merdeka Barat	2193,00	4258,43	C
14	Jl. Aris Munandar	1275,95	2967,99	B
15	Jl. MGR. Sugio Pranoto	1458,30	3182,65	C
16	Jl. Agus Salim	942,85	3149,15	B
17	Jl. Zaenal Arifin (Segment 1)	1598,20	2838,95	C
18	Jl. Zaenal Arifin (Segment 2)	2271,20	2838,95	D
19	Jl. SW. Pranoto	1734,05	2948,14	C
20	Jl. Sutan Syahrir	1586,05	2814,13	C
21	Jl. Pasar Besar	1669,25	2645,39	C
22	Jl. Sersan Harun	607,75	1289,81	B
23	Jl. Kyai Tamin (Segment 1)	1477,05	2995,33	D
24	Jl. Kyai Tamin (Segment 2)	1820,75	2676,54	D
25	Jl. Kopral Usman	754,40	1931,10	B
26	Jl. Kapt. Pierre Tendean	1289,95	1591,33	D
27	Jl. Syarif Al Qodri	1104,95	2676,54	D
28	Jl. Ade Irma Suryani	1433,25	3249,66	B
29	Jl. KH. Wahid Hasyim	1818,60	3340,71	C
30	Jl. Kauman	2137,95	2948,14	C
31	Jl. KH. Hasyim Asy'ari	2377,60	2948,14	D
32	Jl. Arief Rahman Hakim	2879,75	3249,66	D
	MOG Site			
33	Jl. Ijen (Segment 1)	4152,30	6499,31	C
34	Jl. Ijen (Segment 2)	3411,35	6499,31	C
35	Jl. Semeru (Segment 1)	2042,10	5132,40	B
36	Jl. Semeru (Segment 2)	1803,70	4987,43	B
37	Jl. Semeru (Segment 3)	2334,55	3287,56	C
38	Jl. Tennes	1256,00	6028,80	B
39	Jl. Bromo	575,40	6822,09	A
40	Jl. Tangkuban Perahu	2644,22	677,10	B
41	Jl. Kawi (Segment 1)	2704,20	5658,05	C
42	Jl. Kawi (Segment 2)	2789,35	5658,05	C
43	Jl. Kawi (Segment 3)	2747,60	5422,30	C
44	Jl. Kawi (Segment 4)	3117,75	5422,30	C
45	Jl. Kawi (Segment 5)	3004,15	5422,30	C

Source: Analysis, 2013

From all segments studied, there are 8 segments or 17.78 per cent which have a LOS D, E and F. The segment which has LOS D, E and F will cause congestion at peak hours. The area is also dominated by land use as trade and services. This raises a big movement. In addition, there are 22 segments or 48.89% which have a LOS C. The segment consists of 5 segments in Tugu site, 9 segments in Alun-alun site, and 8 segments in MOG site. Segments which have LOS C will cause delays during peak hours and likely to lead congestion.

3.4 Parking Characteristics

Parking problem occurs because vehicles violating parking geometric existing, they used effective lane of the street and parking on the pedestrian way. (**Table 5** and **Table 6**).

Table 5. On-Street Parking (without swath**)**

No	Segment	Parking (m^2)	Type	Capacity
1	Tangkuban Perahu	594,32	90^0	31 SRP car
2	Semeru	107,25	60^0	14 SRP car
3	Tennes	570	90^0	266 SRP MC
4	Kauman	170	90^0	34 SRP car
5	Agus Salim	246,5	90^0	46 SRP MC
6	Zaenal Arifin	655,18	90^0	55 SRP car
7	Basuki Rahmat 1	888	60^0	82 SRP car
		720	60^0	82 SRP car
8	Basuki Rahmat 2	1200	60^0	164 SRP car
		960	60^0	164 SRP car
9	Jalan SW. Pranoto	2	90^0	74 SRP car
10	Jalan Pasar Besar	2	90^0	66 SRP MC

Table 6. On-Street Parking (with swath)

No	Segment	Parking (m)	Type	Capacity
1	Jl. SW. Pranoto	52,5	60^0	21 SRP car
		7,5	60^0	3 SRP car
		90	90^0	30 SRP car
2	Jl. Pasar Besar	157,25	90^0	68 SRP car
		37,5	90^0	15 SRP car
3	Jl. Sersan Harun	167,4	90^0	45 SRP car
4	Jl. Kopral Usman	167	90^0	47 SRP car
5	Jl. Kyai Tamin 1	220	90^0	33 SRP car
6	Jl. Kyai Tamin 2	58	90^0	56 SRP car

Source: Analysis, 2013

There are 14 segments which have a legal on-street parking but there are also 7 segments which have problems such as a vehicle parked in violation of geometrical parking, vehicles parked on the effective lane of the street and on the pedestrian way due to the high number of parking demand and less effective parking management.

3.5 Pedestrian-way Performance

A total of 5 segments have pedestrian-way performance with LOS B, which is in Jalan Merdeka Timur, Jalan Agus Salim, Jalan Zaenal Arifin (Segment 1), Jalan SW. Pranoto, and Jalan Pasar Besar. This is caused by the effective width of the pedestrian way which reduced by street vendors and a large number of pedestrians, so that the volume of pedestrians to be large but the effective width is reduced. Other segments have performed with LOS A because of which little amount of pedestrians and effective width of the pedestrian way is not disturbed by street vendors. Table 7 shows the highest LOS pedestrian way each segment in peak hour for weekday and weekend.

Table 7. Level of Service (LOS) of Pedestrian Way

No	Segment	Q	LOS
	Tugu Site		
1	Jl. Kahuripan (Segment 1)	0,51	A
2	Jl. Kahuripan (Segment 2)	0,61	A
3	Jl. Kertanegara	3,31	A
4	Jl. Brawijaya	1,16	A
5	Jl. Tumapel	0,79	A
6	Jl. Majapahit	0,56	A
7	Jl. Basuki Rahmat (Segment 1)	1,63	A
8	Jl. Basuki Rahmat (Segment 2)	1,51	A
9	Jl. Basuki Rahmat (Segment 3)	1,51	A
	Alun-alun Site		
10	Jl. Merdeka Utara	6,40	A
11	Jl. Merdeka Timur	10,84	B
12	Jl. Merdeka Selatan	6,93	A
13	Jl. Merdeka Barat	6,94	A
14	Jl. MGR. Sugio Pranoto	0,39	A
15	Jl. Agus Salim	7,91	B
16	Jl. Zaenal Arifin (Segment 1)	11,42	B
17	Jl. SW. Pranoto	15,80	B
18	Jl. Sutan Syahrir	0,69	A
19	Jl. Pasar Besar	8,93	B
20	Jl. Sersan Harun	2,29	A
21	Jl. Kyai Tamin (Segment 1)	0,94	A
22	Jl. Kyai Tamin (Segment 2)	1,78	A
23	Jl. Kopral Usman	0,84	A
24	Jl. Ade Irma Suryani	1,79	A
25	Jl. KH. Wahid Hasyim	0,82	A
26	Jl. Kauman	0,39	A
27	Jl. KH. Hasyim Asy'ari	0,07	A
28	Jl. Arief Rahman Hakim	0,36	A
	MOG Site		
29	Jl. Ijen (Segment 1)	0,11	A
30	Jl. Ijen (Segment 2)	0,16	A
31	Jl. Semeru (Segment 1)	0,46	A
32	Jl. Semeru (Segment 2)	0,30	A
33	Jl. Semeru (Segment 3)	0,34	A
34	Jl. Tennes	0,55	A
35	Jl. Bromo	0,55	A
36	Jl. Kawi (Segment 1)	0,34	A
37	Jl. Kawi (Segment 2)	0,44	A
38	Jl. Kawi (Segment 3)	0,36	A
39	Jl. Kawi (Segment 4)	0,53	A
40	Jl. Kawi (Segment 5)	0,49	A

Source: Analysis, 2013

3.6 Passenger Satisfaction to Public Transport Services

Based on the calculation of CSI, consumer satisfaction index has a value of 0.4870 or 48.70 per cent. It has meaning less satisfied. The service category includes seating facilities, cleanliness, transport driving behavior of the driver, the scheduled departure time, the distance to the terminal, comfort, safety and ease of access (**Table 8**).

Table 8. Calculation of CSI

No	Attribute	*Mean Importance Score* (MIS)	*Weighted Factors* (WF)	*Mean Satisfaction Score* (MSS)	*Weighted Score* (WS)
1	Seating facility	3,29	12,63	2,49	0,3151
2	Cleanliness	3,47	13,34	2,47	0,3300
3	Transport driving behavior	3,34	12,85	2,52	0,3231
4	The scheduled departure time	3,05	11,71	2,32	0,2718
5	The distance to the terminal	2,94	11,30	2,33	0,2634
6	Comfort	3,42	13,16	2,42	0,3182
7	Safety	3,43	13,18	2,39	0,3154
8	Ease of access	3,08	11,85	2,52	0,2979
Total		26,02	100		0,2435
CSI score (Total Weighted Score / 5)					0,4870

The Passengers of public transport feel less satisfied with the performance attributes contained in the Service of Public Transport. It is also proved that the Public Transport in the City of Malang successfully satisfying consumers by 48.70 per cent. However the owners and transport drivers should try to improve performance of public transport so that passenger satisfaction is close to 100 per cent and they still choose to use public transport.

3.7 Public Transport Passenger which Interacting with Others

Interaction occurs conditional on the existence of social contact and communication. By using public transport, as much as 100 per cent of passengers making social contact with other passengers. Types of social contacts that goes in this research is a positive social contact and primary contact. While communication occurs in 74 per cent of public transport passengers. As many as 41 per cent of passengers can also get to know new people or 55 per cent of the number of passengers which communicate with each other. Based on these facts, it can be seen that the use of public transport will encourage interaction urban communities. In addition, as many as 33 per cent of respondents which traveling with other people using public transport will reduce the use of private vehicles and reduce the load of the street network.

3.8 Recapitulation Analysis

Recapitulation analysis conducted to determine the results of the analysis of each variable (**Table 9**).

Table 9. Recapitulation Analysis

No	Variable	Parameter and Results
1	**Hospitality**	**Street Geometric** There are some problems such as holes in the road, the existence of street vendors and reduced 'effective lane road' due to parking. **Street Performance** There are 0.19% has LOS D, E and F and 57.89% has LOS C of the total segments studied. **Pedestrian way Geometric** There are some problems such as pedestrian way which hollow and discontinuous, there

No	Variable	Parameter and Results
		are the difference level of pedestrian way of street pavement, did not have pedestrian way and the existence of street vendors in the pedestrian way. **Pedestrian way Performance** 5 segments has pedestrian way performance (LOS) B, and other segments with the LOS A. **Passenger Satisfaction to Public Transport Services.** CSI score is 48,70 per cent, it means less satisfaction.
	Based on the recapitulation analysis, warmth variable has not been fulfilled in the study area due to some problems related to the street geometric and pedestrian way geometric, the satisfaction of passenger to the public transport services.	
2	Familiarity	**Public Transport Passenger which Interacting with Others** Public transport can encourage the interaction of urban communities, reducing private vehicles and reduce the load street. **Parking Characteristics** There are some problems such as geometric parking violation, vehicle parked on the pedestrian-way and on the street.
	Based on recapitulation analysis, familiarity variable has fulfilled on public transport but did not fulfilled in on-street parking due to the problems geometrically.	
3	Warmth	**Uniqueness of Site** Tugu site, and Alun-alun site, and MOG site have physical attractiveness, social attractiveness and historical attractiveness, so that it is able to attract a lot of movement of vehicles and people.
	Based on recapitulation analysis, warmth variable has fulfilled, it needs to be supported with other variables to realize the concept of omotenashi.	

Source: Analysis, 2013

IV. Priority of TDO Strategy

Based on the opinion of experts, TDO can be applied in the study area with the proviso able to cope with the problems of transportation in the city of Malang. The results of the AHP calculation produces the following strategic priorities:

1. Parking management and carpool (21,70 per cent)
2. Improvement of public transport services and the provision of public transport lanes (20,47 per cent)
3. Enforcement (20,45 per cent)
4. Employee and students traveling management (17,13 per cent)
5. Improving the condition of pedestrian way and bicycle lane (10,49 per cent)
6. Growing public awareness (9,75 per cent)

The result showed that Consistency Ratio (CR) of 0.03 or less than 10 per cent. It has a consistent value.

Transportation Management Strategy can be described through the design as follows:

4.1 Parking Management and Carpool

Parking is provided converging in some point to facilitate parking management. These points are then used as a parking lot to carpool. Carpool is to provide a parking space for private vehicles for further change to public transport or to use car together.

By providing carpool, private vehicle users are expected to leave their vehicles in the parking lot, then walk to the destination. Tugu site, Alun-alun site, and MOG site have links tend to be short to reach the destination, so that carpool is the right concept.

4.2 Improvement of Public Transport Services

Improvement of public transport services carried out various aspects of the public transport services. Seating facilities are designed have a soft and comfortable seat. The usual extra bench placed in freight doors removed for the safety of passengers.

There are public transport lanes with large traffic volume. Public transport which frequent stops for passengers up and drop off will be easier with its own particular lane. Here is one example of the design of public transport lanes on Jalan Merdeka Utara (**Figure5**).

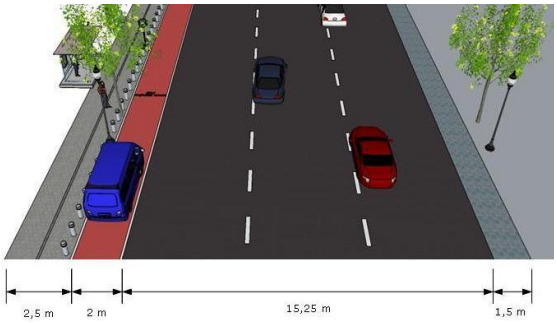


Fig.5. Design of Jalan Merdeka Utara.
Source: analysis, 2013

Parking patterns which initially 45^0 and 60^0, are directed into a parallel parking in either side of the street (**Figure 6**).

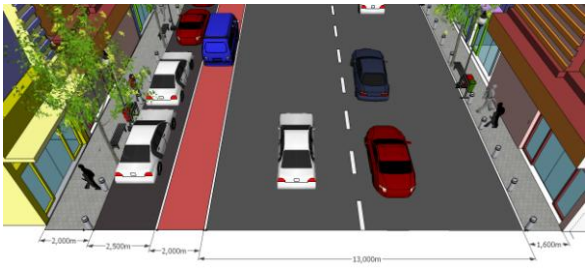


Fig.6. Design of Jalan Pasar Besar.
Source: analysis, 2013

The calculation of the projected LOS design TDO performed in several instances segments, so that it can be seen the change of road capacity and LOS values (**Table 10**).

Table 10. Level of Service (Design)

No	Links	V	C Design	DS/LOS Design	DS/LOS existing
1	Jl. Kertanegara	835,85	5593,53	0,15 / A	0,14 / A
2	Jl. Kahuripan 1	2292,40	2671,48	0,86 / E	0,72 / C
3	Jl. Kahuripan 2	2035,25	3045,49	0,67 / C	0,59 / C
4	Jl. Majapahit	1694,40	3107,64	0,55 / C	0,48 / C
5	Jl. Semeru 1	2042,10	5235,05	0,39 / B	0,33 / B
6	Jl. Semeru 2	1803,70	2726,00	0,66 / C	0,30 / B
7	Jl. Semeru 3	2334,55	3407,50	0,69 / C	0,71 / C
8	Jl. Basuki Rahmat 2	3320,55	6079,92	0,55/ C	0,52 / C
9	Jl. Basuki Rahmat 3	3929,40	6079,92	0,65 / C	0,62 / C
10	Jl. Merdeka Utara	3048,00	4773,98	0,64 / C	0,52 / C
11	Jl. Merdeka Timur	3491,00	4420,35	0,79 / D	0,93 / E
12	Jl. Merdeka Selatan	366,00	3182,65	0,11 / A	0,12 / A
13	Jl. Merdeka Barat	2193,00	3182,65	0,69 / C	0,51 / C
14	Jl. SW. Pranoto	1734,05	3182,65	0,54 / C	0,59 / C
15	Jl. Pasar Besar	1669,25	3182,65	0,52 / C	0,63 / C

Strategy for public transport is done by determining public transport stops, so that public transport will be stopped at the place and stopping is prohibited at any other point along the segment. The passengers can also wait at the stops site (TPB). The driver of the other vehicle has the right horn of public transport stopped in any place. This can be disseminated through regular events in the City of Malang, such as CFD, or through social media such as twitter.

V. Improving the Condition of Pedestrian way and Bicycle Lane

Pedestrian paths which have different heights with street, is designed to be flat as a vehicle lanes. Pavement given different materials, namely paving blocks with specific shapes and colors to accentuate the attractiveness of the region. To prevent the entry of vehicles into the pedestrian path, given the bollard with a 1m distance along the street. Pedestrian paths designed to have patterned pavement in the middle, which is destined for the blind. Width of Pedestrian way adapted to the geometric street. There are some segments that are designed have a width of 2.5 m as bicycle path, so it can also be traversed by bicycle (**Figure 7**).

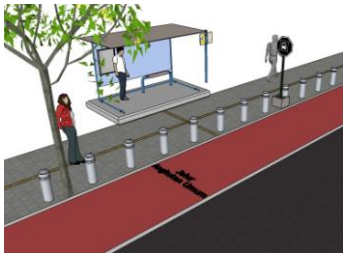


Fig.7. Design of Pedestrian Way.
Source: analysis, 2013

VI. Enforcement

Given a speeding ticket for which vehicle against the flow, did not have any papers completeness, or parking is misplaced recorded by a number of police vehicles, then a penalty is charged at the time of vehicle registration tax. Law enforcement for illegal parking jockey confirmed, and controlling street vendors who sell at any place, especially on the street and pedestrian way.

VII. Employee and Students Traveling Management

To develop mass transportation, it needs for habituation to use public transport. The character of Malang society who has more use of private vehicles are directed to use public transportation, such as through the provision of a free bus for students and civil servants. The bus route in this study was designed to via public transport stops or shelter. For example, free bus of Tugu site will serve the Tugu site, then it will stopped at the carpool location of Tugu site, Alun-alun site, and MOG site. So it also for regional bus in Alun-alun site and MOG site. The bus only operates at peak hours, for example in the morning (07:00 to 08:00 GMT), afternoon (12:00 to 13:00 GMT) and evening (16:30 to 17:30 GMT).

VIII. Growing Public Awareness

Some strategies to raise awareness conducted with community socialization. One of them is with the map in a public space, which conveys information about the location of carpool, public transit stops and legal parking locations.

In addition, socialization can also waged through social media such as twitter account that campaigns for the use of public transport, school bus / bus employees, as well as the attractiveness of the region being the location omotenashi. Other than as a forum for promotion, the account also serve the aspirations of the people related to transportation in the city of Malang.

Organizing events by City Government can also be an excellent of socialization such as Car Free Day (CFD) which has become a regular event every week for the city of Malang. By giving the attractiveness of the traditional market on Sunday, the walking activity becomes extremely enjoyable and gained appreciation from many quarters.

TDO strategy can be illustrated in a map which is a link from Tugu site, Alun-alun site, and MOG site (**Figure 7**).

IX. Conclusion

Transportation Demand Omotenashi (TDO) can be applied in the study area if the characteristic of traffic directed to the concept of hospitality, familiarity, and warmth. Hospitality associated with the design of street and pedestrian way. The street network and

pedestrian way is designed to be friendly for all street users and pedestrians. Familiarity associated with public transport and parking. Public transport is designed comfortable physically, so that passengers feel satisfied and enjoy. Parking is pressed to reduce the use of private cars and switch to public transport. While the warmth associated with the uniqueness of the site, so the appeal of the site is supported by an integrated transportation management that is able to turn the region.

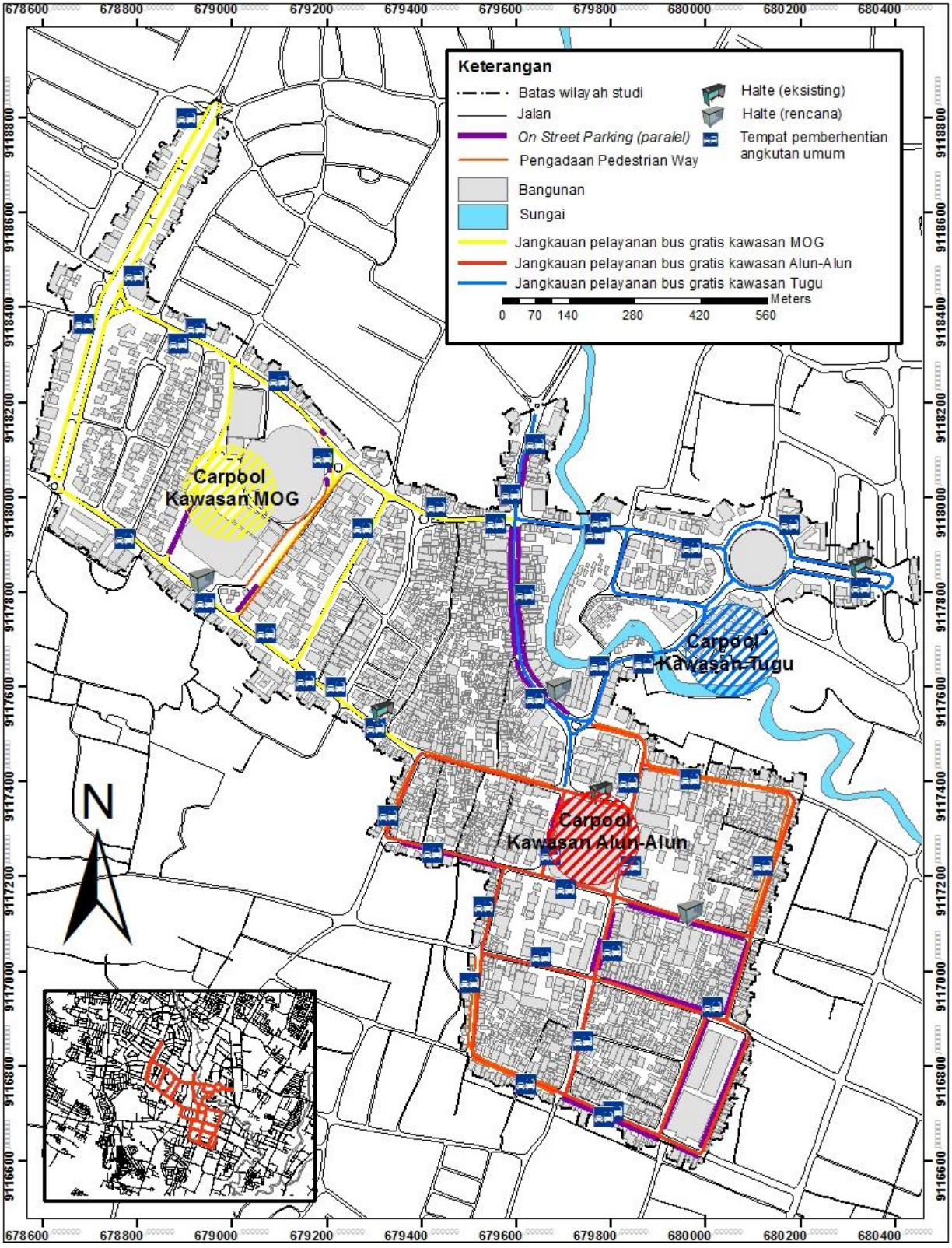


Fig.7. Design of TDO.
Source: analysis, 2013

References

1) Agustin, Imma W., Eddi Basuki, Hisashi Kubota. 2013. The Possibility of BRO Works in The City of Malang: An Idea and Analysis, JAERS 2013, 1 (3) PP 64-71. UK: Text Road Publications.
2) Departemen Perhubungan. 1996. *Keputusan Dirjen Perhubungan Darat Nomor 272/HK.105/DRJD/96 tentang Pedoman Teknis Penyelenggaraan Parkir.* Jakarta: Direktur Jendral Perhubungan Darat
3) Directorate General of Highways. 1997. *Indonesian Highway Capacity Manual (HCM).* Jakarta.
4) Directorate General of Highways. 1997. *Indonesian Highway Capacity Manual (HCM).* Jakarta.
5) Ekafitrawan, Mohammad. 2005. *Studi Pemanfaatan Ruang Terbuka Publik oleh Remaja di Kota Malang.* Skrpsi tidak dipublikasikan. Malang: UB.
6) Kubota, H., Uemura, T., Kojo, M., and Sakamoto, K. 2006. Transportation *Demand Omotenashi (TDO): an Idea and an Analysis.* 考察 管理からおもてなしへ 23:711-716.
7) Oktaviani, R. W and Rita N. 2006. Analisis Kepuasan Pengunjung dan Pengembangan Fasilitas Wisata Argo, Studi Kasus di Kebun Wisata Pasirmukti, Bogor. Journal of Agro Ekonomi, Volume 24 No. 1 Mei 2006: 41-58. Institut Pertanian Bogor
8) Putra, Sucipta, Gst R. Purbanto, Nym W. Negara. 2013. *Analisis Tingkat Pelayanan Fasilitas Pejalan Kaki Studi Kasus Jln Diponegoro di Depan Mall Ramayana.* Jurnal Ilmiah Elektronik Infrastruktur Teknik Sipil Volume 2 Nomor 2 April 2013. Denpasar: Universitas Udayana
9) Wiyanti, Desi R. 2013. *Peningkatan Jalan sebagai Place Kawasan Pusat Kota Malang Berdasarkan Model Kano.* Skripsi tidak dipublikasikan. Malang: UB.

The Study of Smart Growth Concept In Arranging Residential Environment in the City Centre
Case study: Building transformation in Pasar Baru area - Bandung

Nurtati Soewarno[1]

[1] Lecturer, Architecture Department, Institut Teknologi Nasional-Bandung

Abstract

Urbanization occurs in almost all big cities in Indonesia, this is mainly felt in the city center. These days the city centers appear to look like the densest region in the city, buildings are standing in a tight row, leaving almost no open space. Besides of that the buildings seem to be unorganized in shape and heights (skyline). Part of the city center mentioned here is the trade district in the old city area with the market as the focus. This sector was originated from a village which later on grows along with the city development. The development begun with function transformation on houses, located beside the main road, into shop houses. Further developments occurred vertically, along with the increase of the city center density. With qualitative and ground method this research method looks directly into Bandung oldest trade area with Pasar Baru as a center. The research picks a few shop houses that has already transformed along with the transformation of the lot broad, narrower or larger. This type of transformation tends to omit the village that lies behind the shop houses as a residential function. This kind of transformation also becomes one booster for development in the residential area of the suburbs. The large scale of development in the suburbs will soon or later eliminate the green land as natural resources area. The involvement of the local government is required to arrange the urban kampong in the city center to maintain the residential function. The high demand for people to live and stay in the city center, the city center economic condition supported by technological advantage makes it possible to use smart growth concept in arranging the urban kampong that are too dense and not fit for living. With this concept it's expected that the residential unit needs will fulfill and the initial function of the city center as a living neighborhood is restored. The city center is not only a place to make a living but also a save, pleasant and well-arranged residential neighborhood.

Keywords: building transformation, urban kampong, smart growth concept

I. Introduction

At first almost all Indonesian city center had a similar pattern, grid pattern with the city square as the center point. Not far from the city square usually lies the market, services a residential area. Along the time and the rapid city economic growth the market develop into a trade district. At present those districts could be recognized by the row of shop houses along the roads and the remains of the residential area behind the shop houses. Those residential areas are known as the city village or urban kampong because it lies in the city center.

The city center district have a certain appeal that attracts various parties. This boosts into competition, which one of them is the struggle for mastering the lot, by individual or companies. The mastering of a piece of land push the birth of various building shapes. The building shape is a combination of high land demands and the limited land availability so it tend to be build maximum without open space. The building lay out tends to be identical with the land shape, this is what causes the irregularity in building shapes in the urban kampong.

Another impact of the land lot competition is the reduction of the urban kampong area as a recidential environment. In reality the reduction of the urban kampong area is not parallel with the building quantity, this causes the kampong to become a dense habitation.

In the trading district in Bandung city center, the land lot mastery competition is seen on the unregularity of the building shapes like : thin and lengthwise backward, broken like a saw and other irregular shapes. Those irregular shaped buildings are usually built on land lots that are the result of a merger between a few smaller land lots and built to the maximum.

Nurtati Soewarno
---Lecturer at Jurusan Teknik Arsitektur-Itenas
Jl PHH Mustafa no.23 Bandung-40124.
Tel: 0816-606375 Fax: 022-7208292
E-mail: nts_80@yahoo.com

The high demand for the society to live in the city centre, and observing that almost all city center area is already bulit up, the concept *smart growth* is concidered appropriate to rearrange the residential environment in the area. This concept emphazise development in fully bulit area without breaking new ground, as been applied in some big cities like Jakarta, Surabaya, Medan, Beijing by building vertical residential in the shape of apartments and flats in the urban kampong area.

The principle of this smart growth concept is building a sustainable community by creating a comfortable neighborhood as a living, trading, working place and to increase services to the family. It is expected by applying the smart growth concept the needs for a habitable living space in the trade district of Bandung's city center could be fullfilled.

The intervention of the local government is needed to arrange the urban kampong area, especially cases related to permit and ownership data collection to prevent illegal buildings.

II. Smart Growth Concept

The *smart growth* concept was an application from the 21th Agenda on 1992 UN confernce in Rio de Janeiro, Brasil. This conference discuss about Environment and Development (UNCED) (1). The *smart growth* concept is concentrated on a compact, walkable city center growth to prevent urban sprawl.

'Compact City' or 'urban intensification' is often used to explain similiar concept that influenced the British, Dutch and some other European government policy plan (2).

Smart growth is closely releated with Compact City concept, both emphasizes protection to the living environment. This concept protect natural land, water, air and development, especially on the land which already been built.

Observing city center that are usually mixed used environment consist of residential and non residential for example shoping centers, places of worship, schools, offices which could be reached by walking or bicycling because of the short distance.

Moreover the city center strategic location makes it possible to reach the area using various transport system, such as train, local city transport, bus, taxi etc.

Similarly is the inhabitant with various ages. This is expected to create a save and pleasant living environment. This condition is equal to the basic principle of the *smart growth* principle issued by Environmental Protection Agency (EPA) (1).

III. Urban Kampong in Bandung City Center

3.1 Historical Background

The urban kampong mentioned above is the remains of the indigenous village located in the city center. Kampong experienced growth simultaneously with the construction of the Jalan Raya Pos (*Grote Postweg*) and the moving of the district capital of Bandung from Krapyak to Alun-alun (1811) in accordance to the command of the Dutch government orders (3), matching the Bandung city center map in year 1825 (**figure 1**).

Furthermore the grid patern was used for the alun-alun area to divide kampong into blocks. Further on the facade of the block becomes row of shop houses while the kampong is situated behind (4), as seen in Pasar Baru 1915 (**figure 1**).

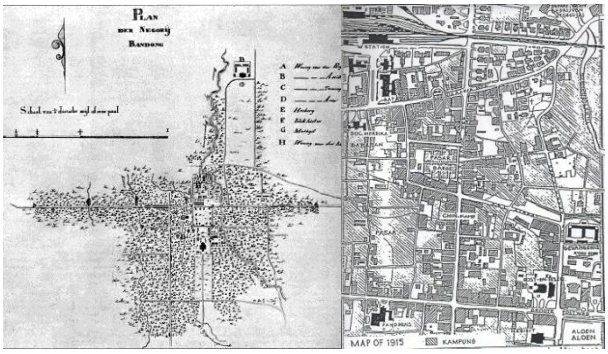


Figure 1. Bandung city center area map 1925 and Pasar Baru area 1915
Source: Voskuil, 1996

3.2 Location

At present kampong still remains in the rear part of the main streets at the city center area (**figure 2**). Kampong is recognized by the building typology which it differ from shop houses in front part.

Figure 2. City Kampong Location

Access to kampong is through small cobbled streets (alley) which are located between the row of the shop houses. Based on access to the city kampong could be divided into two types, closed type and open type (4) (**figure 3**).

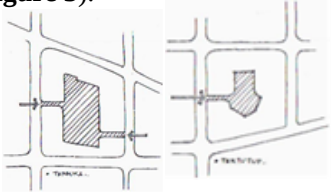


Figure 3. Kampong typology
Source: redrawn from source Siregar, Sandi, 1990

IV. Transformation in the Pasar Baru Area

Transformation mentioned is transform applying similiar pattern (5). Transformation is an effort to

addapt the old shop houses to the new function and shape (adjustment). The adjustment could be done by changing part of the building (alteration) or modification from the old shape.

Transformation discussed in this paper is related with the alteration of land lot dimension, to become smaller or larger. This alteration means reduction or increase of the land lot space caused by division or unification.

4.1 . Lot Division

In the case of lot division generally begins with dividing from one big shop house lot into several smaller lots. This is a tradition in inherited wealth and trading culture. Division that is concidered fair is to divide the lot in the transverse direction, so each divided unit have access to the street to maintain the trading tradition (4).

The limited lot and the high demand for more space, the shop house result of division will expand vertically. Transformation occurs with addition to numbers of floors and this could happen partially, depends on the owner (**figure 4**).

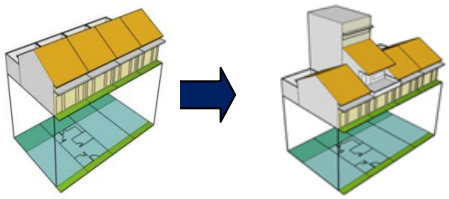


Figure 4. Transformation on shop house sketch

4.2 Lot Amalgamation

A long with time goes by, tough competition occurs, causes some inhabitants to leave city center and sell their lot. This gives a succsess shop owner to expand.

As for the expansion direction depends on the owners succsess to gain a new lot which is generally around his lot so his lot and building could be merge into one (6). This also occour partially (**figure 5)**.

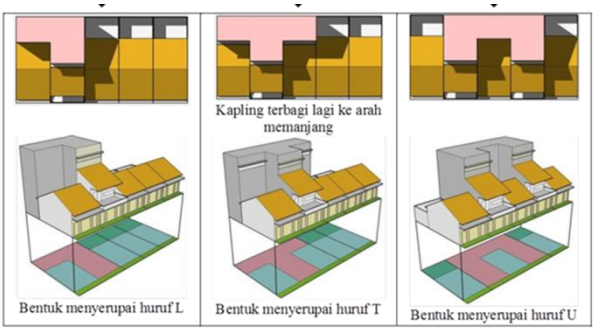


Figure 5. Plot expansion sketch and building shape

Other form of merger is that occurs simultaneously with the same amount of floor numbers.

Figure 6. Plots expansion in large scale

Plot change forms, both division and amalgamation, tends to push density and unregularrity in the shop house building in a block. The difference is on the owner, land lot owned by individual tends to develope partially in a slow tempo, in other hand if owned by a company or corporation it will develope all at once with the same building type, style and number of floors in a relatively fast tempo.

V. Analysis

Observing the condition in the trading district in Bandung city center that is so dense and very irregular, it is best to propose a realigment. Using smart growth consept, development could be well planed on blocks in the Pasar Baru area

Figure 7. Blocks in the Pasar Baru District

Figure 8. Some buildings and density of the district

There are still remaining old shop houses that should be conserved. Thats why it should also be distinguished between conserved buildings and non con-

served. Blocks with conserved buildings could still accentuate the original shape by not building inner block that is more prominent then the outer block. The lack of open space in the area could be solved by planning the inner block as an open space, for example as a play ground or parking area. Further calculation is needed to acquire the optimal open space.

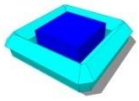
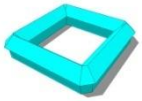
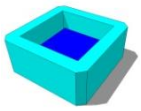
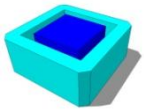
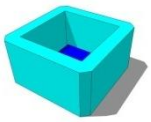
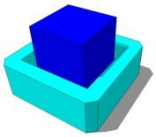
Block with conserved building		
	Inner and outer block equally high	Inner block as an open space
Block without concerved building		
	Outer higher than inner block	Inner and outer block equally high
		
	Inner block remains as one storey building	Inner higher than outer block

Figure 9. Building shape alternative list

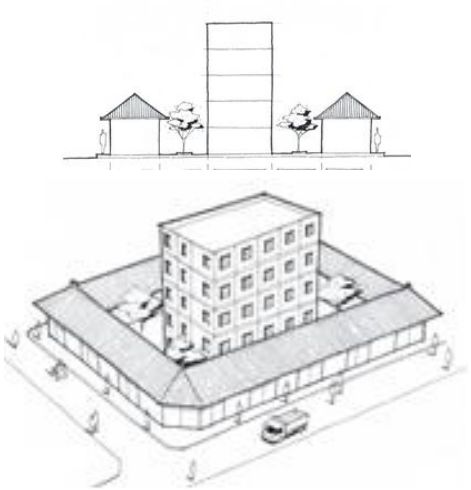


Figure 10. One of the Block Plan alternative sketch

Moreover the diversion of the inhabitant in the city center area at the moment makes the residential resignation distinguished by block. Residential buildings could be built low storey, simple flats or even luxury apartments as an alternative for inhabitants according to the income.

The planning should also include inhabitants mixing based on age, religion and tribe to maintain the safety and comfort, excluding negative posibilities.

VI. Conclution

It is expected that with smart growth concept the needs of recidence units in the city center area could be fulfilled.

The old scheme that separates between trading zone in front and recidential zone in the rear could be maintained. With the smart growth concept it is expected a polution free , walkable, save, comfort and additonal beauty to the city area.

To support this concept, by all means, the role of the Local Government is expected, espesially in licensing and data colletion of the ownership. This is related to the history of the indigenous inhabitants located in the inner block.

Reference

1) http://www.epa.gov/smartgrowth/about_sg.htm#back
2) en. Wikipedia.org
3) Kunto, Haryoto (1984), Bandoeng Tempo Doeloe, PT Granesia, Bandung.
4) Siregar, Sandi (1990), Bandung-The Architecture of a City in Development", Urban analysis of a regional capital as a contribution to the present debate on Indonesian urbanity and architectureal identity, vol I-II, Doctoral Thesis,Katholieke Universiteit Leuven-Belgia
5) Ching, D.K, Francis,1979: Architecture: Form, Space and Order, van Nostrand,USA
6) Soewarno, Nurtati (2002), Pengaruh Perubahan Bentuk Kavling Rumah-Toko Terhadap Morfologi Bandung" (Studi Kasus: Kawasan Pasar Baru Bandung), Magister Tesis, Unpar, Bandung
7) Jacob, M, Harvey:"Property Rights, Land Use and Public Participation", module Property Rights, May 15-19 2006, International Course on Housing and Urban Development (ICHUD 88), HIS-the Netherlands.
8) Morales, Carlos, Schechinger:" Land readjustment",module Land management instruments and applications, June 8 2006, International Course on Housing and Urban Development (ICHUD 88), Institute for Housing and Urban Development Studies-Rotterdam the Netherlands, 2006.

Urban Spatial Structure Identification through Historical Approach

Suryanto[1], Achmad Djunaedi[1], Sudaryono[1], Leksono P.S.[1]

[1]Lecturer of Urban and Regional Planning Studies, Architecture and Planning Department, Universitas Gadjah Mada

Abstract

Global living trend (globalization) has led to the loss of identity of cities. Cities have the same character, almost everywhere on earth, dominated by the global market power. The loss of urban identity threatens the pride of local culture, which in turns deteriorates national resilience. Urban development approach, including planning, is dominated by economic and technical approaches, which characterize market power. Meanwhile, market approach is the main character of globalization, creating cities without local identities. Thus, new approach in urban studies is needed to emphasize local culture as the significant part of urban development. Historical approach, entailing synchronic and diachronic analysis, is believed to be able to identify and explain urban spatial structure. Comprehension upon urban spatial structure as part of the local culture can trigger the pride of urban identity, which eventually impacts on the awareness to preserve the identity.

Keywords: Urban spatial structure, historical approach

I. Introduction

Comprehending urban spatial structure cannot be separated from urban development process. Previous researches have revealed that spatial structure is the product or result of the condition of the people's living or local culture (Short, 1984; Dunleavy, 1982; Mumford, 1991; Bounds, 2004). In other words, comprehension of spatial structure will enable us to elaborate the culture or spirit which depicts the city.

Nowadays, global culture has put pressure on local culture, creating cities without identity. The loss of urban identity impacts on the dwindling of national identity. Constructing cities as the historic center and at the same time, center for culture preservation, needs to be underlined as the approach of development.

In both practices and theories, urban spatial structure is identified through technical approaches, dominated by economic perspective, as distance efficiency (Christaller, 1966) and land value (Alonso, 1964). Those approaches have insufficiently explained cultural aspect as the spirit of urban identity creation because they emphasize on technical and economic or market-oriented issues.

In order to explain the spirit of a city in constructing urban identity, historical approach gives an insight to the relationship between urban structure as the culture inheritance and the values which the structure relies upon.

This research is aimed toconstruct the process of historical approach in identifying urban spatial structure as the manifestation of culture or life of the society in the past by answering:(1) how historical approach is used in the identification of form and meaning of urban structure, and (2) what are the strength and weakness of that method in identifying urban spatial structure.

Methods

The first of seven research strategies in architecture, and urban planning in further, is interpretive historical research, which is closely related to the sixth strategy, logical argumentation (Groat and Wang, 2002). Interpretive and logical argument is needed due to the unchangeable historical facts. What researcher attempts is comprehending the facts by interpreting them, by linking or looking for correlation between facts in before and after time (Hariyono, 1995; Puspitasari, 2009).

* Ir. Suryanto, M.Sc.
Lecturer of Urban and Regional Planning Studies, Architecture and Planning Department, Faculty of Engineering, UniversitasGadjahMada. Tel: (0274) 580092 Fax. (0274) 580854. Email: soer141@yahoo.com

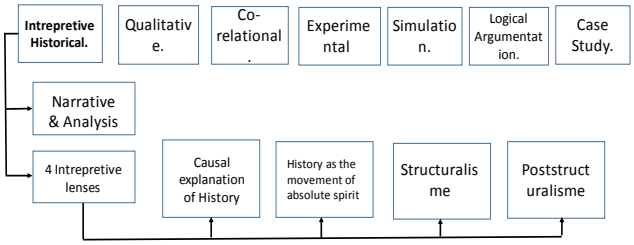


Fig. 1. Research Strategies in Architecture and Planning
(Source: Groat and Wang, 2002)

Within that framework, the interpretation strategy will depend on the logical argumentation in the validity test of the 'capacity' of the fact in explaining the past events. Thus, historical research emphasizes not only in chronology (*diachronic*), but also in its position in the environment and condition at given time (*synchronic*). This approach is explained on the graph below:

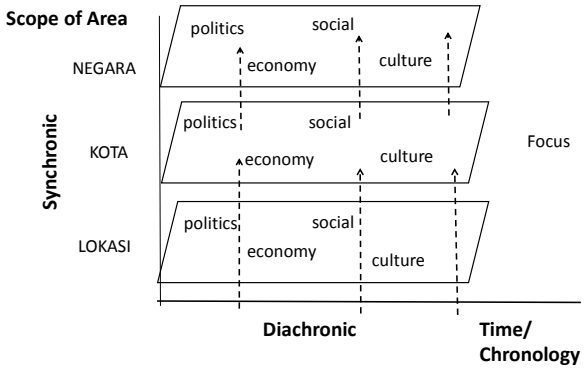


Fig. 2. Scope and Approach of History Researches (translated)
(Source: Hariyono in Popi, 2009)

Groat and Wang used narrative analysis in interpreting historical facts. Meanwhile, Hariyono grouped the analytical description in four continuous stages; data collection, and validity test until the writing process as is seen in the graph below (Hariyono, 1995; Puspitasari, 2009):

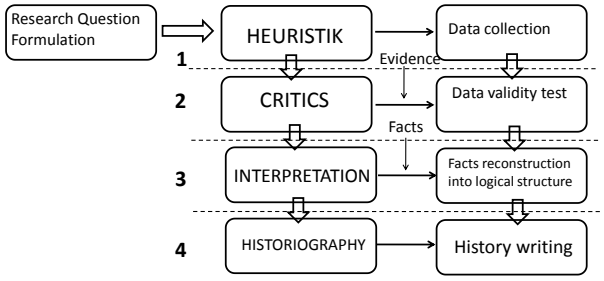


Fig. 3. The Procedure of History Research (translated)
(Source: Hariyono in Popi, 2009)

It is important to make the context of the research clear as research finding is expected to give benefit in life, not only in the purpose of fulfilling curiosity (Chalmer, 1982). In this notion, history-based research does not merely explain the past situation but also needs to inspire the future.

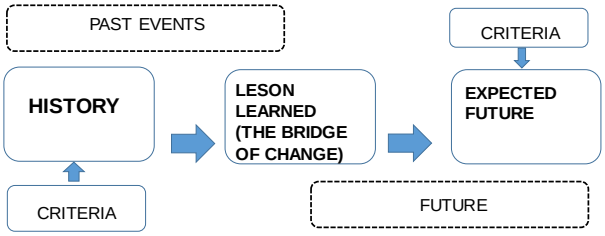


Fig. 4. Research Framework

Literature Review

The most renowned work of Burgess explained that Chicago was divided into layers of functions, like onion, where the function concentrically was structured with the most important part of the city at the center and agricultural land at the periphery (Burgess, 1952). This study is almost similar to Sjoberg's which revealed the correlation of social class and land use. The highest class, the ruler, is at the center, while the lowest is at the edge of the city (Sjoberg, 1960).

Fig. 5. Urban Structure According to Concentric Theory
(Source: Yunus, 2001)

While Burgess and Sjoberg classified urban structure in ecological perspective with concentric structure based on the relation between social structure and land use, Von Thunnen, Hurd, and Alonso identified it through economic approach (von Thunnen, 1966; Hurd, 192; Retcliff, 1999; Alonso, 1964). Their studies illustrated the relation between land value and land use. City center has the highest value for the high-income activities, while the outskirt has lower value as resulted by low-income activities.

In his other study, Hoyt revealed that urban structure does not merely comprise land use structure or hierarchical functionof urban area, but it also includes urban infrastructure, especially transportation infrastructure, because the main functions of the city were not only located in the center but also along the main road, from and to the city center (Hoyt, 1939). That finding concludes that the definition of urban structure is the organization of the urban function and its infrastructure. In keeping with Hoyt, Peter Mann (1965) and Griffin and Ford (1980) showed that in Europe and Latin America, generally, the land use was

concentric but then there wasthe main function of the city along the transportation line, cutting the concentric layer, forming particular functions.

Fig. 6. Urban Structure According to Sector Theory
(Source: Yunus, 2001)

Other definition was disclosed by Harris and Ulman in reality to cities which commonly has more than one center (Harris and Ulman, 1945). In multiple-nuclei theory, they mentioned that urban structure is the organization of city centers and their relation to the disperse of other functions or land uses.

Fig. 7. Urban Structure According to Multiple-Nuclei Theory
(Source: Yunus, 2001)

In Indonesia, the definition of urban spatial structure is stated legally in Act 26/2007 as the organization of settlement centers and the infrastructure system supporting the social-economic activity of the people which hierarchically have functional relationship.

Typologies of Urban Structure

According to Yunus, urban structure can be classified based on the analytical approach (Yunus, 2001). The types of urban structure can be identified through ecological approach, land value approach, urban morphology approach, activity system approach, and factoral ecology approach.

a. Ecological approach

This approach was firstly introduced by Chicago School Group, e.g. Burgess, Mac Kenzie, and Herbert. This approach identifies four types of urban structure; concentric, sector, axis, and multiple nuclei. Axis type can be defined as concentric or sector type because it was originally the variation of the two types. Thus, from the ecological approach, three types of urban structure can be distinguished; concentric (Burgess, 1925), sector (Hoyt, 1939), and multiple nuclei (Harris&Ulman, 1945).

b. Economic approach

Based on urban land market, researches involving economic approach were performed by Cooley (1894), Weber (1895), Hurd (1903), Ratcliff (1949), and Alonso (1964). Urban land value approach is based on David Ricardo and von Thunen's theory, which principally explains the relation between value (economic) of land with land suitability, illustrated in concentric structure (Evans, 2004). The highest value of land is assumed to be at the center as the center has high economic potential (accessibility, public service, mobility orientation, activity concentration, etc.). The highest the opportunity, the higher the demand for land in that location. Thus, it impacts on the higher price compared to that of the peripheral area. Due to the high price and competition for land in the city center, naturally, the functions will be oriented to high profit activity in short term, or activities related to the image of the institutions located in the city where the branding value is higher than the land value.

c. Urban morphology approach

This approach identifies urban structure through physical morphology of urban or settlement area. There has been debates about the components of urban area which distinguish the area. Herbert (1973) stated two components to recognize urban form and structure; road infrastructure system and building blocks. Smailes (1955) mentioned three components; land use, road network, and building types, while Lynch (1960) revealed five parameters to characterize urban form and structure, the so-called-*images of the city*. It entails path, nodes, district, landmark, and edges. Other argument wasintroduced by Doxiadis (1970) mentioning five components of urban structure which are man, society, nature, shell, and nature. Similar to the two previous approaches, urban morphology is unable to describe the model of urban structure. Yet from this approach, urban components can be identified to describe urban form and structure.

d. Activity system approach

Activity system approach is based on the relation between activity system and system of spatial setting. Principally, space and activity allocation in the city are influenced by people's behaviour and motivation in space (Kirk, 1951; Shevky and Bell, 1955; Chapin, 1955; Clark, 1982, and Rapoport, 1977). The dynamics and pattern of location, land acquisition and mobility pattern (men and logistics) are the variables to comperhend the process of urban structure formation.

Generally, activity system approach results in the same structure with economic and ecological approach. In other words, this approach explains the formation of three urban structure models (concentric, sector, and multi nuclei), considering the behavior and motivation of the people. Bringing this to philosophical or ideological level, this approach reveals the correlation between urban structure and the driving ideology, either capitalism (market driven) or socialist (public driven) (Clark, 1982, Bounds, 2004).

Factors Influencing Urban Form

From the review, it can be concluded that there are variables or factors influencing the formation of urban (internal) structure. Those variables can be grouped into three main groups; physical environment, social-institution, and economic.

a. Physical evironment

Concentric model as the result of ecological and economic approach is based on the assumption that the model is applicable in a homogenous environment.

b. Social and institution

In the midieval (ancient cities), this variable was very dominant as that era was under the regime of feodalist and deterministic aristocrate. Urban structure, conceptually, was manifested in concentric form with the ruler in the center, and in layers, the authority and usage of land were dominated by the people affiliated with the ruler.

c. Economic

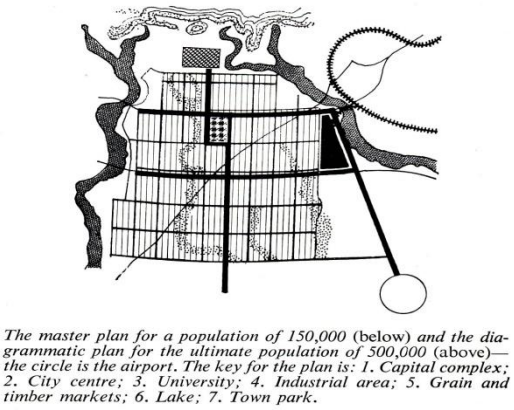
History has proven that economic is the machine of a city, thus this variable can be found in any form of urban structure. Economic variable can explain concentric growth based on land market and accessibility. This variable can also describe the formation of sector and multi nuclei structure through land market and location theory.

Further, urban structure model is not only effected by one variable, but it is very possible, particularly for developing cities with rapid growth of population, three variables operate at the same time, result in mixed structure, and it is difficult to distinguish one over another. Another notion is that the structure does not eliminate each other, but it can be manifested in different cities in the same period. This phenomenon proves the existence of the forth variable, which is locality, which enables the formation of different structure induced by the same factor.

II. Urban Structure Identification Techniques

a. Physical observation

This method is based on Lynch's study about urban structure. To identify the structure, Lynch used urban physical components as the signs. Those components are landmark, path, district, nodes, and edges (Lynch, 1960). The result, inter-correlated urban structure called as *the image of the city*, was then classified and illustrated in the city map.



The master plan for a population of 150,000 (below) *and the diagrammatic plan for the ultimate population of 500,000* (above)—*the circle is the airport. The key for the plan is: 1. Capital complex; 2. City centre; 3. University; 4. Industrial area; 5. Grain and timber markets; 6. Lake; 7. Town park.*

Fig. 8. Urban Structure Concepts
(Source: Hermanislamet, 1999)

Other technique was introduced by Watts (Watts, undated), which was based on urban activities in observable physical form. Activities or functions are reflected in the use of land, e.g. housing, trade, industry, education, offices, open spaces, road network, and urban utilities.

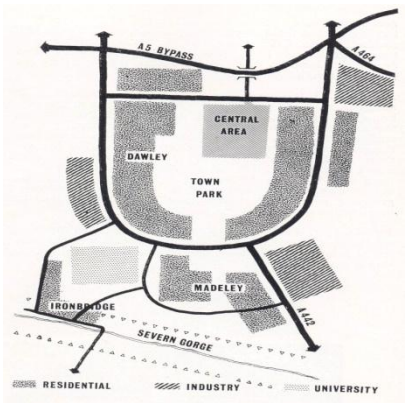


Fig. 9. Urban Structure Consept
(Source: Hermanislamet, 1999)

b. Map Analysis

Introduced by Doxiadis, this method classifies urban structure in functions, as homogeneous part, special part, and circulatory (Doxiadis, 1970)

A more familiar methodforurban planning practitioners is stated in the guidance of urban planning issued by the Ministry of Public Works (Public Works Act no 17/PRT/M/2009). This technique attempts to integrate information in thematic maps e.g. land use map, facility distribution map, road network map, utility map, and mobility of people and logistics. By overlaying the maps, an illustration about the urban structure is obtained. In order to overlay the maps, they need to have the same scale and observation time as overlaying is part of synchronic analysis process.

Weakness of the Current Techniques

The techniques mentioned above involve synchronic analysis, which relates variables assumed tobe applicable in the structure at the same period of time. The analysis describes merely *'what is'*, and does not explain '*how the process is'*, and even more *the meaning of the structure*. The illustration shows the distribution of urban space use, internal mobility prediction, and direction of physical development prediction. Eventually, there needs to be another approach to explain the process and the meaning of the structure. This analysis can only be performed by using diachronic analysis, which is part of historical approach.

III.Historical Approach as an Instrument to Identify Urban Structure

Cities, basically, are the products of human culture development. The existence of city is almost as old as human civilization (Short, 1999). Historical approach is thus the most appropriate technique to understand the alteration, as the development occurred in period of time (Mumford, 1991; Bounds, 2004). The oldest recorded history and facts of cities are found in Greece, e.g. Knossos in Creta (Mumford, 1991). The history of cities' development can be constructed to explain the *'what and why'* of the urban structure.

The History of Cities' Development

a. The initial existence of cities

Archeological proofs have revealed that the initial existence of cities is much related with the surplus of agricultural products. In order to manage the surplus, a leader was needed to maintain the condition. Elitists of the groups, which are commonly soldiers (aristocrat) and shaman, need the production surplus to maintain the source of income for the group.

Society culture and system at that moment reflected in urban form and structure. Pre-historical cities were commonly concentric, with the residence of the elitists, religion building, open space, and market at the center. The border of the area was defined by the elitists to protect their interests (Sjoberg, 1960; Radford, 1979; Mumford, 1991; Bonds, 2004).

b. Ancient cities (600 BC – 6 AD)

Different social structure emerged in Greece in 6 BC. Firstly, the governance system was monarchy then it altered, as the role of the public was strengthened, to democratic system. The ruler was on behalf of the people at the Senate. Philosophers and professionals were at the most important position in the governance. Cities were developed in a more systemic way, according to the ideas of the professionals and philosophers. Urban space segregation was not merely according to status and ethnic, but also profession or function. Generally, the urban structure did not transform, and remained concentric (Short, 1984). The pattern was continued by the Rome Monarchy, which did not only adopt, but also developed systemic urban structure (Sjoberg, 1960)

c. Trade Cities/Pre-Industrial Cities (6 AD – 17 AD)

The transformation of governance system occurred after the era of the Rome Monarchy. The governance system returned to oligarchy and was under the feudalist or aristocrat. In the other side, urban livelihood depended much more on trade sector. Wealthy cities were located in the cross junction or spots where trading occurred. The functions of cities were not only for cultural symbol, but also for the economic power of the region.

The increase of urban wealth due to trade activities had impelled the internal development of cities, particularly with the specialization of employment. One of the cities undergoing rapid and big transformation was Amsterdam. In 1550, there were only 20.000 residents, then in 1700 it had increased into 200.000. Other trade cities in Europe between 13 and 18 ADwere Bruges, Venice, Antwerp, and Genoa (Bounds, 2004). Those cities had structurally transformed from concentric into sector structure, because space segregation occurred not only due to social segregation but also job diversification.

d. Industrial Cities (18 AD – 19 AD)

The great development of economic in the end of 18 century continued in higher scale in 18 century, and had impacted hugely to the cities. Industrial activities, naturally, is a capital agglomeration, labors, and materials. The agglomeration of the three resources had led to rapid urbanization. New cities emerged where the three resources were located, particularly, energy (coal) for the machines to work (Short, 1984). The rapid development outperformed the infrastructure development, resulted in the

substandard cities in Europe, particularly in England, especially in terms of health.

This period has signified a totally different form of cities. Cities were becoming organic, from systemic beforehand, in the beginning of industrial revolution (18 AD). Organic model was characterized with the mixed of industrial location, warehousing, train emplacement/line, and slum settlement of the labors that dominated the city. At the peripheral area, high-class residential area with complete facilities were located. The housings of the elitists and the facilities were located in high-priced land, e.g. around the government's center, public square, and high-class stores, while housings of low-income family was founded at the backside. Urban structure was dominated by industrial and trade activities with non-systemic dispersal. Economic orientation dominated the land use. Urban physical structure clearly exposed social inequality. As the wealthy cities were triggered by industrial activities, unhealthy environment were followed.

e. Contemporary Cities (19 AC – now)

The development of cities after the industrial era, principally, has been showing the same character with that of the past periods. Social, cultural, and technology transformation implicated directly to the physical alteration of the cities. The transformation had strengthened the urbanization process, exemplified by the significant increase of cities with more than one million population. Cities appear as economic agglomeration. While at the trade and industrial period, cities were characterized with the agglomeration of industrial activities, in the end of 10 AD cities have become the agglomeration of capital, indicated by its role as the center of finance, information, and amenities (Frey and Zimmer, 2001).

In developed countries, capital agglomeration in urban area was followed by the progress of urban livelihood, meanwhile in developing countries there have been a degradation of life and environment qualities. Cities in developed countries progressed systemically and controllably, while those of developing countries grew organically and uncontrollably. Cities have been promising economic commodities for investors, so that urban development is determined by the activity of private sectors (Winarso, 2000; Frey and Zimmer, 2001; Abidin, 2012).

According to the discussion above, it can be concluded that economic factor is the main variable of the development of cities. Due to its location and resource, cities are capital agglomeration that trigger urbanization process. However, economic power does not always dominate urban living. In several cities, there are stronger spirit in the society, e.g. the social and cultural power of the people. Among the examples are Venice and Genoa, which functioned as trade city, controlled by Amsterdam, Bristol, Manchester, and other harbor cities. However, as the center of culture, European cities has inevitable position, thus it remains until now the center of world tourism. Also in Vatican and Mecca, which become world cities not because of the economic position, but for its spiritual and cultural power.

Reconstruction of Urban Spatial Structure

In historical approach, in order to comprehend past occurrences, reconstruction is needed by integrating related information. The closure of reconstruction results and the actual incidents is determined by the quality of information and the ability to interpret every information and the relation between information.

One of the reconstruction techniques is to construct and define urban spatial structure with maps, as is performed by Hermanislamet in his research to reconstruct the urban spatial structure of Majapahit (Hermanislamet, 1999).

The method was to construct thematic maps about the information related to Majapahit's city. Those maps were then overlaid and resulted in *composite map*. The composite map is an integration of all information put in the thematic maps.

The thematic maps comprise the characters of cities described in the manuscript (*babad*), the previous researches, or artefacts. The process of thematic maps construction needs interpretation because the information is descriptive. It is possible that one map should be cross checked to another so that correct illustration can be obtained. Before it is puton the map, the description is constructed in a scheme or spatial concept to see the relationship between the spatial components described.

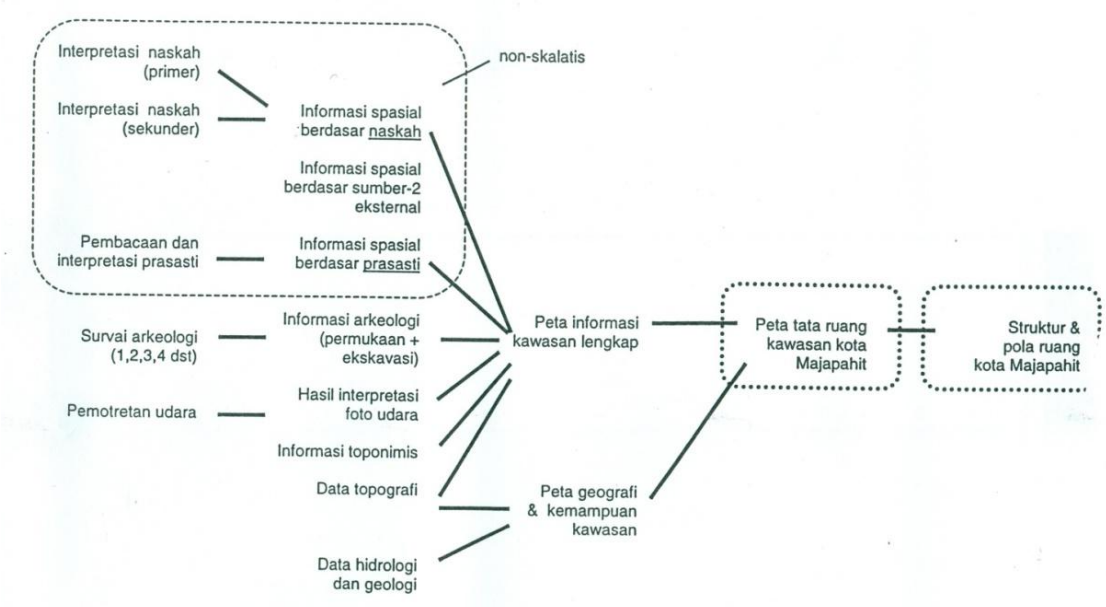


Fig. 10. Urban structure Identification process
(Source:, Hermanislamet, 1999)

In his research, Hermanislamet assembled the concept and thematic map according to the interpretation of the manuscript of Negara Kertagama, previous researches, interpretation of inscription and archeological artefacts. The main resource is the manuscript of Negara Kertagama because the manuscript was referred by other previous researchers e.g. Kern, Maclaine Pont, Stutterheim, Pigeaud, and SlametMulyana.

The next phase is reading the composite map and contest the reliability. This process needs accuracy to comprehend the relationship of the constructed information, how to filter the information which negates one another, and how to strengthen complementary information. Cognition aspect remains important in this process because the comprehension of the information is determined by the ability of logical thinking and information integration.

In interpreting thematic or composite maps, simplification is needed by modelling the phenomenon of information in diagrams thus it is easier to discuss. By simplifying, the relation of themes of each map is easier to be observed, transversally and longitudinally. The example of the simplification is stated below:

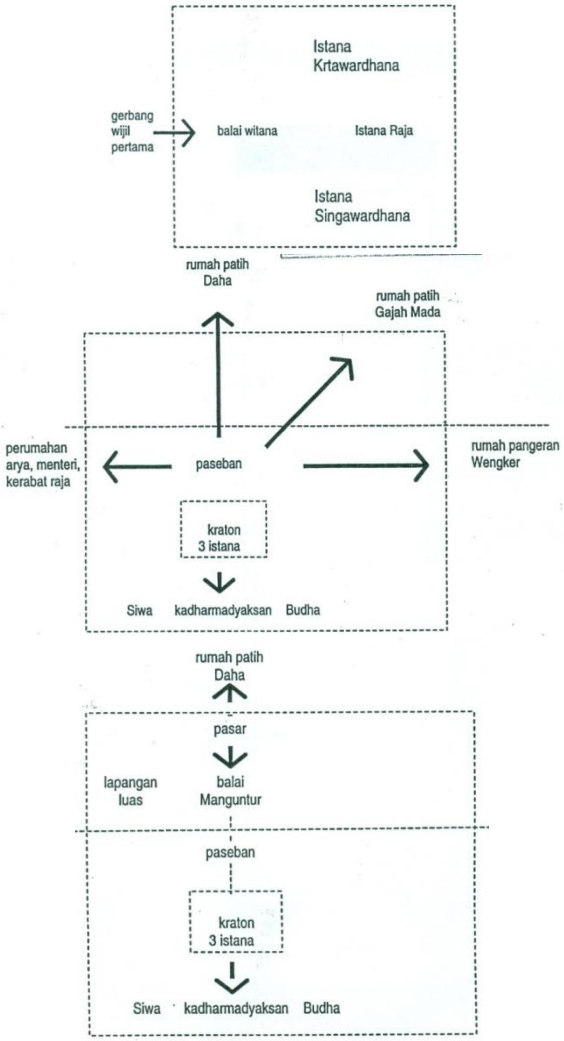


Fig. 10. Spatial Interpretation: The Diagram of the Inner Space of Kraton-Tiga Istana
(Source:Hermanislamet, 1999)

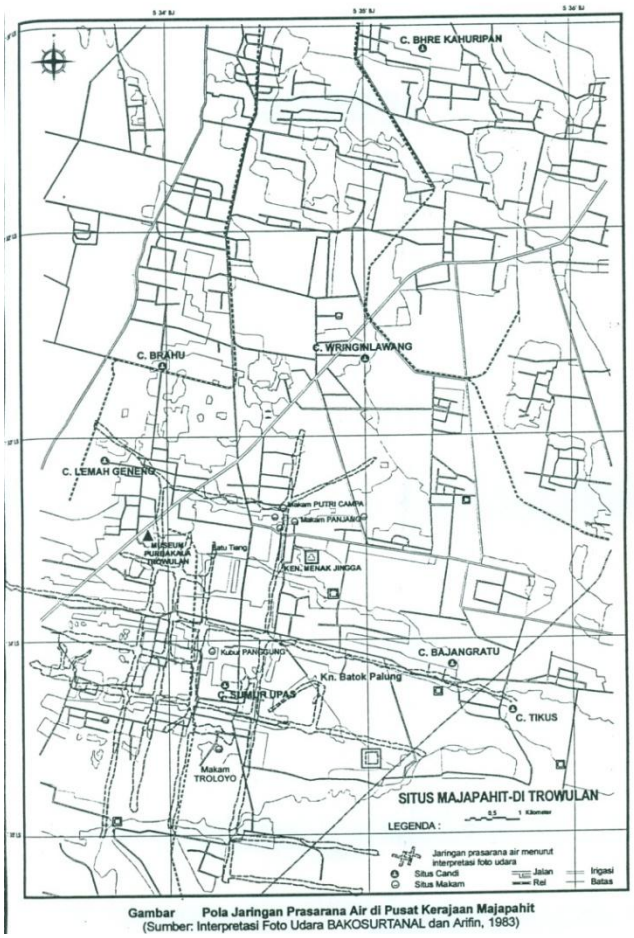


Fig. 11. Water Infrastructure Network in the Center of Majapahit
(Source: Bakosurtanal and Arifin, 1983 in Hermanislamet, 1999)

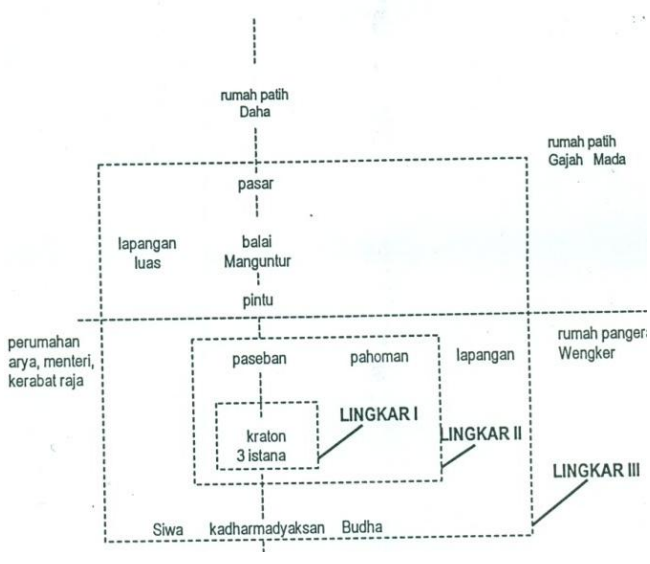


Fig. 12. The Diagram of Location and Orientation of Main Spots in Majapahit: Consolidation of Spatial Interpretation Results
(Source: Hermanislamet, 1999)

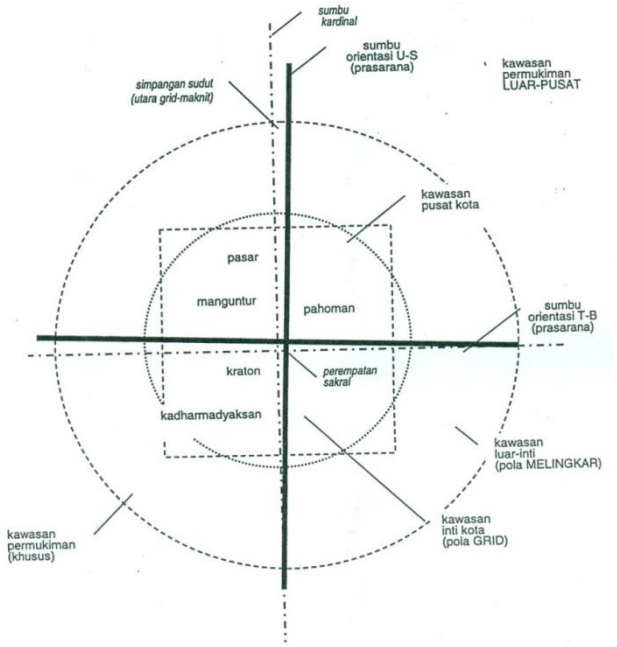


Fig. 13. Spatial Model of Kota Majapahit
(Source: Hermanislamet, 1999)

IV. Conclusion and Recommendation

Strength and Weakness

From the discussion above, the main problem of historical approach in identifying urban spatial structure is in the interpretation process, both in constructing descriptive information into the thematic maps and reading the composite maps.

a. Thematic maps construction

The difficulty in formulating the thematic maps is constructing the descriptive information (normally historical source in description or unscaled picture) into the thematic maps which are compatible to be overlaid. This process comprises synchronic analysis because the mapped information is based on certain period of time.

b. Composite maps interpretation

In order to explain the reality, supporting information indirectly related to the urban structure is needed, e.g. social livelihood development, the transformation of society's structure, and other information about the activity on that era. Interpretation analysis is a diachronic process because the overlaying of maps reveal the transformation of cities and the urban structure.

The findings of Hermanislamet, for example, explained the urban structure of Majapahit is quite similar to that of in India. The difference relies on the strong local culture. Grid structure is a universal structure, yet land use distribution is the reflection of local culture. This incidence is commonly occurred in Java, i.e. *wayang* adaptation,

sekaten, and ritual ceremonies which still exist nowadays in Yogya and Solo.

On the other hand, this method is able to explain the process of the formation of urban spatial structure, the transformation, as well as the interpretation of urban structure. It is possible to construct them because the method integrate the occurrences and see both from synchronic and diachronic perspectives. Transversal and longitudinal information can be comprehended by overlaying thematic maps.

Recommendation

Historical approach enables the explanation and interpretation of urban spatial structure, however quite long period of time is needed to observe the transformation of the city, in which often cities do not have records about its own development phases. Generally non spatial occurrence implicated on spatial terms can be identified as an important milestone of the city. Those events were directly or indirectly recorded in manuscript, artefacts, of tales. Thus, historical approach is important to understand the life and development of cities which have particular role in the development of a nation. Comprehension about urban structure can be an inspiration for the next generation due to the value it comprises.

Historical approach can also be used to apprehend the spirit of cities' development, as in Venice, Antwerpent, Genoa, and other historical cities in the world. For a city aiming to build an identity, studies in historical approach should be considered because the tendency of urban development follows globalization trends, which is characterized in the uniformity of cities and according to the concept of resource use efficiency and commodification of land (Setiawan, 2006; Kusno, 2012)

The identification of urban structure and form is a guidance for decision maker to decide conservation and development policy. Conservation is not merely protecting artefacts or sites, but also an attempt to inherit the identity, pride, and spirit from urban developer, in particular, and country, in general as the energy to build the future. Cities without identity are cities without significance because there is no distinguishable feature compared to other cities.

References

1) Alonso, W, 1964; *Location and Land Use*: Toward a General Theory of Land Rent, Cambridge, Mass. : Harvard University Press.
2) Bound, M, 2004; *Urban Social Theory*, Oxford, Oxford University Press.
3) Burgess EW, 1925, *The growth of the City*; an introduction to a research project. In *The City*, RE Park; EW Burgess; RA McKenzie (eds), 47 – 62, Chicago; University of Chicago Press.
4) Chapin, SF and Weiss SF, 1962; *Factors influencing Land Development*, Chapel Hill: University of North Carolina Institute for Research in Social Science.
5) Christaller, W , 1966, *Central Places in Southern Germany* (translated by C. Baskin), Prentice Hall, Englewood Cliffs, NJ.
6) Craswell, *Reseaerch Design: Quantitative and Qualitative approaches.* Thousand Oaks Califf. Sage Publication, 1994, p. 5.
7) Doxiadis, CA,1968; "An Introduction to the Science of Human Settlements", New York, Oxford University Press.
8) Evans AW, *Economics & Land Use Planning*, Blackwell Publishing Ltd, Oxford OX4 2DQ, UK, 2004.
9) Groat L & Wang D, Architectural Research Methods, John Wiley & Sons, 2002.
10) Hall P., ed., 1966; *Von Thunen's Isolated State*, Oxford: Pergammon Perss.
11) Harris, CD and Ullman, EL, (1945); "The Nature of Cities", in *Ann. Am. Academic Policy Science*, 7, p.242.
12) Hermanislamet B, 1999; "Tata Ruang Kota Majapahit", UGM Yogyakarta.
13) Hurd, R.M., 1903: *Principle of City Land Value*. New York: Record and Guide.
14) Isard, W., 1956: *Location and Space Economy*. Cambridge, MA: MIT Press.
15) Kusno A, 2012; 'Politik Ekonomi Perumahan Rakyat dan Utopia Jakarta. Penerbit Ombak, Yogyakarta.
16) Lynch, 1960, *The Image of the City*, MIT Press, Cambridge, Massachusets.
17) Morgan, G & Smiircich's, L. 1980: *Continuum of research paradigms,*
18) Mumford, L, 1991; *The City in History*, Penguin, London.
19) Paddison, R, (Ed), 2001; *Handbook of Urban Studies*, Sage Publications, London.
20) Rapoport A., 1977: *The Human aspect of Urban Form: Toward a Man Environment Approach to Urban Form and Design*. Oxford: Pergamon Press.
21) Ratcliff, RV,1949; *Urban Land Economics*, New York, McGraw Hill Book Company.
22) Setiawan B., 2006, *The Future of Kampung In Indonesia*, Costs and Benefit of Illegality, Seminar Integrasi formal dan Informal sektor, Yogyakarta, 2009.
23) Short, John R, 1984; *An Introduction to Urban Geography*, Routledge & Kegan Paul, London, Boston, Melbourne and Henley.
24) Sjoberg, G, 1960; *The Pre - Industrial City; Past and Present*, Free Press, Chicago.

Successfulness of Denggung Park as a Public Space

Indriani, Y. [*1], Nugrahandika, W. H. [2]

[1] Undergraduate of Urban and Regional Planning, Departement of Architecture and Planning, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia

[2] Lecturer of Departement of Architecture and Planning, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract

Public space is important public amenity in a city. Public space must be balance between preserving nature and providing public use (for recreational needs). Public space is defined as social space of community to do many activities and interaction with other people; not only as city property but also as important needs of community (Sadana, 2011). Example public spaces in city is city park.

Denggung Park is a large city park in Sleman, D. I. Yogyakarta, which interesting to be studied. Public space literature dominantly described such as components, character, dimensions, and functions of public space, yet explaining the measurement and analysis factors make successfulness of public space. Therefore, aim of this study is to describe measurement successfulness of public space with seven variables as individual, physical setting, activities, accessibility, comfort, safety and accommodation, and other factors that influence public space successfulness at Denggung Park.

This research used qualitative deductive method. This research's finding Denggung Park success as a public space with a very successful rate (92.8%) for individual variation as park users, a complete physical setting, variation of activity, ease of accessibility, a high comfort, a high safety and a high accommodative. Denggung Park successfull to become a public space influenced by three main factors, such as completeness of physical facilities, ease the physical and social accessibility (free entry), and sincerity to carry out Goverment policy in the planning, development and management of public space.

Keywords: Public space, success, park.

1. Introduction

Now, many developed city have a stressed condition because a high urban physical environment make environmental imbalance and peoples feel stress. To overcome these problems, the existence of public space is one of the solutions and the needs of a city.

Public space is a place of social interaction for people to interaction dan do many activities with other people with peaceful and safe (Sadana, 2011). Public space should not only complementary physical setting in city for economic goals, but it is urgent needs of a city. The problem is the existence of a public space is often not recognized with a real function public space by peoples. If it is allowed to continue it will make public spaces failure and will die as a public space.

One of example public spaces in city is city park.Denggung Park is a large city park in Sleman, D.I. Yogyakarta as a green open space and center of community place to interacted each other. This park has a strategic location because it was near arterial roads (Jalan Magelang) and near a variety functions building as Government office, commercial and services, and near a residential community. Denggung Park is favorite place to peoples comes because have a good location and many facilities so this place interesting to be studied.

According to the background stated, this research is performed to answer: was Denggung Park is a successful public space, and how success rate as a public space?; and, what a factors to be Denggung Park as a successfulness public space? This research attempts to identify and measurement Denggung Park as a public space and find factors make successfulness of public space. Essentially, this research responds to the call for a new responds to constraints and challenges of the future especially about to make successfulness public spaces in a city.

This research has described the use of public space, utilization patterns, effectiveness, and public perception of the use of public space but to the study of success and the factors that affect the public space so far have not been found. Therefore, research is necessary to do so can be found a measure of success of a public space that is ideal and can reduce the

Indriani
Undergraduate of Urban and Regional Planning, Departement of Architecture and Planning, Faculty of Engineering, Universitas Gadjah Mada
E-mail: yuvitandriani@ gmail.com

failure of public space in Indonesia.

The remainder of the article is structured as follows: First, it reviews the extent literature relevant to park city and public space theory. Then research methodology and data analysis techniques are presented. Next, findings are discussed and summarized.

2. Relevant Literature

2.1 City Park

Formerly in Indonesia, city park is a open space traditional square. However, in modern era of urban design, city park developed into a public place that used by peoples to rest and relax (Frick and Mulyani, 2006). In general, a city park is an area or region that open space without building, active place, public, and multi-function (Zhand, 2006; Judge and Utomo, 2008; Setiawan and Rahmi 2008 ; Peraturan Menteri PU No. 05/PRT/M/2008; Joga, 2009). City park is one form of green open spaces that can be used by everyone and used for a variety of activities without the cost, and usually a mix open space (active and passive) that the park can enjoy its beauty at the same time there can be used for various activities by the public.

Park city has the physical elements that complement the park as open green space and public space by the community. Elements in the park will support a park be functional to use and add aesthetic value. According to Judges and elements of a city park can be classified into two namely as soft materials (plants and water) and hard materials (furniture and facilities). As part of the urban green space, urban park is a green open space to be built is a combination of natural elements and facilities that are public woke owned and managed by local governments for public (Frick and Mulyani, 2006; Setiawan and Rahmi, 2008; and Utomo,2008). Garden cities possess an important role in the urban spatial ecological functions that support, socio-cultural function, aesthetics, and economics (Frick and Mulyani, 2006; Peraturan Menteri PU No. 05/PRT/M/2008). The four major functions can be combined according to needs, interests, and sustainability of the city such as the protection of water management, ecological balance and biodiversity conservation in an urban area.

2.2 Public Space

Public space is important public amenity in a city. Public space is a place that can be accessed and used public for people to meet each other, get together and express themselves, so a public space must be responsive, democratic and meaningful place (Sadana, 2011). Public spaces in urban areas are generally open space that everyone is free to enter and used no charge to accommodate the various interests of the general public (Hakim and Utomo, 2008; Setiawan and Rahmi, 2008). Type of public space such as such as roads, parks, public facilities (such as playgrounds, neighborhood parks, and sports fields) in residential areas, plazas, malls, sports stadiums, and other.

Public space is part of the urban space as it can be a place for good people to do a variety of activities or favored option activity and social activity. According Sadana (2011), there are many different types of activities that often do people in public spaces such as: sport, enjoying the weather, learning nature or hobbies, fun together for annual event or special events, relaxation, and make the activities economy. Therefore, the public space is a space that can be used by various segments of society. Good public space can be seen from the space utilization by individuals as user. In the utilization of public space there are many types of activities undertaken by people freely to enter and use at no charge.

2.3 Theory Successfulness of Public Space

The success is derived from the results mean something held by a business; result: the denouement; succeeded: got results, not fail, so the success implies that the process of getting results as a result of organized efforts (Kamus Besar bahasa Indonesia, 2013). Public space is a place of social interaction to the cultural city of citizen interaction with other people who are generally free to enter and visit it even can do a variety of activities at no charge (Hakim and Utomo, 2008; Setiawan and Rahmi, 2008; Sadana, 2011). From this definition, it is concluded that the successfulness of public space is a process or act gets of the use of space by peoples to visiting and doing activities in public spaces.

To measure the success of a public space then there is a specified indicators. Here are today several indicators to identify the successful utilization of public spaces by several authors.

Table 1. Deduction Matrix Theory Results

Indicator	Shirvani (1985)	Carr *et al*. dalam Carmona (2003)	Gehl (2004)	Kurniawati, dkk (2005)	Carr dalam Budiyono (2006)	Hatmoko dalam Mirsa (2012)	Weisman dalam Mirsa (2012)	PPS (*Project for Public Space*)	Intensity
Individual	■						■		**2**
Organization							■		**1**
Physical Setting	■					■	■		**3**
Activities	■	■				■		■	**4**
Accessibility						■	■	■	**3**
Comfort		■	■	■			■	■	**5**
Safety			■	■			■		**3**
Pleasure			■						**1**
Accommodative				■	■			■	**3**
Democrative					■				**1**
Meaningful					■				**1**
Legibilitas							■		**1**
Control							■		**1**
Territoriality							■		**1**

Source: Indriani, 2013

From the above matrix can be concluded that there are several indicators that are both mentioned by the authors. From the intensity of the emergence of the theory then be concluded that there are seven indicators that become variables in the research on the identification success rate of utilization of public space, namely: individual, activity, physical setting, accessibility, comfort, safety, and accommodating.

3. Methodology

3.1 Research Method

This research used mix method. First, to identify, measurement and find factors make successfulness of public space using qualitative methods. To strengthen the result to measurement of successfulness level then using quantitative methods.nWith this approach, researchers can better describe and analyze the situation that occurred in the Denggung Park, and data collection explore existing resources in the field by observations and interviews the respondent to visitor Denggung Park. A interviews was tested in 46 respondents during April-June 2013.

3.2 Research Location

Denggung park is one of public green open space in Sleman, Yogyakarta, which has an area of about 15,822 m² Denggung Park has a strategic location because it is located on the edge of Jl. Magelang-Jl. Pringgodiningrat, Tridadi, Sleman. The location was close to the seat of government of Sleman district and is surrounded by residential functions, commercial and services make Denggung park as public space.

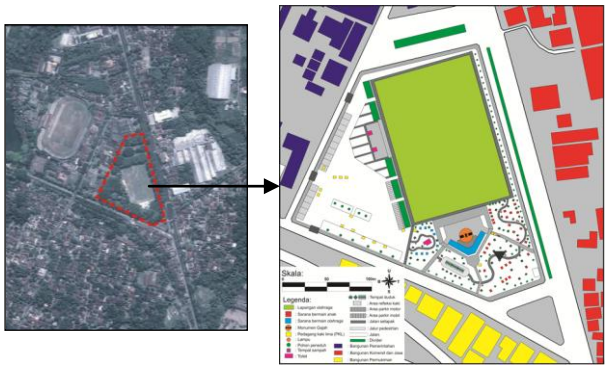


Figure 1. Denggung Park in Yogyakarta
(Source: Indriani, 2013)

3.3 Measurement

Successfulness of public space used seven variables such as: individual, activity, physical setting, accessibility, comfort, safety, accommodating. Used indicators and parameters are served in Table 2 below:

Table 2. Parameter on Successfulness of Public Space

No	Variable	Indicator	Parameter	Scale Percentage	Percentage Success Rate
1	Individuals	a. Age b. Gender c. economy d. Motivation visit e. Intensity visit f. The number of visitors	successfulness if accommodate all individuals from different characteristics and have high visitor numbers	100%	a. Very successful: 81-100% b. Success: 61-80% c. Quite successful: 41-60% d. Less successful: 21-40% e. Not successful: 1-20%
2	Physical Setting	a. Vegetation b. Sport facilities c. Play facilities d. Sanitary facilities e. Seating facilities f. Parking g. Facilities h. Monument or landmark	successfulness if accommodate all activities both active and passive activities for all day or special day.	100%	
3	Activities	a. Sport b. Learn c. Unwind (relax) d. Enjoy the weather e. Fun together f. Economics activities	successfulness if physical facilities are available and complete and in a good condition	100%	
4	Accessibilty	a. Accessibilty to the park b. Accessibilty in the park	successfulness if has easy accessibility (to and in accessibility park)	100%	
5	Comfort	a. Comfort of the physical condition b. Comfort of the social and psychological condition	successfulness if visitors feel comfort to visiting and doing various activities	100%	
6	Safety	a. Safety of the vehicle and traffic b. Safety against crime and violence c. Safety against unfavorable weather conditions	successfulness if visitors feel safety from inside and outside interference	100%	
7	Accommodative	a. Accommodating to all users b. Accommodating to doing various activities	successfulness if accommodating to all users and to doing various activities	100%	
		TOTAL (Σ Percentage Variable: Variable Σ)		100%	

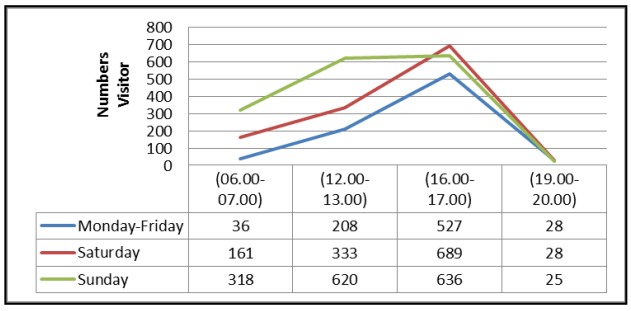
This stage of analysis is aimed to measurement successfulness level of public space. The percentage is expected to be resulted through the analysis.

4. Results

4.1 Analysis Succesfulnes of Denggung Park as a Public Space

Succesfulnes of Denggung Park as a public space is measurement by seven variables such as: individual, activity, physical setting, accessibility, comfort, safety, accommodative. The result is:

a. Individuals as Denggung Park visitors. Denggung Park be a center public space in Yogyakarta because many peoples come there. It measured by the number of visitors at Denggung Park.



	(06.00-07.00)	(12.00-13.00)	(16.00-17.00)	(19.00-20.00)
Monday-Friday	36	208	527	28
Saturday	161	333	689	28
Sunday	318	620	636	25

Figure 2. The Average Number of Visitors in Denggung Park (Sources: Indriani, 2013)

From these results it can be found that the highest number of visits in the afternoon is at 16:00 to 17:00 pm both on workdays (Monday-Friday) and weekend days (Saturday-Sunday), while the lowest number of visits is during night time at 19:00 -20.00pm. The higher the number of visitors and the more varied backgrounds of individuals as user space (age, gender economic level), the more accommodating a public space for the individual. Each individual have a motivation to visit Denggung Park, it make Denggung park is increasingly becoming an attractive and interested place. From the interview, only 35% of individuals who have erratic visiting Denggung, Park whereas 65% have a disciplinary intensity to visiting Denggung Parks. It findings when individual arrival intensity Denggung Park.

Denggung Park as public space to accommodate a various range of age groups such as children, adolescents, adults, and parents both a male and femal, but the age group form a pattern of use of the park. Denggung Park as a public space that is open to the public because it can be enjoyed by people of all classes regardless of economic level.

The motivation and the intensity of the arrival of individuals also become important in a public space so as to measure the attractiveness of a public space for people to use and exploit Denggung Park. Therefore, individuals as visitors make Denggung Parks Parks Denggung managed as a public space because it can accommodate individuals as measured by the number of visitors to the park visitors and the high intensity of the arrival of the always great every week even Denggung Park also accommodate individuals of various backgrounds of age, type of sex, occupation and motivation visit very varied. It shows the variation of individual shows Denggung park accommodating and democrative for all classes of individuals.

b. Physical setting is complete park elements in the form of physical and non-physical forms such as vegetation, sports facilities, play facilities, fsailitas cleanliness, parking facilities, seating facilities, monument or marker, and other supporting facilities such as garden lights, water catchment areas, stage ceremony, free hotspot service and CCTV, and the informal sector such as street vendors (PKL) trade and services. But there are some facilities which have conditions such as poorly maintained such as children's play facilities, toilets and garden lighting. In addition, from interview, there's visitor need a some facilities but nothing in Denggung Park such as a place of worship (musholla/ mosque) and the gazebo as a shade from rain.

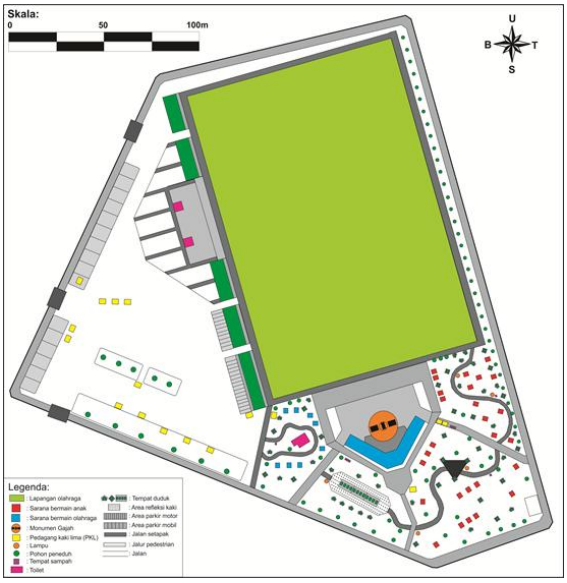


Figure 3. Physical Setting in Denggung Park (Sources: Indriani, 2013)

c. Denggung Park accommodate for all activies both active and passive activities such as: sports (soccer, cycling, running and playing sports facilities, learn (kindergarten visits, developing interests or hobbies such as skateboarding), unwind (sitting, relaxing walks, playing, eating and drinking), enjoying the weather, special events (mass gymnastics, campaigns, teacher workshops, music concert events, even events of various races), and economic activities (informal sector/ street vendors). Therefore, Denggung Park is managed as a place in a public space to accommodate a variety of activities.

Figure 4. Sport Activities at Denggung Park
(Sources: Indriani, 2013)

Figure 5. Relax Activities at Denggung Park
(Sources: Indriani, 2013)

d. Aspect of the easy accessibility to the park and in the park itself which consists of the ease of accessibility of available physical and social accessibility is the ease of access to the park at no charge to get in (free). Accessibility becomes an important variable in the success of a public space because to be successful, a place must be easily accessible in a way that is easy and affordable. From the analysis, Denggung Park has a good level of accessibility and easily accessible by a variety of vehicles and non-vehicles (on foot). Ease of access to the park is also supported by good physical condition as the road to the park that has been hardened and access within the park that has been provided convenient for pedestrians so that visitors can access the park easily. Denggung Park also have social accessibility as a public space because it can be enjoyed by a variety of individuals at no charge (free) making Denggung park more accessible to all individuals. Therefore, ease the physical and social accessibility given to users to make Denggung Parks managed as public space.
e. Aspects high comfort perceived by individuals in utilizing Denggung Park as a public space like the convenience of the environmental conditions, physical, social and economic given Denggung Park. Visitors expressed Denggung Park is a public space that free cost to enter and perform activities so that the comfort of the social level is also quite high because it can freely interact and communicate with each other. Therefore, Denggung Park has a great convenience as a public space that is influenced by environmental conditions in terms of ecological and provision of vegetation, which is supported by the physical condition of the facilities available to support a variety of activities, and social conditions as perceived visitors Denggung Park is a public space free entrance fee (free), cozy and comfortable from social disorders to interact with each other.
f. Aspect of safety is low to interference from both inside and outside the Denggung Park. From the analysis, it can be stated Denggung Park as a public space that are considered safe by park visitors. The sense of security as a sense of security to the vehicles and traffic, crime and violence, and the unpleasant things that might happen like rain, pollution, and high winds. Thirdly it makes Denggung Park but felt safe enough not maximized create a sense of security, especially in the security against crime and violence and unpleasant things that might happen as rainy weather and high winds. Therefore, a sense of security in the park Denggung considered quite successful but not maximized so that the perceived need for increased security level back supported by the physical development of the park.
g. Denggung Park success accommodating to all visitors and in a variety of activities. Denggung park is one of the accommodating space as public space. From the results of field observations, every day Parks Denggung used by all levels of society, both men and women of children, adolescents, adults and the elderly. In addition, the results of interviews with respondents also expressed Denggung Park very accommodate all visitors from different backgrounds, it because Denggung Park facilitate all visitors from various backgrounds age, gender and economic level (profession/ work). Denggung Park also accommodating to all the needs of society to move because Denggung Park has complete facilities that accommodate a variety of activities such as sports, play, recreation, relax, sit around and eat and drink. All activities can be performed by any visitor to the availability of complete facilities to Denggung Park be accommodating container as public space.

Seven indicators above proved the success of the Denggung Park that attracts many people come to the Denggung Park views of the average number of visitors per day for 25-689 people with the intensity that always routine visits every week. However, the park has a slight shortage Denggung particularly in the visitation park at night and rainy weather, so it can be done Denggung Park development in order to overcome these problems. Of testing success

Denggung Park as a public space above the subsequent measurement of the level of success Denggung Park to determine to what extent the success Denggung park as public space. In measuring the success rate, the method of analysis used is the Likert Scale measurements, which are grouped into five levels. Here is a measure of the success rate Denggung Park as a public space in Sleman, Yogyakarta.

Table 3. Measurement of Successfulness Denggung Park as Public Space

No.	Variables	Percentage
1	Individuals	100%
2	Physical Setting	90%
3	Activities	100%
4	Accessibility	100%
5	Comfort	93%
6	Safety	67%
7	Accommodative	100%
TOTAL (Σ Percentage Variable: Σ Variable)		**92,8%**

(Source: Indriani, 2013)

From the measurement of the success rate above Denggung park based assessment indicators then found success percentage Denggung Park is 92.8% indicating that the park is a public space Denggung very successful (included in category 1) but there are still some things that need to be improved in order produce maximum utilization as a public space.

4.2 Factor of Successfulness of Public Space

Denggung park is one of the largest public space in Sleman, Yogyakarta, which is unique as a green open space (RTH) in the form of park city town forest as well. From the results of testing and measuring the success rate Denggung Park as a public space, Denggung Park expressed as a successful public space with public space levels approaching very successful (92.8%). The success is supported by individual, physical setting, activities, accessibility, comfort, safety, and accommodating that can be found and felt intertwined with each other and produce a successful public space.

The success Denggung park as public space does not occur directly but through the various processes of dynamic linkages between the relationship of physical settings, individuals and activities that occur. In the Garden Denggung, availability and completeness of the physical facilities the park is a factor that affects the success Denggung Park. However, behind the availability and completeness of the garden there is a physical facility that Government policies play a direct role in the dynamic process of creating successful public spaces. In addition, factors that influence the success of Denggung park is also included in the ease of access to the park, both physical accessibility and social (individual ease Denggung freely access the park at no charge / free). Therefore, there are three factors that influence the success of Denggung Park as a public space that is the completeness of the physical facilities, ease of accessibility (physical and social), and government policies. These factors enter into the process of creating dynamic linkages Denggung Park as a public space that is managed as a successful public space is not just a one-off but it is a dynamic process in its development. Therefore, inside there are the success factors that affect success Denggung park as public space, namely:

a. Physical Setting
b. Accessibility
c. Government policy

Those three things will be explained in detail in the following analysis and identification.

5. Conclusion

Denggung Park is a public space that has the criteria as a very successful public space with a great performance that can be an example for creating successful public spaces in other places. Success of a public space is a series of dynamic process that is created between the policy of the Government in the planning, development and management of public space with the relationship between the individual, the physical setting, and activities that make a public space has its appeal. Successfulness of public spaces is influenced by three factors such as the completeness physical facilities, ease of accessibility, and influences government policies.

Through this research, it is notable that a park city can function not only as a complement city property but also as an important place to people interaction each other. Therefore, a successfulness public space must be support from Government and community in planning, development and management of public space. Making a successfulness public space is a dynamic process to relationship between government policies that affect the public sphere, especially completeness of the physical facilities to make magnets and attraction of individuals to visit the park.

References

1) Altman, Irwin dan Zube, Ervin H. 1989. *Public places and spaces*., New York, Plenum Press
2) Anonim. 2004. "SNI 03-1733-2004 tentang Tata Cara Perencanaan Lingkungan Perumahan di Perkotaan", Bandung : Badan Standardisasi Nasional.
3) Anonim. 2007. "Undang-Undang nomor 26 tentang Penataan Ruang", Jakarta: Direktorat Jenderal Penataan Ruang.
4) Anonim. 2008. "Permen PU Nomor 05/PRT/M/2008, tentang Pedoman Penyediaan dan Pemanfaatan Ruang Terbuka Hijau di Kawasan Perkotaan", Jakarta : Direktorat Jenderal Penataan Ruang Departemen Pekerjaan Umum.
5) Carmona, Matthew dkk. 2003. *Public Places, Urban Spaces: The Dimension of Urban Design*, New York, Architectural Press.
6) Frick, Heinz & Mulyani, Tri Hesti. 2006. *ArsitekturEkologis*, Yogyakarta, Penerbit Kanisius (Anggota IKAPI).
7) Gehgold,Jan. 2004. *Public Space, Public Life – in the 21st CENTURY*, Copenhagen: Gehl Architect dan Urban Quality Consultans.

8) Hakim, Rustam & Utomo, Hardi. 2008. *Komponen Perancangan Arsitektur Lansekap*, Jakarta, PT Bumi Aksara.
9) Haryadi & Setiawan, B. 1995. *Arsitektur Lingkungan dan Perilaku*, Yogyakarta, Direktor Pendidikan dan Kebudayaan Republik Indonesia.
10) Joga, Nirwana. 2009. *RTH 30%! Resolusi (Kota) Hijau*, Jakarta, Penerbit Gramedia.
11) Kamus Besar Bahasa Indonesia (KBBI). *http://kbbi.web.id/* diakses tanggal 7 Januari 2013, pukul 14.33
12) Kurniawati, Wakhidah dkk. 2005. *Studi Penataan Ruang Publik Berdasarkan Aspek Keamanan Bagi Wanita*, Semarang, Direktorat Pembinaan Penelitian dan Pengabdian Masyarakat, Direktorat Jenderal Pendidikan Tinggi.
13) Mirsa, Rinaldi. 2012. *Elemen Tata Ruang Kota*, Yogyakarta, Graha Ilmu.
14) Project for Public Spaces. 2012. *How to Turn a Place Around*. New York: *http://www.pps.org/reference/grplacefeat/ (*accessed by July 2th 2012 at 21.44)
15) Sadana, Agus S. 2011. *Ruang Publik dan Kehidupan Warga Kota*. Jakarta, Kios Bacaan.
16) Sadyahutomo, Mulyono. 2009. *Manajemen Kota dan Wilayah*. Jakarta, PT. Bumi Aksara
17) Setiawan, Bakti & Rahmi, Dwita Hadi. 2008. *Kota Ekologis*, Jakarta, Kementerian Lingkungan Hidup.
18) Shirvani, Hamid. 1985. *The Urban Design Process*, New York, Van Nostrand Reinhold Company
19) Zhand, Markus. 2006. *Perancangan Kota Secara Terpadu*, Yogyakarta, Penerbit Kanisius (Anggota IKAPI).

Planning Context

Second Session Parallel Notes
Moderator: Alexander Rani Suryandono

K5 Room 2nd Floor
15.00 – 16.00

Presenter	:	**Imma Widyawati A (Universitas Brawijaya)**
Title	:	**The Possibility of Transportation Demand Omotenashi (TDO) Works u the City Centre in Malang City**
Presentation Duration	:	**14 minutes**

PRESENTATION CONTENTS

- TDO is an implementation of transport DM management (TDM) that is livable, TDO divided 3 part Hospitality, familiarity, and warmth.TDO to reduce potential problem traffic.
- Use the customer to analyze the quality of the public transport.

3 part of TDO

1. Hospitality :
   Also implies familiarity in socializing, related street desain.
2. Familiarity
   It offers a principle of familiarity with parking management and optimization of public transport to reduce private vehicle.
3. Warmth
   Implies a state of excited, pleased, and happy, it offers a unique characteristic of the region

Study area : City center of Malang City

1. MOC Side
2. Tugu side
3. Alun2 merdeka side

Strategy TDO :

- Improve pedestrian
- Improvement of public transport and public transport lane
- Parking management and car pool
- Management of student and employee traveling
- Law enforcement

Conclusion :

- The characteristic of the traffic, based on three variables (hospitality, warmth, and familiarity) need to improve
- The possibility of TDO in the city centre is 67%.

DISCUSSION

Questioner	:	Hassim Mat (Universiti Sains Malaysia)
Question	:	Why you can say that car pool is the effective way? And how to make car pool succesfull?
Answer	:	It is from the quisioner from the public, it shows that the parking management and carpool get the highest percentage. Carpool like the center of the private car to park there then they can go anywhere use the public transport from the carpool. It can more success by give a different place for walk and parking.

Presenter	:	**Nurtati Soewarno (ITN)**
Title	:	**The Study of Smart Growth Concept in Arrangin Residential Environment in the City Centre. Case Study : Building Transformation in Pasar Baru Area - Bandung**
Presentation Duration	:	**about 12 minutes**

PRESENTATION CONTENTS

Residential Environment at Bandung City Centre

Historical Background

1. The first residential environment is indigenous kampong
2. Kampong growth simultaneously with the construction of the Jalan Raya Pos and the moving of the district capital of Bandung from Krapyak to Alun Alun(1811)
3. Grid pattern divided kampong into blocks
4. Further on the facade of the block becomes row of shop houses

The Accessibility to Kampong

Through small cobbled streets (alley) which are located between the row of the shop houses. Access to Alkateri Block : Some of them are closed by semi informal door.

The Transformation

1. Transform to other shape applying similiar pattern
2. Transformation is an effort to addapt the old shop houses to the new function and shape
3. The adjustment could be done by changing part of the building (alteration) or modification from the old to the new shape.

The building typology at Kampong

1. Previous Time : traditional models and semi-permanen building mass
2. Present time : modern house models and permanen building mass

Transformation of the Building

Changing part of the building or modification from the old shape or style to the new one. Two houses in one roof (for commercial)

Transformation of the Site

Alteration of land lot dimension, to become smaller or larger. Facade change, wide sideback

Smart Growth Concept

1. The concept is concentrated on a compact , walkable city center growth to prevent urban sprawl.
2. The concept emphasizes protection to the living environment, natural land, water, air and development, especially on the land which already been built.

The Idea

1. Observing the condition in the trading district in Bandung city center (so dense,very irregular) it is best to propose a realigment.
2. Using smart growth consept, development could be well planed in every block
3. There are still remaining old shop houses that should be conserved.
4. It should also be distinguished between block with conserved buildings(inner block as an open space for children play ground or parking area) and non conserved(outer block higher as commercial function, inner and outer block equally high, and inner block higher as flat/apartment or rumah susun)

Conclusion

1. It is expected that with smart growth concept the needs of recidence units in the city center area could be fulfilled.
2. The old scheme that separates between trading zone and recidential zone in the rear could be maintained.

3. It is expected a polution free , walkable, safe, comfort and additonal beauty to the city area.
4. To support this concept, by all means, the role of the Local Government is expected, espesially in licensing and data colletion of the land ownership.

Presenter : Suryanto (UGM)
Title : Urban Spatial Structure Identification through Historical Approach
Presentation Duration : about 14 minutes

PRESENTATION CONTENTS

Globalization Trend

1. Globalization not only as a movement or culture
2. Globalization dominated by economic approach and global economic
3. Impact of globalization, city become similar every where, loss of their spirit and identity
4. City identity reflected by structure and image

Why Historical Approach

1. Urban structure and image are represent of urban identity as cultural product
2. Until now, method to identified and analysis urban structure dominated by economic and techical approach.
3. Historical approach, entailing synchronic and diachronic analysis, is be able to explain relation between structure(physical) with identity or spirit

Advantages of Historycal Procedure Research

1. Ability to explain the process formation of urban spatial structure, the transformation and urban development as a whole, through diachronic analitic process.
2. Ability to explain possibility interpretation relationship between artefact as tangible evidence with story, myth or report documentation as intangible evidence for understanding about formation or transformation of urban structure

Disadvantages of Historycal Approach

1. Limitation of spatial information
2. Limitation of knowledge and compatibility supporting information

Recomendation

▶ Historical interpretation needs to be supported by spatial interpretation, to clarification about relationship between Concept in mind (philosopic) and physical structure (reality), to developed tematic maps and to intrepretwed composite map.

Presenter : Indriani Yuvita (UGM)
Title : Successfulness of Denggung Park as A Public Space
Presentation Duration : 10 minutes

PRESENTATION CONTENTS

Introduction

City has high physical development which cause an imbalance environment and stress (people), open space be the one of the solutions for the city.

Methodology

1. Research Method
2. Research Location

Result

1. Analysis Successfulness of Denggung Park as a Public Space
2. Factor of Successfulness of Public Space

Seven indicator to assess and measure the successfulness of public space

1. Individual
   Denggung Parks success to accommodate all classes of individuals and the percentage of individuals is 100%, because
2. Physical setting
   Physical setting is complete park elements in the form of physical and non-physical forms
3. Activity
   Denggung Park accommodate for all activities , both active and passive activities
4. Accessibility
   It has a good access in Denggung Park as parking access for vehicle (car and motor), and a pedestrian pathways.
5. Comfort
   Vegetation and the accessible increase the comfortable value, but the condition of the facilities need to be increased.
6. Safety
   Low safety, there are no facilities to accommodate for night-day and weather (rain/ high wind)
7. Accomo-dative
   Denggung Park is success to accommodate all peoples and all activities as a public space

Conclusion

1. Dengung Park is a very successful public space
2. Successfulness of a public space is a series of dynamic process
3. Successfulness of public spaces is influenced by physical setting,accessibility, and government policies.

Design Context

Design Context

Budiman Hendropurnomo

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 08.30 – 10.00
Moderator	: Ikaputra
Presentation Duration	: 30 minutes

PRESENTATION CONTENTS

Focus on planning in Indonesia
May Ubud Bali, located between two famous river.
According to the legend of Hindu. All balinese villages of central of Bali.
Sanur are near the village
All of the form of balinese village have meanings
Some of the landscape elements also follow the existing

Ciwalk open air shopping mall and sensa hotel, Bandung
There was an existing and famous shopping mall.
One of the first openair shoop, spaces elevated, which people could walk during raining
Ciwalk is very classy and popular
The new innovation mall Cihampelas Walk

Central Library University of Indonesia
Lake front, consist of not so much book but focus on the lace where people to meet.
Most of the ornament usually use prasasti

Binus Kindergaten Serpong
Using the lego concept to make more interesting and attractive

Maya Sanur Bali
There was a temple in tanah lot, about 300 meters separate from the beach, the landscape ara ups and downs

Improvement Criteria for Open Space Quality in Jakarta in Accordance to Their Typologies (Case Study: Plazas in Jakarta Kota District)

Addi Darmawan[1], Felia Srinaga[2]

[1] Architecture Department, School of Design, Pelita Harapan University
[2]Lecturer, Architecture Department, School of Design, Pelita Harapan University

Abstract

Public space, is a destination; purpose-build stage for ritual and interaction (Kostof, 1992:123). Public open spaces are divided into three kinds: roads, parks, and plazas. Plazas especially, are public open spaces with a diverse geometrical typology. Paul Zucker classifies plazas into three types: linear, square, and amorphous (Zucker, 1959). Typologies of plazas in Jakarta are formed in accordance with the development of the city. Based on the conducted survey, Jakarta Kota District is the most influential district in the history of Jakarta. But now this area is not functioning properly, for the quality of the space can no longer provide comfort for the users. This leads to unsuccessful areas in this district. Therefore, the author conducted a study regarding the criteria necessary to improve the quality of public space. Additionally, this research focuses on certain types of plazas in Jakarta Kota District. The research began with literature study on the development and typology of plazas formed in Jakarta Kota district. Criteria of plazas by Clare Cooper Marcus and William Whyte were used as the ground for this research. Qualitative methods were used through observation of study cases, enhanced with questionnaires appointed to the visitors. The data obtained were analysed based on literature studies and precedents. The results of this study stated that in order to improve the quality of public space in Jakarta Kota District, each typology will need distinct criteria. This variation occurs because of the difference in physical aspects from the place and sociological aspects as the respond from the users.

Keywords: *criteria, open space quality, typology*

I. Introduction

Public space, is a destination; purpose-build stage for ritual and interaction (Kostof, 1992:123). Paul Zucker classified public spaces into three categories: roads, parks, and plazas. Roads act as circulation, parks as recreational spaces, while plazas act as interaction spaces.

Historically, plazas are built to accomodate different activities. For example, plazas in front of churches are built mostly for rituals or interactions after masses, while water-fronts are plazas built for the purpose of circulation. Since there are a lot of type of plazas, they can be classified into certain typologies. Geometrically, Paul Zucker classified plazas into three different categories: linear, square and amorphous.

In Indonesia, formal plazas are introduced by Hollands in colonization era. A Holland Trading Company, VOC (Verenigde Oostindische Compagnie) built a town center, now known as Kota Tua (Old Town) Jakarta. The town center at that time became a center of development of the city we now know as Jakarta. While, the allocation of the people around the town center has yield different types of plazas, mostly informal. At the moment, the whole area has developed into an old town with different typologies of plazas.

The Plazas in Old Town Jakarta isn't functioning properly, for the quality of the space can no longer provide the users, yielding some unsuccessful areas. Therefore this research tries to analyse certain criteria that can be used to improve the quality of plazas in Old Town Jakarta. The criteria will be divided according to three typology of plaza: linear, square and amorphous.

Addi Darmawan
--- Jurusan Arsitektur, School of Design
Universitas Pelita Harapan
Fax: 021 - 5460910
E-mail: addi.darmawan@gmail.com.

II. Plazas: Typologies and Qualities

The word plaza comes from an italian word 'Piazza' that means square (geometrical shape). Spiro Kostof defines plaza as a place in town, a space to meet, and an identity for a certain area. While in People Places, Clare Cooper Marcus defines plaza as an open area free of vehicles, used

for seatings, eat, destination, not just a place to pass by. What can be concluded from these definitions is that plazas are places of destination that attract people to meet and do something inside.

Plazas are divided into five archetypes: closed square, dominated square, nuclear square, grouped square, and amorphous square (Zucker, 1959). Closed square are plazas with internal orientation. Dominated square are plazas directed into a building or buildings. Nucleus square are plazas with a focal point (nucleus) usually placed in the center. Grouped square are spaces combined into one plazas. The last type, amorphous square are plazas with no geometrical shape, separated but still holds the same quality of space.

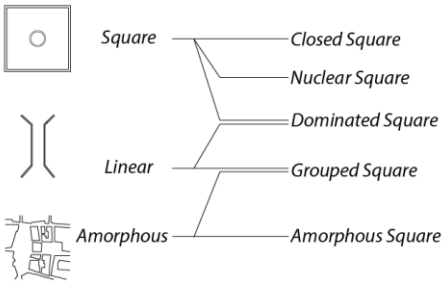


Figure 1 Typologies of Plazas
Source: Zucker, 1959

Plazas are also divided into three shapes geometrically: square (central), linear and amorphous (organic). Square shape here means a central type of spaces with one focal point, geometrically, it could be either oval, circle or square. Linear squares are plazas that forms a path. Amorphous plazas have no geometrical shape and can be defined as organic/irregular plazas.

CRITERIA FROM 'PEOPLE'S PLACES'	CONCLUSION	WILLIAM WHYTE
LOCATION SIZE	LOCATION & SIZE	LOCATION CAPACITY
MICRO-CLIMATE VEGETATION	VEGETATION	NATURAL ASPECTS
FOOD	ACTIVITY	FOOD
USES & ACTIVITIES BOUNDARIES & TRANSITIONS SUB-SPACES PROGRAM SERVICE AREA	ZONING	
CIRCULATION SEATING	CIRCULATION	SITTING SPACE CIRCULATION
LEVELING VISUAL COMPLEXITY PAVING	CITYSCAPE	CONTEXT
PUBLIC ART MAINTANANCE & AMENITIES	AMENITIES	TRIANGULATION COMFORT

Figure 2. Criteria of Succesful Plaza
Source: Clare Cooper Marcus & William Whyte

Every typology of plaza has their own quality. To measure the space quality of every plaza, criteria from People Places (Marcus, 1990) are used. Clare Cooper Marcus distinct 17 criteria of successful plazas. Since some of these criteria are too specific to be analyzed, these criteria is compared with William Whyte's criteria (Whyte, 1980). William Whyte distinct 8 criteria of successful plazas. The whole criteria are then summarized and classified into seven groups: Location and Size, Vegetation, Activity, Zoning, Circulation, Cityscape, and Amenity. The last seven criteria are the ones that will be used in further research. In further research, it will be combined with typologies of plaza: square, linear and amorphous.

III. Jakarta Kota District

Jakarta Kota (Old Town Jakarta) is a district in West Jakarta. It was first established in 1526 when Fatahillah, a man from Islamic Kingdom Demak, attacked the area and named it 'Jayakarta'. The area then was destroyed when Holland came and started the colonization era. In 1619, under the commandment of Jan Pieterszoon Coen, the new town 'Batavia' was built. The town center of Batavia, now known as Fatahillah Field was located beside Ciliwung River which was the main access for trading at that time. Through the colonization era by Holland for 350 years, Batavia has been planned to become the main part of Jakarta. A road was built south of the town center (now known as Hayam Wuruk Rd.) to the heart of Jakarta, now marked with Monas (National Monument).

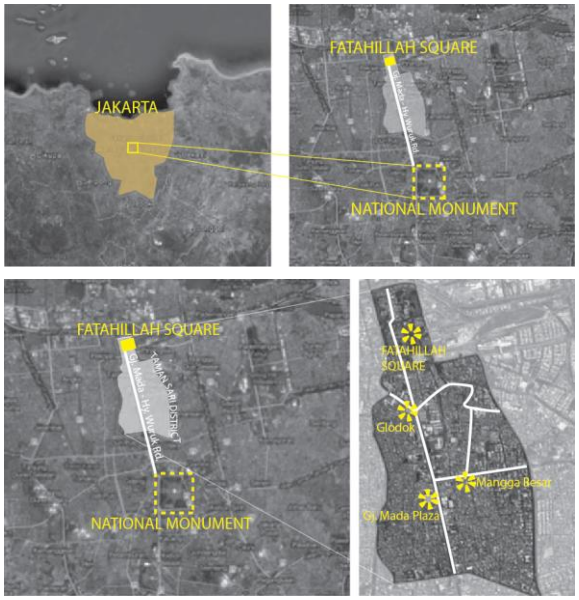


Figure 3. Location of Jakarta Kota District
Source: Google Maps with modification, 2013

Jakarta Kota District is now a preservation area (since 1972). It is known for its building typology, edges of old shopping corridor flanking cilliwung river in the middle. From the whole district, three important areas are picked. The first one is a square located in the former town center of Batavia. It is a plaza with rectangular shape in front of a museum. The second one is a corridor southern of the square. It's a shopping district called Pancoran.

And the last one is a chinatown, a shopping and housing district called Petak Sembilan. These three areas represent three different typologs of plazas: square, linear and amorphous.

IV. Fatahillah Square

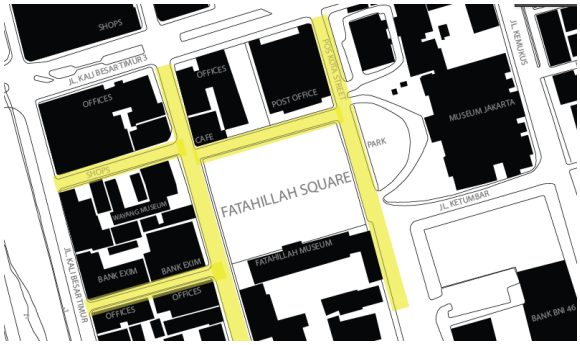


Figure 4. Nolli Map of Fatahillah Square
Source: Google Maps with modification, 2013

Fatahillah square is located in the northern side of Jakarta Kota District (shown in **Figure 4**). The most significant building in this square is Fatahillah Museum (the former Government Building in colonization era); a symmetrical building; facing northeast. Surrounding the square, there are buildings such as Wayang Museum, Café Batavia, Banks and other buildings, creating a secluded plaza in the center.

Physically, three categories of physical elements are classified: boundaries/walls (the horizontal elements that seclude the plaza from the surrounding); flooring (the horizontal elements in the plaza); and nucleus (the features that stands out inside the plaza). Other elements apart of those mentioned will be categorized into additional elements.

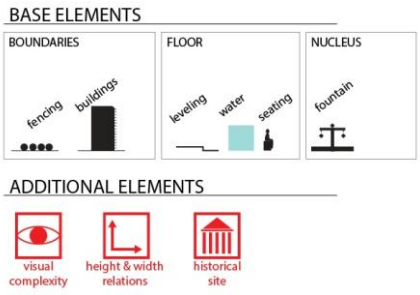


Figure 5. Physical Elements in Fatahillah Square

Fatahillah square is a very secluded plaza. There are total of 10 building surrounding the square and fencing made of concrete that limits the vehicle from entering the area. There are varieties of flooring in the plaza; leveling, water (from the fountain) and seating spaces. Acting as the center of the square is an old fountain formerly used as water station.

From my observation, the condition present at the plaza can be evaluated according to the criteria of successful plaza. Below is the diagram showing the elements present, lack, or absent. Based on the evaluation, the elements unfullfiled and in need of improvement are location (access), circulation, vegetation, activity, zoning, nucleus, and operational time.

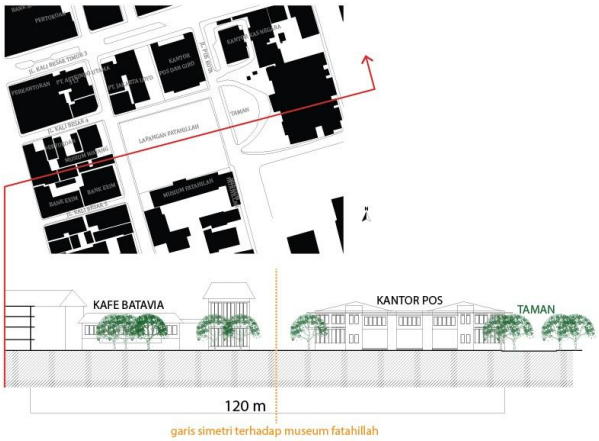


Figure 6. Section of Fatahillah Square

Figure 7. Quality Assessment of Fatahillah Square

V. Pancoran

Figure 8. Nolli Map of Pancoran
Source: Google Maps with modification, 2013

Pancoran is a linear plaza, located South of Fatahillah Square. It is a shopping corridor, marked

with row of shops flanking a small river in the middle. This linear plaza connects two buildings at two ends, both commercial building. There are sidewalks in front of the shops with street furniture, such as trees, seating space, and outdoor lights.

Figure 9. Atmosphere of corridors in Pancoran

The activities in the plaza enable me to divide this plaza into two sections; the north (the left **Figure 9**) and the south (the right **Figure 9**). This plaza connects the two important buildings: Pasar Pagi Building and Shopping Center Glodok. Unfortunately, Pasar Pagi Building is no longer operating (there are only 3 out of 10 floors operating). That is why pedestrians are no longer visiting this area and the flow of pedestrians are lesser in the north section. This leads to a different atmosphere and activities in both sections.

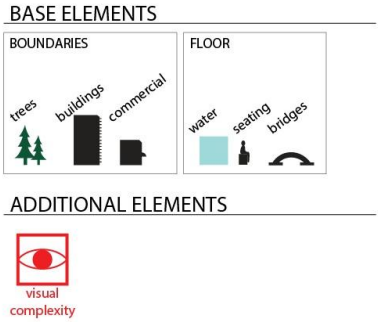


Figure 9. Physical Elements in Pancoran

The row of buildings and road pavements act as the boundary of this linear plaza. In horizontal aspects, there are water, seating space and bridges that connects the plaza through the small river. The rows of trees, street lights, and buildings create a visual complexity (shown in Section of Pancoran Road in **Figure 10**).

Based on my evaluation of the quality of space in Pancoran, there are certain criteria that have not been fulfilled. Those criteria are circulation (lack of anchor /nodes), vegetation, cityscape, building and road interaction, and amenities (shown in **Figure 12**).

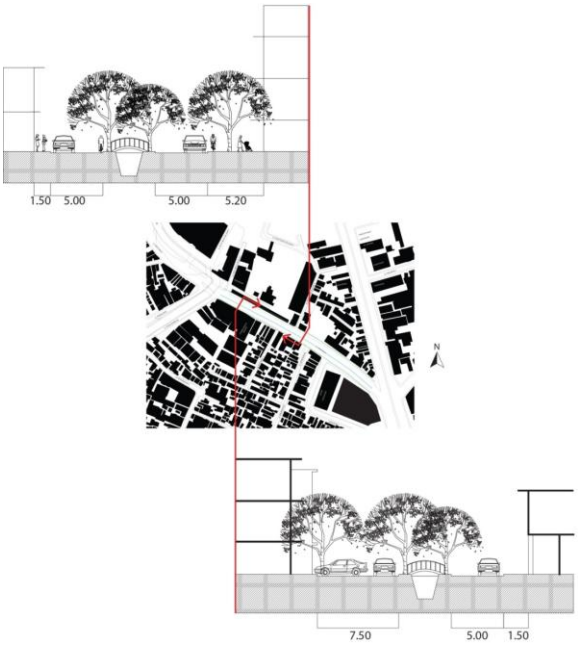


Figure 10. Section of the North and South Area of Pancoran

Figure 11. Quality Assessment of Pancoran

VI. Petak Sembilan

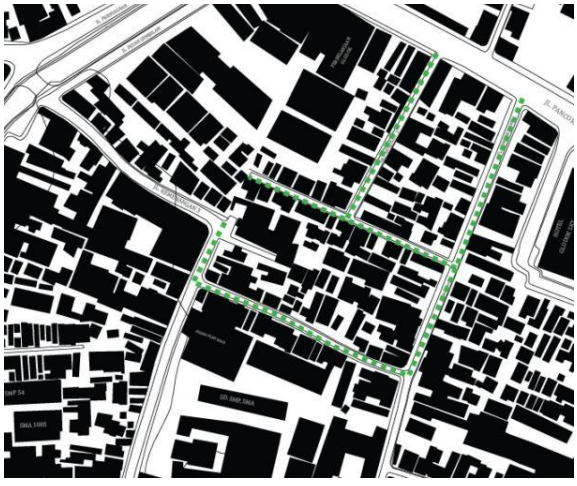


Figure 12. Nolli Map of Petak Sembilan
Source: Google Maps with modification, 2013

Petak Sembilan is an amorphous plaza consists of intersections of corridors. It is located South-West of Pancoran, intersecting each other. Petak Sembilan is actually a settlement and

commercial with high-influence of Chinese culture. It is a very busy area, filled with formal and informal commercials, restau- rants, school, and church. In addition, this place also has high historical value. A massacre to the Chinese happened once at this place. Now, most of the people living in this area are Chinese descent. This affects how the this place are so influenced by the Chinese Culture.

Figure 13. Corridor of Petak Sembilan

This plaza is located between residential areas. Therefore, the typology of the building are usually 2-storey residentials with the ground floors function- ing as stores. There are several intersections of the road that connects to alleys. Most of the time, the alleys lead to more private housing inside.

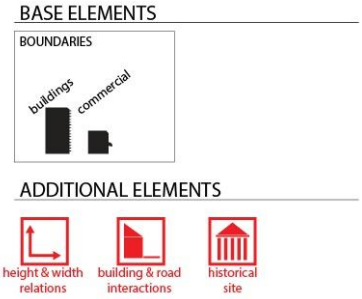


Figure 14. Physical Elements in Petak Sembilan

This area does not have the wide range variety of flooring. Instead, the atmosphere in the plaza is influenced by the relationship of buildings heights and pedestrian path. This atmosphere creates a very narrow corridor that it can only be traversed by pedestrians. This leads to a place with strong boundaries and lack of visual view.

Based on my evalution, there are some criteria that have not been fulfilled. The criteria include: zoning, circulation, cityscape, amenities, building and road interactions, landmarks and vegetation.

Figure 15. Sections of Petak Sembilan Corridors

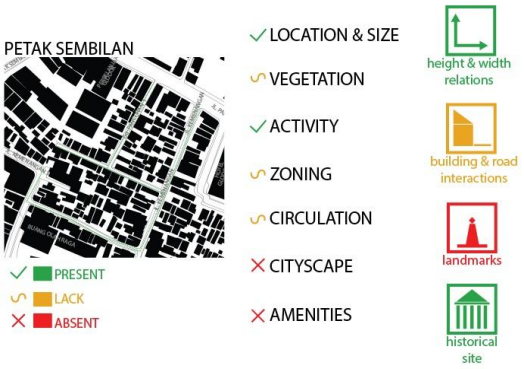


Figure 16. Quality Assessment of Petak Sembilan

VII. Contextual Issue

In my further observation, it was found that the Jakarta Kota District has a very strong peculiarities. Hence, a further adjustments to the criteria are needed so that it can be applied to the context. In order to do that a quality that can only be able to be found in this district must be observed.

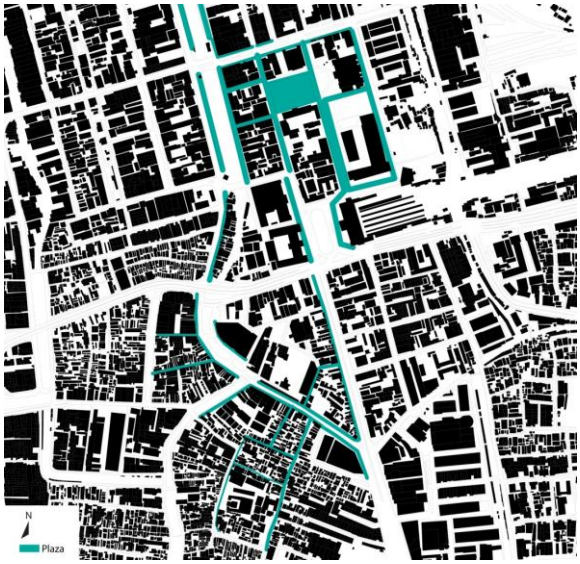


Figure 17. Jakarta Kota District's Permeability
Source: Google Maps with modification, 2013

In the Figure above, it is shown that the open space in the city of Jakarta City District has a very high permeability. Physically, the entire plaza is located within walking distance and plazas are connected to each other through corridors. Therefore, the plaza in the district can be seen through two perspectives, the plazas as a whole (in the Jakarta Kota District) and as individuals (according to each typology).

When observed as a whole, there are two major factors in the peculiarity of Jakarta Kota District. The first factor is the permeability of the entire plaza in the district. When observed further, the plazas in Jakarta Kota District are no longer 'pure'. They have evolved and start to blend each other creating a continuous space. Therefore, the entire plaza in the Jakarta Kota District is a unity of circulation. Connectivity is one of the most important quality in these plazas. As a space, Jakarta Kota can be described as a behavior space; the space used by individuals or groups of people who make that space as a place.

Figure 18. Human Activities in Jakarta Kota District

The second factor concerns the non-physical aspect; collective memory. Collective memory in this context relates to the history that has ever happened at a place.

Figure 19. Map of Nodes in Jakarta Kota District

The society has a lot of 'memory' of this place that make this place important. One of the averment of collective memory is the board that describes important places in the Jakarta Kota District.

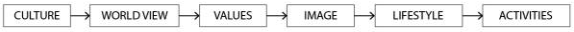


Figure 20. Activity Development by Rapoport
source: Rapoport, 1977

Meanwhile, the activities in this area come from a very long development. Rapoport stated that activity comes from a very attached culture. The same thing happens in the Jakarta Kota District People's habits and activities emerge based on their culture. This affects how people see Jakarta Kota District. The people living in this area have a really close connection with the place.

However, all of the case studies have diffferent visual qualities. In the old city, the visual quality is emphasized over the physical quality. This can be observed from the amount of activities related to photography in the square. On the other hand, Petak sembilan's visual quality is more emphasized than the social quality. In Petak Sembilan, the activity and the presence of others become the visual quality. Interestingly, Pancoran area has both the physical and social quality. Pancoran area has a lot of activities and the building proportion enables people to have a wide range of view.

From the diagram below (**Figure 21**), it can be observed that it is necessary to adjust the criteria by Clare Cooper Marcus to Jakarta Kota District

context. The criteria used as the base of this research can be applied in different places. Meanwhile, this study tries to find criteria contextual to Jakarta Kota District. In order to do that, these criteria need to be adjusted with the quality from Jakarta Kota Context.

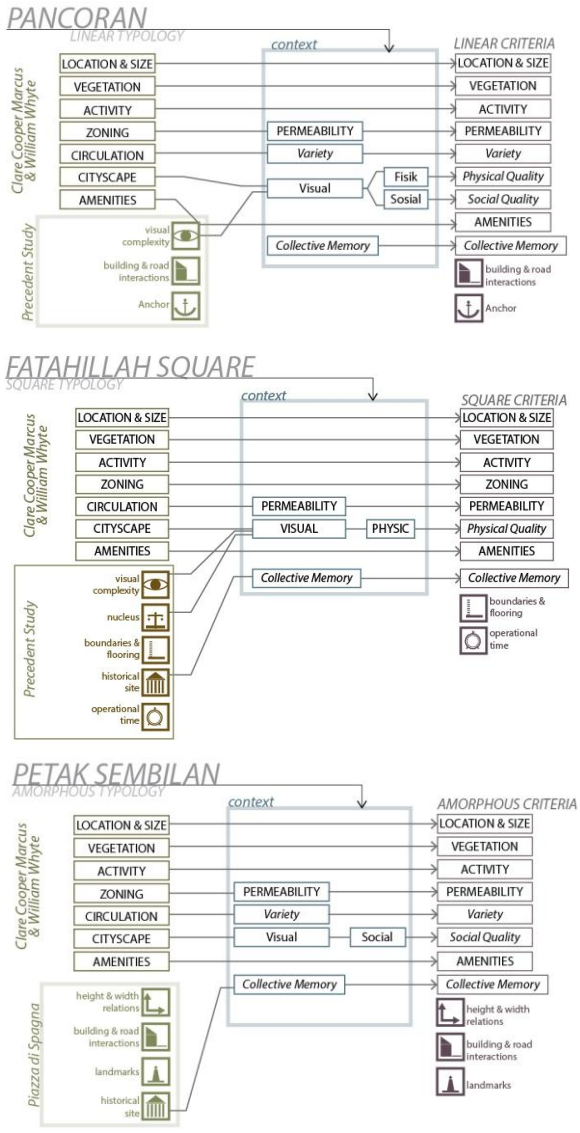


Figure 21. Criteria for every plaza typology

VIII. Conclusion

This research tries to find certain criteria in order to improve the quality of space in plazas in Jakarta Kota District. In order to do that, criteria defined by Clare Cooper Marcus and William Whyte are used and combined into one set of criteria as the base of the research. Then, precedents of succesful plazas for each typology and some additional criteria are added. These whole package of criteria are brought back to the context and through that contextual criteria for every typology of plaza in Jakarta Kota District are founded.

Every single typology of plaza needs different criteria (shown in Figure 21). The difference between these criteria for each typology occur based on the differences in physical and social aspects. Different physical forms of plaza produce different activities. In addition, these criteria has associated with the quality from Jakarta Kota Context. Therefore, it has high personalization of each plaza inside Jakarta Kota District.

Table 1. Improvement Needed in Every Plaza.

Plaza	Fatahillah Square (*Square*)	Pancoran (Linear)	Petak Sembilan (*Amorphous*)
Improvement Needed	○ Permeability ○ Activity ○ *Operational Time* ○ Location and Size, Accessibility ○ Vegetation	○ Permeability ○ *Anchor* ○ *Visual Quality* ○ *Building & Road Interactions*, continuity ○ Vegetation ○ Amenities	○ Permeability ○ *Building & Road Interactions* ○ *Landmark* ○ Amenities ○ Vegetation

There are some qualities inside the plazas in Jakarta Kota District that need improvement. Based on the evaluation of the quality of spaces in this research, the aspects that need improvement can be concluded. The above table shows the criteria in need to improve for every typology of plaza. Even every plaza has its own distinct improvement needed because every plaza has different activities with different geometrical shapes. Therefore, in order to improve the quality of the space, each plaza needs distinct criteria.

Referensi

1) Bentley, I., A. Alcock, P. Murrain, S. McGlynn, and G. Smith. (1985). *Responsive Environments: A Manual for Designers*. Oxford: Architectural Press.
2) Carr, S., M. Francis, L. G. Rivlin, and A. M. Stone. (1983). *Public Space*. Cambride: Cambridge University Press.
3) Carmona, M., T. Heath, S. Tiesdell, and T. Oc. (2003). *Public Places Urban Spaces*. Oxford: Elsevier.
4) Childs, M. C. (2004). *SQUARES: A Public Place Design Guide for Urbanists*. University of New Mexico Press.
5) Cooper Marcus, C. and C. Francis. (1998). *People Places*. Canada: John Wiley & Sons.
6) Darmawan, E. (2005). *Analisa Ruang Publik Arsitektur Kota.* Semarang: Badan Penerbit Universitas Diponegoro.
7) Gehl, J. (2010). *Cities for People*. Washington: Island Press..
8) Kostof, S. (1991). *The City Shaped*. Hong Kong: Thames and Hudson, Ltd.
9) Kostof, S. (1992). *The City Assembled*. Hong Kong: Thames and Hudson, Ltd.
10) Lennard, S. H. C. and H. L. Lennard. (1995). *Cities for People.*

California: Gondolier Press.
11) Marbun, B. N. (1979). *Kota Indonesia Masa Depan: Masalah dan Prospek*. Jakarta: Penerbit Erlangga.
12) Mulyandari, H. (2011). *Pengantar Arsitektur Kota*. Yogyakarta: Andi Offset.
13) Rapoport, A. (1977). *Human Aspects of Urban Form.* Oxford: Pergamon Press Ltd.
14) Steele, F. (1981). *The Sense of Place*. Massachusets: CBI Publishing Company, Inc.
15) Webb, M. (1990). *The City Square*. London: Thames and Hudson, Ltd.
16) Whyte, W. (2005). *The Social Life of Small Urban Spaces*. Santa Monica, CA: Direct Cinema Ltd.
17) Zucker, P. (1959). *Town and Square: From the Agora to the Village Green*. New York, NY: Columbia University Press.
18) Bunga, D. dan F. Srinaga. "Preferensi dan Makna Taman Fatahillah sebagai Obyek dan Tempat Fotografi". Prosiding Seminar DTP. (November 2012): III-53 - III-61.
19) Colquhoun, A. "Typology and Design Method". Typology and Transformation. (Maret 1996): 260-263.
20) Johnston, M. M. "Labor Heights Plaza: Place for an Emergent Public". Maret (2006)
21) Kangur, K. dan M. Traks. "The Square in Space and Time". Maret (2011)

Mapping Timeline of Architectural Styles in Nusantara Region

Ahmad Sanusi Hassan[1]

[1]Associate Prof. Dr., Lecturer in Architecture, School of Housing, Building and Planning
Universiti Sains Malaysia

Abstract

This paper discusses development of architectural styles in Southeast Asian Archipelago (Nusantara Region) with a special reference to Malaysia which can be categorised into three styles namely traditional, colonial and modern design. Traditional architecture is an adaptation to the local climate which evolves to the condition of the place, local material, environment, native ways and culture. Colonial architecture is an adjustment of imported architecture to the local climate, a primary expression of classical style introduced by the European through colonisation and a result of cross cultural architecture with the local built environment as well as architectural styles brought by the Chinese, Arabs, Indian Muslims and Indian Hindus immigrants. Modern architecture is an adjustment of universal style to the local climate, compatible with a large number of mass-produced housing and building units since Industrial Revolution taken place in Europe. The methodology of this research study is to map these three development styles with architectural timeline from pre-colonial to the current period to reflect historical context when the samples of the buildings were constructed. The study finds these three styles have progressed to each own identity and character in forming the architectural landscape in this Nusantara Region.

Keywords: *traditional; colonial; modern; architecture; Nusantara Region*

I. Introduction

This study discusses the architectural timeline in Southeast Asian Archipelago. Southeast Asian Archipelago is a chain, or collection of islands which covers several countries of Malaysia (including Peninsular Malaysia), Indonesia, Brunei and Singapore predominantly with Muslim population. This region is also known as Nusantara Region. For the past decade, these countries have experienced a rapid development in the building industry with several directions of the architectural styles. The objective of this study is to do a comparative study on architectural styles evolved in Nusantara Region. The areas cover architectural style of pre-colonial, colonial and present time, namely traditional, colonial and modern architectural styles which have influenced architecture in Nusantara Region. The findings will be able to provide a mapping timeline on a history of architectural styles which is important knowledge for a precedent study in architecture.

II. Literature Review

The word 'Nusantara' is derived from Sanskrit language of two words, 'nusa' and 'antara' (Wahyono, 2009) which mean a land of 'islands in between'. Today the word 'Nusantara' is a terminology both used in Malaysia and Indonesia as a group of islands connected by sea in Southeast Asia. In Malaysia, this term is defined as Malay Archipelago (Malay realm) whereas in Indonesia, this term is known as Indonesian Archipelago. According to Martin Bernal (2006) who is specialized in Near Eastern Studies, the meaning of 'Nusantara' in Latin language is from the word 'nesos' which means islands and people. Thus this term could be defined as the region of Southeast Asian Archipelago with the people sharing similar culture.

With similar in cultural value, this region has been shaped with similar regional architecture and its development with traditional, colonial and modern style. Each style has emerged at different time as a popular style in this region, and all these styles have concurrently integrated in the regional architecture to each direction accommodated with present technology. Traditional style is known with heavy roof construction of long inverted 'v' and pyramid roof form. There is no recorded date when the traditional style had evolved. Most evidences are architecture of the existing palace, mosque and palace design in this region. The style was influenced first by Hindu-Buddhist architecture since 8th century, and later by

Ahmad Sanusi Hassan, Assoc. Prof. Dr.
---School of Housing, Building and Planning
Universiti Sains Malaysia
Tel: +604 6532835 Fax: +604 6576523
E-mail: sanusi@usm.my

Islamic architecture since 15th century (Dawson and Gillow, 1994).

By 16th century, colonialism had taken place by European powers namely the Portuguese, Dutch and British who had built buildings with classical and European style imported from the west which had given an influence to the local architecture (Hassan and Che Yahaya, 2012). Modern architecture was introduced since early 20th century with international style in the construction of government and public building by the Dutch in Indonesia and British in Malaysia, Brunei and Singapore. After the countries' independence to present day, this style was continued adopted by local architects in Nusantara Region.

2.1 Traditional Styles

As discussed earlier, the traditional style was greatly influenced by two styles namely Hindu-Buddhist and Islamic architecture. Before introduction of Islam in this region, most local populations practised either Hinduism or Buddhism as their religion. The Hindu and Buddhist influence can be traced in *candi* architecture. *Candi* refers to a masonry (stone) building of the Indian type of shrine, with a pyramidal tower as a figure built above it. Its style is also derived from temple-mountain design concept to symbolise the Cosmic Mount Meru, a holy mountain of the universe (Rawson, 1967). Borobudur (Buddhist) and Prambanan (Hindu) Temple in Java, Muaro Jambi (Buddhist) Temple in Jambi, Sumatra and Bujang Valley (Hindu) Temple in Kedah, Peninsular Malaysia are among the popular Buddhist and Hindu temples in Indonesia. Borobudur is the largest Buddhist Temple in the World.

The temple has a square-base plan with a circle plan platforms on the top floor plan known as 'mandala'. This base, body, and top elevated temple has a design with diminishing with height. This temple has decorations with 2,672 relief panels and 504 Buddha statues. The first circular platform has 32 stupas, the second 24 and the third 16 stupas. Prambanan is the largest Hindu Temple in Indonesia. The temple design is influenced by 'Hindu Nagara Style' with a square-base plan and has a beehive tower type with a number of small tower projections which gradually inclines inwards in a convex curve (Soekmono, 1976).

Introduction of Islam began spreading in Nusantara Region in 13th century with one of the evidences from Terengganu Inscription Stone discovered in 1899 at Terengganu, Malaysia. The inscription is the oldest artifact with Malay-Arabic alphabet's writing (known as *Jawi*) in this region. It is believed to be written on 22 February 1303 which marks Islam had already reached in Terengganu, Peninsular Malaysia. The other evidence is 1297 royal tomb at Samudra, Sumatra inscribed in Arabic texts a century's earlier before the establishment of Malacca, Demak, Samudera Pasai and Acheh Sultanate as Islamic Kingdom and a centre of trade in Nusantara Region in 14th century. Today, Hindu religion only has been adopted as the primary religion by the local population in Island of Bali, Indonesia.

The spreading of Islam as primary religion in this region had influenced local architecture style with timber as primary construction material and dominant roof design. According to Lim (1984), the traditional building serves the housing needs of the majority of people living in rural areas in this region. According to Lim (1984), the traditional building was evolved by over the generations, and adapted to their owned needs, religion, culture and environment. The question can be done in many ways such as the usage of timber as the main building component, traditional construction technique and the design of pitch roof. These elements do not only satisfy the traditional form and design, they are also the most logical choice for hot and wet climate condition in the country. The buildings form consists of palaces, houses, mosques, community halls etc.

All buildings are designed to suit the local climatic requirements using various ventilation and solar-control devices, and low-thermal capacity building materials. The traditional building is basically a prefabricated post-and-lintel (post and beam) timber structure with wooden or bamboo walls and a thatched roof. Windows provide good ventilation and views for the house. This quality of openness is reflected by the large open interior spaces with minimal partitions. The buildings blend naturally with the surroundings. The large roof dominates the low walls and the open stilted bottom of the house (Lim 1987).

Based on Hassan (2004), most buildings and houses are detached and bridged house type. House has an open interior, promoting good cross-ventilation and lighting and allowing the space to be used for many purposes depending on the season, occasion, or time of day. Since most activities take place on the elevated floor/platform, the need for furniture is minimal, bedding materials and sleeping mats are rolled up and stored during the day to eliminate the need for separate living and sleeping quarters.

The design development with equally sensitive use of local materials and traditional building style provides intimate natural settings near to the sea, along the river or the 'kampung' (village) essence with a view of paddy fields.

According to Hassan (2004), most traditional buildings have a roof system made from two different roof slopes. The upper pitch roof is relatively steep about 45-55 degree compared to the lower pitch roof, which has about 25 degrees slope. The two pitches are merged to form two different roofs slopes under one roofing system. This type of roofing system is the most commonly constructed for the core house (*rumah ibu*). Based on Khan (1981), the application of pitch roof in building construction in Nusantara Region is a logical choice in hot wet climatic

conditions. The steep pitch, permits rapid removal of rain water and creates a high sloping ceiling ideal for inducing air movement, ventilation and escape of hot air, thus bringing in comfort.

According to Mohd (1983), the vernacular tradition focuses our attention mainly to the condition of the place, the local material, and environment and native ways and habits. In the Nusantara traditional architecture, the most distinctive vernacular attributes are the raised floor construction, the flexibility of spaces and use of readily available rain forest material in the best possible ways to counter the hot-humid climate.

The traditional buildings were entirely built from the readily available natural materials found in the vicinity of the site. The tropical rainforest abounds in natural building materials. The simplest building may be built with cut jungle poles, bamboo, rattan ropes and palm trunks and leaves that are gathered neatly around the site. According to Lim (1987), a range of traditional and hybrid building forms can be identified in this region. They are classified mainly by their roof shapes.

(a). Long roof (*Bumbung Panjang*)

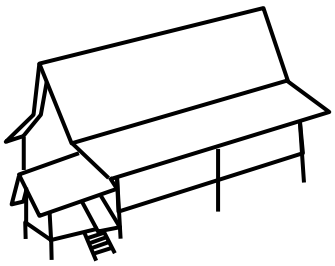


Figure 1. *Bumbung Panjang* - Long gable roof.

This is the most common and oldest building type. Long roof (*Bumbung Panjang*) building is characterised by a long gable roof (**Figure 1**). Its simple construction accounts for its popularity and is also the most highly developed of the various building types. It has a system which allows extensions and addition of many type and variation. *Long roof building type* is the simplest of the four building forms. It has a simple gable roof, supported by kingposts. The most common roofing material used for the *bumbung panjang* is the *attap*. *Atta*p is thatch made from *nipah* and other palm trees found in the local natural vegetation.

(b). Limas Roof (*Bumbung Limas)*

This building type is characterised by a hipped roof which is believed to be influenced by colonial roof form (**Figure 2**). The floor plan is almost square in shape and the common types of roofing materials are either clay tiles or asbestos sheet. An urban family as it allows the use of modern furniture which requires higher headroom. Limas roof form is not originated from Nusantara Region but developed through foreign influences such as the colonial Dutch and British building forms during their period in the country.

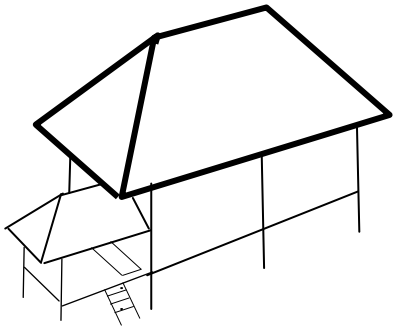


Figure 2. *Bumbung Limas* (hipped roof)

(c). Perak Roof (*Bumbung Perak*)

This roof type is believed to be copied from Dutch building forms in the colonial period (**Figure 3**). The pointed high pitch roof uses a combination of *attap* (nypah roof), zinc and other modern roofing materials to allow for the more elaborate roof construction here. The ridge is straight. The centre of the roof is covered with *attap.* This technique ensures that the building does not over heat during the day and has the ventilating properties of the *attap*. Because the edges of the roof are protected by the metal, the roof is last longer.

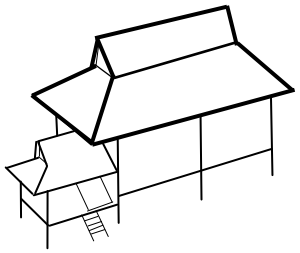


Figure 3. *Bumbung Perak* (gable roof)

(d). Lima Roof (*Bumbung Lima*)

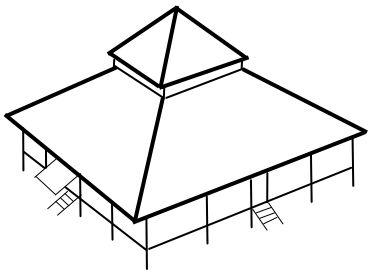


Figure 4. *Bumbung Lima* (pyramidal gable)

This roof type is commonly used for mosque and *Surau* (building not conducted Friday Prayer). It is a square base in plan and usually raised above the ground. The roof is a two and three-tiered pyramidal form (**Figure 4**). The tiers of the roof are meant for ventilation purposes in the hot humid climate of Nusantara Region. The top most roofs are lifted high

enough to allow the presence of clerestory windows. It is tiered and made of more permanent materials like tiles or shingles rather than *attap*. Thus the number of tiers is related to the size of the mosque's plan.

2.2 Colonial Style

Colonial buildings and monuments symbolise an expression of its architectural sovereignty over the existing local and expatriate architecture in the conquered lands. The intention behind this expression is to image the success of the Portuguese, Dutch and British colonial governance and monetary economy. The prosperity of the economy consequently had made the British and Dutch view over their conquered province of this region changed (Hassan and Che Yahaya, 2012).

For the Dutch and British, Nusantara Region was a prosperous province, which produced profitable monetary economy in agriculture and natural resources. This province was not anymore regarded as a temporary place for their living compared to England and Netherland. The officers also did not consider anymore this region as a remote and exotic region. They however regarded this province as a land of opportunity that they preferred to build grand buildings and monuments as if they would settle there permanently. They viewed Nusantara Region as one of the region in England or Netherland, part of their homeland.

Their view had influenced their decision to build grand and aesthetic classical style's institutional and financial buildings and monuments across the towns and cities in Nusantara Region. Classical style's buildings define a symbol of institutional status and its monetary economic success. Buildings erected with classical pillars such as Doric, Ionic, Tuscan and Corinthian columns were popularly built. Some buildings were integrated with Greek pediments and a series of Roman arches and vaults as an expression of the colonial success. Like other colonial towns throughout the world when the British and Dutch had settled in Penang and Batavia respectively and established as a port city, they built their buildings and influenced with their architectural style for the construction of other buildings.

Colonial architecture is an expression of the image of classical structures and motives. The architecture does not only have dominant classical expression, it also has a mixture of the colonial style with the local styles. All buildings expressed images of cross cultural correlations with diverse architectural characters such as facade decorations blending with motives originated from other ethnic backgrounds' architectural elements. Parts of the building forms integrated with the local architectural settings, i.e. overhanging roof structures for shades, maximum openings for cross ventilation purpose, cantilevered floor (veranda or *anjung*), and double roof construction (jack roof system) for cool and hot air internal circulation that eventually had produced a new hybrid architectural style.

Colonial architecture is an expression of the image of classical structures and motives. The architecture does not only have dominant classical expression, it also has a mixture of the colonial style with the local styles, which can be seen at heritage buildings erected during colonial time in Nusantara Region. Compared to classical and colonial architecture at other parts of the world, the primary distinction is that colonial architecture in Nusantara Region is a result of cross cultural elements not only with the local built environment, but also with Islamic, Chinese and Indian architectural style due to the influence of other cultures and architectural styles. It was a result of the migration of Chinese, Arabs, Indian Muslims and Hindus who arrived, settled and participated in the trading activities in Nusantara Region.

As a result, this had created as argued by Abel (1985) a new hybrid which has diverse architectural backgrounds between the east and west. This can been viewed at the heritage buildings - new offspring with new architectural styles of western style's building form blended with Islamic, Nusantara (local), Chinese and Indian structural styles and elements. Such adjustment from western, European architecture to local tropical climate architecture such as the traditional styles are manifested with overhanging roof structures, maximum window openings, cantilevered veranda floor and big roof construction.

The design of traditional building form gave the British and Dutch builders numerous lessons to adapt their architectural style to the local climate. The same approach was used by the Chinese, Indians and Arabs when they built their buildings and houses. The British and Dutch architects used this lesson to cope with the building design in this region. The warm humid climate was barely comfortable for the original design of the classical buildings, and these European architects successfully manipulated the traditional design for the climatic adjustment to build classical buildings in this tropical region. The British and Dutch officers, however, did not interest to adopt the traditional house as a dominant house form for colonial identity.

The design of traditional building is not due to climatic adjustment but because of climatic responses. The development of the design had evolved since the indigenous settlement was made in this region, and it had been improved from one generation to another generation due to the development of technology, changes of religious belief and social value, and political structure. Due to tropical responses, the house form has lightweight structures and walls erected from prefabricated timber components with maximum wall openings. For the locals, it is the most appropriate design for their living but for the British and Dutch officers, the design was not comfortable for them because they had used to live in the house forms (known as cottages and villas) which are very distinct (in term of climatic responses) to that of the traditional building.

The British and Dutch argued that the traditional design would not provide sufficient privacy and social satisfaction that they had used to have when living in Tudor houses, cottages or villas in England and Netherland. The villas, cottages and Tudor houses were generated in responding to cool temperate climate which was an opposite to the environment that have dictated the traditional building form. They came from a region which is located along the longitude 60 degree which is 10 degree below the Artic Circle. Heating system and construction using heavy materials such as bricks and stones are the solution to adapt to their local climate.

Traditional building forms in Europe are constructed on the ground with fireplaces and chimneys as crucial parts of the building for heating purposes. Barley (1967) described the English houses usually built about two feet wall thickness of stone or brick and some of the walls daubed with clay which is the same condition in Netherland. In warm and humid climate like Nusantara Region, the architects/builders should tackle the constraint in the other way around. The design must be a solution to the constraint of warm and humid environment. The cooling system is crucial but there was no technology of air-conditioning system at that time.

It was a major reason that the British and Dutch architects had immediately adjusted the classical buildings, Tudor houses, cottages and villas to the tropical contexts (new hybrids known as colonial buildings and houses) as argued by Allen (1986) for their own comfort. The new hybrids were able to provide good air movements, shading devices with higher ground level with efficient sewerage system to avoid from floods, deflected rainwater, direct sunlight, fungus, parasites, and mosquitoes.

The colonial buildings had imitated the traditional roof with a huge and dominant roof to cope with the regional high annual rainfalls and to avoid direct sunlight to the building. Fry (1964) noted that the building design in Southeast Asia should have overhangs for external shades protection against the sun and rain, and optimum wall openings to give cross air ventilation. Among the popular elements derived from classical and other European architecture by the British and Dutch architects are the Dutch gables, Venetian arches, Ionic, Corinthian, Tuscan and Doric columns, Greek pediments, Greek posts and lintels, Roman round arches, segmented arches, Italian colonnades, balustrades and parapets.

Many buildings have cantilevered balconies projected from the facade with classical motives. The British and Dutch architects and planners had played a crucial role in the construction of new towns and development of the existing towns during colonial period that functioned as port cities like Batavia (Jakarta), Singapore and Penang, as mining towns such as Kuala Lumpur and Ipoh, and as agriculture centres like Medan, Johor Bahru and Yogyakarta. Among colonial buildings and houses still exist today are state and federal administration office buildings, churches, market places, fire and police stations, hotels, governor's mansions, gallery and museums, estate villas and bungalows, British and Dutch officer's houses and etc.

2.3 Modern Style

Modern style presently is a popular design in building industry in Nusantara Region as well as other countries in the world. Rapid economic growth had given huge changes in term of development of modern style introduced since Industrial Revolution, which had revolutionise with new material used in building construction. Today this building construction becomes conventional which must be mastered by architects. Bricks, concretes and glasses as main material which are inexpensive. Cements, sands and gravels are primary building material mixed to create concrete. By using 'mould construction', the wet concrete mixture is poured into the mould with reinforced bars to create reinforced concrete post and beam structures. The greatest contribution of modern style was from Le Corbusier, father of modern architect.

Modern style is influenced by engineering character, the advent of machine age, and the architecture is adjusted with this engineering method in approaching building construction, with universal concept. Modern style was derived from engineering approach in machine design with form follow function perspective. Engineers do not design any part of a machine without function. The definition can be by a concept of 'purity' as emphasised on the meaning 'ball bearings' as displayed at Museum of Modern Art (MOMA) in New York as a symbol of true identity in Modern Arts in machine design of mass production system in factory. The approach in mass production technique had given concept the same effect to early modern building design in following 'machine' art form. The art form is simple and functional. An advance in mathematics, sciences and physic was greatly affected the definition of design form in engineering as well as other fields like architecture. Many modern architects were also engineers namely Joseph Paxton, Gustavo Eiffel, Mies van der Rohe, Walter Gropius, Le Corbusier, Auguste Perret, and Antonio Sant'Elia.

Modern architects believed on the importance of understanding function of the building by using simple geometrical form like machine invention as the concept of aesthetic form (Banham, 1970; Hitchcock, 1929). William Curtis (1983) in his book Modern Architecture Since 1900 argued geometries as the principle architectural form. However when this form is decorated with motifs in classical and traditional styles, it had made elements of geometry become less dominant. Concept of purity in architectural design with an emphasis on geometrical form had promoted

universal style which does not integrated with cultural and regional identity, parable with the theme of 'Less is More' by Mies van der Rohe.

By 1980s, concept of 'regionalism' got attraction with an issue of the need to integrate regional character in architecture. Critical Regionalism, first introduced by Frampton (1980), is a term which rejects the homogeneous practice of universalism. The concept resists universal iconography; it is a fact that all cultures develop from cross-fertilisation with other cultures, each being in a process of civilisation. In this case, it is important for every region to retain its own identity while experiencing the process of becoming modern and civilised. Regionalism is dedicated to the essence of place, being in a certain place with a special culture or tradition, being in one place with an understanding of the needs of that place - a special place with unique characteristics. Environment profoundly affects human development because daily life constantly responds to buildings, landscapes and other elements of the non-human universe as much as it does to social experience.

Among the prominent architects who have an emphasis on their architectural projects are Ken Yeang, Hijjas Kasturi, Norman Foster, Kushiro Kurokawa, Renzo Piano and Jean Nouvell. They hve integrated cultural value and climatic factors with interpretation in modern style. Arguably elements of nature with air ventilation, day lighting, thermal comfort, shading devices and planting vegetation are as parts of the design approach. Expression of cultural contact is in abstract form to meet the regional identity and building image. Appreciation to climatic factors in regionalism the emergent of architectural reform in sensitivity to the surrounding built environment. Ken Yeang (1987) defined regional architecture with appropriate technology focusing aspects of the computer technology era able to build with precision, using glass and plastic as new additional primary material to steel and reinforced concrete construction.

In June 1992, one hundred seventy-eight government representatives from all over the world attended the 'Earth Summit' in Rio de Janeiro, Brazil. All representatives at the Summit mutually agreed with 'Agenda 21', a general programme which outlines a strategy leading to sustainable development. The proposal's aim is to provide an international programme for all countries to encourage environmental concern in their national development in the 21st century. Under this agenda, all countries must ensure that all developments are integrated with regional sustainability. The goal of the agenda is to suggest a development that can provide environmental and social satisfaction. The issue has been debated ever since the Rio Summit, in Brazil in 1992. That conference raised concern for eco-development, sustainability, and adaptation to the existing surroundings and provision of living conditions with minimal threat to the environment, habitats and inhabitants (Hassan, 2004).

In the last 30 years, the direction of architecture has shifted from universal to regional approach because of the concern with environmental sustainability. Rapoport (1990) argues, "There is currently a revival of interest in the history of architecture and urban form; a similar interest applies to theory, vernacular design and culture-environment relation." (Rapoport, 1990). Agenda 21 has outlined the importance of both the quality of life of the people and environmental sustainability. Grubb *et al* (1993) relative to Agenda 21 of the Rio Summit said, "Preventive measures should be adopted with the overall aim to increase the vegetation cover of the land…." However, architecture in Nusantara Region after 2010 has shifted to Neo-minimalist style. Neo-minimalism is an architectural style which typifies a style after 2010s with integration of modern design with complex simplified geometry with white and grey tones colour facade. It has also known as "neo-geometric" or "neo-geo" art's concept (Foster, 1994).

III. Methodology

Methodology of this research uses timeline factor in recording the architectural styles namely traditional, colonial and modern architecture. This timeline maps the evolution of architectural styles which will be narrated with a reference to a series of building images with its brief description.

IV. Results and Discussion

There are two parts will be discussed in this description which contains illustrations of the architectural styles with discussions. The results and discussion can be summarised as follows:

825. Borobudur Temple (Buddhism), Yogyakarta, Indonesia Source: Amitabha Buddha

856. Prambanan Temple (Hinduism), Yogyakarta, Indonesia Source: Gunawan Kartapranata in Wikipedia

1278. Muaro Jambi (Buddhist) Gumpung Temple in Jambi, Sumatra, Indonesia Source: *Titik Temu*, Wikipedia

Figure 5. Architectural styles before 13th century

Before the 14th century, architectural styles in Nusantara Region were influenced with Buddhism and Hinduism with an expression of temple design. Hinduism was expressed with beehive tower form of Nagara style while Buddhism was with architecture of stupa with mandala plan layout. Stones carved with decorations and motifs were primary material in the temple construction.

1400s. (photo-full scale) replica of Istana Sultan Mansur Syah, Malacca, Malaysia
Source: Author

1500s. Demak Great Mosque, Semarang, Indonesia
Source: Wikipedia

Figure 6. Architectural styles in 14th and 15th century

Architecture styles in the 14th and 15th century were influenced by traditional long and pyramid roof type with a roof design concept of tier roof system. Timber (wood) became a primary construction material. The adjacent jungles (tropical rainforest) supplied the building materials. Stones were unpopular material during these centuries. Architectural styles were an impression of Islamic architecture as a design concept in building Islamic Kingdom of Malacca, Pasai and Demak Sultanate.

1521. A' Farmosa, Portueguese conquest Malacca.
Source: Author

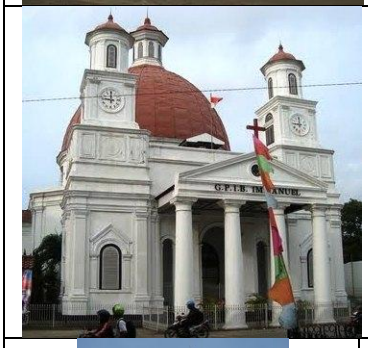
1525. Ruins of Kastella, Portuguese conquest Ternate, Indonesia
Source: Wikipedia

1600s. Masjid Kampung Laut, Tumpat, Kelantan
Source: Museum Kota Bharu

Figure 7. Architecture during Portuguese conquest

Beginning of the 16th century was a conquest era by the Portuguese, European invasion in Nusantara Region. The Portuguese who was the first European who had colonised this region starting in Malacca in 1521 and later Ternate in 1521. The architectural style was fortress architecture using stone not properly cut into blocks building the walls. However colonialism was only taken place in strategic places limited in port city area. Other territories were free from the Portuguese conquest. The traditional architectural style evolves without European influence. For example, Kampung Laut Old Mosque was built in 1600s.

1707. Jakarta History Museum before known as The Stadhuis Batavia
Source: Edi Wibowo, Wikipedia



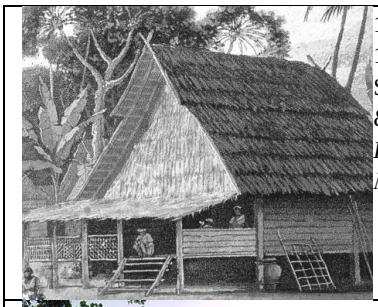
1753. Blendug Church in Semarang, Central Java
Source: Rekayasa Bentuk dan Ruang

1753. Christ Church Malacca
Source: Author

1778. National Museum of Indonesia, Jakarta
Source: Indonesia Ministry of Culture and Tourism

Figure 8. Architecture during Dutch Conquest

Seventeenth century is an era of the Dutch conquest in Nusantara Region with the establishment of Batavia (Jakarta) in 1619 and Malacca in 1641. The Dutch introduced European architecture with classical style's image in administration building design in Nusantara Region. The conquest was limited in strategic port city area.



1811. Malay 192ampong house.
Source: Painting by T & W. Daniell (in *'A Pictorial History of Malaysia'*)

1818. St. George Church, Penang
Source: Author

1826. Pagaruyung Palace (replica in 1976) is the *istana* (royal palace) of the former Pagaruyung Kingdom, in West Sumatra, Indonesia
Source: Wikipedia

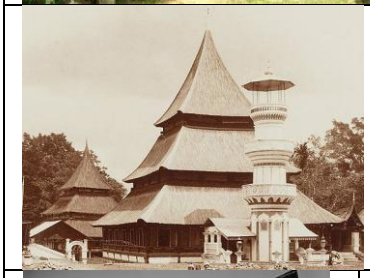
1851. Crystal Palace Station in London, England by John Paxton
Source: Wikipedia

1855. Rumah Bujang Berserambi (Rumah Syeikh Abdul Kadir Kolam), the local aristocrat in Terengganu
Source: Author

1860s. Syed Alatas Mansion, the local aristocrat
Source: Author

1885. Home Insurance Building in Chicago by William Le Baron Jenney
Source: Wikipedia

1887. Wakaf (perkarangan Jahar Palace) in Kota Bharu, Kelantan
Source: Author



1892. Traditional Minangkabau mosque in Indonesia
Source: Wikipedia

1894. Prudential Building, Buffalo, USA by Louis Sullivan
Source: Wikipedia

Figure 9. Traditional, colonial and modern styles during British and Dutch colonial era in Nusantara Region.

There were many architectural occurrences happened in the 18th century in Nusantara Region. The first occurrence was the British and the Dutch began expanding their colonisation to the whole Nusantara Region. The British had began colonised all parts of Malaysia, Singapore and Brunei and the same condition done by the Dutch in Indonesia. In adition to control trade in the port cities, the British and Dutch had introduced monetary economy like rubber and oil palm plantations and mining activities to Nusantara Region to export raw resources to factories in Europe. As a result, this region became wealthy not only to the British and Dutch officers but also local people (including sultan) who had participated in the economy. There were many buildings, palaces, houses and villas built with an expression of wealth during this -

period with the rise of the European, local and expatriate aristocrats, typifying variety of styles of traditional and colonial architecture. Traditional and colonial styles were popular in Nusantara Region.

The second occurrence was when Industrial Revolution taken place starting from 1750 in England. Later the revolution had spread to the rest of Europe. Industrial Revolution was the advent of industrial age with monetary economy and engineering development. Engineering elements and its concept of purity with simple style had influenced to modern architectural style in Europe and North America. Crystal Palace Station in London was designed by John Paxton in England. In the United States, architect William Le Baron Jenney designed Home Insurance Building in Chicago and Louis Sullivan designed Prudential Building in Buffalo, New York. Modern architecture started gradually to replace neo-classical style in Europe. New material using reinforced concrete, iron and glasses were widely used in construction of modern buildings.

1905. Penang Council State Assembly
Source: Author

1915. Aceh Museum
Source: Tropen Museum

1935. Ipoh Railway Station
Source: Author

Figure 10. Nusantara Region with traditional and colonial style in 20th century during British and Dutch colonialism

In the early 20th century, Nusantara Region was continuously influenced by traditional and colonial style compared to the rise of modern architecture in Europe and America. The construction technique still used cements and bricks in construction of colonial building while timber in traditional building.

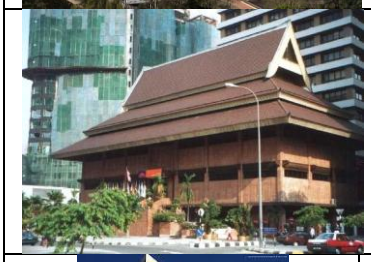
1960s. Villa at Pasir Pekan Kelantan
Source: Author

1965. Sultan Abdul Aziz Salehudin Airport, Subang, Malaysia
Source: http://pakmus.blogspot.com

1967. Pekeliling Flat, Kuala Lumpur

Source: Author

1978. Istiqlal Mosque, Jakarta
Source: Photo by Micheal Lowe



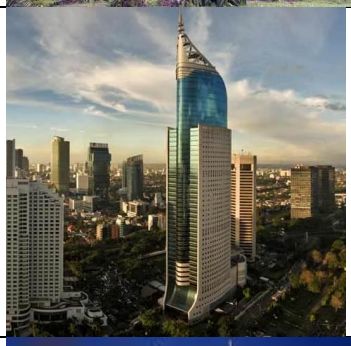
1982. *Bank Muamalat Head Quarter*
Source: Author

1988. Maybank Tower by Hijjas Kasturi
Source: Author

1976. KLSE building Kuala Lumpur
Source: Wikipedia

1985. PWTC Convention Hall
Source: Author

1993. Salinger Residence, Bangi, Selangor
Source: Wikipedia



1996. Wisma 46 in Jakarta
Source: Gallery S Gallery

1997. Petronas Twin Towers Kuala Lumpur
Source: Wikipedia

1998. Avillion Legacy Melaka Hotel
Source: Author

2000. Annora Bali Villas, Bali Indonesia.
Source: Wikipedia

2000. Precinct 16 Apartment, Putrajaya

Source: Author

2002. Villa in Melor, Kelantan
Source: Author

2009. Iron Mosque Putrajaya by Ahmad Hilmy Abdullah AHA Architect
Source: Wikipedia

2010. Kuala Terengganu Bazaar
Source: Author

2010. Marina Bay Sands, Singapore
Source: http://mundonarnia.com

2012. Masjid Ulul Albab
Source: Author

2012. Tan Residence designed in Jakarta, Indonesia by Chrystalline Architect
Source: *freshome: Design and Architecture Magazine*

2014?. Neo-minimalist Apartment in Kuala Lumpur

Source: Author

Figure 11. Application of modern material in construction of buildings with traditional, colonial and modern architectural style in 21st century.

Beginning from the late 20th century to current (the early 21st century), architecture of traditional and

colonial expression as well as modern architecture continuously becomes a point of interest in Nusantara Region. However, all the architectural styles share the same construction technique using reinforced concrete as primary structural construction. The differences are the material used in enveloping the building façade and roof system. Traditional style applies timber, colonial style use plaster cements and modern architecture use plaster cements as a dominant material in the design of the building facades. By 1992, sustainability becomes a point of concern regarding to the architectural development. Many architects have an input in integrating sustainability in their building design especially in areas of passive design, thermal comfort and energy efficiency. After 2010, new modern style has emerged known as neo-minimalist style which concerns accuracy in functional design with simplicity to reduce construction cost and maintenance.

V. Conclusion

By mapping the architectural timeline, the advantage is that it illustrates the evolution of architectural style in Nusantara Region. The study finds that there is no development of Hindu-Buddhist architectural styles in this region, possibly limited to the Island of Bali. The dominant architectural styles are traditional, colonial and modern design. With the advent of engineering technology, all the styles adopt the same construction post and beam technique using reinforced concrete as primary material even though all the styles applies different techniques in designing the building façade and roof system. All the styles in addition have an emphasis on sustainability after 1992's the Earth Summit in Rio de Janeiro. Neo-minimalist become a new style evolved from modern architecture with additional focus on design efficiency in spatial functionality and minimise construction cost and building maintenance.

Acknowlegement

The authors would like to express appreciation for the financial support under Research University Grant by Universiti Sains Malaysia. [Grant Number = 1001/PPBGN/816237].

References

1) Abel, C (1985), Living in a Hybrid World, *Design Policy: Proceedings of the 1982 Design Research Society Conference*, R, Langdon and N, Cross, London
2) Allen, C (1986), A Home Away From Home, *Architecture of the British Empire*, Weidenfeld and Nicolson, London
3) Banham, R (1970), *Theory and Design in the First Machine Age*, 4th edition, The Architectural Press, London
4) Barley, M.W (1967), 2nd Ed., *The English Farmhouse and Cottage*, Routledge & Kegan Paul Ltd., London
5) Bernal, M (2006), *Black Athena*, Rutgers University Press, New Jersey
6) Curtis, W (1983), *Modern Architecture Since 1900*, Prentice-Hall Inc., New Jersey
7) Dawson, B and Gillow, J (1994), *The Traditional Architecture of Indonesia*, Thames and Hudson Ltd, London,
8) Foster, H (1994), What's Neo about the Neo-Avant-Garde?, *The Duchamp Effect*, 70:5-32, http://www,jstor,org/stable/779051, Accessed on Jun 1, 2014
9) Frampton, K (1980), *Modern Architecture: A Critical History*, Thames and Hudson, London
10) Fry, M (1964), *Tropical Architecture in the Dry and Humid Zones*, B.T. Batsford Ltd, London
11) Grubb, M, Koch, M, Munson, A, Sullivan, F and Thomson, K (1993), The *Earth Summit Agreements: A Guide and Assessment*, Earthscan Publication Ltd., London
12) Hassan, A.S and Che Yahaya, S.R (2012), *Architecture and Heritage Buildings in George Town, Penang*, USM Press, Penang
13) Hassan, A.S (2004), *Issues in Sustainable Development of Architecture in Malaysia*, Universiti Sains Malaysia Press, Penang
14) Hitchcock, H.R (1929), *Modern Architecture, Romanticism and Reintegration*, Payson and Clarke Ltd., New York
15) Khan, H (1981), *MIMAR 2: Architecture in Development*, Concept Media Ltd., Singapore
16) Lim, J.Y (1987), *The Malay House Rediscovering Malaysia's Indigenous Shelter System*, Institut Masyarakat, Penang
17) Lim, J.Y (1984), *Under One Roof*, vol. 12.4, A World in Cities IDRC Reports
18) Mohd, A.K (1983), A Vanishing Heritage: The Old Traditional Malay House, *Architecture Journal*, Universiti Teknologi Malaysia Press, Skudai
19) Rapoport, A (1990), *History and Precedent in Environmental Design*, Plenum Press, New York
20) Rawson, P.S (1967), *The Art of Southeast Asia*, Thames & Hudson, London
21) Soekmono (1976), *Chandi Borobudur*, The UNESCO Press, Paris
22) Wahyono. S.K (2009), *Indonesia Negara Maritim*, PT Mizan Publika, Jakarta
23) Yeang, K (1987), *Tropical Urban Regionalism*, Concept Media Pte. Ltd., Singapore

Privately Owned Public Space as a Solution to the Future Urban Space

Cynthia Puspitasari[1]

[1] Lecturer, Department of Architecture, Faculty of Engineering, Universitas Pancasila

Abstract

The never-ending development placed in urban structure resulted in the commercialization of urban spaces. Nowadays, it has concerned to be a big issue, considering the need of communal spaces for human in the future. Could the impact of development by the private sector is still giving the rest of the space for urban communities in the future? Is the land accessible for public will still existed? or diminished? To ensure the existence of the public space remains for future generations, it is necessary to do a control to preserve the existing public spaces, but also to force the current and future development to contribute to the enhancement space for public uses. Incentive Zoning is a method that can be used as a development control undertaken by the private sectors, with building intensity bonuses. Its policy encourages the developer to provide the space where can be accessed by the public. In US, this method is often done in terms of Privately Owned Public Space (POPS). In this paper, POPS implementation will be analysed using observational research technique. The result is expected to give a solution for the improvement of POPS and encourages the increasing of public open spaces quantity in Jakarta.

Keywords: *public space; urban; incentive zoning; POPS*

I. Introduction

What is it that your own? How do you know what is yours? How do you protect what is yours from assertation by others, including the government, that what is yours is theirs? Is what is yours, what you own, the same as what your parents, grandparents or great-grandparents cosidered their ownership rights? And if what you own is not the same as what prior generations owned, why has this changes, and most importantly how is it likely to change into the future? (Jacobs, 2004)[2].

Human needs for shared spaces becomes indisputable fact. Shared space is a place that is accessible to the public at no charge. This space often referred as public space. Currently, urban conditions have demonstrated the existence of a public spaces are getting limited. If the current conditions have shown a minimal amount of public space, and how about the conditions in the future? Are the amount of public spaces will increase? Will future generations can enjoy the public spaces in the city?

Public space is a space where everyone has access to use it. According to Stephen Carr in his article titled Public Space, the main characteristics of public spaces are: open, easily reached by the public to do community activities and do not always have a green element, the form can be malls, plazas and playgrounds (Carr, 1992)[3].

In many big cities in Indonesia, especially in Jakarta as the capital city, public spaces are still facing some problems such as flooding and air pollution. One of the reason is the lack of green open space. It makes even worried that during the last 25 years, Jakarta has lost 85% of its green space (walhi.or.id, 28 Juli 2011)[4]. When the city began losing its green open space, it will have an impact on environmental issues in the city. A healthy city is a city of green, lots of trees. Whereas, less healthy city is a city where green space is getting reduced due to the construction of buildings continue to increase.

Jane Jacobs (1961) through her book The Death and Life of Great American Cities, quotes that the more successfully a city mingles everyday diversity of uses and users in its everyday streets, the more successfully, casually (and economically) its people thereby enliven and support well-located parks that can thus give back grace and delight to their neighborhoods instead of vacuity[5]. The statement is clear that the success of the city is determined by the high society activities conducted in public spaces. This is clear that public spaces are important for the life and sustaninability of a city.

Abidin Kusno (2009) in his article titled Ruang Publik, Identitas dan Memori Kolektif: Jakarta Pasca-Suharto, said that public space in the city is

Cynthia Puspitasari
---Lecturer, Universitas Pancasila
Jalan Srengseng Sawah, Jagakarsa, Jakarta Selatan
Tel: +6281214422244 Fax: +62217270128
E-mail: cynthia.puspitasari@gmail.com

very important to build community togetherness, as it gives a place for our fellow citizens to interact and knitting historical moments that can be remembered together. The statement is clear that the memory or memory resident requires the presence of a place that embodies, the so-called public spaces[6]. Meanwhile, in the book titled Re-desain Jakarta Tata Kota Tata Kita 2020, Ahmaddin Ahmad (2002) said a fact that Jakarta has experienced a distortion in the use of public space. Public areas in Jakarta are stand between the conflict of interest regardless of the economy, then they impact on shrinking the amount and quality of public space[7]. Based on the needs of the city for the sake of memory and identity needs of the community now and in the future that the existence of public spaces in the city of Jakarta such as: Gelora Bung Karno, Monumen Nasional, Taman Ismail Marzuki, Taman Suropati, Taman Menteng, Taman Tomang, Taman Langsat, Teater Salihara, Gedung Kesenian Jakarta, and so on, need to be preserved and the amount need to be added.

Until now, the area of green open spaces in Jakarta is about 9.8% area of the city (www.antaranews.com, 7 Mei 2011)[8]. To reach the amount of 16% as indicated in Detail Spatial Plan (RDTR), Jakarta still needed an additional 6% green open space. Jakarta still requires effort very hard to reach that number. As an illustration, with a total area of 66152 km2 Jakarta, each additional 1% of green space, takes an area of 6.6 km2. Moreover, following the rules in the UU No. 26 Tahun 2007 about Penataan Ruang, green open space (RTH) should be provided 30%, consisting of 20% public and 10% private[9]. That is why, Jakarta should try to provide green open spaces wider. Therefore, Jakarta Provincial Government in recent years creates the regulation plan for the addition of private green space in an office area, trading and services, as well as industrial areas.

One of the effort to increase the amount of private open space that contribute to the public is to do the development control. Development control can be implemented by incentives or bonuses approach to the builder or developer (UU No. 26 Tahun 2008)[10]. This solution is also called incentive zoning, where the government is working with both the private sector owner and developer of the land development through intensity bonuses to those who are willing to give a portion of land to public purposes.

Currently, the implementation of incentive zoning in spacial planning not much applied. This is caused by the less explanation of the rules and, but also because of the lack of socialization is done from the government as a regulator of the players in the property field. Based on these facts, we need a way for the application to do. One of the fit way, is by sosializing the Privately Owned Public Space program, as it is done in New York, United States. Socialization of POPS is in addition to introduce the term but also giving an understanding to the builders, government - and public users about the rules and guidelines of incentives and disincentives in spatial planning.

II. Research Method

The method used in this paper is observational research techniques, which are assessing the implementation of POPS and followed by Incentive Zoning in several CBD around Jakarta. The assessment of each case studies use three observation techniques:

1) Assessment of POPS physical form using Design Guidelines as the criteria. The output of this analysis is the comprehension of various POPS in Jakarta (see table 2);
2) Comparison of the intensity data (determined by the government) with actual intensity data as the result of the development done by the developer. The output of this analysis is incentive zoning or bonus in the form of intensity values;
3) Quantity assessment by using calculation of the number of visitors within 1 hour. The output of this analysis is the successful rate of the public space (see table 1).

Table 1. Public Space Succesful Rate

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7

III. The role of the Development Control to Create Sustainable Urban Public Space

Rapid development of the city led to increased demand for urban land. It is often characterized by changes to land use in urban areas. Changes in land use often effected conflict between the parties concerned; The intent conflict is a mismatch and disagreement between two or more parties to a problem or more (David, 1995)[11]. Parties that require land use change (developer / private) usually has considered the benefits to be gained, but often do not take into account the negative externalities on others. On the other side, the city government is very concerned about the changes in land use due to face directly to the negative impacts of land use change to the arrangement and overall city services. Other parties who are often suffering affected / negative externalities of land use change are the people.

In terms of changes in the utilization, the government must have a clear and effective procedures for controlling changes to the land. In Laporan Akhir Kajian Kebijakan Insentif dan Disinsentif Tata Ruang dalam Pembangunan Nasional, explained that in order to anticipate the rapid growth of development that occurs at this time, the government made a layout plan called kawasan strategis nasional (KSN) accompanied by control instruments, named space utilization incentives and disincentives[12]. In PP No. 26

tahun 2008 about RTRWN (pasal 75) mentioned that the formulation of incentives related to the determination of kawasan strategis nasional (KSN) performed based on the interests of: (a) economic growth; (b) social and cultural; (c) the functions and the carrying capacity of the environment; (d) the utilization of natural resources and / or high technology; and / or (e) defense and security[13]. Incentives related to the realm of public space, the formulation of spatial incentives into the KSN carrying capacity and the environment, but the results of the formulation can not be used as a reference for the Government and local government so that the necessary guidelines for the implementation of incentives and disincentives are more detailed.

Incentive is bonus while disincentive is revocation. Incentives granted if space utilization in accordance with the structure plan area, spatial plan pattern, and an indication of the direction of zoning regulations. In the context of spatial planning, proper behavior is the behavior of the given incentives such as the following examples: in the building permit required coefficient of 40%, but the permit holder uses only 25% while the rest is made of green open space. This behavior is an example of the ideal behavior of deserving incentives to encourage the ideal behavior. While those who build in accordance with the permit utilization of space does not need to have an incentive because it is the standard of compliance with regulations set forth in the spatial plan.

The application in detail for incentives in public spaces associated with zoning regulations, better known as incentive zoning. Incentive zoning is a provision of a municipal zoning ordinance that allows developers to create a higher density (usually expressed as housing units per acre) in return for providing some feature considered to be in the public interest. This extra often is called a density bonus. The density bonus under incentive zoning might be awarded if a developer provides affordable housing, granny flats or other accessory dwelling units, additional open space, public art, street lighting, contribution to a fund for a new bridge or school, or some other desirable public amenity. This tool also could be used to promote mixed use development, work-at-home units, or a transit connector.

Fig.1. Incentive Zoning in Pedestrian Way MH. Thamrin, Jakarta.
Source: http:// www.pdw-architects.com downloaded on 14 June 2014

Incentive Zoning policies have been successfully performed on several buildings located in the business district in the city. As examples of the application of incentive zoning has been done in Jakarta are Gedung Danamon dan Gedung Dharmala on jalan Sudirman or Taman Gunung Agung on Kwitang Senen, that donated six meter land for pedestrians. In the case of spatial planning in Jakarta, Incentive Zoning application is not regulated and socialized in detail with specific guidelines. Moreover, in the Laporan Akhir Kajian Kebijakan Insentif dan Disinsentif Tata Ruang dalam Pembangunan Nasional, it only discusses the types of incentives in the form of non-design matters such as tax relief, ease of permits and others, but did not elaborate on the building density bonuses are regulated in detail and accompanied by a complete device.

Seeing the examples of the successful application of zoning incentives to make the busy city to be more friendly, the city of New York, USA, is one of the successful cases of applying it. This approach promoted by the program called Privately Owned Public Space (POPS), where every builder who introduced the rule proposed permit and negotiated on its application on their land. This approach encourages the involvement of multiple stakeholders in taking responsibility agreement to manage public space and improve the environment together.

IV. The Implementation of POPS

POPS is defined as an open space in private development under private management where the general publics are entitled to access, use and enjoy. POPS may be located on private land within a private development and/or on government land adjoining a private development.

Privately owned public spaces are owned and operated by private developers and management firms. Urban planners first introduced these spaces several decades ago in an effort to provide the private sector with attractive incentives to achieve certain public goals. Now quite common in major cities, these spaces are most often constructed in exchange for fl oor area ratio (FAR) bonuses. This arrangement stipulates that developers may transgress the zoning code or construct buildings that exceed maximum building envelope allowances in exchange for the provision and perpetual maintenance of a publicly accessible space. The resulting ‘bonus spaces’ are legally required to invite public access, but their physical configuration and design, as well as the regulations governing their use, are introduced and maintained by private interests rather than city planning or governmental agencies (Smithsimon, 2008)[14].

It seemed a splendid idea. Developers wanted to put up buildings as big as they could. Why not harness their avarice? Planners saw a way. First, they would downzone. They would lower the limit on the amount

of bulk a developer could put up. Then they would upzone, with strings. The builders could build over the limit if they provided a public plaza, or an arcade, or a comparable amenity (Whyte, 1988)[15].

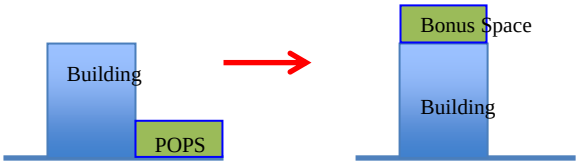


Fig.2. POPS Implementation, where the POPS space is granted with a bonus space.

POPS seeks primarily to achieve better quality design, optimization of land use, better site planning, and/or synchronizing the availability of open space and the community needs a rising from developments. With proper design and management, POPS could contribute towards the provision of quality leisure and recreational space and improve Jakarta's living environment.

To implement the program POPS in the city, it requires a control strategy that gives the chances of an agreement between the private sector and public areas, with the application of descriptive and detailed as well as urban design guidelines (UDGL).

V. Design Guidelines

Following Hong Kong Development Bureau in controlling its city, they use The Design Guidelines as a set of clear and practicable guidelines to facilitate better design and management of POPS. On design, the guidelines provide standards and guidance on better quality design based on the principles of connectivity, appropriateness and quality.

Design guidelines assist interested parties such as governments, developers, the public and others in understanding the lines that have been established in relation to the application of the POPS. POPS design guidelines can also be the basis for planning and design of buildings and areas in designing the built environment while contributing to the needs of the public.

Based on the guidelines created by the Hong Kong Development Bureau, POPS design criteria in the application is divided into several sections, such as[16]:

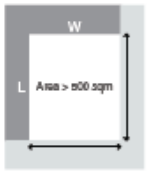
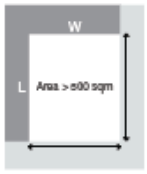
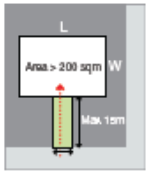
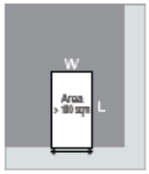
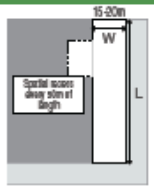
a. Shape, a more defined space is preferred to a loosely defined one, since the former will facilitate public use and enjoyment. A regular shaped space is generally more usable than one with changing edges and irregular shapes, as acute angles within the irregular space may lower the visibility of the full space. That said, design flexibility should be allowed on individual merits.
b. Street frontage is the linear extent of access to the public open space from the adjoining street. A preferred street frontage should have at least the same width as the public open space, and should be as wide as possible so as to enhance visibility and popularity of the space.
c. The width to length (or width to depth) proportion defines visibility of the space. Length generally refers to the greater dimension of the space, or the average of such; while width or depth refers to the lesser. The more elongated the space is, the lower the possibility for it to accommodate a variety of public uses. Elongated space is mainly for circulation purpose. A higher width or depth to length ratio is preferred.
d. Major / Minor Space Major space refers to the main portion of the POPS, which in general is larger in area. Minor space refers to the space attached to a major space, usually with smaller sizes. Its relationship with and the transition to major space will affect the scope of possible activities. Major space should account for preferably not less than 75% of the area of POPS.
e. Area refers to the extent of space available for specific use. The smaller the area, the more restrictive the space would be to uses, activities and other amenities that could be accommodated. If the area was too big and without proper design, it would affect the intimacy and lose human touch. POPS of appropriate size that corresponds to its use and context is preferred.
f. Visibility relates directly to seeing the public open space and being seen from the view of the public. The position or orientation of the seating at various locations determines the view. It is ideal to have views without any blockage, and the range of openness may vary from a fully open view to facing a slope or other visual barriers. Visibility into and around the space is also important to promote a sense of openness and safety.
g. Openness to sky or outdoor open air public space should generally be adopted as a design principle. Canopy and tree shading could be employed to create a more comfortable microclimate for the open space. Transparent materials could be selected for canopy required to provide weather protection while admitting natural light to enhance the environmental quality.
h. Slope/Gradient, it is always desirable to have public open space at grade or on the principal pedestrian level. Inappropriate gradient change would limit the use of space while suitable gradient or change in level could create linkages with visual interests. Connection and continuation at different levels, both spatial and visual, could enhance visibility and hence popularity. Multilevel space should be well designed and integrated. Mechanical access may be accepted to improve the connectivity between levels.
i. Landscape Planning, should reflect the distinctive character and amenity of an area. Reinforce desirable local character through appropriate artworks and landscape design. Highlight the

uniqueness of local characteristics interms of landform, landscape character, vegetation, local cultures, landmarks etc.

According to the same research, Hong Kong Bureau, divided spatial types of POPS into five types[17]:

a. Public Green, is defined as a public open space with extensive green coverage and soft landscaping that serves the district for leisure, relaxation and breathing space in the neighborhood. It is open to sky, passive recreation-oriented and should preferably be at grade. The minimum area should be 500 sqm and minimum green coverage should be 50%.
b. Plaza, is defined as public open space with a vibrant atmosphere that serves the districts and/or the city with multiple usage from leisure, communal gathering, to cultural performance. It is well connected with adjacent street and has high visibility too the surrounding area, and a high degree of flexibility on uses. The location should preferably be at grade or at the principal pedestrian level with sufficient size allowing multiple uses and well-proportioned configuration. The minimum area should be 500 sqm and minimum green coverage should be 30%.
c. Courtyard, is defined as a public open space similar to plaza but with a relatively less vibrant atmosphere that serves the neighborhood and/or the district with more limited usage from leisure
d. informal gathering, to play areas. It is surrounded by buildings and the major space is indirectly connected with the street through a pedestrian path with a minimum width of 6 m and maximum length of 15m. The minimum area should be 200 sqm and minimum green coverage should be 30%.
e. Pocket Space, defined as a small scale public open space indented along the street and serves the local neighbourhood as resting space, casual gathering and sitting as well as brief stop for passer-by. The space is connected with the adjacent street and has minimum width of 6 m. The minimum area should be 100 sqm and minimum green coverage should be 30%.
f. Promenade, is defined as a public space which provides passive recreation facilities and is more than passageway for public access. For such promenade to be able to serve the purpose as POPS, the space should be linear with minimum width of at least 15-20 m, which allows activities and other uses to take place along it. Every 50m requires a spatial recess with seating or resting area.

Table 2. POPS Criteria as Design Guidelines.

CRITERIA	PUBLIC GREEN	PLAZA	COURTYARD	POCKET SPACE	PROMENADE
	 Over 30% and min 13.5m	 Over 30% and min 13.5m	 Over 15% and min 6m	 Over 15% and min 6m	
Shape	Site-specific	Site-specific	Site-specific	Site-specific	Site-specific but Generally elongated
Street Frontage	Over 30% 13.5m min width	Over 30% 13.5m min width	Over 15% 6m min width	Over 15% 6m min width	N/A
Width / Length Ratio	1:3 min	1:3 min	1:3 min	1:3 min	15-20m min width, spatial recess every 50m of length
Major / Minor Space	Site-specific but preferably 75% min for major space	Site-specific but preferably 75% min for major space	Site-specific but preferably 75% min for major space	Site-specific but preferably 75% min for major space	Site-specific but generally elongated
Area	500 sqm min	500 sqm min	200 sqm min	100 sqm min	N/A
Visibility	Visible	Highly Visible	Visible	Visible	Visible
Open to Sky	Open air	Open air	Open air	Open air	Open air
Slope / Gradient	Preferably on flat land	Preferably on flat land	Preferably on flat land	Preferably on flat land	Site-specific
Green Coverage	50% min	30% min	30% min	30% min	Site-specific, Tree for shading should preferably be provided

Source: Public Open Space in Private Developments Design and Management Guidelines, 2008

6. POPS Analysis in DKI Jakarta

In order that the implementation of the five types of POPS space can be more clearly, and the obstacles and problems can be understood, it needs to do analysis of the types of POPS that have been applied in the business district of Jakarta.

6.1 Public Green: Podomoro City Central Park

Location : Jalan S. Parman, Slipi, Jakarta
Function : Super Block
Site Area : 9 hectares
Floor Area : 655000 sqm

Architect : DP Architects & ARK Design
Built : 2007

Fig.3. Public Green on Central Park.
Source: http://rumahdijual.com, downloaded on 14 June 2014

a. POPS Assessment

The table below, showed that at Central Park project, the developer provides a public space in the form of Public Green. Based on the criteria for the application of POPS, percentage points of Green Coverage min. 50% and min. 75% to major space, these implementations are still not large enough. Therefore, POPS on this project was judged insufficient, because it does not comply with the minimum standards.

STANDARD CRITERIA	POPS
	
Shape (site-specific)	Site-specific
Street Frontage (>30%) (13.5 m min.)	30 % 57 m
Width/Length Ratio (1:3)	1:3
Major/Minor Space (75%)	21 %
Area (min. 500 sqm)	18200 sqm
Visibility (visible)	Visible
Open to Sky (open air)	Open air
Slope (flat)	Flat land
Green Coverage (50 % min.)	21 %

b. Incentive Zoning Assessment

INTENSITY POLICY	APPLIED ON PROJECT	INCENTIVE ZONING
Site Area: 87000 sqm		**Bonus Density:** Total Floor Area 655000 sqm/ Site Area 87000 sqm= 7.5 FAR 7.5-7.2=0.3
FAR: 7.2 (626400 sqm)	FAR: 655000 sqm	
BCR: 60 %	BCR: 60 %	
Max. Height: 60	Height: 56 floors	
Green Coverage: min. 10 %	Green Coverage: 21 %	
	POPS: 21 %	

The table above showed that the Incentives are given in the form of additional FAR of 0.3. The Bonus is given to the developer because the development has contributed to a public space and green space of 21%.

c. The Success Rate as a Public Space

The success rate measured by the number of visitors who visit the Public Green on Saturday afternoon within 1 hour. From the table below, we can conclude that this public space is not successful due to the less number of visitor. This may happened because of the space that placed behind the commercial building is difficult to access by the public.

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7
Survey Data	x			

6.2 Plaza, Rasuna Epicentrum

Fig.4. Public Plaza on Rasuna Epicentrum.
Source: http://skyscraperscity.com, downloaded on 14 June 2014

Location : Jalan HR. Rasuna Said, Kuningan, Jakarta
Function : Super Block
Site Area : 44 hectares
Floor Area : 60000
Architect : PTI, Urbane, EDAW, HOK
Built : 2006

a. POPS Assessment

The table below, showed that at Epicentrum project, the developer provides a public space in the form of Plaza. Based on the criteria for the application of POPS, percentage points of Green Coverage min. 30% and min. 75% to Major Space. Physically, this Plaza has not met the standards for POPS, but it is considered succeed because of its opening and interesting features.

STANDARD CRITERIA	POPS
	
Shape (site-specific)	Site-specific
Street Frontage (>30%) (13.5 m min.)	100% 402 m
Width/Length Ratio (1:3)	1:13
Major/Minor Space (75%)	31 %
Area (min. 500 sqm)	13200 sqm
Visibility (highly visible)	Visible
Open to Sky (open air)	Open air
Slope (flat)	Flat land
Green Coverage (30 % min.)	10 %

b. Incentive Zoning Assessment

The table below showed that the incentives are not given in the form of additional FAR. However, based on existing data that are reduced to the maximum height of the building regulations, there are a total of 7 stories additions to the building. This bonus was probably given because of their contribution for giving 31% of POPS.

INTENSITY POLICY	APPLIED ON PROJECT	INCENTIVE ZONING
Site Area: 44000 sqm		**Bonus Density:** Total Floor Area 60000 sqm/Site Area 440000 sqm= 0.14, no FAR added. Building height 47 – max. height 40 = 7, bonus 7 floors.
FAR: 4.5 (626400 sqm)	FAR: 60000 sqm	
BCR: 40 %	BCR: 40 %	
Max. Height: 40	Height: 47 floors	
Green Coverage: min. 10 %	Green Coverage: 10 %	
	POPS: 31 %	

c. The Success Rate as a Public Space

The success rate measured by the number of visitors who visit the Plaza on Saturday afternoon within 1 hour. From the table below, we can conclude that this public space is very successful due to the high number of visitor. This may happened because of the space is accessible by the public and the friendly features that favor pedestrians such as separating vehicular access from pedestrian access.

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7
Survey Data	x			

6.3 Courtyard, Plaza Senayan

Location : Jalan Asia Afrika, Senayan, Jakarta
Function : Super Block
Site Area : 11 hectares
Floor Area : 130.500 sqm
Architect : Airmas Asri
Built : 1994

Fig.5. Courtyard on Plaza Senayan.
Source: http://jakarta1000bars.com, downloaded on 14 June 2014

a. POPS Assessment

The table below, showed that at Plaza Senayan project, the developer provides a public space in the form of Courtyard. Based on the criteria for the application of POPS, percentage points of Green Coverage min. 30% and min. 75% to Major Space, has not met the standards for POPS. These are obvious from its pavement all over the surface and water features installed on the site.

STANDARD CRITERIA	POPS
	
Shape (site-specific)	Site-specific
Street Frontage (>15%) (6 m min.)	27 % 39 m
Width/Length Ratio (1:3)	1:2
Major/Minor Space (75%)	17 %
Area (min. 200 sqm)	3040 sqm
Visibility (hvisible)	Visible
Open to Sky (open air)	Open air
Slope (flat)	Flat land
Green Coverage (30 % min.)	10 %

b. Incentive Zoning Assessment

The table below showed that the incentives are not given in the form of additional FAR and also there is no bonus on building height. These are known from the level of intensity applied on a project those are under regulation. This is because the project was built in the 90s, where at that time contributed to a public space has not been rewarded with an incentive.

INTENSITY POLICY	APPLIED ON PROJECT	INCENTIVE ZONING
Site Area: 110000 sqm		**Bonus Density:** Total Floor Area 130500 sqm/ Site Area 110000 sqm= 1.9, no FAR added
FAR: 4.5 (626400 sqm)	FAR: 60000 sqm	
BCR: 40 %	BCR: 40 %	
Max. Height: 33	Height: 28 floors	
Green Coverage: min. 10 %	Green Coverage: 10 %	
	POPS: 17 %	

c. The Success Rate as a Public Space

The success rate measured by the number of visitors who visit the Courtyard on Saturday afternoon within 1 hour. From the table below, we can conclude that this public space is very successful due to the high number of visitor. This may happened because of the space is easy enough to access by the public, placed in the middle of commercial spots, and also has interesting features like water fountain.

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7
Survey Data		x		

6.4 Pocket Space, Plaza Indonesia

Fig.6. Pocket Space on Plaza Indonesia.
Source: http:// www.pdw-architects.com downloaded on 14 June 2014

Location : Jalan MH. Thamrin, Menteng, Jakarta
Function : Super Block
Site Area : 4 hectares
Floor Area : 62747 sqm
Architect : HOK
Built : 1990

a. POPS Assessment

The table below, showed that at Plaza Indonesia project, the developer provides the public space in the form of Pocket Space. Based on the criteria for the application of POPS, percentage points of Green Coverage min. 30% and min. 75% to Major Space, are still not large enough. But the existence of this space are rated quite effective because it provides comfort for pedestrians both physically and visually.

STANDARD CRITERIA	POPS
	
Shape (site-specific)	Site-specific
Street Frontage (>15%) (6 m min.)	77 % 325 m
Width/Length Ratio (1:3)	1:8
Major/Minor Space (75%)	15.5 %
Area (min. 100 sqm)	5900 sqm
Visibility (hvisible)	Visible
Open to Sky (open air)	Open air
Slope (flat)	Flat land
Green Coverage (30 % min.)	10 %

b. Incentive Zoning Assessment

The table below showed that the incentives are not given in the form of additional FAR and building height. These are known from the level of intensity applied on a project those are under regulation. This is because the new POPS was applied after building was built. POPS applied later through widen sidewalks along jalan MH. Thamrin. Courtyard on this project become a node that wider than the sidewalk and becomes a space inbetween.

INTENSITY POLICY	APPLIED ON PROJECT	INCENTIVE ZONING
Site Area: 40000 sqm		**Bonus Density:** Total Floor Area 62747 sqm/ Site Area 40000 sqm= 1.65, no FAR added
FAR: 2 (626400 sqm)	FAR: 62747 sqm	
BCR: 60 %	BCR: 60 %	
Max. Height: 60	Height: 48 floors	
Green Coverage: min. 10 %	Green Coverage: 10 %	
	POPS: 13 %	

c. The Success Rate as a Public Space

The success rate measured by the number of visitors who visit the Courtyard on Saturday afternoon within 1 hour. From the table below, we can conclude that this public space is successful due to the high number of visitor. This may happened because of the space is very accessible by the public and friendly to pedestrian.

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7
Survey Data			x	

6.5 Promenade, Rasuna Epicentrum

Fig.7. Public Plaza on Rasuna Epicentrum.
Source: http://www.panaromio.com, downloaded on 14 June 2014

Location : Jalan HR. Rasuna Said, Kuningan, Jakarta
Function : Super Block
Site Area : 44 hectares
Floor Area : 60000 sqm
Architect : PTI, Urbane, EDAW, HOK
Built : 2006

a. POPS Assessment

The table below, showed that at Rasuna Epicentrum project, the developer provided public space in the form of Promenade. Based on the criteria for the application of POPS, the applications have already met the criteria of promenade. Because every items of the criteria applied above the standards. This brand new project can become a pilot project for the implementation of the POPS.

STANDARD CRITERIA	POPS
	
Shape (elongated)	Site-specific: Elongated
Street Frontage	70 % 404 m
Width/Length Ratio (15-20 m min. Spacial Increase /50 m)	1:8
Major/Minor Space (site-specific: elongated)	Elongated
Area	14300 sqm
Visibility (visible)	Visible
Open to Sky (open air)	Open air
Slope (site-specific)	Flat land
Green Coverage (tree for shading)	Tree for shading

b. Incentive Zoning Assessment

The table below showed that the incentives are not given in the form of additional FAR. However, based on existing data that are reduced to the maximum height of the building regulations, there are a total of 7 stories additions to the building. This bonus was probably given because of their contribution for giving 31% of POPS.

INTENSITY POLICY	APPLIED ON PROJECT	INCENTIVE ZONING
Site Area: 440000 sqm		**Bonus Density:** Total Floor Area 60000 sqm/Site Area 440000 sqm= 0.14, no FAR added. Building height 47 – max. height 40 = 7, bonus 7 floors.
FAR: 4.5 (626400 sqm)	FAR: 60000 sqm	
BCR: 40 %	BCR: 40 %	
Max. Height: 40	Height: 47 floors	
Green Coverage: min. 10 %	Green Coverage: 10 %	
	POPS: 31 %	

c. The Success Rate as a Public Space

The success rate measured by the number of visitors who visit the Courtyard on Saturday afternoon within 1 hour. From the table below, we can conclude that this public space is very successful due to the high number of visitor. This may happened because of the space accessible by the public. It also has an interesting and innovative features in revitalizing public spaces in the form of riverfront.

Criteria	Not Successful	Less Successful	Successful	Very Successful
Visitor (in an hour)	2	4	6	>7
Survey Data				x

VII. Conclusion

The results of research and analysis above showed that mostly, the application of POPS in five case studies have not met the minimum criteria. These were caused by the absence of a set of rules that guide and can be used by developers in implementing POPS. Meanwhile, in a project development area, after developer applying POPS, there are no strong and detailed rules regarding density bonuses, for example: the contribution of 10% of public space is equal to the density bonus by the addition of 1 floor of the building, or the additions of FAR 0.5 and so on. Existing policies detailing just about incentives and tax benefits, and other benefits listed on the Laporan Akhir Kajian Kebijakan Insentif dan Disinsentif Tata Ruang dalam Pembangunan Nasional.

On the other side, the management of public spaces on private land still had problems in terms of maintenances and operations. Among those five case studies, only Pocket Space at Plaza Indonesia that the maintenance is the responsibility of government and the private sector, while in other cases the respon-

sibility of the management is purely private owned. That is why, the initial agreement needs to be set in a rule in a POPS management guidelines so the government can still supervising them.

In the end, to make the city more vibrant and livable, we need a public space that sustainable for now and for the next generations. This was achieved through the POPS program that encourages cooperation among government, society and the private sector in contributing to the existence and continuity of public spaces. The POPS program implemented must also be supported by strong regulations and policies accompanied by tools consist of the design and management guidelines.

References

1) Puspitasari, C (2014), *Privately Owned Public Space as a Solution to the Future Urban Space*, Gadjah Mada University Press, Yogyakarta
2) Jacobs, H. M (2004), *Private Property in 21st Century: The Future of An American Ideal*, Northampton, MA
3) Carr, S (1992), *Public Space*, Cambridge University Press, NY
4) Jacobs, J (1961), *The Death and Life of Great American Cities*, Random House LLC.
5) http://www.walhi.or.id/, accessed on 10 June 2014
6) Jacobs, J (1961), *The Death and Life of Great American Cities*, Random House LLC.
7) Kusno A (2009), *Ruang Publik, Identitas dan Memori Kolektif: Jakarta Pasca-Suharto*, Ombak, Yogyakarta
8) Ahmad A (2002), *Re-desain Jakarta Tata Kota Tata Kita 2020*, Kota Kita Press, Jakarta
9) http://www.antaranews.com/ accessed on10 June 2014
10) *UU No. 26 Tahun 2007 tentang Penataan Ruang*
11) *UU No. 26 Tahun 2008 tentang Penataan Ruang*
12) David, S (1995), *City Comforts: How to Build an Urban Village*, City Comfort Press, Seattle
13) Bappenas (2011), *Laporan Akhir Kajian Kebijakan Insentif dan Disinsentif Tata Ruang dalam Pembangunan Nasional*, Jakarta
14) Bappenas (2011), *Laporan Akhir Kajian Kebijakan Insentif dan Disinsentif Tata Ruang dalam Pembangunan Nasional*, Jakarta
15) Smithsimon G (2008), *Dispersing the crowd. Bonus plazas and the creation of public space*, SAGE, NY
16) Whyte (1988), *City: Rediscovering the Center*, Doubleday, NY
17) Hong Kong National Bureau (2008), *Public Open Space in Private Developments Design and Management Guidelines*, Hong Kong
18) Hong Kong National Bureau (2008), *Public Open Space in Private Developments Design and Management Guidelines*, Hong Kong

Accessibility to Public Spaces for People with Disabilities: The Universal Design Approach

Wan Mariah Wan Harun[1], Fuziah Ibrahim[1], Tiun Ling Ta[2], Muna Hanim Abdul Samad[1], Nor Zarifah Maliki[1], Sia Siew Chin A.M.W[3], Surayahani Mohd Yusuf[1]

[1]School of Housing, Building and Planning, Universiti Sains Malaysia, 11800 USM, Penang.
[2]School of Social Science Universiti Sains Malaysia, 11800 USM, Penang.
[3]Beautiful Gate Foundation for the Disabled, 47300 Petaling Jaya, Selangor.

Abstract

Purpose: This study investigated people with disabilities' (PwD) level of accessibility to spaces. Methodology: Access audit was used to evaluate spatial accessibility. Workshops were carried out based on four (4) objective, to impart knowledge and awareness on the rights, needs and requirements for PwD user-friendly spaces, to impart knowledge on the principles of Universal Design, to train target groups to conduct access audits of spaces and finally to conduct access audits. Additional data was collected through plan analysis, observation, and interviews. Several public spaces were chosen in Selangor as case studies. . It was done in collaboration with Beautiful Gates Foundation for The Disabled and Petaling Jaya City Council (MBPJ). The target group for the study comprised of technical personnel from the local authority, professionals, PwD caretakers and the PwD. Results: The workshops increased knowledge and awareness among target groups on the importance of providing disabled-friendly spaces through the application of the Malaysian Standards (MS) and guidelines of Universal Design. It found that PwD' accessibility to buildings studied was poor and difficult to access. The results call for a strict implementation of the principles of Universal Design in the built environment to allow accessibility for all.

Keywords: *People with Disabilities (PwD), Universal Design, Audit Access.*

I. Introduction

Accessibility to public spaces in cities is one of the factors that contribute to social and economic growth in a country. Apart from being a center for commercial activities, industries and trades, spaces in cities are known also as an important place for people to meet and socialised since it is able to provide variety of opportunities, activities and choices for people to achieve a fulfilling lifestyle.

The world population is expected to increase by 2.3 billion from 6.8 billion in year 2009 to 9.1 billion in year 2050. The population in cities is estimated to increase by 2.9 billion from 3.4 billion in year 2009 to 6.3 billion in year 2050 (United Nations, 2010).

Approximately 6 million additional populations are projected to live in the urban areas of Peninsular Malaysia during year 2010-2020, accounting for an urbanisation rate of 75% in 2020 or equivalent to the total of 20.9 million urban populations (National Physical Plan 2, 2010). The increasing rate of urbanization and growth of cities lead to the need of creating liveable cities for everyone including people with disabilities (PwD). This situation ensures that cities are able to support the needs and requirements of each resident in every aspect. World Health Organization (WHO) estimated 5 to 10% of the nation's population are people with disabilities (PwD) (United Nations Enable). Their statistic shows that 2.8 million Malaysians out of 28 million live with one or more disabilities. They are the marginalised group when it comes to mobility impairment. However the need of the marginal groups especially the PwD to fully participate in the socio-cultural and economic sector in the country is still neglected. It is disappointing to note that most of the built spaces that housed the socio-cultural and economic activities in Malaysia is not disabled friendly as it does not equipped with accessible facilities. Hence, a study was conducted to identify the extent spaces and buildings in a city are accessible to PwDs and the extent the principles of universal are implemented in the design of public spaces and buildings in Malaysian cities. A workshop was carried out in the study to transfer knowledge on universal design to the participants and to get their participation in the research work. Together with the participants, the researchers carried out access audit on selected public spaces and buildings and in the city of Petaling Jaya under the authority of Petaling Jaya City Council.

Wan Mariah Wan Harun
--- Senior Lecturer, School of Housing, Building and Planning, Universiti Sains Malaysia, 11800 USM, Penang.
Tel: 604-6533174/4108 Fax: 604-6576523
E-mail: mariah@usm.my

II. Literature Review

Accessible and livable spaces in a city are crucial to provide opportunities for people to show their maximum self-potential and contribute to national growth. Accessibility is one of the driving forces and elements for every community to achieve the available opportunities and options. However, the media claimed that the needs of PwD in Malaysia are commonly ignored although lots of efforts were carried out to improve the standard of living of the disabled. Such situations are seen as the result of lack of understanding on the rights, requirements and culture of the disabled. The above situations occur even with the existence of the Malaysian disability policies which incorporate the provisions that recognize disabled people's basic human right to equal access to the built environments. As such, future proposed physical and spatial development should include the implementation of sustainable design elements to ensure that every opportunity and need is fulfilled. Application of universal design as part of a sustainable design of the built environment is one of the approaches to increase accessibility for all, especially for people with disabilities (PwD). Universal design concept was coined by the architect Ronald L. Mace (1980) who defined universal design as the design of products and environments that is usable to the greatest extent possible for all groups of people without having any adaption or specialized design. Metts (2000) also agreed that people of diverse abilities and disabilities should be able to access buildings and places comfortably and safely, as far as possible without special assistance or create unnecessary cost for the society by artificially creating a class of "special needs users".

Universal design consists of seven principles which provide a framework for cost-effective policies and strategies to increase physical accessibility for people especially people with disabilities (PwD). These principles include: equitable use referring to the design which is useful and marketable to people with diverse abilities; flexibility in use whereby the design accommodates a wide range of individual preferences and abilities; simple and intuitive use in which the use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level; perceptible information where the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities; tolerance for error in which the design minimizes hazards and the adverse consequences of accidental or unintended actions; low physical effort where by the design can be used efficiently and comfortably with minimum fatigue; and size and space for approach and use in which the appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

The commitment to equalizing the opportunities for people with disabilities has two primary purposes: one, to affirm the basic human rights of people with disabilities to equal access to social and economic opportunities; and two to create environments in which people with disabilities can maximize their capacity for making social and economic contributions. The study was carried out in attempts to contribute to these two primary purposes by disseminating the knowledge and train people to enable accessibility and monitor the creation of the built environment according to the seven universal design principles "within the context of a long history of negative stereotypes about people with disabilities and limited expectations about their capabilities" (Metts, 2000). Design strategies can play their roles in removing and preventing unnecessary barriers in the spaces as well as in making cities in Malaysia more livable and humane. The planning and design of building layout and configuration, circulation routes, exits and approach will influence the success of the universal design implementation.

III. Methodology

The methodology in carrying out the study was by running a workshop which was divided into 3 stages of work. Three meetings with Beautiful Gates Foundation for the Disabled and two of the meetings involving the local authority of Petaling Jaya City Council were held to plan and prepare for the 3 stages of work.

In order to recruit the focus group as part of the research team, a workshop was necessary and was held to impart knowledge and awareness on the rights, needs and requirement of PwD and user friendly facilities, and to impart knowledge on the principles of universal design. Five modules related to the issues, problems, challenges and guidelines of universal design were presented by the researchers. Each of the participants was given a set of printed modules and CD that contained the modules, Malaysian Standard (MS) and checklist for access audit before the workshop started for their references. The workshop prioritized the participation from the local authority, professionals in the built environment, public transport management, the PwD caretakers and also PwD as they have the authority and abilities to make positive changes to the spaces in and around buildings. The 3 stages of work were:

3.1 Stage 1: Pre Workshop Stage

The first stage involves information gathering on past experiences, research and workshops carried out; related literature from existing publication: books, journal, theses, reports and the internet; upon which to develop a structured framework. The framework guides in disseminating the knowledge on PwD issues, on universal design principles and training the focus group on how to carry out access audit to gather

primary data on the accessibility of selected buildings in Petaling Jaya, Selangor, Malaysia.

3.2 Stage 2: The Workshop Activities

This stage prepared 2 sets of activities. The 1st set of activities was the workshop which imparted knowledge to the focus group consisting of 65 participants from the local authority, professionals in the built environment, public transport management, the PwD caretakers and also PwD. On the first day of the workshop on 15th May 2013, the participants were presented with 5 modules related to the issues, problems, challenges, and guidelines on the principles of universal design by the researchers. The modules included 1) Introduction to the Person with Disabilities; 2) The Rights and Requirements of Person with Disabilities and Their Implications; 3) Living Together and Interacting with Person with Disabilities (PwD): Vision Impairment; 4) Living Together and Interacting with Person with Disabilities: Physical Impairment; and 5) Application of Universal Design in the Making of Liveable City. 4 video presentations were screened to the participants during the workshop solely on person with disabilities (PwD) focusing on the challenges and difficulties of person with disabilities (PwD) in the issue of their mobility; the best way to interact with person with disabilities: vision and physical impairment and useful facilities for the person with disabilities to be Independent.

Figure 1: Module on "Living Together and Interacting with Person with Disabilities (PWDs)

The 2nd set of activity introduced the focus group to access audit followed by access audit simulation. The simulation exercise was to prepare the participants for the actual access audit, familiarising them with the equipment used in the audit such as the use of the leveller and gradient etc., and letting them experience the difficulties that are faced by PwD in their daily life by trying to use wheelchair, blind-folded and using the crutches to walk. The professionals and technical personnel were blind folded and required to use the wheel chair while performing the access audit simulation. This allows them to experience the difficulty to move around the space when blinded and physically handicapped.

Figure 2: Simulation on Guiding Person with Disabilities with Vision Impairment

Figure 3: Simulation before Starting the Actual Access Audit

Two of the PwD participants volunteered to share their life experiences especially on the issues of mobility in the built environment. The participants were given opportunities to ask question and seek further information and clarification from the researches and PwD themselves during the presentation of the modules. Enquiries by the participants were immediately addressed.

3.3 Stage 3: Data Collection using Access Audit as a Tool for Assessing the Accessibility of Spaces In and Around the Building

The second day of the workshop on 17th May 2013 the focus group was presented with 2 more modules 1) Reading Plan for Access Audit; and 2) Access Audit Training and Data Collection. The purpose of the access audit was to train the participants to conduct access audit and simultaneously to audit the accessibility of facilities and services provided for PwD at spaces, buildings and precincts of Petaling Jaya City Council. The participants were assigned to access audit 3 selected public spaces in the precincts of Petaling Jaya City Council which included areas from the bus stop to the headquarters of Petaling Jaya City Council, areas from the parking lots of Petaling Jaya City Council to the shop lots and the areas from the bus stop to the tower of Petaling Jaya

City Council; and finally the Headquarters of Petaling Jaya City Council.

The participants were divided into 5 groups with various backgrounds and including PwD. Based on the group exposure to the access audit simulation on the first day of the workshop, the participants facilitated by the researchers carried out the actual access audit to assess the accessibility of the premises. The data from the access audit were further supplemented with data from the observations, building plan analysis and interviews. After completing the access audit, the participants grouped together to prepare for the slide presentations and reported the issues and findings that have been discovered during the access audit on the third day.

The reports and presentations were gathered, documented and submitted to Petaling Jaya City Council for their implementation and further action in making the buildings and the precincts audited to be more user-friendly, accessible and humane. The researchers analyzed the data descriptively to explain the extend the spaces and buildings were accessible to the PwD.

Figure 4: Site Plan of the Access Audit at Petaling Jaya City Council Precinct.
Source: Google Earth

IV. Result and Discussion

Findings from the access audit were analysed as below:

4.1. Bus stop at Yong Shook Lin Street

There were no sign of PwD universal symbol at the bus stop. There were also no step ramps provided for wheelchair user to the bus stop. The placement of the bus stop at the diversion of road has hindered the bus to stop near to bus stop and disabling PwD to light the bus with ease. The railing (Fig. 7) blocked a direct access to the bus. The size of railing is > 60mm which exceeded the specified diameter required.

The bus stop has not provided space for the wheelchair user to park their wheel chair. The seats (Fig. 8) are not even comfortable for the PwD who wear crutches or artificial leg till waist to sit on.

Figure 6: The Bus Stop

Figure 7: Railing at the Bus Stop

As recommendation, the bus stop should be provided with proper universal PwD sign and be provided with step ramp when there exist different height of levels between the pavement of the bus stop and road. The step ramp should be design according to MS1331 clause 6.1 for PwD to have easy access to the bus stop.

Figure 8: Seat at the Bus Stop

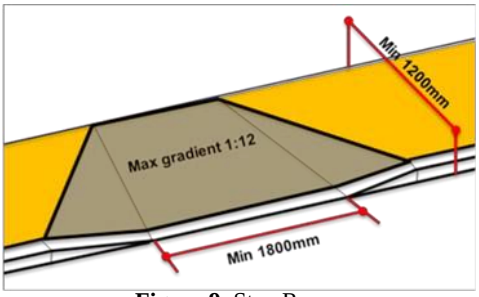


Figure 9: Step Ramp
Source: MS1331

The installation of a non-slip materials for the railing at the height between 840mm-900mm and diameter between 40mm-50mm with its end bend down would ease the hold of users (**Fig. 10**).

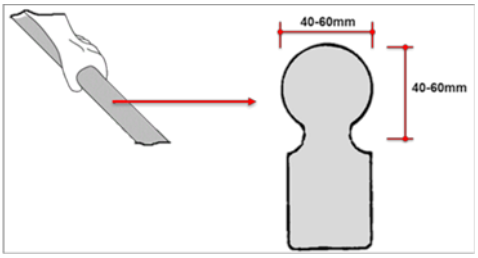


Figure 10: Railing
Source: MS1331

4.2. Pedestrian walkway at Jalan Yong Shook Lin

Initiative to make pedestrian walkway accessible in the city centre of Petaling Jaya can be seen with the installation of two lines of guiding blocks. However the feedback given by the participating vision impaired says that a single line of guiding block is sufficient for their way finding since they only require the width of the swing of their white cane which is about the width of their hip (300-450mm), to detect their way finding. As such 2 lines of guiding block is uneconomical (**Fig. 11**).

However a single line of the guiding blocks should be placed a clear distance from the objects found along the travelling route (not less than 150mm (**Fig. 13**).

Some of the guiding blocks were found to direct the travelling route into dangerous areas such as the roadside drain or smack onto a wall. Ignorance also occurs in the laying of the tactile blocks where the blocks are used for other than its true function. The true function of line-type blocks are to indicate the line of flow of travel and the dot-type function as warning signal or alarm. However, it was found that most of the tactile blocks were wrongly used.

Fig. 11

Fig. 12

Figure 11: Pedestrian walkway and guiding blocks.
Figure 12: Dangerous location of signages.

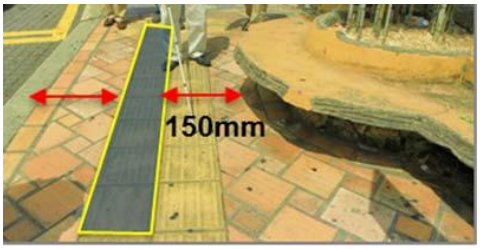


Figure 13: Recommendation for Guiding Blocks

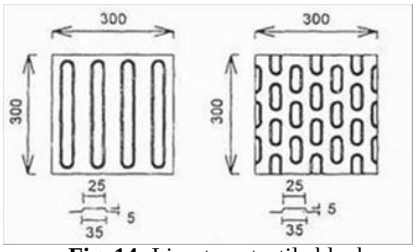


Fig. 14: Line-type tactile block

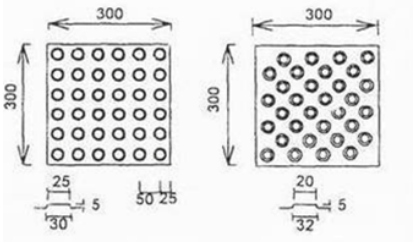


Fig. 15: Dot-type tactile block

It was also found that most of the signage along the pedestrian walkway in the city is at a dangerous height, lack head clearance and showing erratic direction (**Fig. 12, 12a & 12b**).

Fig. 12a

Fig. 12b

4.3 Pedestrian walkway at Petaling Jaya City Council Public Park

Main public access to the city park is through a wide flight of steps exceeding 3.0 meters in length. No railing was provided at the staircase. The edge of the staircase or the nosing lack colour contrast which does not allow vision impaired users to notice the existence of the steps. Furthermore the height of the risers for each of the steps varies and caused movement imbalance among users.

Figure 17: The Staircase to the Petaling Jaya City Council's Public Park

Apart from the main entrance, a ramp is provided leading from the main road to the side entrance of the public park. However there is no kerb at the edge of the ramp, exposing wheel chair users to accidently slip at the edge of the ramp since there is no kerb to prevent the wheels of the wheel chair from slipping down. The gradient of the ramp exceeds the standard gradient of 1:12 with uneven floor surface and a manhole in the middle of the ramp path (**Fig. 18**).

Figure 18: Dangerous ramp

Along the ramp path the audit found landscape which was poorly maintained and hinder the passage of movement along the pedestrian pathway (**Fig. 19**)

The audit suggested the wide staircases to the public park be installed additional railing that breaks up the width of the long staircases exceeding 3000 mm. The nosings are to be coloured contrast to allow visibility of the edge of the steps for users. It is also recommended that a dot-type guiding blocks for warning to be laid at a distance minimum of 300 mm before going up and down the staircase.

Figure 19: Poor landscape maintenance

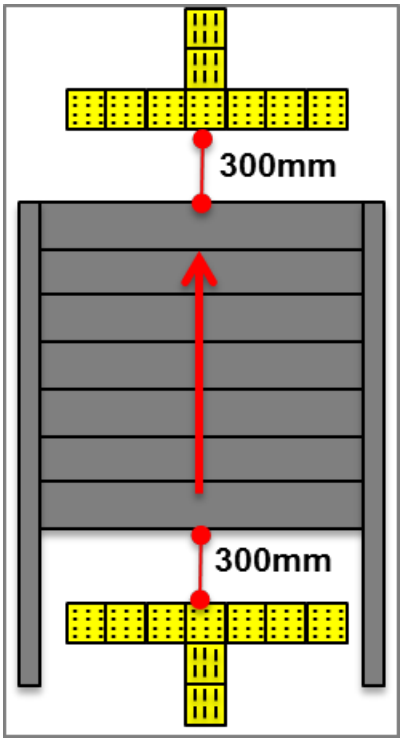


Figure 20: Recommendation of Guiding Blocks at the Staircase

4.4 The Headquarter of Petaling Jaya City Council (MBPJ)

a. Approaches to Building and Car Parking Space Provision

Approaches to a building and the condition for parking space provision around building are of high importance to any PwDs to allow easy access in and out of buildings. This is especially so for government owned buildings such as the headquarters of the local authorities which are highly frequented by the general public for their everyday dealings with the authorities on variety of life issues. Designated car parking spaces are to be provided for the PwDs as close as possible to the building main entrances to allow equal access to the building as other members of the public following the universal design principles – within 25m-30m. However it is common to find that there is

no provision at all or the provision of car parking spaces for PwD are located away from the main entrance either at the back entrance, the side entrance or any adhoc and unused spaces of and around the building. Road side parking is also discouraged due to the constraint incurred to exit and enter the car from the side along a busy thoroughfare as well as from the side of the road kerb. However, this is a common sight in Malaysia

The audit found that for the headquarter building of Petaling Jaya Council, car parking spaces are provided within the 25m-30m distance from the main entrance but the location of the spaces are not suitable for ease of use. They are placed across the road fronting the main entrance that requires the PwD to cross the road to approach the main entrance of the building. Furthermore the sizes of the car park are below the required size according to the Malaysian Standard.

Figure 21: Insufficient Buffer Zone for Wheelchair Users

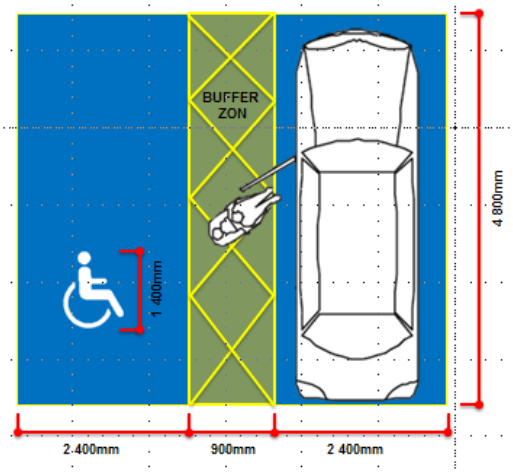


Figure 22: Recommended Parking Lot for PwD

b. Ramp and handrail at the main entrance of the Headquarter of Petaling Jaya City Council

A ramp up to the main entrance of the building is provided within the accepted gradient and surface textures. However it lacks a kerb on both sides of ramp to prevent the wheels of the wheelchair to slip down. The length of the ramp exceeds 6m without a landing and level resting space. The two lines of guiding blocks are unnecessary and should be laid 150mm from the side of the ramp

.

Figure 23: Unsuitable length of the ramp and guiding blocks

c. Staircase at the main entrance of MBPJ's main building.

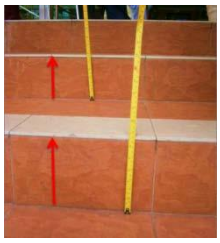


Figure 24: **Figure 25:**

Fig. 24: Different height of risers

Fig. 25: Staircase without railings for support

Fig. 24 shows the different height of the risers to the steps for the staircase at the main entrance of the building. No railings are provided at both sides of the stairs that should be installed for staircases exceeding 3m wide.

In summary Petaling Jaya City Council was observed to have provided various facilities to enable public to have easy access to the city such as the bus stop, pedestrian walkways, ramps and stairs. Spaces and facilities designed especially for PwD such as guiding blocks and ramps that are built to ease their way to the end destination is also provided. However, the audit found that most of the facilities provided are inaccessible especially for PwD. One of the reasons the provided facilities cannot be used is due to wrong design. For instance, the bus stop does not have any ramps for the PwD to have direct access to the bus stop. The absence of these ramps is inconvenient for PwD especially the wheelchair users to access the bus stop. This situation requires user to wait for the bus along the pedestrian walkway near to the bus stop. The design of the seat at the bus stop is not user friendly for the PwD especially for those who use artificial leg or crutches. The seat does not have any special space for wheelchair user to park their wheelchair while waiting for the bus to arrive.

The placement of the car parking spaces for PwD for the approach to the main entrance to the building requires the PwD to cross the road. The surface condition of the spaces also influence the accessibility at the MBPJ's area such as uneven surface of the ramp and the pedestrian walkway. The uneven surface may restrict the movement of the wheelchair users and make them difficult to access the route. Lack of detail design of the facilities in the open public spaces such as the public park is one of the reason the spaces are inaccesssible. For instances providing wide staircases that is not universally designed instead of proper ramps to access the park creates barriers for PwDs. Width of the staircases that is more than 3000mm should be equipped with additional handrail at the stair. 100mm high curb should be provided on both side of a ramp for safety factors and act also as a guide for the visual impaired people. In addition, diameter of the handrail should not be more than 40mm – 60mm for easy holding.

The accessibility to the public spaces for PwD can be further increased with good selection of materials and proper installation of the facilities. Malaysian standard can be referred to as a medium to provide facilities such as parking, ramp, stair and pedestrian walk in public spaces. Among the examples of facilities that do not follow the standard are the distance of the guiding block which is less than 150 mm from any barriers and obstructions; and lack of resting area provided at the ramp that exceed 6000mm in length. Not only that, certain of the facilities provided are not economical such as the installation of the double line guiding blocks at the MBPJ's area where a single line guided tactile is sufficient.

V. Conclusion

The workshop conducted in the study have successfully imparted knowledge and awareness on the rights, needs and requirements for the PwD user friendly facilities and principles of universal design to the participants through the presentation of the modules by the researchers. As such the workshop has successfully trained the participants to conduct access audit and simultaneously to audit the accessibility of facilities and services provided for PwD at public spaces and buildings of Petaling Jaya City Council. Consequently, the workshop managed to increase the knowledge and awareness among the participants on the importance of providing disabled-friendly and humane facilities in public spaces through the application of the Malaysian Standards (MS) and guidelines of universal design. Although some facilities are built and claimed to cater the need of the people especially the disabled such as the bus stop, seats, ramps, railings and stairs, they are still deemed inaccessible because of inappropriate design, sizes, placements, surfaces and detailing implemented in its construction. This happen due to the lack of knowledge, insight and empathy toward PwD and lack of understanding of the principles of universal design.

The study shows weaknesses in way finding for the PwD where travel routes are being obstructed with barriers and the lack of cues and meaningful signages, Future research should focus on way finding issues for the disabled especially for the vision impaired in public spaces and transportation terminal.

The fact that most of the facilities for the PwD are found to be inaccessible raises questions to the reasons for its occurrences. The requirement of universal design was gazetted under the Street, Drainage and Building Act (1974), amended through By-laws 34A of Uniform Building By Laws 1991 (UBBL). The amendment makes it compulsory for buildings to provide access to enable disabled persons to get into, out of and within the buildings. Buildings already built before the commencement of this by-law must be altered to comply with the by-law within 3 years from the date of commencement.

However twenty three years down the road, we see that implementation of the requirement is still slow and often overlooked by the actors of our built environment, more so in the public spaces created between buildings. The answer to this slow implementation of the universal design principles in spaces and buildings should be the focus of future research, to pin down the source of hindrance to its implementation and enhance the existing policies and strategies to overcome the situation.

Acknowledgement

The authors would like to thank the whole team from Universiti Sains Malaysia (USM), Beautiful Gate Foundation for the Disabled, Petaling Jaya City Council (MBPJ), participants, PwD caretakers and PwD who participated and gave full commitment in the workshop and study till the end and to the people who involved either in the access audit and discussion. We also like to acknowledge Ministry of Higher Education (MOHE) Malaysia for their financial support and the opportunity that have been given to us for the continuity of this project (203/PPBGN/6750028).

References

1) Imrie, R., Responding to the Design Needs of Disabled People. Journal of Urban Design, 2000. 5(2): p. 199 – 219
2) Metts, Robert L. (2000). Disability Issues, Trends and Recommendation for the World Bank
3) Mace, R.L., G.J. Hardie, and J.P. Place, Accessible Environments; Toward Universal Design, 1991, Centre for Universal Design, North Caroline State University; Raleigh.NC.
4) World Urbanization Prospects the 2009 Revision, United Nation (2010). Access from: http://esa.un.org/unpd/wup/Documents /WUP2009_Highligh ts_Final.pdf
5) National Physical Plan 2 (2010). Access from http://www.kpkt. gov.my/kpkt_2013/fileupload/dasar/NPP.p df
6) UN Enable (2011). Factsheet on Person with Disabilities. Access from: http://www.un.org/disabilities/default.asp?id=18
7) The Center for Universal Design. Access from: http://www. ncsu.edu/ncsu/design/cud/

The Influence of Urban Design on Walkability for Tourists Prawirotaman and Tirtodipuran Streets, Yogyakarta

Bonifasia Yuniar Rifani[1], M. Sani Roychansyah[2]

[1] Urban and Regional Planning
[2] Lecturer at Architecture and Planning Department
GadjahMada University

Abstract

Understanding how urban design elements can influence walkability is a research priority to develop sustainable tourism city. Walking is the modest way for tourists to discover city; innovations of urban design based on tourists' priority needs may be able to promote the higher level of participation, and help them enjoying the walk. In this research, the term of urban design refers to physical features on PrawirotamandanTirtodipuran Streets that consist of four elements: pedestrian facilities; aesthetics; circulation; land use and access. Importantly, this research was performed based on the tourists' priority needs through perception.

This research was carried out through deductive-quantitative method with observation and questionnaire survey; one hundred and eleven tourists were participated. Descriptive statistic and principal component analysis were performed to assess urban design quality and identify its influence on walkability.

The research result identified that there are three main factors representing urban design elements that influence walkability for tourists: (1) safety and flexibility (2) convenience and attractiveness (3) accessibility and diversity.The quality assessment result shows that all land use and access elements, and some aesthetics elements are considered to have high quality, whereas all circulation elements and some pedestrian facility elements considered to have poor quality.Additionally, it was concluded that safety is the most essential factor and traffic plays important role on walkability.Depending on the outcome of this and other follow-up research, the ultimate purpose would be to improve the walkability in tourism area.

Keywords: urban design, walkability, tourists, Yogyakarta

Introduction

Many studies have been done to confirm a correlation between the built environment and walking, but rarely show which characteristic of built environment that affectsmost on walking. They have not identified the priority needs according to the pedestrian. Walking is one of the commonly used modes of transportation by tourists in Yogyakarta. Walking is simple, free, and the easiest way to explore neighborhood. It can be associated with less consumption compared to other means of transportation, and may give more experiences. It also brings life to streets (livable street) in the tourism area.

* Bonifasia YuniarRifani
Urban and Regional Planning, Architecture and Planning Department, Faculty of Engineering, GadjahMada University
Tel: +62 899 411 8880
e-mail: bonifasiayr@gmail.com

Besides travel time minimization, other positive utilities such as social interaction, scenery interaction, or enjoyment of walking itself can influence the willingness to walk. Those positive utilities mostly generated by the urban design elements. Thus, this research attempts to assess the urban design quality on Prawirotaman and Tirtodipuran Streets as tourism corridors, and identify the influence on walkability for tourists.

Walking matters, a sustainable tourism city need to be realized.Walkable areas have to be built to encourage and promote walking for tourists. The ultimate purpose of this research would be to improve the walkability through urban design innovation.

Walking can be defined as walking for travel/transport, exercise, and pleasure/recreation (Leslie et al, as cited in de Cambra, 2012). Distinction among those is relevant: design seems to be more important for walking for recreation than it is for walking for travel

(Handy, 2005). Social interaction will be more possible to occur while walking rather than riding vehicles (Untermann, 1984). Walking is the only way for face-to-face interaction in commercial and cultural activities that compromise the urban milieu (Fruin, 1971).

Many factors have been considered as stimulant or constrain to walking.Environmental factors such as recreational facilities, community cohesion, and other physical condition can encourage people to walk. On the other hand, crowd, noise, traffic, and crimes can be constrains (Handy, 2005). Walking may be influenced by (1) opportunity as external aspect: distance, weather, topography, cost – money and time to travel, traffic volume and speed, and infrastructure; (2) motivation as personal aspect: physical condition, family circumstances, culture, education, profession, habits, attitudes, and values (Shay, 2003).

General theory of walkability explains how, to be favored, a walk has to satisfy four main conditions: it must be useful, safe, comfortable, and interesting (Speck, 2012). Each of these qualities is essential and non-alone is sufficient.Useful means that most aspects of daily life can be reached by walking. Safe means pedestrians must not only be safe, but feels safe; they have fighting chance against being hit by vehicles. Comfortable means building and landscape shape urban streets into 'outdoor living rooms'. Interesting means sidewalk which has friendly faces that signs humanity abound.The most elements in walkable neighborhood are summarized as (Shay, 2005):

Table 1. Elements in Walkable Neighborhood

	Pedestrian Facilities	Accesibility and Convenience	Mixed Land Uses	Aesthetics	Traffic Calming
Burdenn (Walkable Communities, Inc)	√	√	√	√	√
Corbett & Velasquez (1994)	√	√	√	√	√
Florida Department of Transportation (1995)	√	√	√	√	√
Saelens et al (2003)		√	√		
Shriver (1997)	√	√	√	√	
Southworth & Owens (1993)	√		√		
Friedman et al (1994)		√	√		
Lund (2003)	√	√	√		
Litman (2003)		√			√

Source: Shay, 2005, modified

The influence of physical environment on walking decision is mediated through perceived amenities (Ewing, 2006). It is should be noted that it's the individual's perception about existence of such factors that explains behavior, rather than the objective existence (Handy, 2005).

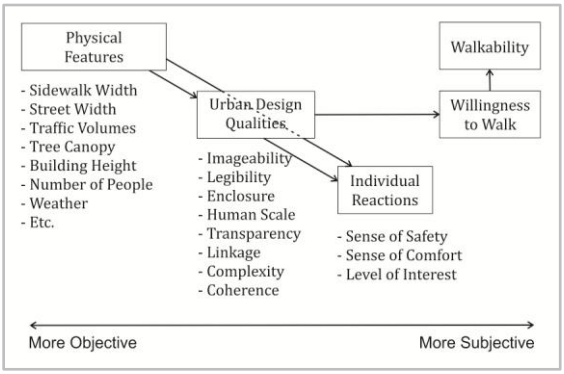


Fig 1: Conceptual Framework of Urban Design Influence on Walkability
(Source: Ewing and Handy, 2009, modified)

There are a number of urban design elements that influence walkability (Lynch, Gehl&GemzøeJaskiwicz as cited in Hutabarat, 2011; and Jacobs, Brown, and Giles-Cort as cited in Barker, 2012) that can be implemented in this research, as shown in the table below. Each of this element are expected to give tourists as pedestrians safe, comfort, and pleasant feeling while walking.

Table 2. Urban Design Elements Influencing Walkability

Urban Design Element	
Pedestrian Facility	Space of Walking
	Crosswalk
	Street Lights
Aesthetic	Trees and Plants
	Architectural
	Activity
	Street Furniture
Circulation	Traffic Volume
	Traffic Speed
	On-Street Parking
Land Use and Access	Mixed Land Use
	Distance

Source: Researcher, 2013, adapted from Hutabarat (2011) and Barker (2012)

Methods

The research work was carried out through deductive-quantitative method. A sample survey is implemented in order to get a description of the population (Creswell, 2009). The sample size

was obtained by the Slovin formula method with confidence level of 90%. One hundred and eleven walking tourists in Prawirotaman and Tirtodipuran Streets were participated to complete questionnaire survey with accidental sampling method. The tourist are dominated by international tourists, with age between 17-25 years old. This survey was conducted to assess the quality of 12 elements of urban design and their influence on walkability based on tourists perception using a 4 point Likert scale of 1 to 4. The tourist are dominated by international tourists, with age between 17-25 years old.

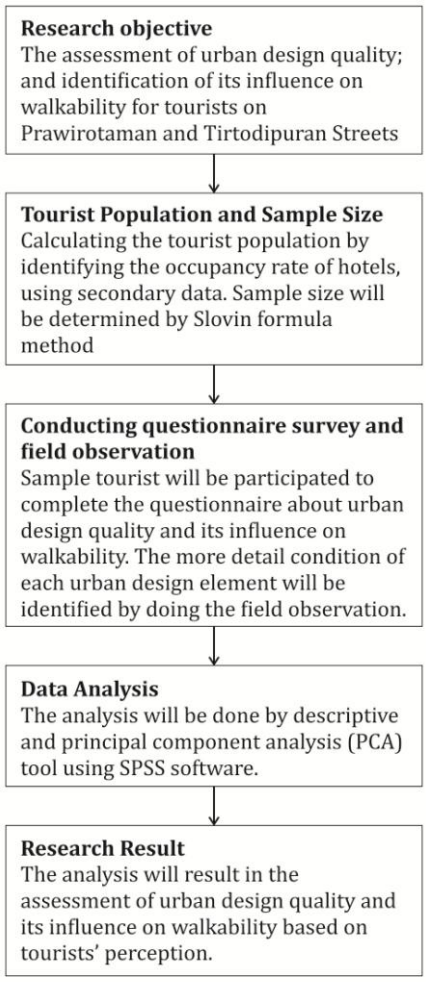


Fig 2. Research Design
(Source: Researcher, 2013)

Descriptive analysis was used to figure out the tourist' assessment on urban design quality. The Likert scale was turned into percentage using the frequency tabulation. It resulted the quality rating of each element that was classified as high or poor. The detail analysis about each element condition was completed by doing the observation through field survey.

Principal Component Analysis was performed to understand the influence factors underlying the 12 urban design elements. In order to assess the validity of the model, the data was tested with KMO Measure of Sampling of Adequacy and Barlett's Test of Sphericity. The result value must be higher than 0.5 with significance lower than 0.05. The Anti-Image Matrics value has also to be higher than 0.5 so that all the variables can be processed in the next step. The PCA will generate the main components or factors that influence walkability based on the higher variance and eigenvalue above 1. Furthermore, another question about non-urban design aspect that may influence walkability for tourist was designed in the end of questionnaire with open question type.

Prawirotaman and Tirtodipuran: Urgency as Case

As tourism city, some neighborhoods in Yogyakarta have been developed into tourism area. Prawirotaman and Tirtodipuran are used to be residential and business district which was well known for its batik production. But then the situation change rapidly and this area transformed into tourism accommodation area. The former batik shop owners turned their shops into hotel/guesthouse, restaurant/café, travel agency, etc. Some of the shops are still preserved till now, though. According to travel guidebooks, Prawirotaman – Tirtodipuranis one of the most popular tourism area in Yogyakarta. It lies in the strategic place of Yogyakarta City center. It is also located near from Kraton and Taman Sari as main tourism attraction.

The accommodation sector in this area falls under the category of non-star-rated accommodations. But, the sense of Javanese character here has attracted tourists in its way. It also explains why tourists coming to this area are largely 'backpacker' with low budget way of travelling. They tend to explore neighborhoods by walking instead of riding vehicles. It is necessary to provide these tourists' needs. The tourism area has to be a pleasant corridor for walking. Further, urban design innovations can be implemented, begins with identifying the influence of walkability. In the case of Yogyakarta city, Prawirotaman – Tirtodipuran has great potential to be developed. Additionally, it will lead to improvements in other tourism neighborhoods in Yogyakarta.

Results

Urban Design Influence on Walkability

Before identifying the urban design influence on walkability, this research try to assess the quality of each urban design element based on tourist perception. According to the percentage data, all land use and access elements (mixed land use and distance) and some aesthetics elements (architectural and activity) are considered to have high quality. Whereas all circulation elements (traffic volume and speed, on-street parking) and some pedestrian facility elements (space of walking, crosswalk) considered to have poor quality. It indicates that these corridors have not satisfied tourists as pedestrians by providing the walkable streets.

The factor analysis begins with KMO and Bartlett's Test to test the validity of the data. The value result is 0.83 with significance 0.00. It indicates that the data is valid, and continued processing is allowed. The PCA result shows thatthere are three main factors that influence walkability for tourists: (1) Safety and Flexibility, (2) Convenience and Attractiveness, (3) Accessibility and Diversity.

Each factor represents the influential urban design element based on tourists' priority, as shown in the table. Most of the highly influential elements have poor quality assessment. For example, the table result signifies that pedestrians are very concerned to traffic. But in fact, the traffic condition in Prawirotaman and Tirtodipuran Streets has poor quality. As pedestrians, the touristsdo not feel safe. They do not have the fighting chance against being hit by cars or motorbikes. This early evidence is promising that urban design has an important role on walkability. The table below shows following elements that also give influence on walkability.

Table 3. Results of Influencing Factors on Walkability and Quality Assessment

Influencing Factors	Variables	Quality Assessment
Safety and Flexibility	Traffic Speed	(-)
	Traffic Volume	(-)
	On-Street Parking	(-)
	Walking Space	(-)
Convenience and Attractiveness	Trees and Plants	(-)
	Architectural	(+)
	Street Furniture	(-)
	Crosswalk	(-)
Accessibility and Diversity	Mixed Land Use	(+)
	Distance	(+)
	Activity	(+)
	Street Lights	(+)

(+) High quality
(–) Poor quality
Source: Researcher, 2014

Safety and Flexibility

Traffic speed, traffic volume, on-street parking, and walking space are rated as the most important elements that represent flexibility and safety. Flexibility means unimpeded way for walking, while safety means the less possible conflict occurred between pedestrian and vehicles. Meanwhile, those variables are considered to have poor quality.The high traffic speed (around 30-50 km/h) brings about the unsafe feeling to tourists, as well as the traffic volume does. Motorbikes contribute most to traffic (average by 91 motorbikes within ten minutes).

The on-street parking and walking space are considered as less important. However, the on-street parking such as car, bus, motorbike, and pedicab which impeding the sidewalkmay increase the chance of pedestrian get hit by vehicles.There is no particular sidewalk along the street. The fenced buildings andthe edge of high BCR (building coverage ratio) buildings usually limit the space to walk.

Fig 3. On-Street Parking
(Source: Researcher, 2014)

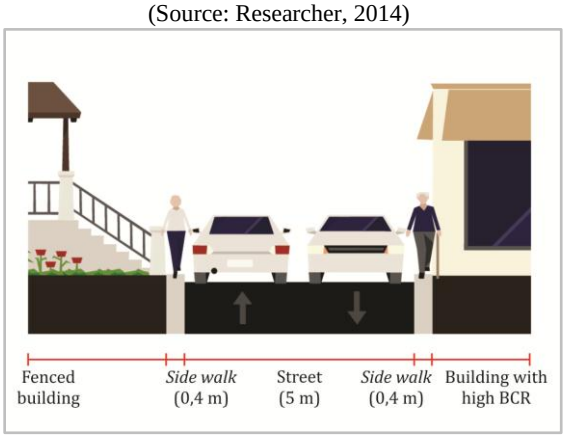


Fig 4. Walking Space Illustration
(Source: Researcher, 2014)

Convenience and Attractiveness

Convenience and attractiveness play quite important role on walkability. Tourists need shading when walking. But,the trees and plants along the streetsdoes not meet the tourists' need

because of the high number of land conversion in the area. The picturesque building architecture such as traditional Javanese and colonialism become visual interests that enhance enjoyment of walking.

The placement of street furniture such as electricity pole and advertisement board on the sidewalk may be obstruction for pedestrians. Besides, there is no crosswalk that specifically provided for walking tourists. However, these two elements are less influential to walkability.

Fig 5. Building architecture
(Source: Researcher, 2014)

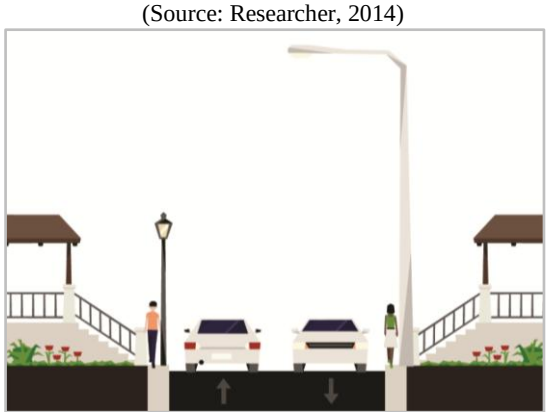


Fig 6. Street Furniture Illustration
(Source: Researcher, 2014)

Accessibility and Diversity

This factor has least influence on walkability but still be considered for walking. The mixed land use help tourists to fulfill their needs easily. Moreover, those destinations are within walking distance. There are various destinations for tourists such as hotel, restaurants, café, art gallery, shops, tourist information, travel agency, minimarket, etc.

Variety of activities are offered along the streets, such as shopping, dining, seeing exhibition and music performance, joining in the process of making "batik", etc. Walking tourists can see the activity that takes place inside or outside building. Transparency as one of urban design qualities plays important role in this case. While the street light has good quality, however it has the least influence on walkability. It is related to walking activity that occurred most during the day.

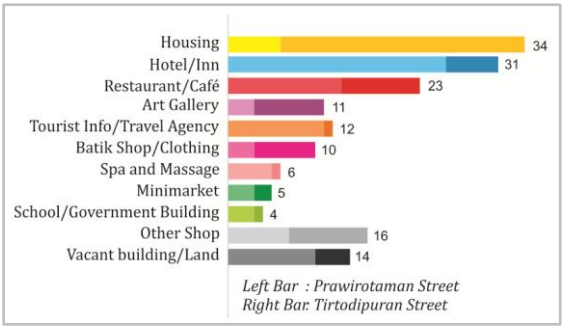


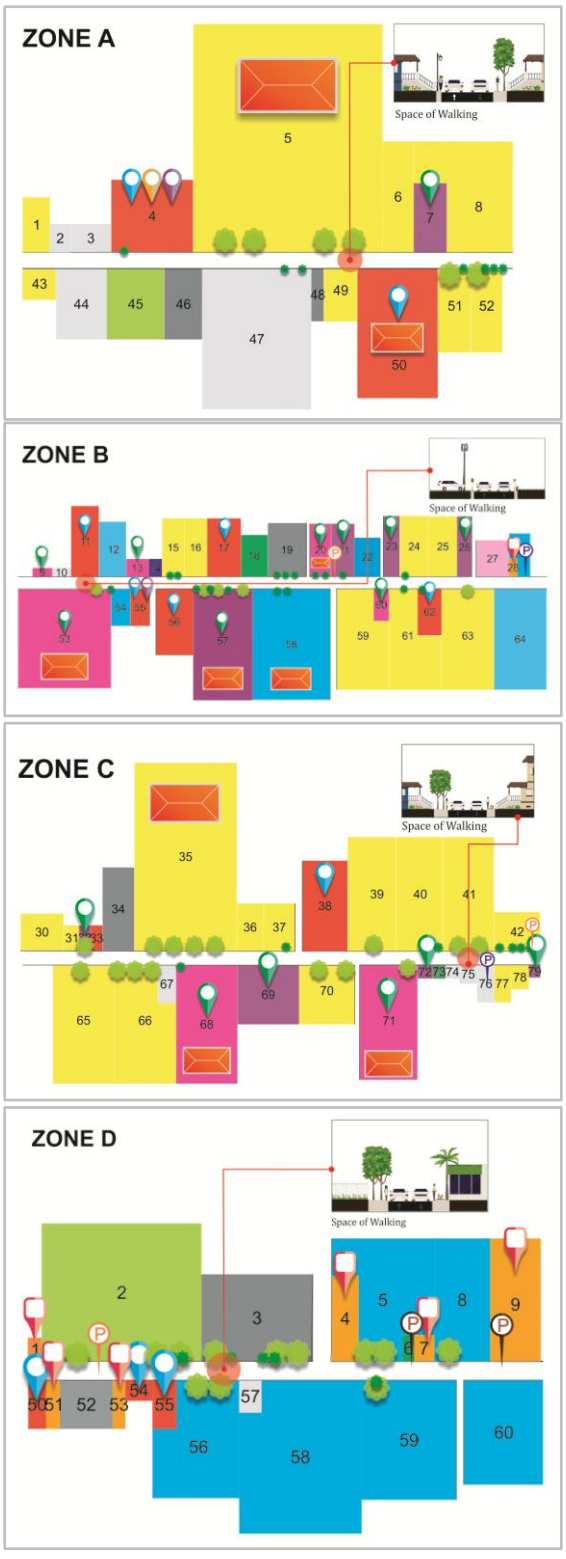
Fig 7. Land Use Diagram
(Source: Researcher, 2014)

Fig 8. Destination and Activity for Tourist
(Source: Researcher, 2014)

Urban Design Characteristic Segmentation

The Prawirotaman and Tirtodipuran streets are divided into 6 zones in order to identify the specific characteristic in each zone as shown in the map figures below. From the segmentation analysis, it can be concluded that the most active surrounding takes place in the middle of both streets, Zone B and E. It is related to the mixed land use and various activities. However, it also leads to on-street parking condition, and lacking of walking space. Comfort are likely to be felt in zone A, B, C because there are many old buildings with big trees and unique architecture. Otherwise, a number of new buildings are built in the zone D, E, F. These zones are developed faster than the other. They have more choices of hotel and restaurant/café. But nowadays, the similar development tends to happen in the zone A, B, C. It can be seen from some land conversion from residential to commercial.

Map information:



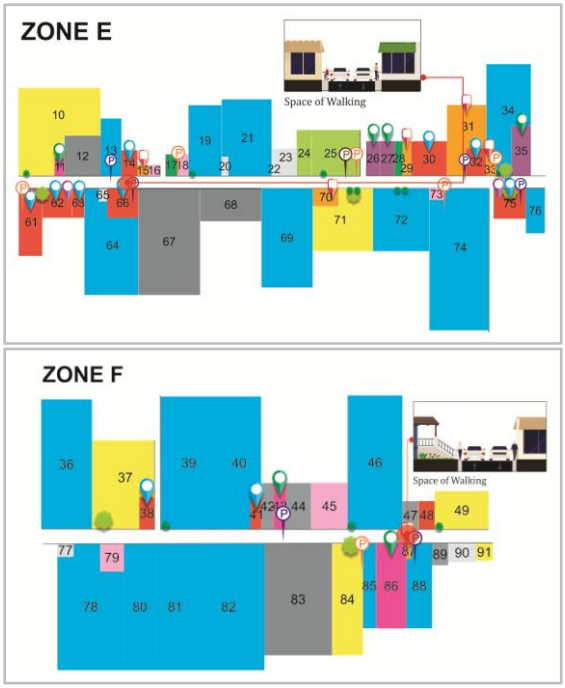


Fig 9. Segmentation on Urban Design Characteristic
(Source: Researcher, 2014)

Non-Urban Design Influence on Walkability

The data results represent the fact that there are non-urban design aspect that influence walkability for tourists. The tourists stated that they choose walking over any other mode of transportation because it is possible to see more things and observe neighborhoods by moving slower. By walking, there is no haste of parking the motorbikes in every destination. Moreover, they are impressed with the hospitality of friendly local people. It shows that behavior and culture of people around the neighborhood play important role on the walkability for tourists.

The tourists also gave their aspiration of the condition that can help them to enjoy the walk more. They are expecting less aggressively sales person, such as pedicab driver, tour guide, etc., that are considered to be not polite. The existence of other people/tourists walking will give them more comfortable, safe, and pleasant feeling while walking. It indicates that tourists need social interaction which is possible to do by walking.

Conclusion

Tourist are likely to choose walking over any other mode of transportation. But, the enjoyment of walking may depend on some particular things, such as urban design. It has been proven in other previous researches that built environments influence walkability.

Furthermore, the important thing is that the design has to fulfill the pedestrian needs.

This research has already identified the main factors representing urban design elements that influence walkability for tourist. More importantly, this result is based on the tourists' priority needs through perception. Those three main factors are (1) safety and flexibility, (2) convenience and attractiveness, (3) accessibility and diversity.

It can be concluded that safety is the most essential factor and traffic gives highest influence on walkability. The tourists as pedestrians need to feel safe, not just be safe. This research also figured out the assessment of urban design quality on Prawirotaman and Tirtodipuran Streets. Most of the high influential urban design elements on walkability have poor quality. It indicates that there need to be innovation and improvement on urban design of these streets to be more walkable. It may promote the higher participation of walking.

Other follow-up research about this topic should be performed in the other tourism areas of Yogyakarta. It can be followed by making applicable design in the process of creating more walkable corridors. In doing soand with much efforts, Yogyakarta can be aleading sustainable tourism city. Moreover, we need to help the tourists to be in the places that are not only easy to get, but also worth arriving at.

References

1) Barker, L. (2012). *Exploring the Relationship between Walkability and the Built Environment: A Case Study of Three Intersections in Seattle's University District*. Thesis. Washington: University of Washington
2) Creswell, John W. (1994). *Research Design, Qualitative & Quantitative Approaches*. Thousand Oaks : Sage Publication
3) deCambra, P. J. M. (2012). *Pedestrian Accesibility and Attractiveness Indicators for Walkability Assessment*. Dissertation. Lisbon: TecnicoLisboa
4) Ewing, R. (2006). Identifying and Measuring Urban Design Qualities. *Journal of Physical Activity & Health, Supplement 1*, Vol. 3, pS223
5) Ewing, R. and Handy, S. (2009). Measuring the Unmeasurable: Urban Design Qualities Related to Walkability. *Journal of Urban Design*, Vol 14. No 1, 65-84
6) Fruin, J. J. (1971). *Pedestrian Planning and Design*. Metropolitan Association of Urban Designer and Environmental Planners
7) Handy, S. (2005). *Critical Assessment of the Literature on the Relationships among Transportation, and Physical Activity*. Paper for Transportation Research Board and the Institute of Medicine Committee on Physical Activity, Health, Transportation, and Land Use
8) Shay, E, et al. (2003). *Walkable Environments and Walking Activity*. Final report for Seed Grant, Southeastern Transportation Center, University of Tennessee, Knoxville
9) Speck, J. (2012). Walkable City: *How Downtown Can Save America, One Step At A Time*. Farrar, Straus and Giroux
10) Untermann, R. K. (1984). *Accommodating the Pedestrian: Adapting Towns and Neighborhoods for Walking and Bicycling*. New York: Van Nonstrand Reinhold

Design Context

First Session Parallel Notes
Moderator: Dyah Titisari

K4 Room 2nd Floor
10.30 – 12.30

Presenter	:	**Addi Darmawan (Universitas Pelita Harapan)**
Title	:	**Improvement Criteria for Open Space Quality in Jakarta in Accordance to Their Typologies (Case Study: Plazas in Jakarta Kota District)**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Open space → Roads, parks, plaza
Plaza in Jakarta Kota
Plaza Typology (Paul Zucker) :
- Square
- Linear
- Amorphous

Additional elements
- Square typology
  - The view surrounding the space
  - Historical value of the place
  - Certain boundaries surrounding the open space
  - Focal point
- Linear typology
  - The view surrounding the space
  - Unity between the road and buildings
  - Magnet of activity at both ends of the space
- Amorphous
  - Proportion between buldings and road width to create a corridor
  - Historical value of the place
  - Unity between the road and buildings

Criteria of successful plaza :
- Location & size
- Vegetation
- Activity
- Zoning
- Circulation
- Cityscape
- Amenities

Jakarta Kota → centre of Jakarta
- Kota Tua → square typology
- Pancoran → linear typology
- Petak Sembilan → amorphous typology

Results
- The most frequently-used plaza
  Kota Tua 22%, Pancoran 18%, Petak Sembilan 60%
- User's preference of each typology of plaza
  Kota Tua 17%, Pancoran 46%, Petak Sembilan 37%

Context observation
- Permeability
- Collective memory
  Culture → World view → Values → Image → Lifestyle → Activities
- Visual

Conclusion
Square, linear and amorphous are different criteria.
Typology which is often used are linear and amorphous.

Presenter	:	**Ahmad Sanusi Hassan (Universiti Sains Malaysia)**
Title	:	**Mapping Timeline of Architectural Styles in Nusantara Region**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

- Architectural timeline in Southeast Asian Archipelago**.**
- The word 'Nusantara' is a terminology both used in Malaysia and Indonesia**.**
- There are two parts will be discussed in this description which contains illustrations of the architectural styles with discussions.

- Before the 14th century → were influenced with Buddhism and Hinduism with an expression of temple design. Ex : Borobudur Temple (Buddhism), Prambanan Temple (Hinduism)
- 14th and 15th century → were influenced by traditional long pyramid roof type with a roof design concept of tier roof system. Architectural styles were an impression of Islamic architecture as a design concept in building Islamic Kingdom of Malacca, Pasai and Demak Sultanate. Ex : Demak Great Mosque
- 16th century → a conquest era by Portuguese, European invasion in Nusantara Region. The architectural style was fortress architecture using stone. Ex : Masjid Kampung Laut
- 17th century → an era of the Dutch conquest. The Dutch introduced European architecture with classical style's image in administration building design. Ex : Jakarta History Museum
- 18th century → industrial revolution → traditional and colonial style. Ex : Malay ampong house, Pagaruyung Palace
- 20th century → was influenced by traditional and colonial style, the construction technique still used cements and bricks. Ex : Aceh Museum, Istiqlal Mosque Jakarta
- 21st century → modern material in construction of buildings continues with traditional, colonial, and modern architectural style. Ex : Masjid Ulul Albab

Conclusion
- The dominant architectural styles are traditional, colonial, and modern design
- The early 21st century, architecture of traditional and colonial expression as well as modern architecture continuously becomes a point of interest in Nusantara Region
- All the architectural styles share the same construction

Presenter	:	**Cynthia Puspitasari (Universitas Pancasila)**
Title	:	**Privately Owned Public Spaces as a Solution to the Future Urban Space**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Fact : Human need for share spaces
Public spaces is a space where everyone has access to use it. Public space in the city is very important to build community togetherness.
Characteristic open, easily reached by the public to do community activities and do not always have a green element, the form can be malls, plazas and playgrounds (Carr, 1992)
Jakarta fact : Public spaces oriented by the economic.
POPS is open space in private development. In crowded place, controled by private management where the general publics are entitled to access, use and enjoy

Implementation POPS in Jakarta include 5 case studies in CBD in Jakarta :

1. Public green = Podomoro city central park, developer project
   Not really succes, not accessible
2. Plaza, Rasuna Epicentrum = maximum high floor. Very successful : why?
3. Plaza Senayan : Not really success, not accessible
4. Pocket space in Plaza Indonesia, effective : comfort zone, pdestrian OK. implementation of POPS
5. Promenade, Rasuna Epicentrum, good implementation of POPS

Conclusion

- Pocket Space in Plaza Indonesia is the most successful to make city more vibrant & liveable , the maintenance is the responsibility of government and the private sector
- The management of public spaces on private land still had problems in terms of maintenances and operations

Presenter	:	**Wan Mariah Wan Harun (University Sains Malaysia)**
Title	:	**Accessibility to Public Spaces for People with Disabilities: The Universal Design Approach**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Introduction

Accessibility to public spaces contribute to social economy growth in a country.
Space → places for people to meet and socialized, provide variety of opportunities, activities and choices for people.

Purpose

- Identify the extent spaces and buildings in a city are accessible PwDs
- Identify the extent the principles of universal design are implemented in the design of public spaces and buildings in Malaysian cities.

Literature Review

Universal design consists of seven (7) principles:

1. Equitable use – in which design is useful and marketable to people with diverse abilities
2. Flexibility in use – where the design can accomodates a wide range of individual preference and abilities
3. Simple and intuitive use – in which design is easy to understand regardless of experience, knowledge, language skills etc
4. Perceptible information – design which communicates necessary information effectively
5. Tolerance for error – design which minimize hazards and the adverse consequences of accidental actions
6. Low physical effort – design can be use with ease;
7. Size and space.

Methodology → simulation

Stage 1 : Pre Workshop Stage

Stage 2 : The Workshop Activities

Stage 3 : Data Collection using Access Audit

Result and discussion

- Bus stop at Yong Shook Lin Street
  No sign of PwD universal symbol.
  ➔ The bus stop should be provided with proper universal PwD sign.
- Pedestrian walkway at Yong Shook Lin Street
  2 lines of guiding block is uneconomical, the guiding blocks were found to direct the travelling route into dangerous areas, the blocks are used for other than its true function.
  ➔ Guiding blocks should be placed a clear distancefrom the object found along the travelling route not less than 150 mm.
- Pedestrian walkway at Petaling Jaya City Council Public Park
  No railing was provided at the staircase where steps exceeding 3.0 meters in length, lack of colour contrast, the height of the risers for each of the steps varies.
  ➔ The wide staircases be installed additional railing that breaks up the width of the long staircases exceeding 3000mm.
  ➔ The nosings are to be coloured contrast to allow visibility.

Conclusion

- Successfully frained the participants to conduct access audit and simultaneously to audit the accessibility of facilities and services provided
- Successfully imparted knowledge and awareness on the rights, needs and requirements for the PwD user friendly facilities and principles of universal design

---

Presenter : **Bonifasia Yuniar Rifani (Universitas Gadjah Mada)**

Title : **The Influence of Urban Design on Walkability for Tourists Prawirotaman and Tirtodipuran Streets, Yogyakarta**

Presentation Duration : **10 minutes**

PRESENTATION CONTENTS

Introduction

- What about Yogyakarta as tourism city? Needs may be able not only to promote the higher level of participation, but also help them enjoying the walk.
- The influence of physical environment on walking decision is mediated through perceived amenities (Ewing, 2006).

Physical Features → Urban design qualities → individual reaction → willingness to walk → walkability

Prawirotaman and Tirtodipuran : urgency as case → located in the center of Yogyakarta → popular tourism area

Method → deductive-quantitative methode with observation and questionnaire survey

Result

- Safety and Flexibility
  Traffic speed, traffic volume impede the way of walking and may increase the chance of pedestrian getting hit by vehicles.
- Convenience and Attractiveness
  The lack of trees and plants gives no shading for tourists when walking. It is related to the high number of land conversion.
  There isn't crosswalk that specifically provided for walking tourists.
- Accessibility and Diversity
  The destinations are within walking distance.

Conclusion

- Safety is the most essential factor and traffic gives highest influence on walkability
- In Prawirotaman-Tirtodipuran Streets, most of the high influential urban design elements on walkability have poor quality.

Appropriate Strategy in Healthcare Design: Responding Variety For The Next Generation, An Indonesian Experience

Adi Utomo Hatmoko[1]

Lecturer, Department of Architecture, Gadjah Mada University, Jogjakarta, Indonesia
Architect, PT Global Rancang Selaras, Jogjakarta, Indonesia

Abstract

Appropriateness is the key. How to recognize difference between one phenomenon and the other, one context with another. Differentiate one place to another, differentiate one solution with other solution, differentiate one culture (or even sub-culture) with another. How to incorporate variety in architecture design, finding the most appropriate strategy, being given a specific design problem, specific site, and specific context. First, there are many types of healthcare facilities. Large hospital, medium-sized hospital, small hospital, or even primary healthcare facility and small clinics. Large site, medium site, small site, or even very cramped lot for a healthcare facility. General hospital, specialistic hospital, or general hospital with center(s) of excellence(s). Healthcare facility for urban area in Jakarta, satellite town in Bogor, suburban area in Bandung, rural area in Klaten, and even remote area in Merauke. Each type would require different strategy. Second, there are many facets within healthcare facilities. The emergency area, the diagnostics area, the outpatient department, the inpatient department, the central medical units (surgery, intensive cares, CSSD, maternal, and perinatology), and services. The public and the private, the areas for patients, visitors, doctors and paramedics, for clean and soiled equipments and linens. Each facet would require different strategy, getting more and more complex while confronted with different culture as the context for the design. Third, there will not be a single idea of sustainability, as it has several facets: ecological balance (preserving the resilience of natural environments and balances), economic performance (balance of production and consumption patterns), institutional capacity (meeting the organizational needs of private entities, firms, and public agencies), and viable governance (ensuring effective policy, regulation, and accountability). While also faced with the richness culture of Asia, each client and design would require different strategy. To illustrate the variety and the importance of appropriateness of strategy, there will be several examples of many facets of hospitals, of small and large hospitals, on large and small sites, in urban and rural area, and with different socio-economic context. There is and there will be no single solution in a plural and colorful world of Asia and Indonesia.

Keywords: *healthcare, next generation, variety, appropriateness, sustainability*

1. Responding Variety in Healthcare Design

Healthcare facilities design is a highly-technical design that should be oriented towards a community in a specific environment. Appropriateness is the key. How to recognize difference between one market and the other, one context with another. Differentiate one place to another, differentiate one solution with other solution, differentiate one culture (or even sub-culture) with another. How to incorporate variety in architecture design, finding the most appropriate strategy, being given a specific design problem, specific site, and specific context.

Adi Utomo Hatmoko
--- Lecturer, Department of Architecture, Gadjah Mada University, Yogjakarta, Indonesia
Architect, PT Global Rancang Selaras, Indonesia
E-mail: adiutomohatmoko@yahoo.com

First, there are many types of healthcare facilities. Large hospital from 400 beds to more than 1000 beds (A type hospital), medium-sized hospital from 200 beds to 400 beds (B type hospital), small hospital below 200 beds or even below 100 beds (C or D type hospital), or even primary healthcare facility and small clinics with or without inpatient units. Based on the large size of the site, healthcare facilities can be divided into: large site more than 30,000m2, medium site between 10,000-30,000m2, small site between 5,000-10,000m2, or even very cramped lot below 5,000m2 for a healthcare facility. General hospital, specialistic hospital, or general hospital with center(s) of excellence(s). Those typologies mentioned above will be discussed through 5 real design cases of healthcare facilities for urban area in Jakarta, satellite town in Bogor, suburban area in

Bandung, rural area in Klaten, and even remote area in Merauke.

Second, there are many facets within healthcare facilities. The emergency area, the diagnostics area, the outpatient department, the inpatient department, the central medical units (surgery, intensive cares, CSSD, maternal, and perinatology), and services. The public and the private, the areas for patients, visitors, doctors and paramedics, for clean and soiled equipments and linens. Each facet would require different design strategy that get more and more complex when confronted with different culture as the context for the design.

2. Case 1. Healthcare facility for urban area in Jakarta

Figure1. PGI Cikini Hospital. Central Jakarta
(courtesy of PT Global Rancang Selaras)

PGI Cikini is located at the central part of metropolitan Jakarta. The 55,000m2 site is occupied with a more than 400 beds hospital, a nurse academy, and a mortuary that also held ceremony for the deceased. The problem increased as half of the site and the main building (formerly the house of famous painter Raden Saleh) is protected by conservation law as a cultural conservation site and building. PGI Cikini Hospital is famous for the renal unit, being the first hospital held renal transplantation successfully.

The identified key problems are (1) the conflict of conservation and development, (2) the phasing and development plan that allow the operational of current hospital, and (3) the accommodation of the centers of excellences.

The proposed key concepts are (1) conserving the key buildings and overall spatial quality, while accommodating new developments, (2) rotating development plan system that allow the operational of current hospital, and (3) acccommodation of the centers of excellences, such as the renal center and the surgical center.

3. Case 2. Healthcare facility for satellite town in Bogor

Figure 2. Pertamedika Sentul City Hospital. Bogor
(courtesy of PT Global Rancang Selaras)

Sentul City is one of the satellite city of Jakarta that located in Bogor, among the 3 other satellite cities (Depok, Tangerang, Bekasi). Sentul City has more than 28,000ha landbank (along with Sentul Nirwana that just merged) and will be developed as the main residential area at the satellite city of Bogor. The suburban atmosphere characterized the Pertamedika Sentul City Hospital, a joint operation of Pertamedika (subsidiaries of Pertamina, the state oil company of Indonesia) and Sentul City.

Pertamedika Sentul City Hospital is a typical satellite-city hospital that should allow development through its lifetime. It will cater the general hospital, and some center-of-excellences such as the cardiac center and the liver center. Therefore, theidentified key problems are (1) the phasing plan that allow growth over development, (2) the excellent separation between sterile and common areas even during the development stage, and (3) the accommodation of the centers of excellences.

To answer the design problems mentioned above, the proposed key concepts are (1) growing hospital along a strong medical spine, (2) differentiation between zones and circulation system of the medical area and the public area, and (3) acccommodation of the centers of excellences, such as the liver center and the cardiac center.

4. Case 3. Healthcare facility for suburban area in Bandung

Figure 3. Maranatha University Academic Hospital. Bandung
(courtesy of PT Global Rancang Selaras)

Every medical department in Indonesia has obligation to have an academic hospital that serves as the hands-on research-and-skill educational facility for the students and the lecturers. Being an academic hospital, Maranatha University should have integrated (but separated in functional zoning) outpatient facilities, inpatient facilities, emergency department, diagnostic facilities, central medical units, educational and research facilities, and general service units.

The relatively large site allows for horizontal development and the concept of garden-hospital. While the mild climate of Bandung let the utilization of natural ventilation throughout most of the building. The key problems are (1) the accommodation of outpatient, inpatient, and educational system with different access, (2) the phasing that allows the hospital to grow from small size, to medium size, and finally become a large hospital, and (3) the utilization of surrounding as a healing environment.

The key concepts are (1) multiple zones and access of outpatient, emergency, inpatient, and educational facilities, (2) phasing plan that allows growth over time with complete hospital body on every step, and (3) utilization of green building and green garden principles as healing environment.

5. Case 4. Healthcare facility fora small town in Klaten

Klaten is a small town east of Jogjakarta. Located halfway both from Jogjakarta and Solo, Klaten often nicknamed as a paradise for the retired and senior citizen. Being a nationwide social-oriented Islamic organization, Muhammadiyah has efforts to facilitate each town with appropriate hospital and appropriate healthcare services, usually with a tight budget for construction. A small maternal hospital is considered as a priority for the small town of Klaten.

Located at the core of the small town with the very tight site with only 16m wide frontage, the key problems are (1) the utilization of a very tight parcel of land, with only 16m wide site frontage, (2) the orientation of the openings that allow the light penetrate the rooms while filtered the heat radiation, and (3) the building strategy to overcome the tight budget.

The key concepts are (1) division of horizontal zones and access of outpatient and emergency, while maintaining the vertical separation with the inpatient facilities, (2) orientation of the building and the openings to accommodate the tropical climate, and (3) selection of building strategy to minimize the investment, operation costs and maintenance.

Figure 4. Aisyiyah Klaten Hospital. Klaten.
(courtesy of PT Global Rancang Selaras)

6. Case 5. Healthcare facility for remote area in Merauke.

Figure 5. Bunda Pengharapan Hospital. Merauke
(courtesy of PT Global Rancang Selaras)

Being one of the fastest growth poles in Papua, Merauke also has several healthcare problems, such as the high HIV-AIDS threats, the high mortality among maternal cases, and the high mortality from the common tropical diseases. To tackle those threats, the sisters of Bunda Pengharapan have the plan to build a new hospital that allows incremental growth, while maintaining complete service from the start.

The cultural issues are central in this case, as the hospital will serves both the Papuans and the transmigrants from many parts of Java and Bali. Some small habits still should be disciplined such as washing hands before seeing the relative/patient, separating between the sterile aisles and the relatives of the patient, while also should implement the general principles of modern hospital for the future.

The identified key problems are (1) the phasing plan thatallows incremental growth of healthcare facility on remote area, (2) the appropriate technology and strategy to minimize costs over the

phases, and (3) the harmony between the architecture and the culture.

The key concepts are (1) strategic steps and phasing allows incremental growth of healthcare facility on remote area, (2) appropriate technology and strategy to minimize costs and maximize benefits, and (3) new interpretation of culture for better healthcare facilities

Epilogue

The cases above illustrate examples of many facets of hospitals, of small and large hospitals, on large and small sites, in urban and rural area, and with different socio-economic context. The lessons learnt from the cases is that there will not be a single idea of sustainability, as it has several facets: ecological balance (preserving the resilience of natural environments and balances), economic performance (balance of production and consumption patterns), institutional capacity (meeting the organizational needs of private entities, firms, and public agencies), and viable governance (ensuring effective policy, regulation, and accountability). While also faced with the richness culture of Asia, each client and design would require different strategy.

There is no and there will be no single solution in a plural and colorful world of Asia and Indonesia.

References

1) Cama, Rosalyn (2009), *Evidence-Based Healthcare Design*, John Wiley and Sons, New Jersey
2) Guenther, Robin and Gail Vittori (2008), *Sustainable Healthcare Architecture*, John Wiley and Sons, New Jersey
3) Hatmoko, Adi Utomo, Wahju Wulandari, and Muhammad Ridha (2011), *Arsitektur Rumahsakit,*Global Rancang Selaras, Yogyakarta
4) Levin, Debra, ed., (2014), *General Hospitals: Planning and Design,* Design Media Publ Ltd, Hong Kong
5) Miller, Richard, Earl Swenssons and Todd Robinson (2012), *Hospital and Healthcare Facility Design*, WW Norton & Co, New York
6) Roberts, Rebel, ed., (2014), *Specialized Hospitals: Planning and Design,* Design Media Publ Ltd, Hong Kong
7) Verdeber, Stephen (2010), *Innovations in Hospital Architecture*Routledge, New York

The Architectural Language for Retail Design: a Transition in Space

Azizi Bahauddin[1]

[1] Lecturer, School of Housing, Building and Planning, Universiti Sains Malaysia, Penang, Malaysia

Abstract

This study investigates retail design, based on the application of architectural components in retail design principles; focusing on the impact of the architectural language and components and specifically on the architectural characters in transition of connecting between the outside and the inside spaces. The objectives are to evaluate the use of the architectural language in retail design, to investigate the meaning of space in relation to retail design and to formulate retail design criteria of architectural language and components in this aspect. The investigation employs a qualitative method that requires naturalistic observation, surveys to determine the level of application of architectural components, interviews, technical documentation, and visual data collection in determining the design components that are needed. This determines the impact of design language on brand personality beliefs, and the psychology of space beliefs. They indicate that the architectural language and its components have great impact on the success and the enhancement of retail design as far as apparel premises are concerned. By establishing retail design criteria, a more successful apparel retail design premises model will be rendered and achieved, to ensure their success and acceptance in a space in transition, to connect between the inside and the outside spaces.

Keywords: *Cagar retail design, architectural language, inside, outside.*

I. Introduction

The uncertainties in economic outlook and the solution out of a crisis that Malaysia (figure 1) has been facing for the past few years had witnessed failures as well as rapid growth in the commercialisation sector of retail products. Retailing in this country is said to have grown significantly over the years, witnessing foreign retailers with expanded retail brands having entered the country, offering a wider choice of selection to consumers in terms of brands and styles. The retailing landscape continues to gain sophistication with new retailing formats, products and services being introduced. This is to cater to the demands of more educated and discerning consumers.

Currently there are 300 retail centres in Malaysia offering a total of 114 million sq ft of space and enjoying a healthy average occupancy of 80.2%. Of these more than 40% consisting of 50.6 million sq ft of available space are located in the Greater Kuala Lumpur (GKL) area (figure 2).

Most of these are located within the city centre, where they enjoy an average occupancy rate of 84.2% (Syarifuddin, 2011). However, the economic environ-

Fig 1 – Map of Malaysia

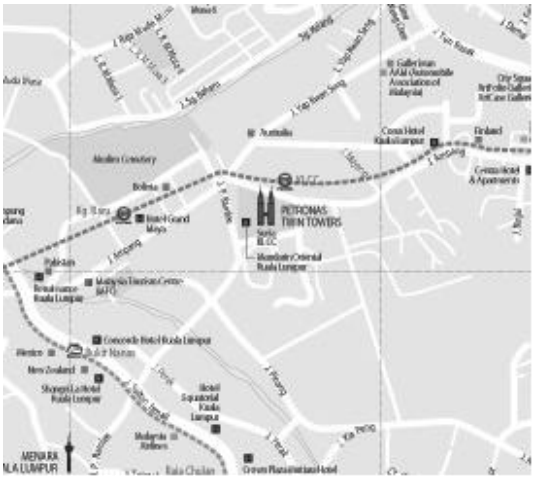


Fig 2 –Map of Kuala Lumpur Main Shopping Areas

Azizi Bahauddin
--- Associate Professor Dr.,
School of Housing, Building and Planning, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia
Tel: +6046535433 Fax: +6046535430
E-mail: azizigt@gmail.com

ment remains challenging, with many uncertainties still shadowing the global economy.

Although many retailers resumed their expansion plans, they are still doing it in a moderate way. This is because in general, there is still uncertainty about the economic environment and consumers are spending more but cautiously. This can be done in many creative ways in selling products in order to attract customers. The apparel businesses in Malaysia have always been governed by the branding of well-known names. However, according to a survey conducted by the Ministry of Domestic Trade and Consumer Affairs in 2011 found that 1,816,612 registered business premises licenses have been revoked at the end of January 2012 (KPDNKK, 2013). This is due to many factors that include the unsustainable business practices in attracting customers. Consumers in the retail market are found to be loyal to several stores, thus the phrase 'polygamous loyalty' is used to describe the consumer shopping behaviour (Worthington & Hallsworth, 1999). Some consumers tend to be cherry pickers, i.e. they are not loyal to one store and instead they shop around for bargains (Mogelonsky, 1995). Hence, the more reason for retailers to attract customers to gain their loyalty though proper retail designs application of the right architectural components and language into their stores. Few studies on the physical aspect of the retail design, a space for the next generation, calls for this study to be undertaken mainly in dealing with various retail choices. Che Wel et. al (2011) suggested that consumer retail choice is highly dependent on the types of goods purchased. The current study also identifies the important determinants of retail store selection in Malaysia which comprise factors such as (1) Store Personnel and Physical Characteristics of the Store; (2) Advertising by the Store; (3) Store Convenience & Merchandise Selection; (4) Convenience of Reaching the Store; (5) Accompanying Friends and Store Location; (6) Product Variety and Quality; and (7) Services offered by the Store. Based on this data and related identified problems, this study plans to focus on formulating criteria in apparel retail design in commercial premises of shopping complexes in Kuala Lumpur. As this investigation is about the world of architecture, the criteria will be based on the architectural components that are required for such commercial entities, mainly on the physical characteristics of the retail detail of the apparel premises in creating a transitional space, connecting from the outside to the inside, a space design for the next generation. Hence, the physical characteristics of the stores are identified as issues that are investigated and the formulation of retail design criteria will be the main outcome of the study.

II. Methodology

The research employed a qualitative method. However, with the lack of secondary data on apparel retail design in Malaysia, it requires the researcher to depend on and source out from primary sources. Since this research is focusing on formulating retail design criteria for premises in shopping malls, it is imperative that the study reviews the retail design practices and their displays in premises and identified and selected two shopping malls in Kuala Lumpur. They were chosen for their success in making their premises known and attractive to visitors. The importance of the understanding of retail design according to the retail design requirements has to be taken into consideration for the understanding of the architectural components. A pilot study will identify specific premises before further work can take place. This process involves the observation method, looking at the attractiveness of the premises against their products and architectural components. The study will be conducted on the success of design featured by identified branded names against the least successful premises in similar shopping malls. There are two identified premises that have successful retail design outlooks, namely Pavilion and Suria KLCC. A pilot study has also been undertaken looking at other premises such as the Mid Valley Megamall, One Utama etc. The identification of the premises was followed closely by the visual documentation searching for the most successful form of retail design. This was conducted on weekends and public holidays when visitor numbers are at their peak. This research method also involved some owners of the apparel premises through non-structured interview on their understanding of the application of inside and outside spaces with architectural components and language.

III. Defining the Transitional Space

A space in between spaces that require attention is the transitional space that connects the outside to the inside (Fig. 3). It can act as a buffer zone as well as a physical link between the outdoor and indoor environments. The unique character of this link must be dealt with intelligently in the manner the architectural components are applied to ensure the success of the retail design.

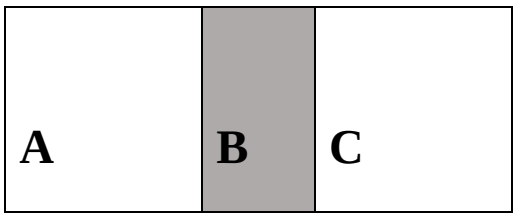


Fig. 3 – The in between space B

This point is what makes the transitional space so intriguing and offers the potential for extraordinary

architectural space. Transitional space bridges the gap between solely interior and solely exterior. Architectural elements usually demarcate these spaces, but most dialogues typically deal separately with either the interior space created within a building or the exterior space created by a building and the surrounding urban fabric (Bolos, 2009). However, the issue specifically addressed in this paper is the creation of provocative experiences in architectural transitional spaces namely the most influential architectural component of colour. The ability of architecture with colour to produce awe and inspirational experiences for its spectators and users has been understood since humans began creating structures more complex than purely utilitarian shelters.

IV. Retail Designing with Colour

One of the most important criteria for retail design in apparel premises in designing a space for the next generation is the focus on colour. Colour is also found to considerably affect our other senses -- hearing, taste, smell and touch. In Gestalt psychology the entire organism is looked upon as a unity in that the centres for processing sensory information are linked to each other, leading to a chain of reactions, and how the colour affects other senses (Wong, 2009; Singh, 2006). The colours apparently react with the architectural language and architectural components, such as the shape of the spaces, textures and materials and ultimately the arrangement of furniture for the displays of products. The colours can be interpreted in many ways to make the retail design more successful and they are as follows:

4.1 Perception of Temperature

The colour of a room will affect the perception of temperature. It was found that most people in the red-orange room felt warm and the people in the blue-green room felt cooler. Therefore it is useful in interior design where the location and use of energy is also being considered. For example, it can use cool tone in room that is facing west so as to make the occupant feel cooler and it can also be a way of saving energy.

4.2 Perception of Noise and Sound

Colour also has an effect on the perception of noise and sound. Studies showed that the bright warm colours are associated with loudness and the opposite for cool colours. These findings are particularly useful in interior decoration for different settings such as clubs and restaurants.

4.3 Association of Odour and Taste

Some studies also found that colours are associated with smell and taste. For instance, pink is associated with sweetish, yellow is sour, orange is strong, and green is sour and juicy. It is also found that pink, lavender, pale yellow and green have a pleasant smell. Hence, we can find most candies are in pink packaging. On the other hand, blue is found to be an appetite suppressant so using it is avoided in restaurant or food packaging.

4.4 Colour Psychology in Commercial Areas

As we know that colour psychology has great influence on how we see colours and the likeliness of colours. Moreover, colours can also influence the subjective appreciation of the quality of goods or the perception of an advertising message. Hence designers and marketers can use colour psychology to add value to the products and services and to increase sales.

V. Space Designing for the Next Generation in Retail Design – Outside and Inside

Colour has been found to have significant impact on a product attribute, and it plays a larger role in the success of a product than the performance of the product itself (Gonzalez, 2005). If the colour is unappealing to the customers, it would fail miserably in the market even though it performs very well.

5. 1 Interior Design

In interior design, colour also plays an important role. Colour can define space, indicate function, and suggest temperature, influence moods and project personality in the environment. For instance, light value colours bring happiness and suggest eternal love and peace. They can be used in an active room to lift up the spirit and also reduce stress. Moreover, colour symbolism can also help to create a corporate image in its logos, stationery, and corporate offices. In corporate offices, the creation of a good company-client relationship is important and the use of colours, such as warmer hues that can display a friendly and personable manner, especially using them in the reception area is a good choice to build goodwill. Colour psychology has a larger part to play in design and marketing. However, we should always bear in mind that colour marketing is not a simple process that colour conveys different messages to different groups of people. We should always take precaution when using colours in different settings. To comprehend the meaning of colours and its emotional influence is critical to determine the success of a products or design.

VI. Retail Premises

A total of two shopping malls (Fig. 4) were surveyed to analyse the application of colours to brand their names. Suria Kuala Lumpur City Centre Mall and Pavilion Mall house branded names of retail premises.

Fig. 4 – Locations of Suria KLCC and Pavilion

6.1 Suria Kuala Lumpur City Centre (KLCC) Mall

Suria KLCC (Fig. 5) is Malaysia's premier shopping destination, located at the foot at the Twin Towers at the heart of Kuala Lumpur City Centre. It caters to the diverse and discerning shoppers, both local and international.

Fig. 5 – Suria KLCC

Fig. 6 – Aigner Store

Fig. 7 – Calvin Klein Store

Fig. 8 – Calvin Klein Store Transitional Space

Fig. 9 – Giorgio Armani Displays

Fig. 10 – Giorgio Armani Store

Fig. 11 – DKNY

The retail design employed by the branded name stores (Fig. 6 – 11) were chosen due to their attractiveness through observation and the pilot study. It was also based on the number of visitors who frequented the stores. The retail premises in Suria KLCC have succeeded in attracting customers through the application of colours for the display areas and in connecting the space outside to the inside. Most of the stores surveyed managed to brand themselves with the products they displayed, being mainly clothes. However, the colours chosen are mainly black and white to give the impression of sophistication.

6.2 Pavilion Kuala Lumpur

Located at the heart of the trendy Bukit Bintang district, lies the iconic Pavilion shopping mall that provides food and urban leisure (Fig. 12). It offers shopping experience and excitement in a 1.37 mil square feet retail haven with over 500 outlets, offering from the finest fashion and home furnishing to entertainment and culinary delights.

Fig. 12 – Pavilion

Also known as the couture Pavilion, this retail premise is the ultimate expression of designer luxury. With its impressive collection of international boutiques, haute fashion straight off the catwalks of Paris, Milan, New York and Tokyo, it's a haven for all fashionistas who want to have what's 'in' every season. It is a place to be seen and seems to attract a lot of fashion conscious people from Malaysia and abroad. (Fig. 13 – 17).

Fig. 13 – MNG Store

The stores chosen, through observation, have displayed characters that are in synchronicity with the application of colours to attract people. This can be seen especially in the transitional space where first impressions are able to capture the attention of the visitors.

Fig. 14 – Hugo Boss Store

Fig. 15 – Dorothy Perkins Store

Fig. 16 – Hermes Store

Fig. 17 – Bulgari Store

VII. Discussion

Interestingly, the precedent of successful transitional space does not occur in any specific fashion. No formula can be applied, and no blanket-statements can be made about how to overlap building and nature in any particular application. The design of transitional space, much like the exercise of architectural investigation in general, is limited to a case-by-case basis. Good transitional space is consequential of the design philosophy of any particular design process and the appropriate form of integration of nature, based on locale. Transitional space is not separate from the rest of a building; it is not something that can be added on as an afterthought. True and inspirational transitional space is an integral part of a building's architecture, a fulfilment of the needs of both humans and the environment. These precedents show several ways in which transitional space has been accomplished well.

The transitional spaces, for the user of the architecture create profound moments in their own right and heighten the inquiries and lines of thought as addressed in this paper. The spaces discussed here are only meant to encompass the issue of colour. However, the issue of colour expanded earlier is only a fraction of possible multiple transitional space issues. The intent also is not to provide a universal solution for creating remarkable spaces or establishing a more responsible connection to the ambience through architecture. The examples, methods, and case studies presented merely are meant to provide discussion as to how, through transitional space, our architecture can improve. In today's world circumstances, people are faced with social, economic, and climactic problems which must be addressed, and the ideas contained in

this paper provide a particular route as to how improvement towards an end can be made.

VII. Conclusion

Transitional spaces hold a certain power and opportunity to create extraordinary spaces which speak to a fundamental human need and longing for therapeutic ambience while providing practical architectural solutions. A space consisting of an overlapped interior and exterior is unique as an opportunity in that it not only improves the quality of life for its human users but lessens the necessity for additional linkages. The integration of nature and building contributes to a more sustainable architecture, both environmentally and in terms of longevity, because if people feel a greater connection to their architecture, the likelihood of its endurance over time increases exponentially.

Modelling factors for architectural language and architectural components in apparel premises in the retail design context require precision understanding of the psychology of space. However, without proper guidelines or criteria all the efforts will be futile. Business premises are designed and arranged architecturally and categorically that ease the process of displaying spaces and products (Hassel, 1996). This point may be a starting point in recommending measures to be taken for the display of commercial products relating to apparel merchandises. In the showcase of apparel products, the consideration that should be taken seriously is in terms of design and layout of spaces (Inaba, 2002) of commercial premises, lighting, graphic design and colour application to attract customers, among other uses of the landscape to add charm to the premises and the use of the theme for a product display. Displays of apparel products in two-dimensional and three-dimensional spaces would likely be the main attractions as they are put into a particular theme that go hand in hand with the products' identities or branding. This formulation of retail design criteria for apparel premises can be used as a guide in Malaysia for architects, interior designers and owners of commercial premises, to enhance their saleability of products.

IX. Future Research

If one agrees that transitional spaces may be valuable for individuals' identities, the case studies offered in this paper may be a good way of trying to create further elements of transitional space architecturally, specifically in retail design related cases. Future research should look into issues such as elements of transitional space and their role in facilitating the process of going through the transitional space, experiencing it while being informed and educated. The proposed future work can further enhance the learning process of going through this space, identifying the design brand with the space and to relate the experience with the brand in terms of personal engagement and identity.

Another possible future study would be looking into cultural space, thus cultural identity being located in this particular transition space. However, it will be a challenge in trying to make cultural identity universal, as cultural components demand specificity. If one should look into the common ground of parallel similarities, the architectural components meant for this transitional space can be achieved. After all, the transitional spaces in retail design can not only provide a therapeutic ambience as in retail therapy but also as a space that can project identity as well as a learning space. In the architecture world, its components can provide all the tools for such activities, a new meaning of transitional space for the next generation.

Acknowledgement

The authors would like to acknowledge the Universiti Sains Malaysia for funding this research under the Fundamental Research Grant Scheme (FRGS) 203/PPBGN/6711346 and the School of Housing, Building and Planning, Universiti Sains Malaysia for this research project.

References

1) Bolos, Christos Chrisovalantis. (2009). Transitional Space in Architecture: Elements and Profound Experiences. A Senior Honors Thesis Submitted to the Fa culty of the University of Utah in Partial Fulfilments of the Requirements for the Honors Degree of Bachelor of Science.
2) Che Wel, Che Aniza, Siti Rahayu Hussin, Nor Asiah Omar and Sallehuddin Mohd Nor. 2012. Important Determinant of Consumers Retail Selection Decision in Malaysia. World Review of Business Research. Vol 2 No. 2 March 2012:164-175.
3) Gonzalez, Luz M. (2005). The Impact of Ad Background Color on Brand Personality and Brand Preferences. Undergraduate Thesis at the College of Business Administration Honors Program at California State University, Long Beach.
4) Hassell, Greg. "Malls Slipping As Shopping Meccas." Houston Chronicle 9 Oct. 1996 cited in Hines, Thomas S. Burnham of Chicago: Architect and Planner (Chicago Studies in Ethnomusicology). 2nd ed. Chicago: University of Chicago Press, 2008.
5) Inaba, Jeffrey, Rem Koolhaas, and Sze Tsung Leong. The Harvard Design School Guide to Shopping / Harvard Design School Project on The City 2. Koln: Taschen, 2002.
6) KPDNKK. Suruhanjaya Syarikat Malaysia (2012). Bilangan Pembubaran Syarikat dan Penamatan Perniagaan. Retrieved on 30 July 2013 at http://www.kpdnkk.gov.my/home
7) Mogelonsky, M (1995), "Everybody Don"t Pick the Cherries," Marketing Tools (September/October), 10.
8) Singh, Satyendra. (2006). Impact of Colour On Marketing. Current Research Development. Department of Administrative Studies, University of Winnipeg, Winnipeg, Canada.
9) Syarifuddin, Afiq. The Retail Market in Malaysia. Property Quotient. V. 12, May 2011.
10) Wong, Barbara S.K. (2009). Colour Psychology in Design. Shine-21.com. Published on January 15, 2009.
11) Worthington, S and Hallsworth, A (1999), "Card in Context – The Comparative Development of Local Loyalty Schemes. International Journal of Retail & Distribution Management. 27(10)

The Settlement Pattern Space of Dayak Sekajang as a Part of Dayak Bedayuh At National Borders Area

Agustina Nurul Hidayati[1,2], Sudaryono[3], Heddy Shri AP[4]

[1]Student of Architecture and Planning, Technic Faculty, UGM,
[2]Lecturer at Urban and Regional Planning Department, Civil and Planning Faculty, ITN Malang
[3]Professor at Architecture and Planning, Universitas Gadjah Mada, Yogyakarta, Indonesia
[4]Professor at Anthropology, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract

Dayak Sekajang as a part of Dayak Bedayuh is one of indigenous population in Kalimantan. A close attachment to the past is expressed through adherence to customs inherited from his ancestors hereditary. Almost all the activities of life a Dayak Sekajang as a part of Dayak Bedayuh overshadowed by cultures, customs and traditions. This tribe is a fractions of dayak Kanayatn that have the greatest number in West Kalimantan.. Settlement formed as human beings and culture activities performed. The space is formed on the border countries area is certainly different from the other . Although elements from space remains the same, but the formation of the space on the state border of various interests will be loaded. Elements of politics, defense and security is one of the elements that must inevitably affect the formation of the settlement. With the naturalistic method approach to the behavior, characteristics and cultural society is carried out an analysis of the relationship between man, space and behavior. The study was done by taking the location in the village Suruh Tembawang, Sub-district Entikong, District Sanggau, West Kalimantan province which borders Malaysia. Based on the analysis, it was concluded settlement patterns of Dayak Sekajang as a part of Dayak Bedayuh community based on the culture and behavior.

Keywords: The Settlement Pattern Space; Dayak Bedayuh

1. Introduction

Man and society has a different character reflected of the differences in lifestyle and system value. Relation between man and reflected from his behavior - are at a position mutually dependent with their environment consisting of natural environment and artificial environmental (Samadhi, 2004; Setiawan, 2010).The Dayak tribe is the original inhabitants of Western Kalimantan (more living in the outback) is known as the who have always avoided from the elements outside influences that can affect their lives. Dayak tribe is divided into sub-sub tribes such as Dayak Kanayatn/Kendayan, Punan, Taman, Iban, Otdanum, and so forth that each has differences in terms of language but the similarities are evident in the indigenous custom behavior (rituals, beliefs and his philosophy). A quiet life is preferred rather than a full social riot. In association with other nations they would prefer a more residential location free from the influence of the culture of other Nations. While the form of kinship that is important in the concept of the settlement is a broad family lived in a large house called *betang/stage(panggung)/radakng*. The concept of home this *betang* embraced by most of the sub-sub tribe of Dayaks, however in the further development of this concept home *betang* experience extreme transformation into a settlement pattern consisting of several individual houses inhabited by dayak families. With the changing concept of the settlement from the house inhabited *betang* some families together into a pattern of individual settlements that each family, also poses a spatial pattern, structure and Division of spaces/new space arrangements that in fact is the transformation of settlement patterns along the *radakng*.

Through a close to the traditional law bound, the understanding expressed in the utilization of space and space settings within the scope of his community will be directly affected. The behavior of the people who are obedient to the indigenous customary law, the culture will shape the structure/typical patterns of living space in a certain space limitations (such as traditional / *adat* village). Whereas one of the basic understanding of the behavior of the group then examines the link between attitudes of individuals in the group, the attitude of individuals as members of the group as a whole is important. For each society was a Union of individuals who each other are in a steady relationship is patterned interactions. With the existence of the phenomenon is based on a transformation of the form/ethnic dayak settlement patterns of collective settlement patterns (along) to settlement patterns of individuals, as well as keep their consistenious phenomenon in carrying out indigenous customs in any behavior of his life, plus more with the

Agustina Nurul Hidayati
Doctoral Student of Architecture and Planning,, UGM, Yogyakarta, Indonesia;
Lecturer at Urban and Regional Planning Department, Civil and Planning Faculty, ITN Malang
e-mail: karadyajoe@gmail.com

location of residences adjacent to the border, then popped a thought whether the behavior with thick is based on culture, norms and mores were reflected in a pattern formation of its spatial structure/space? How the shape of the spatial pattern in a setting of space that's been clearly restricted (administrative limits) ?. The rationale underlying this research theme that is seeking retrieval of red thread that connects human behavior as individuals based on indigenous customs, culture, religion, beliefs and culture who then poured in a concept of structure/patterns of shared space.

Behavior of the Dayak Sekajang as a part of Dayak Bedayuh community which consists of a variety of different individuals have different capacity in responding to the environment (setting) although sheltered by indigenous customs and cultures are the same. The differences of each individual which would later form the perception of shared space (the system of setting) in the context of the management and the use/use of space (the system of activity). The perception of spatial that is formed based on the Indigenous customs and culture of the very powerful role in shaping a good space utilization patterns in a micro scale (residential environment) as well as in the messo scale (collected from some places of residence) as well as the macro-scale (village). Identification of the behavior of each individual ethnic Dayak is absolutely necessary to know the behavior affects creations space and any aspects that influence the emergence of such behaviour.

2. OBJECTIVE

The study aimed to know the behavior of the pattern/structure space in neighbourhoods that have experienced changes in settlement patterns of collective settlement in *radakng* home individual per family settlement into the affected ethnic Dayak society Bedayuh behavior in the area of the State border in Entikong. The research was carried out in the hamlet of Suruh Tembawang, the village got Gun Tembawang the settlement patterns have changed, then the observed behavior of the society's role in the formation of the space of the pattern of utilization of space and the activity and interaction being performed on another village outside the boundaries of the State. So that it can be found a special characteristic of the concept of ethnic Dayak Sekajang as a part of Dayak Bedayuh space around the borders of the State as its identity.

3. METHODOLOGY

This is the ongoing research. The first time, this research use the naturalistic method approach to the behavior, characteristics and cultural society is carried out an analysis of the relationship between man, space and behavior (Lincoln, 1985). Because attraction of researchers on an existing phenomenon, finally using the method of transcendental phenomenology by Husserl that explains the relationship between noesis as awareness of intentionality with consciousness noemta. Transcendental Phenomenology focused on aspects as awareness or noematic entrusted (believed) or passion (desied) and its relation to the activities of aware (Howell, 2013).

Limitation in this study aims to make discussion of the issues that have been formulated can be focused to achieve the goals and objectives that have been set. Limitation of such content include the following:

1. Formulation of the Dayak Sekajang as a part of Dayak Bedayuh ethnic community live order, include:
   a. Excavation background the philosophy, religion, belief, order value, culture, indigenous customs and life patterns and behavior affect society.
   b. Identification of specific activities as ethnic Dayak culture of appreciation such as ritual ceremonies, as well as typical art-viable systems apply.
2. Understanding the characteristics of the ethnic Dayak Sekajang as a part of Dayak Bedayuh includes the identification of the place of living (location, geographical situation, climate), socio-cultural factors, livelihood systems, technology and character building.
3. Formulate a relationship/influence of ethnic Dayak Sekajang as a part of Dayak Bedayuh behavior towards the creation of spaces, include:
   a. Elaboration of cultural elements into a material research includes coverage of knowledge systems, systems of religion, language, the arts, social organizations, systems and livelihoods systems equipment and technology.
   b. Identification of a pattern of ethnic Dayak society Bedayuh movement based on activities, including identification of:
      i. nature of socio-cultural activities, either in the form of activity that affected mores as indigenous custom ceremonies, rituals, and beliefs of others as well as activities arising out of transforming cultures such as education, health, or the orientation of the spatial beyond the scope of the village (direction of movement outside the village)
      ii. a socio-economic Activities, including the activities of work/activities related to livelihood systems and systems activities that are routine.
      iii. a socio-political Activities, namely activities related to institutional indigenous customs, both in the form of role and perception.
      iv. religious activities, including location, Trust Ordinance as well as the role of the community in these activities.
   c. Formulation of the use of space based on patterns of behavior. d. identification of spaces

4. FINDINGS OF THE PROJECT

Many factors influence the existence of Dayak Sekajang as a part of Dayak Bedayuh ethnic community, especially those located in the hamlet of Suruh Tembawang, the village Gun Tembawang, indecision that occurred as a result of a confrontation between indigenous horizontal that in fact is part of the history of their existence with the demands of growing as a result of the renewal of education as well as technology that affect young people's mindsets in order of their society, the influx of new values from the outside is not unstoppable, which is sometimes at odds with the prevailing mores. But deep in their hearts remain ingrained desire to dig back, keeping and implement indigenous customs as a form of homage and tribute to ancestors. Regardless of the complexity of problems that must be faced to keep the existence of their mores, many things can be dug either by direct assessments of their current life nor with chronicling the long history of the brand (Djuweng, , 2010).

The pattern of settlement in the Area as well as the character of its people, settlement patterns in the village of Suruh Tembawang has been changed from its original creations that embraced the settlement patterns which tend to be linear and its development road and follow the development of the River as well as tend to separate (no specific motive of the community to gather). This is caused by several factors, namely:

1.` indigenous custom Factor, as in the above explain that the population in the South is very obedient towards indigenous peoples so that their implementation more total. One of them is the implementation of indigenous custom *patio toa'* (parenting parents habits in her time as a form of homage) which led to the formation of housing based on family and each other. The provisions of the Indigenous customs to build the housing society with the concept of *patio tua'* consisting of:

a. a location is allowed to build a House, after marriage: 1) has been carrying out ceremonial *tanungn* to find out if the location is condoned by Jubata (now this ceremony was rarely done, because consideration of the difficulty of having the ground) 2). Not too close to the sacred place 3). Not too steep, 4). Close to forest/work location

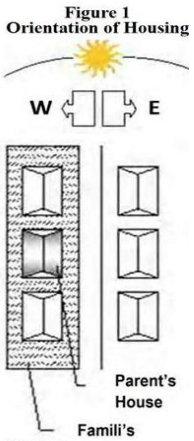


Figure 1
Orientation of Housing
Source :
Observation, 2013 and Modification from Akbar, 2001

b. Provisions of the House are: 1) the orientation of the House leads to a sunrise/sunset. This rule is not absolute. It could also lead to a reorientation of the way. 2). entrance should not be in line with the kitchen door 3). Door should not directly facing a large tree or something sacred 4), it is not blocked by another home (orientation) 5). The rear kitchen layout and not parallel with beds 6). Built with traditional ceremony 7). Done at on 9, 19 and 29 China's calender

Based on interviews and observations, then Dayak Sekajang as a part of Dayak Bedayuh settlement space pattern around the border of the State is:

a. A space settlement

1) concept of *Sute'* (influence of kinship in Radakng, the habit of compromise in the determination of the residence of the child after her marriage, as well as indigenous custom *patio'toa* (parenting parents)

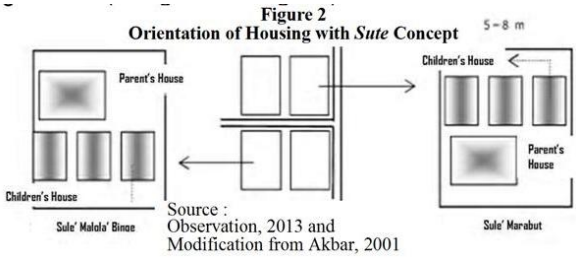


Figure 2
Orientation of Housing with *Sute* Concept
Source :
Observation, 2013 and Modification from Akbar, 2001

2) Influence model of the division of space in *radakng* according to the nuclear family and the family of the child in an open-space cubicle-bulkhead

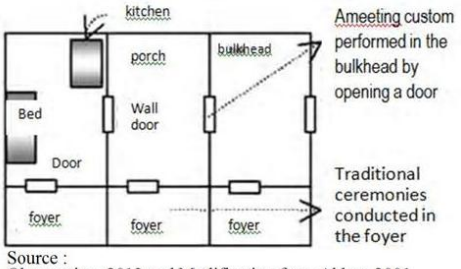


Figure 3
The Division Of Space In Radakng
Source :
Observation, 2013 and Modification from Akbar, 2001

3) the influence social system (existence leadership social structure and organization indigenous customary)

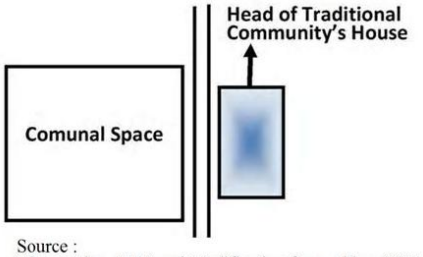
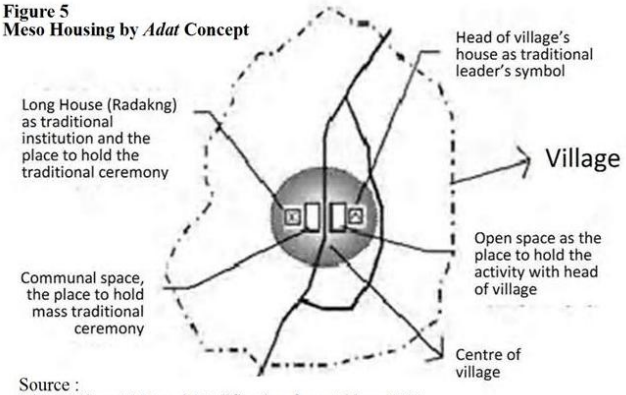


Figure 4
Orientation of Housing by Social System
Source :
Observation, 2013 and Modification from Akbar, 2001

4) the pattern of settlement space micro has identified are formed based on the concept of indigenous peoples, will form a meso spaces arising from indigenous law.

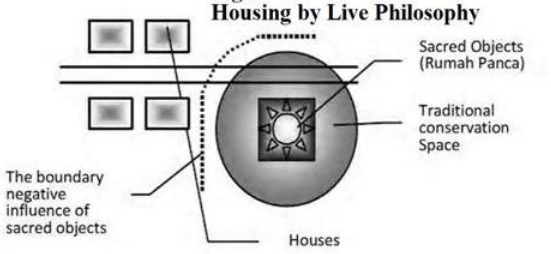
Figure 5
Meso Housing by *Adat* Concept



Source :
Observation, 2013 and Modification from Akbar, 2001

b. Conservation of indigenous Space Pattern : 1) religious Meaning of Environment believes the existence of spirits and the spirits of the ancestors who inhabited an object 2) indigenous ceremonies associated with the circle of life, as well as the ceremonial activities yearly, monthly or incidental consequential 3) philosophy of life, very close and depend on the nature and believe that everything human action will be replied to by Jubata

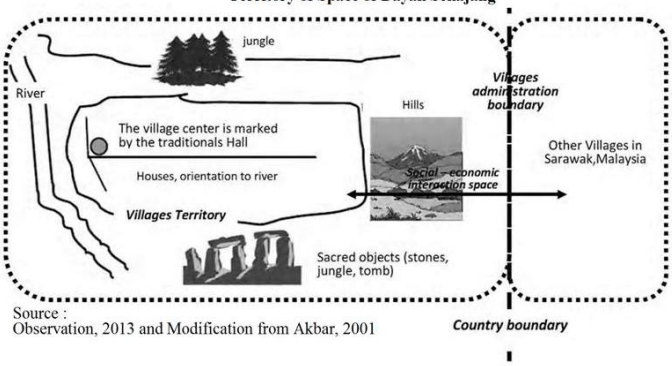
Figure 6
Housing by Live Philosophy



Source :
Observation, 2013 and Modification from Akbar, 2001

c. A Mastery pattern of space.
Mastery space recognized by society dyaks bedayuh consisting of three parts, namely mastery space indigenous customary village formed by indigenous custom, system mastery space formally shaped boundary village, and mastery space formed due to social interactions carried along between the dyaks bedayuh in indonesia and dyaks iban living in serawak, malaysia; and interaction economic intersociety two countries. Determination of the limits based on village livable sacred objects recognized by the villagers.These restrictions can be the forest makammakaam permanent nor mountains regarded as dwellings pama (spirit) middlemost viilage ditantai existence balai indigenous customs and or abode of the gathered and the broad place for the purposes of indigenous customary

Figure 7
Territory of Space of Dayak Sekajang



Source :
Observation, 2013 and Modification from Akbar, 2001

2. Professional factors and social structure, which populated profession as much as farmers led to the need for farmland is very high and the mastery of the land based on the history of many hereditary owned so much land ownership belongs to one person. If views based on indigenous custom where land ownership is also seen from the moderate form, then to still have the recognition of indigenous customary ownership, the land owners had to cultivate the land jointly with others (because of lack of energy), so there a form working group (aletn) and cause the pattern formed a cluster based on the working group.

In addition to the settlement patterns, other things must be considered within the framework of an overall settlement are:

a. A form of homage to the ancestors of the ritual that is distributed with a magical view of life, as well as those who strongly believe the existence of supernatural powers, causing the emergence of places considered sacred, places will be used for begging, performing traditional ceremony or the bitching from distress.
b. The magnitude of the influence of the indigenous leadership of the dayak people's lives, cause the onset of penguasan territories based on the structure of Indigenous customs (binua, alean, panagaraga, and patio% u2019toa) that each have a different influence on the boundary sphere. Communal space is also required which functions as a container for implementing indigenous custom meetings
c. Conservation of indigenous territories that arise because of the presence of the sacred places (pentulak) that have no apparent restrictions (physically), this is due to their view of life that menyakini that the existence of pama (occult spirits) who inhabit a sacred place will affect their lives.
d. Change the indigenous custom view towards death expressed in the placement of the grave in the settlement area (formerly far from settlement in the

forest or on a mountain) as a result of the influence of the values of the new religion.

e. The form of recognition of the village as a vast territory that should be further protected and must be maintained, which is expressed in indigenous customary style pantak (indigenous customary silence in the House and a ban on entering and passing through the village to the village as well as a ban on outsiders for villagers to get out the House or outside the territory of the village after the execution ceremony talisman% u2019) and indigenous customary law enforcement for violators without exception. This should be a major concern so that in residential areas should be set the boundaries of the village of clear selasnya and marking borders the village to the village each region as well as the laying of siam (jars) in each driveway in the village limits must be clearly seen as a marker that one village had just finished performing ceremonial reject bala'.
f. To form a single dwelling homes, there was found to be a form of home rule, according to the indigenous custom of the raw metrics are evident in the distribution of each space, as well as models/special shapes (Windows, doors, etc.) but only in the form of general rules is not binding like the recommended home orientation direction parallel to the direction of movement of the Sun, the selection of the location of the House should not be close to a sacred place, the door should not be dealing directly with large trees/large rocks or something strange/monumental, the kitchen should not be parallel to the bedding as well as the entrance of the House may not align with the doors of the kitchen.
g. Activities against the background of Culture/Indigenous customs influenced the pattern space is formed as the desire to build and make the House radakng in the middle of the village as the Center/Center of all activities that smacked of indigenous customs, as well as with certain spaces are treated specially, such as the existence of sacred places arising from a strong sense of trust towards the things unseen. So it can be inferred that in public order role Bedayuh Dayak culture and indigenous customs in the formation of residential space in usage pattern is very strong.
h. The origin of the tribe with similarities to the nearby kampong in the border region caused the incidence of interactions and activities implemented jointly between the border communities in Indonesia in this hamlet of Gun Tembawang with Kampung Sadir (Dayak Iban) in Sarawak led to the existence of a new space that occurs due to the interaction of social and economic second kampong. A space occurs is: 1). in the border area of the trail where the inhabitants of the hamlet of Gun Tembawang rugged results for sale to his needs and buy Sadir from Kampung Sadir. 2). footpath connecting the Gun Tembawang with Kampung Sadir became one of the media liaison between kampong-between community groups when doing indigenous custom events such as Gawai Dayak which was carried out together with same each year on 30Mei - June 1 by the second kampong.

V. Conclusion

With regard to studies that have been done, so some things that should be noted are:

1. further study to dig deeper cultural values relating to space and a space based on Dayak indigenous customs Bedayuh, because the author felt due to the limited capabilities of resources (both personnel and material) causes not completing the work.
2. with regard to the aspirations of the public, preferably in one kawaan binua (village) there is one home radakng that serves as a container of indigenous custom events that had performed at places of indigenous elders or the selected places, so in addition to the activities of a mass nature containers and indigenous custom backgrounds, as well as the identity and the village centre.
3. in the determination of the limit of the village should be adapted to the model of the distribution according to the indigenous custom of the institutional order so as not to change the existing indigenous customs. In addition to limitations between the village should also be as specific as possible and every driveway on the border between the village should be labelled and put *Siam* or *Guci* (place to be easily seen by anyone who will enter the village), this relates to indigenous customs with the applicable pantak in Dayak Sekajang as a part of Dayak Bedayuh where public order after committed ritual indigenous custom *tolak bala'* in village, everyone was banned from entering the village until at least noon, and for offenders will be subject to the indigenous customs.
4. in the planning of the Dayak community Sekajang as Bedayuh settlement should also consider factors:
   a. population profession Domination, because usually in the village which has a population that is dominated by farmers there will be a model working group (aletn) which will result in a model of the engelompok residence patterns.
   b. the existence of complex *Patio' toa* exclusive.
   c. a very strong dependence of dayak people against nature
   d. Remain the indigenous customary law in addition to the existing constitution, so that necessary adjustment-adjustment such as: confidence in the things unseen which is expressed in the presence of the sacred places that predestination was based on certain

parameters such as grandioseness an object, the uniqueness/rarity as well as specific causes as a result of acts of the community; Conservation of indigenous spaces (with regard to the existence of sacred places)

e. Special creations as the identity of the dayak indigenous symbols such as Hornbill, *Guci*, a form of traditional house (radakng) as well as a decorative ornaments of the building.

f. the existence of sacred places that also functioned as ceremonial venue or place begging or request addition to the existence of houses of worship.

g. A space that is formed due to the interaction between the border communities in the form of social interaction because of the similarity of tribal background and economic interaction that is formed due to the presence of arable land together, selling between inhabitants (inhabitants of Indonesia who sold his farm to the results of some parts of Borneo, Malaysia; and buying basic necessities from some parts of Borneo). To shorten the distance, it is not uncommon for economic interaction is done at the border between the two countries through the walkways. For community social interaction also makes use of the trail to visit each other and celebrate the festivities together.

h. Tht is important for the next Dayak Sekajang as a part of Dayak Bedayuh generation to care their traditional communities and their interaction between the border communities, and the government should facilitate the interaction with the legal space like a communal space between two country on the border area..

References

1. Akbar, Syamsul, (2001), Studi Pola Ruang Pemukiman Masyarakat Etnis Dayak Kanayatn Berdasarkan Budaya Dan Adat Istiadat, Skripsi Jurusan T. Planologi ITN Malang
2. Anyang, Thambun Y.C, (1998), Kebudayaan dan Perubahan Daya Taman Kalimantan in Arus Modernisasi, Grasindo-Perwakilan Koninklijk Institut voor Taal-, Land-en Volkenkundende, Jakarta;
3. Azwar, Saifuddin, Drs.MA, (1998), Sikap Manusia-Teori dan Pengukurannya, Pustaka Pelajar, Yogyakarya,
4. Budiharjo, Eko, (1997), Lingkungan Binaan dan Tata Ruang Kota, Penerbit Andi Offset, Yogyakarta,
5. Djuweng, Stepanus, (Eds)., (2010), Manusia Dayak: Orang Kecil Yang Terperangkap Modernisasi, Cetakan Ketiga, Institut Dayakologi,Pontianak.
6. Howell, Kerry E, (2013), An Introduction to the Philosophy of Methodology, Sage Publications Ltd, London
7. Institut of Dayakology Risearch and Development, (1997), Mencermati Dayak Kanayatn, Pontianak,
8. Ismani, Drs, (1987), Pengantar Sosiologi Pedesaan, Fakultas Ilmu Administrasi Universitas Brawijaya, Malang,
9. Jayadinata, Johara T, Dra.MSc, (1992), Tataguna Tanah dalam Perencanaan Pedesaan, Perkotaan dan Wilayah, Teknik Planologi, Institut Teknologi Bandung, Bandung
10. Koentjaraningrat, ((1994), Pengantar Ilmu Antropologi, Penerbit PT. Rineka Cipta, Jakarta,
11. Lincoln, Yvonna S., (1985), Naturalistic Inquiry, Sage Publication, California.
12. LP3S dan Institut of Dayakology Risearch and Development, (1994), Kebudayaan Dayak, Aktualisasi dan Transformasi, PT. Gramedia Pustaka Utama, Jakarta,
13. Lontaan, J.U, (1975) Sejarah-Hukum Adat dan Adat Istiadat Kalimantan Barat, Pemerintah Daerah Tingkat I Kalimantan Barat, printed by Offset BumiRestu, Jakarta,
14. Samadhi, T. Nirarta, (2004), Perilaku dan Pola Ruang, Kajian Aspek Perancangan Kota di Kawasan Perkotaan Bali, LPPM ITN Malang.
15. Setiawan, B. Haryadi, (1995), Arsitektur Lingkungan dan Perilaku, Direktorat Jendral Pendidikan Tinggi RI, Departemen Pendidikan dan Kebudayaan RI, Yogyakarta,
16. Sinulingga, Budi D. Ir.Msi, (1999), Pembangunan Kota, Tinjauan Regional dan lokal, Pustaka Sinar Harapan, Jakarta,
17. W. Sarlito, (1992), Psikologi Lingkungan, Program Pasca Sarjana, Program Studi Psikologi, Universitas Indonesia, PT. Gramedia Widiasarana Indonesia, Jakarta,
18. Wiryomartono, A. Bagoes P, (1995), Seni Bangunan dan Seni Binakota di Indonesia, PT. Gramedia Pustaka Utama, Jakarta,

Design Context

Second Session Parallel Notes
Moderator: Kurnia Widiastuti

K4 Room 2nd Floor
15.00 – 16.00

Presenter	:	**Adi Utomo Hatmoko (Universitas Gadjah Mada)**
Title	:	**Appropriate Strategy in Healthcare Design: Responding Variety For The Next Generation, An Indonesian Experience**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Hospital Architecture
- Patients+relatives, doctors+paramedics, supplies: clean+dirty

Hospital Components → function, technology, space, context, form, circulation

Appropriateness of Process
- Existing hospital evaluation, design and construction, masterplanning: highest and best use

Hospital Architecture
- Ideal design, research, real world reality, practice

Case 1 → Jakarta Urban Area
- Conservation and development → open space, building conservation

Case 2 → Bogor Sattelite Town
Case 3 → Bandung Suburban
Case 4 → Klaten Small Town
Case 5 → Merauke Remote Area

Hospital Trends : Context
- More parking, less land
- More specifics+addressing specific needs
- More considerations on patient safety
- More economics
- More aesthethics

What's more?
- More ambulatory care
- More patient centered
- More healling environment
- More green
- More entertaining spaces

What's less?
- Less maintenance
- Less patient per inpatient room
- Less sickness atmosphere
- Less waste
- Less distance

What's next?
- Evaluate our resources
- Design+build relating ideals and real world
- Masterplan+plan our facilities

Presenter	**:**	**Azizi Bahauddin (Universiti Sains Malaysia)**
Title	**:**	**The Architectural Language for Retail Design: a Transition in Space**
Presentation Duration	**:**	**10 minutes**

PRESENTATION CONTENTS

Scope Malaysia
Identified Super Malls in Kuala Lumpur – Suria KLCC, Pavilion, One Utama

Problem Statement
Studies on retail have demonstrated that many premises in shopping malls faced sale problems due to lack of customers as 'physical attractions' are not considered seriously.

Objectives
- To evaluate the significance of the use of the architectural language in retail design
- To investigate the meaning of space in relation to retail design
- To formulate retail design criteria of architectural language and components in shopping malls

Methodology
Qualitative
- Primary sources
- Observation
- Visual data

Retail Design
Transitional Space → a space in between spaces that require attention is the transitional space that connects the outside to the inside.

Case studies
Shopping motivated
- Adventure motivation
- Social
- Gratification
- Idea
- Role
- Value
- Anticipated utility

Type of shopping mall
- Neighborhood center/convenience centers
- Community center/community malls
- Regional center
- Superregional center
- Fashion/specialty center

Shopping mall components spaces
- Department stores
- Stand-alone stores
- Food courts

Design Environment
Shopping malls compete by providing the best services and facilities by creating an exciting retails store environments space.

Shopping Mall in Malaysia
- The modernization brings a lot of changes in retail sector and economy in Malaysia.
- Suria KLCC is a 1.5 million sp. feet (140,000 m^2) shopping complex with a luxurious mall with over 320 stores, and is located directly beneath the Petronas Twin Towers.
- Pavilion KL located at the centre of Kuala Lumpur's major shopping strip, Jalan Bukit Bintang, Pavilion KL is roughly equidistant from KLCC and the forthcoming KL International Financial District.
- This area is commonly known as 'The Golden Triangle'.
- One Utama, also known as 1 Utama, or 'OU', has become one of the most popular shopping malls in Kuala Lumpur.

Discussions
Good transitional space is consequential of the design philosophy of any particular design process and the appropriate form of integration of nature, based on locale.

Conclusion
Transitional space → hold a certain power and opportunity to create extraordinary spaces, speaks to fundamental human need, longing for therapeutic ambience while providing practical architectural solutions.

Future Work
Elements → transitional space and their role in facilitating the process of going through the transitional space, experiencing it while being informed and educated.

Presenter	:	**Agustina Nurul Hidayati (Institut Teknologi Nasional)**
Title	:	**The Settlement Pattern Space Of Dayak Bedayuh At National Borders Area**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Introduction
Indonesia-Malaysia Border Area in Kalimantan
The behavior of the pattern/structure space in neighbourhoods have changes in settlement patterns of collective settlement.

Objective
To find the settlement pattern space of Dayak Sekajang as a part of Dayak Bedayuh at National Borders Area

Methodology
The naturalistic method approach to the behavior, characteristics and cultural society is carried out an analysis of the relationship between man, space and behavior (Lincoln, 1985).

Findings of The Project
- A space of settlement
  - Concept of Sute' (influence of kinship in Radakng the habit of compromise in the determination of the residence of the child after her marriage, as well as indigenous custom patio'toa (parenting parents)
  - Influence model of the division of space in radakng according to the nuclear family and the family of the child in an open-space cubicle-bulkhead

    - Influence social system (existence leadership social structure and organization indigenous customary)
- Conservation of indigenous space pattern
    - Religious Meaning of Environment believes the existence of spirits and the spirits of the ancestors who inhabited an object
    - Indigenous ceremonies associated with the circle of life, as well as the ceremonial activities yearly, monthly or incidental consequential
- A mastery pattern of space

Conclusion

- Further study to dig deeper cultural values relating to space and a space based on Dayak indigenous customs Bedayuh, because the author felt due to the limited capabilities of resources causes not completing the work.
- To plan the Dayak community Sekajang as part of Bedayuh settlement should also consider factors:
    - population profession Domination, because usually in the village which has a population that is dominated by farmers
    - the existence of complex Patio' toa
    - a very strong dependence of dayak people against nature
    - necessary to conservate of indigenous spaces
    - the existence of sacred places that also functioned as ceremonial venue or place begging or request addition to the existence of houses of worship

Historical and Heritage Context

Presentation Note Keynote Speaker: Kruti Garg

Presentation Note Keynote Speaker: Yasufumi Uekita

Challenges in the Management of Tourism Infrastructure in Melaka World Heritage Site: A Preliminary Evaluation
Jamil Jusoh, Azizan Marzuki, Norkamaliah Shahrin

Law for the Protection of Cultural Properties: A Process of Translating the Regulation into Institution Support and Implementation Instrument
Arif Sarwo Wibowo

Third Session Parallel Note Moderator: Adi Utomo Hatmoko

City History and Image as Morphology Shaper in Malang City
Amandus Jong Tallo, Yulia Pratiwi

The Outstanding Value of Cultural Landscape: Borobudur as a *World Heritage Cultural Landscape*
Dwita Hadi Rahmi

Fourth Session Parallel Note Moderator: Diananta Pramitasari

Historical and Heritage Context

Kruti Garg

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 13.30 – 15.00
Moderator	: Laretna T Adhisakti
Presentation Duration	: 20 minutes

PRESENTATION CONTENTS

Definition of Heritage

- Cultural heritage is the legacy of physical artefacts and intangible attributes of agroup or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations*.*
- Often though, what is considered cultural heritage by one generation may be rejected by the next generation, only to be revived by a succeeding generation constitutes a fundamental part of the identity.
- Conservationis all measures and actions aimed at safeguarding tangible cultural heritage while ensuring its accessibility to present and future generations" (ICOM-CC 2008, author's italics).

Conscious Efforts

- Protection of world cultural heritage - 1954, the government of Egypt decided to build the Aswan High Dam
- In 1959, after an appeal from the governments of Egypt and Sudan, UNESCO launched an international safeguarding campaign.
- Archaeological research accelerated - the Abu Simbel and Philae temples were dismantled, and reassembled.
- The campaign cost about US$ 80 million, half of which was donated by some 50 countries, showing the importance of solidarity and nations' shared responsibility in conserving outstanding cultural sites.

Realising Heritage

- Heritage – As Asset
- Importance of Governance (Goverment plays a big role to prevent the heritage by regulatin etc)
- Awareness amongst people
- Sense of Identity
- Sense of "Space"
- Sense of Place
- Creating Awareness
- Visual Medium of outreach
- Bridging the Gap
- Not Anti Development

Building and Shaping local identity

It would be good to turn our old buildings into commercial assets by turning them into space for creative businesses.

Non monumental Heritage

- Mumbai, first City in India to have Heritage Regulations in the DCR through Citizen's Movement – 1995
- Involvement of local governance towards heritage conservation
- Has been nominated for World Heritage as the only city with a glorious ensemble of Victorian Gothic and Art deco in co-existence

Heritage – Restored-"Re Created"

Heritage in contemporary, inclusive usage – has come to mean anything created in the past that helps us, collectively or individually, to understand the present,create a (better) future.

Heritage as catalyst

Heritage as both a catalyst and nucleus - bringing community identity and aspiration together

Heritage – Transforming identity

- Kala Ghoda Festival Transforms the art district
- Brings together Architecture, theatre, workshops, food, heritage in one frame
- Managed by Kala Ghoda Association formed by people of the area for a larger initiative
- Proceeds of which go in the restoration of the buildings of the Kala Ghoda Area

Heritage – Adaptive Reuse

Heritage buildings need to be used. Once a building's function becomes redundant, adapting it to a new use provides for its future.

Space for the next generation

- Taking a Step Forward – Safeguarding the identity under protected norms
- Acknowledging Heritage - 20th century manifestations in Architecture resulting in iconic urban forms
- Heritage is anything that defines localness – the way in which a town is set out, where it's come from, its industry, geography, history, its economy.. In Mumbai, it's our stories, our accent, our brunmaska, our vadapav's, our sea side, our grey stones, Gateway of India, Amitabh Bacchan – mix all that together and throw it in a pot kiln, and you might be halfway to it'.

Historical and Heritage Context

Yasufumi Uekita

Place	: K1 Room, 2nd floor
Time	: Friday, 22 August 2014, 08.30 – 09.30
Moderator	: T. Yoyok Wahyu
Presentation Duration	: 15 minutes

PRESENTATION CONTENTS

- Jakarta, Beijing, and Tokyo is historical city which developed to become modern city. So, the landscape and the facade is barely same. The historical landscape and facade merely gone.
- Tsukuba, a town in Japan which lately build from zero and planned as a modern city by ignoring the historical aspect, in it's development, Tsukuba has their own historical site and it has its own landscape not the typical city facade.
- Tokyo in the beginning has a water lines to protect the town fromthe outside attacks and to do certain activities that time. But now, there's toll roads built above the water line. To makes it, it's very difficult. That thing make a typical tokyo thing. So, that modern buildings in tokyo really built above the historic buildings.
- Beijing, the city which has unique tradition including the house, is towards a modern city. So there is so many new modern massive building. The most famous modern massive building in Beijing is Beijing National Stadium. To built that, there's so many traditional house been evicted and destroyed, so the number decrease in 2008.
- The study case located 4 kilometers from the city centre, there are still has some traditional house. Those typical traditional chinese house there is has a no roof hall in the middle of the house, then all the room face those hall.
- Why is the arrangement of space in the house goes like that? Because in the begining, those house is for 1 family. Then, the descendant which is usually more than one divided the house for more than one family.
- The main room is in front of the gate. This room usually use to entertain guests. So, the guests enter from the gate then to the main room and then to the bedroom, not from hall directly to bedroom. Main room is the important room because some heritage thing displayed there. This is the tradition in China.
- So, the question is, although Beijing towards to a modern city, the space arrangement in the modern house in china is still keep the tradition or not?
- And the answer is yes. The modern house in Beijing like in the apartment, still has that kind of space arrangement. They enter the door then go to the main room then the bedroom. The space arrangement tradition is still applied nowadays.
- The samurai house in Hiroshima, Japan is for the rich people and become a conservatory. This traditional house has two different doors, the one is in front and the other is in the side. For guests, they enter from front door then to the main room. For family, they enter the side door and directly go to the living room where the family usually hang. For the important guest, there are the deepest room in the house

So in Japan there is a different way to entertain the guest and family.

- In meiji house, different with the samurai house because its more simple and just has one door in front. The guests enter directly to the hall then the beroom in the left, the right is for the family activities. It is more compact but still separate the guest room and family room.

- In Yogyakarta, the traditional house called Joglo. The author never been done the research about the space arrangement in Joglo. So it's still become a question about the tradition in space arrangement in this modernisation area.
- More research about traditional house should be done before it disappeared altogether. As much as possible when the new building remains adapted with traditional building.

Challenges in the Management of Tourism Infrastructure in Melaka World Heritage Site: A Preliminary Evaluation

Jamil Jusoh[1], Azizan Marzuki[1], Norkamaliah Shahrin[2]

[1] Senior Lecturer, School of Housing Building, Planning, Universiti Sains Malaysia.
[2]Post Graduate Student, School of Housing Building, Planning, Universiti Sains Malaysia.

Abstract

Infrastructure is an important facility or the main services in the tourism sector. The increasing number of tourists visiting the world heritage site each year requires an efficient infrastructure management. Melaka is a unique historical heritage city and has a range of historical elements of the Malay Sultanate in the 15th century and the Portuguese and Dutch in the 16th century. Historical relics and heritage are still well maintained even though there have been development changes since 500 years ago. Melaka and George Town has been recognized by UNESCO as a world heritage site on July 7, 2008. This recognition has attracted increasing number of tourists every year, either international or domestic. Successful demands for infrastructure in urban heritage tourism are a challenge for the city of Melaka. Infrastructure plays a vital role in supporting its historical elements to ensure that the heritage is being preserved. Effective infrastructure is one of the essential elements in attracting tourists to the destination. There are issues and problems in the planning and implementation of tourism infrastructure, although there are guidelines and standards set by Melaka Local Planning Authority. A preliminary research and site inventory were conducted in the Core Heritage Zone of Melaka to evaluate the standards and quality of infrastructure for the heritage site which was based on planning standards established by the Melaka Local Planning Authority. Findings found that lack of enforcement by local authorities, poor maintenance, low quality of infrastructure and shortage of financial allocation in infrastructure maintenance are among the issues. Therefore, to ensure sustainability in the tourism infrastructure management, local authorities have to impose appropriate planning, sufficient allocation, effective implementation and maintenance in ensuring tourism infrastructure in Melaka to be the best of its class in the tourism industry.

Keywords: *tourism infrastructure, heritage, efficiency, evaluation*

I. Introduction

Tourism is one of the biggest contributors to the nation's economy. It is a growing sector and keeps on rising to the rear of the development sector. In 2013, Malaysia's tourism sector generated revenue of RM 65 billion and attracted 25 million visitors from all over the world. Infrastructure is the key element in tourism development in the area. Crouch and Ritchie (1999) stated that tourism development will not be successful without basic infrastructures such as roads, ports, electricity and water. Meanwhile, Gunn (1988) and Inskeep (1991) stated the potential attractiveness of a tourist destination is based on the basic infrastructures of a country. However, Smith (1994) considers the role of infrastructure in creating a product experience. These infrastructures will indirectly play an important role in supporting the historical element to ensure that it is permanent and maintained. The planning of infrastructures as a support element for the development of sustainable tourism in the city is very important to the Melaka State Government.

The increasing number of tourists throughout the year resulted in the high demand of the tourism sector. According to Ortega (2002), an increase in the number of tourists should involve changes in the tourism management practices in order to protect, promote and develop the site or area as a tourist attraction. The relationship between tourism and heritage manage- ment, cultural heritage management in particular, is dialectical according to Garrod and Fyall (2000). They also pointed that in caring for and maintaining the heritage assets, issues such as finance and public amenities importance in the

Jamil Jusoh
--- School of Housing Building & Planning,
Universiti Sains Malaysia, 11800 USM,
Pulau Pinang, Malaysia.
Tel: +60104006922 Fax: +604-6589666
e-mail: jjamil@usm.my

decision making process is of secondary consideration. Domestic tourism in deve- loped countries is based on public-private partnership in the planning, financing and implementation.

II. Melaka as the World Heritage City

Melaka City has been around since the year 1400, and it is the placement of the straits people who make a living as a fisherman at the mouth of the Straits of Melaka. Parameswara arrival to Melaka from Sumatera has opened a new chapter for Melaka at that point of time. In the heyday of Melaka Sultanate Empire, it has attracted traders from all over the world. Melaka how- ever fell to the hand of Portuguese in 1511, followed by the invasion of the Dutch in 1641 and finally the British in 1824 until 1957. Melaka is located in the southern region of Peninsular Malaysia and is located facing the Straits of Melaka. The city with the size of 1650 square miles is divided into 3 main districts and 81 sub-districts. Nowadays, there are numerous histo- rical relics such as the element of tangible and in- tangible heritage in Melaka City which has attracted tourists to come to this historical city. Heritage is seen as a non-renewable resource that reflects or depicts human achievement and cultural identity of Melaka. The recognition of UNESCO to Melaka as a World Heritage Site in 2008 has divided the city of Melaka into three zones, namely the Core Zone, Buffer Zone and Heritage Village.

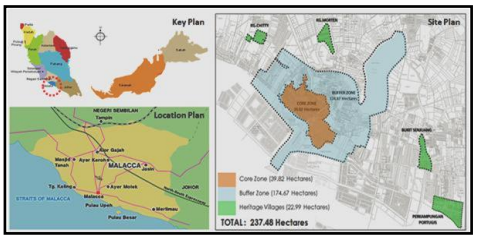


Fig 1: Site Plan of Melaka World Heritage Site
Source: Special Area Plan Historic City of Melaka (2007)

III. Tourism in Melaka

The effective and sustainable promotion of tourism is being done by Tourism Malaysia both locally and abroad. Effort has been made by the Melaka Tourism Division in diversifying the attractions of the heritage elements to attract tourists to visit Melaka. Tourist arrivals to Melaka have improved over the years (See Table 1 below). The improvements of domestic and international tourists are so significant from the year 2009 to 2012. There are 12 tourism sub-sectors in Melaka as listed by the Tourism Promotion Division, Department of the Chief Minister of Melaka in 2012. They include the history, culture, recreational, sports, shopping, conventions, health, education, agro, food, Melaka My Second Home, and Youth Tourism. Under these 12 sub-sectors there are 603 attractions listed. Based on the 2014 Budget Speech by the Chief Minister of Melaka, the revenue from tourist spending in Melaka in 2013 amounted to RM 9.1 billion.

Table 1. Tourists Arrival to Melaka from 2009-2012

Year	Total
2009	8,905,273
2010	10,354,661
2011	12,165,866
2012	13,700,000

Source: Department of the Chief Minister of Melaka

IV. Definition and Concept of Tourism Infrastructure

According to the World Bank report (2004), infrastructure is defined as the basic public infrastructure that formed the foundation to the social and economic development. According to Fourie (2006), economic infrastructure is the infrastructure that carries out economic activities such as streets, roads, highways, railways, airports, ports, electricity, water, and sewerage. This scientific literature described the role of infrastructure through the services provided by using the physical infrastructure assets. The basis of the household activities and economic production are based on the infrastructure services such as electricity, transportation, telecommunications, water supply, sanitation and waste disposal.

Gearing (1974), who studied the case in Turkey as a tourist destination since the 1970s, explained that the main determinants of tourist arrivals is infrastructure which include roads, water, electricity, security services, health services, communications, and public transport. Meanwhile, Mauritius has been continuously recorded an increasing number of tourist arrivals every year since 1972. Efforts were done by the government of Mauritius by heavily investing in public infrastructure which support for the needs of tourism development (Seetanah *et. al.*, 2010). Effective infrastructure found based on the case of Turkey and Mauritius, shows that infrastructure plays a particularly important role in determining the arrival of tourists to a tourist destination. It is difficult to find an example for physical infrastructure model in most of the infrastructure projects undertaken in Malaysia, especially in the world heritage area. Practically, most of the infrastructure is based on the concept of 'shared usage', meaning that the facilities provided are being shared by the locals as well as the travellers or other users (Kah, 2003).

According to Cristian *et. al.* (2010), the concept of sharing implied the infrastructure for tourism is not a priority, instead attention only being given to the other components of development such as housing, agriculture and industrial development. Figure 2 below shows the main infrastructure such as roads; water supply, electricity and public transportation have to be shared by two users at a time. However, there are special infrastructures for the tourists such as hotels and tourist information centre that cannot be used by

the local citizen (Crouch & Ritchie, 1999). In Malaysia, the key component in the implementation of a project are infrastructure, utilities and services, the main building, public amenities, green spaces and recreational facilities. According to Jamil (2009), 20% of the project cost was allocated for infrastructure while 50% was for the main buildings such as residential, commercial and recreational construction. Among the main infrastructures to be included are roads, electricity, water supply and public amenities such as playgrounds, green spaces, schools, police stations and sewage treatment plants. In many cases construction and subsequently the delivery of public amenities and infrastructures are done by the Local Authority (LA).

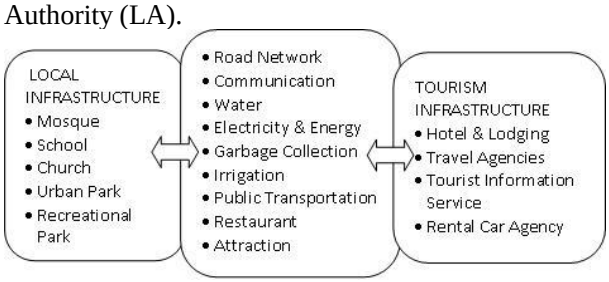


Fig 2: Sharing Concept of Infrastructure
Source: Modified from Crouch (1999) and Smith (1994)

V. The Concept of Tourism Infrastructure Effectiveness

According to Jamil (2008), the effectiveness of the infrastructure depends on four main factors, namely; suitability of the location, the type of infrastructure, the user of infrastructure, and the role of infrastructure. First, the appropriateness of the location is associated with the placement location (site) in the area and the relationship between these infrastructures with the local area. Second, the type of infrastructure often depends on the suitability of the infrastructure available. It covers many aspects of design that are appropriate to the place or land condition, whether the design is excessive, adequate or inadequate. The maintenance of the layout and materials used for the construction of infrastructure has also to be considered. Third, the user of the infrastructure; namely tourists or locals, depending on the frequency of usage of the infrastructure involved, whether it is frequently, rarely or never use the infrastructure provided. Finally, the role of infrastructure as public amenities in accounting for the usage either within the site or other area outside of the site involved. If the infrastructures provided are only for the tourists, therefore, it does not reflect the effectiveness of the tourism infrastructure. This is because the effectiveness of infrastructure should be based on the concept of infrastructure sharing, as shown in Figure 2.

VI. Tourism Infrastructure Management

Heritage tourism management traditionally involves individuals from diverse backgrounds, including conservators, curators, planners, operation managers, strategic specialist, public relations specialist, and marketing professionals (Garrod and Fyall, 2000). According to Gray (1989), stakeholder is an organization or an individual who has the power and has the ability to participate in such management process. Moreover, according to Milne & Ateljevic (2001), stakeholder participation throughout the decision-making is very important and widely accepted, especially in the usage of resources. Stakeholders have a clear understanding and insight into their areas of various aspects of the economy, the needs of society, the nature and social. Apart from the stakeholders, according to Garrod and Fyall (2000), co-operation and involvement of other government agencies, private sector, local communities and groups of visitors is important. This is to ensure that the tourism management involves various groups and not only monopolized by certain groups in decision-making but views from various parties involved. The Melaka Historical City Council, Public Works Department, Department of Drainage and Irrigation and 17 related technical agencies are responsible for the planning, implementation, controlling and maintenance most of the infrastructure facilities in the state of Melaka. Therefore, the management aspects involving the development and local management is under the jurisdiction of local authorities which is placed under the administration of the respective districts. There are three districts in Melaka namely Jasin, Alor Gajah and Melaka Tengah. The World Heritage Site is however under the administration of Melaka Historical City Council.

VII. Issues in Tourism Infrastructure Management

According to Murphy (1997), the key issues in modern tourism management is the guarantee of quality in the product or service being delivered, both of which are for the tourists and those who live in the tourism environment. This is important because in a crowded urban environment, tourism maybe in conflict with the economic activities and other social and the achievement of quality tourism experience should be in line and balanced with other priorities and goals. Russo and Borg (2002) have also pointed out issues in tourism that will prevent the viability for a long time in the development of tourism.

7.1 Irregular Maintenance

According to Rangarajan (2001), the provision of infrastructure should be consistent and interconnected with each other to support the whole development structure of an area. Based on the preliminary site inventory done on site and referring to the studies performed by Jamil *et al.* (2012) show that there are various types of infrastructure and facilities that are available to accommodate the demands from the

locals and tourists. He also noted that the physical infrastructure available in the Melaka Heritage Site is sufficient and meet the needs of the heritage city. However, there are supplementary issues and problems related to the infrastructure discovered on site such as improper location, poor design, insufficient allocation, low quality and poor maintenance. The tourist walkway has no continuity route between one attraction to another. The design of pavements that are not compatible with the *Universal Design* that is consistent with the requirements set by the UNESCO itself. This situation is very difficult, especially for the tourists and even for the disabled consumers. The information boards available around the heritage site are not properly maintained. Most of the information displayed are in shabby condition and cannot be read. Directional signs are not consistent in terms of its placement, smaller sizes and misleading. In addition, there are only 3 public toilets available, while the location of toilets are far from each other as well as it is also out of sight and difficult to be discovered by the tourists (Jamil *et. al.*, 2012). Evaluation on site identified that there was an of inappropriate location of toilets and no clear signage direction being allocated.

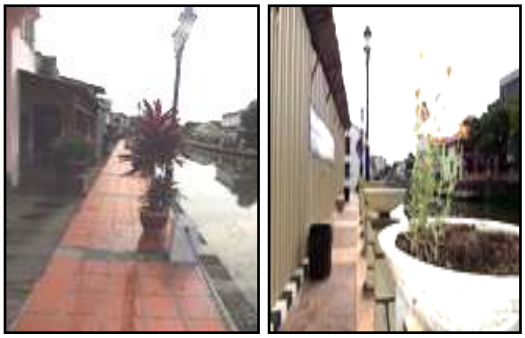


Fig 3: Small walking lane with no continuity as pedestrian walkways.

7.2 Infrastructure Construction Not Contributing to Urban Tourism

There are several infrastructures provided in Melaka but however not giving any advantages and benefits to the tourists. According to Jamil *et al.* (2013), not all the infrastructure built are being used by the tourists. Based on the concept of infrastructure sharing as shown in Figure 2, good construction is the construction of non-detriment and it is being used by both tourists and locals. Research in planning and designing appropriate infrastructure to the current situation is important so that it will give a positive impact and benefits to the tourists and locals. Investigation on site showed that the signs built do not provide any information or describe the relevant information to the tourists about the World Heritage Site. The Melaka Monorail along the Melaka River with the length of 1.6 KM with the construction cost of RM16.5 million can accommodate 22 passengers at any one time. According to Lai (2011), the monorail service has experienced a total of 21 disorders since it began its operations in October 2010 until September of 2011. Till now, the monorail is still operating as normal, but they are often subjected to disturbance. In the recent case in December 2013, three tourists from Australia were trapped in the Monorail (NST, 2013).

Fig 4: Signage that does not provide relevant information about World Heritage Site.

7.3 Poor Enforcement by the Local Authority

Most business activities operating on the roadside or along the 5 foot way of the shop have created congestion along the tourist route. The situation causes more problems when piles of rubbish being left along the walkways and not properly discarded at the dump site provided. In addition, the pedestrian routes that are used to be walkways for tourists can no longer be used since the shop operators exhibit their product along this the pedestrian routes. Investigation has noticed that no action taken by authorities to monitor these setbacks in addressing and controlling these business activities. Small businesses operating in rows of hawkers' tents in front most of historical buildings in Melaka also started to increase in number. The structures have indirectly interfered with or obstruct the views of the main building. Based on the Preservation Zone Action Plan 2001, the issue of hawkers is always in control or in scrutiny of the authorities. There should be strict actions taken by conducting regular monitoring by the enforcement agencies of the City Council to address these hawkers.

7.4 Insufficient Funds for Infrastructure Management

According to Garrod and Fyall (2000), heritage goals tend toward conservation with financial constraints and public access. Based on the 2013 and 2014 Budget as presented by the Prime Minister of Malaysia, the government has allocated RM 1.2 billion for tourism development and management including advertising and promotional programs. Maintenance of infrastructure is important to keep the infrastructure at the heritage sites are always in good condition and

safe to be visited. Special fund in the provision of infrastructure indirectly ensures the maintenance will be done properly and regularly. If there is any damage, it can be repaired as soon as possible without taking a long time or left unattended. Based on visual analysis, it was noticed however, little efforts was done to upgrade or conserve some basic infrastructure for the benefit of tourist. Pedestrian lane, sign board, bus stops and street furniture were not properly maintained. Based on the 2014 Budget announced by the Chief Minister of Melaka, RM 16.25 million will be spent on infrastructure. Meanwhile, a total of RM 2 billion is allocated under the Tourism Infrastructure Special Fund for the construction and maintenance of tourism infrastructure by the private sector through a loan from Bank Pembangunan Malaysia Berhad.

7.5 Unclear Policies, Acts and Regulations

Management of World Heritage Site has developed a *Management Guidelines for World Cultural Heritage Sites* in 1993 as a reference to provide a functional heritage in the society's life. It also discuss the overall requirements in terms of objective and comprehensive strategy that should be taken by the local authorities and tourist boards for a comprehendsive strategy of overall tourism development (Fielden & Jokilehto, 1998). However, according to Rodwell (2002) and Wilson & Boyle (2006), *Management Guidelines* is more concern on the conservation of heritage sites over the management of intangible heritage and visitor's activities. Based on the *Management Guidelines for World Cultural Heritage Sites*, Landorf (2009) stated that steps should be taken to address the issues of tourism management to formulate a structured management plan and methods in the planning process. The plan is divided into four parts, namely; analysis of the situation; strategic orientation; vision and values: and stakeholder participation.

The management of tourism infrastructure is bound by the conditions set by the UNESCO itself. If there are any issues and problems, and if reports have been made, the consideration for the withdrawal of the status as a World Heritage Site can be withdrawn if no concrete actions have been taken. There are guidelines and standards set by the Department of Town and Country Planning which is under the management of local authorities. There is a Special Zone Planning Draft for the town of Melaka and Conservation Zone Action Plan that has been gazetted to smooth out the tourism management. The management plan is used to maintain the existing heritage properties in the World Heritage Site of Melaka. Based on the Special Zone Plan for the Historical City of Melaka in 2007, there are three aspects taken into the management policies. It involves the management plan, financial and activities that promote the heritage site. However, to what extent these policies are being implemented?

Other acts involved are as follows, the Local Government Act, 1976 (Act 171), Town and Country Planning Act, 1976 (Act 172) and Enactment No. 6, 1988, the conservation and preservation of the cultural heritage (Yuszaidy *et. al.*, 2011), Act 645, National Heritage Act 2005, the Heritage Building Conservation Guidelines from the Department of National Heritage in July 2012. However, there is still lacking, especially in the tourism infrastructure planning where there should be an accurate and clear standards and guidelines so that the tourist infrastructure can be improved.

VIII. Infrastructure Management Suggestions: Planning and Implementation

8.1 Infrastructure Management

Although the tourism infrastructure is managed by the local authority, there should be a well-defined or efficient body or management which only manage the tourism infrastructure, as a guarantee for the tourism infrastructure in the heritage sites is in the best condition and well maintained and monitored by the parties involved.

8.2 Clear and Well-defined Guidelines, Standards and Acts

Clear guidelines and act in the management of tourism infrastructure is crucial in ensuring that the service provided is accurate and in accordance with the standards or the required level. Efforts such as to download the guidelines, standards and act by using the latest technologies such as the websites, mass media and the billboards can help, as well as providing an understanding to the local residents and tourists.

8.3 Provision of Incentives or Funds

Incentives or maintenance funds provided by the government should be used prudently and are able to solve the problem of financial constraints faced in maintaining the physical infrastructure.

8.4 Co-operation between the Stakeholders

Cooperation between the local authorities, local communities and other agencies to ensure the sustainability of the infrastructure management in the area of World Heritage Site is in the best solution. According to Mohamed *et al.* (2002) in reducing traffic problems, particularly in the core zone, especially during the holiday season, the design of the route from two way traffic to one way traffic is the best solution. Providing buses for the tourist to avoid the use of personal vehicles by introducing 'Park and Ride' is the best way to control traffic congestion.

IX. Conclusion

The acknowledgement given to the city of Melaka by the UNESCO has granted a new phase in the

management of tourism infrastructure. The increasing number of tourists coming to Melaka every year has resulted in a growing demand for the infrastructure among the residents and visitors. There should be a more relevant approach to the management of tourism infrastructure in the city of Melaka so that it is on the level or class of its own. The city council will need to take more drastic measures and plan effective infrastructure, so that the infrastructure is built with good quality and would benefit not only to the tourists but also the locals. The usage of this infrastructure is for the public and it becomes a necessity, especially for the tourists and locals. Therefore, planning implementation, management and maintenance factors should be considered in providing effective and efficient infrastructure for a heritage city like Melaka.

References

1) C., Rangarajan (2001). Definition of Infrastructure. Retrieved from: http://infrastructure.gov.in/pdf/doi.pdf
2) Crouch, G. I., & Ritchie, J. R. B. (1999). Tourism Competitiveness and Societal Prosperity. *Journal Of Business Research* .44(3): 137-152.
3) Feilden, B. & Jokilehtho, J. (1998). *Managing guidelines for World Cultural Heritage Sites*. Rome:ICCROM.
4) Garrod, B. & Fyall, A. (2000). Managing Heritage Tourism. *Annals of Tourism Research*, Vol 27, No. 3, pp. 682-708, 2000.
5) Gearing, C. E. (1974). Establishing A Measure of Touristic Attractiveness, *Journal of Travel Research* 12: 1-8.
6) Gray, B. (1989). *Collaboration: Finding common ground for multi-party problems*. San Francisco: Josey-Bass Publishers.
7) Gunn, C. A. Eds. (1988). *Tourism Planning (Second Edition)*. New York: Taylor & Francis.
8) Inskeep, E. (1991). *Tourism Planning: an integrated and Sustainable Development approach*. New York, Van Nostrand Reinhold
9) Iordache, C. (2013). Coordinates of The Development of Tourism In The Urban Area. Retrieved from: http://www.strategiimanageriale.ro/images/images_site/articole/article_d85c8299b32e25bd965f39940caa41be.pdf
10) Jabatan Ketua Menteri Melaka (2012). Data Asas Melaka 2011. Retrieved from: http://www.melaka.gov.my/static/index.php/bm/penerbitan/data-asas-negeri-melaka-2011/book/31.html?page=1
11) Jamil, J., Azizan, M. & Nor, F. A. H. (2012). *Efficiency of Physical Infrastructure of Melaka for Fulfilment as UNESCO World Heritage Site: A Preliminary Evaluation*, Tourism & Hospitality International ConferenceNovember 23-24, 2012, Kuala Lumpur.
12) Jamil, J., Azizan, M. & Nor, F. A. H. (2013). *Challenges in Discovering the Hidden Heritage Attractions in Melaka World Heritage Site*. Architecture Politics Art Conference 2013. Istanbul: Eastern Mediterranean Academic Research Center (DAKAM).
13) Kah, K. C. (2003). '*Think Tourism'* Courses to Frontliners Sabah, Kudat, Sabah, 18 Ogos 2003.
14) Lai, A. (2011). Malacca monorail stalls after rain, 18 KH tourist stranded. Retrieved from: http://www.thestar.com.my/story.aspx/?file=%2f2011%2f11%2f28%2fnation%2f9987956&sec=nation
15) Landorf, C. (2009) Managing for sustainable tourism: a review of six cultural World Heritage Sites, *Journal of Sustainable Tourism*, 27:1,53-70, DOI: 10.1080/0966958080215919
16) Majlis Bandaraya Melaka Bersejarah (MBMB) (2007). Draf Rancangan Kawasan Khas Bandar Melaka.
17) Majlis Bandaraya Melaka Bersejarah (MBMB) (2001). Pelan Tindakan Kawasan Pemuliharaan.
18) Mohamed, B., Ahmad, A. G., & Badarulzaman, N. (2002). Challenges of Historic Cities in the New Millennium: Lessons from Malaysia. Retrieved from: publications.ksu.edu.sa/Conferences/Future%20Cities%202002/Article004.doc
19) Milne, S. & Ateljevic, I. (2001). Tourism, economic development and the global –local nexus. Tourism Geographies, 3(4), 369-393.
20) Murphy, P. E. (1997). *Quality Management in Urban Tourism*. Chichester : John Wiley
21) New Straits Times (NST) (2013). 3 Australian tourists stranded in Malaka Monorail. Retrieved from: http://www.nst.com.my/latest/3-australian-tourists-stranded-in-melaka-monorail-1.446388
22) OECD. (2007). "Infrastructure to 2030: Mapping Policy for Electricity, Water and Transport. 2. "Organization for Economic Co-operation and Development, Paris.
23) Ortega, M. L. G. (2002). Managing Heritage Tourism: Challenges for the Management of Urban Heritage Cities and Attractions (Case Study of Madrid), United Kingdom: Bournemouth Univer-sity.
24) Russo, A. P. & Borg, J. V. D. (2002). Planning considerations for cultural tourism: a case study of four European Cities. Tourism Management 23 (2002) 631-637.
25) Seetanah, B., Juwaheer, T. D., Lamport, M. J., Rojid, S., Sannassee, R. V. & Subadar, A. U. (2011). Does Infrastructure Matter In Tourism Development?. *University Of Mauritius Research Journal* – Volume 17 – 2011. University of Mauritius, Réduit, Mauritius.
26) Smith, S. L. J. (1994). The Tourism Product. *Annals of Tourism Research*. 21(3): 582-595
27) World Development Report (1994). *Infrastructure for Development. World Development Indicators*. The World Bank, Washington D.C.
28) Yuszaidy, M. Y., Hanapi, D. & Ab, S. K. (2011). Akta Warisan Kebangsaaan, 2005: Tinjauan Sepintas Lalu. *Jurnal Melayu* (8) 2011:173-188

Law for the Protection of Cultural Properties: A Process of Translating the Regulation into Institution Support and Implementation Instrument

Arif Sarwo Wibowo[1,2]

[1]Assistant Professor, School of Architecture, Planning and Policy Development, Institut Teknologi Bandung, INDONESIA
[2]JSPS Post-Doctoral Fellow. Sasano Seminar, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, JAPAN

Abstract

It is almost four years since the current law for the protection of cultural properties, knows as UURI No.11 tahun 2010 tentang Cagar Budaya, replaced the one of 1992. It is clearly written that the law has a several improvement in term of regulation, but in the application term, it is hard to find any sign of the improvement. It is a rule of thumb that any regulation should be followed by action to make it work. The action itself would take in affect if only every single resolution pointed in the law and regulation are being applied, implemented and controlled by a specified competent institution. This article will provide a general overview on how a law should be understood and translated, not only into more applied regulation, but the most important is on how the regulation itself is being supported by a dedicated institution. By understanding the history of Japan law for the protection of cultural properties, and how they evaluate themselves and furthermore evolve their institution to fulfill the requirement corresponding what is written in the law, hopefully this would become an input for the implementation of Indonesian law for the protection of cultural properties. The study will cover the analysis of institution responsibility and how and in what portion they cover and suit to the regulation. A comprehensive checklist on the previous and curent law should become an effective way to examine the availability of institution for a better application in the object, especialy in the context of architectural cultural heritage. This study is not proposed to criticize the current law, neither to make comparison between the two, but is to find a better way for protecting Indonesian cultural properties based on what is currently available in Indonesia and based on the Japan experience.

Keywords: *Cagar Budaya, Cultural Properties,Undang-undang, Law, Regulation*

I. Introduction

In November 2010 the Indonesian government made a huge step in the context of protection of cultural properties. The Undang-Undang RI No.11 Tahun 2010 tentang Cagar Budaya was released to substitute the Undang-Undang RI Nomor 5 Tahun 1992 tentang Benda Cagar Budaya. The former law had several weakness for the application and didn`t have enough room for the local government and the individual owner of the object of heritage to manage their cultural properties. This issue was later regenerate in the current one, and suddenly the number of articles in the law significantly increased from 32 articles into 120 articles.

Similar experience was also happen in Japan during establishing and developing their law of protection of cultural properties. Japan had started to develop that very similar law centuries back to protect their heritages. They started develop an institutional cultural properties system during the Nara period, in the early 8th century, and since then the government got the responsibility to built and repair important buildings, included temples.[1] While carpenters are affiliated to government agencies for repairing, restoring and reconstructing of heritage buildings.

But after the Meiji restoration in 1868, the conservation works was not favorable and the government was more attracted on industrialization. Many architectural cultural properties were left unmaintained. But soon they realized their mistake, and immediately issued a special decree for the protection of antiquities in 1871. The decree was followed by a big action in 1880 by giving maintenance grant to Buddhist temples and Shinto shrines. An inventory of cultural properties was also being performed in the period of 1853-1908. As the result, in 1897 the government issued the Law for the Preservation of Ancient Temples and Shrines, which was the first law that insures the maintenance of the cultural properties. This law was replaced in 1919 by the Law for the Preservation of National Treasures, with an important addition points to insure cultural properties own by government and individuals. After the tragedy of the Horyu-ji temple fire in 1949, once again the government issued a replacement to the previous law

Arif Sarwo Wibowo
School of Architecture, Planning and Policy Development,
Institut Teknologi Bandung,
Architecture Programme, Labtek IXB Building
Jalan Ganesa 10, Bandung 40132 INDONESIA
Tel: +62-22-2504962 Fax: +62-22-2530705
E-mail: wibowo@ar.itb.ac.id

in 1950.

Knowing the long history of the Law for the Protection of Cultural Properties in Japan will gave a general overview on how the law was enhanced and applied. This could become a good lesson learn and example at the same time to the similar law and its application in Indonesia.

II. Research Design and Methods

This article is based on literature study on the law for protection of cultural properties in Indonesia known as Undang-Undang No.11 Tahun 2010 tentang Cagar Budaya. The study focuses on the content of the law in providing suitable regulation and room for the application and what is not included in it. The discussion will be preceded with an exposure of the current law, and its implementation in the real world, with several data and evidence from the field survey. A review of the previous law by general assessment in the field in 2009 in the context of its application will also available in the article to obtain a concrete description from the field during the end of the previous law period.

The field surveys conducted in 2009, in the period of the previous law, the Undang-Undang No. 5 Tahun 1992 tentang Benda Cagar Budaya, was intended to clarify the result or the effectiveness of the former law. The survey focused on old mosques that registered as cultural properties in West Sumatera. To complete the embodiment comparison between the two laws, other field survey was also conducted to some cultural properties in Java in 2013, just three years after the latest law issued. The field survey in different period was intended to clarify the changes in the application between those two laws, even though the limitation of these comparisons was not being exactly done on the same objects. And as complimentary to those cases, a field survey to several cultural properties in Japan was conducted in 2013. The aim of the Japan field survey is to understand the embodiment of a cultural heritage law in a proper way, knowing Japan as one of the most advance country in this matter.

The article was developed by analyzing chapters and articles written in the law and highlighting important issues and comparing the content of each law and seeing its strength and weakness for the application. To make it easier for understanding, a case study of Japan will also brought in to provide illustration of some success application of the law. The Law for the Protection of Cultural Properties of Japan will be used as benchmark in this study, as it is proven to be very effective in the field until now. The historical record of the law will be also considered to analyze the improvement in the regulation aspect.

Some limitation on the study might be found, such as the comparison between the two cases, in Indonesia and Japan was not exactly equal in the context of ownership. Case in Japan used in this study was a private building, while cases in Indonesia were public building. Even though both are not on the same status, the status of private building in the case of Japan surely was more complicated and hard to get the support from government for the preservation. Public buildings, in theory, are directly under the government protection. And for the preservation purpose does not need to going through a long procedure.

III. Discussion

The discussion will be started with some evaluation of the past law. The most noticeably point in the UU No.5/1992 is the lack of the lure for the people who own what is so called object of cultural property. The law did not provide any benefit for those who own, keep and maintain a cultural property, neither stated in any regulation under that law. But in the contrary, in the article 13, the law had mention about the obligation to those individuals to protect and maintain any kind of object of cultural property under their ownership, by concerning the historical value and its originality. This statement was hard enough to be implemented by any personal who own it. The situation can even became worse for those who did not applied that obligation by getting a warning from the government, and at the worse case, the government will take over the protection and the maintenance, as mention in article 14, while the it procedure was available in the government regulation.

Those articles mentioned above surely put the owner of cultural property in a hard position, especially the owner of heritage buildings. To protect and maintain a building needs a large budget and efforts, and most of them are incapable to do that. Take an example of old mosques in West Sumatera, surveyed in October 2009. 30 mosques were being surveyed, and 9 of them are wooden architecture. Some of them were constructed in the 17th century [2] while the newest were constructed in the early 20th century [3]. Most of the mosques were suffering of aging and deteriorating, especially those wooden structured building. And many other were demolished as caused of the strong earthquake occurred in September 2009 in West Sumatera.

This condition had shown us the real condition of our cultural heritage. Not only unmaintained, but also those building were not anticipated to face disaster such as earthquake and perhaps also fire. This condition had threatened us with the destruction, caused by aging as well as natural disaster, of all object of cultural properties, especially in the context of architecture. Referring to the UU No. 5/1992, there is no statement in the law on the possibility to modify an object of cultural property to meet the current needs and to add some modern application on it.

In Japan, just after the big fire tragedy of Horyu-ji temple in January 1949 that toke a severe damage to the building, a reformation of the Law of the Protection of Cultural Properties was made. And as the result a new law was issued in 1950 allowing

addition of modern equipment, such as fire extinguisher and hydrant to the heritage buildings. The reconstruction work of the temple finished in 1954 with the addition of some modern protection equipment; make it the first architectural cultural property implementing the new protection system. Once again the history records a very important moment in the field of cultural properties. After the Great Hanshin earthquake known as the Kobe earthquake in 1995, the Japan institution for cultural heritage determined to allow and even recommend to any heritage buildings to infiltrate modern structure reinforcement to the building to make it stronger against the earthquake and to prolong the lifetime of the building, as long the additional structure won't affect the beauty of the original architectural design. As an example one case of the Ono family resident in Shiojiri city, a small city in Japan.[4] Even in a small local cultural property, the Japan government provide a full protection on it.

These are some example from Japan on how a law was reformed as the result of the real situation in the field and due to the high concern on protecting the cultural properties. Now, have a look at the current UU No.11/2010. This law was issued a year after the great earthquake in West Sumatera, that had destroyed many cultural properties in the area. Generally the current law seems to be more applicable and comprehensive, by providing more articles and clearer definition. The government had anticipated the probability of several actions that cause the loss of an object of cultural properties, especially from the natural disaster.

The participation of experts in several action mentioned in many articles of the current law gave the flexibility of adjustment in several cases of cultural heritage, especially in the context of architecture. As mention in Chapter VII, article 53, paragraph 2 and 3, that any action of preservation on cultural properties should be discussed and coordinated with a preservation expert, and should also considering the possibility to restore it back into its original state. It is even possible to move the object to another place to keep it save, as mention in the article 59. And in the article 65, it is mention that to make it save, it is possible to put additional protection instrument on an object of cultural property.

The article 77 clearly mentioned that the restoration project of a cultural property is integrated with reinforcement activity. By considering these articles in the current law of cultural property, it is clear that this time the government had made a huge step on the effort of preserving cultural properties. Judging from it, the current law seems had answered well in response several experiences and needs, at the regulation stage.

Even though seems to be a good law, it is almost 4 years the current law put in effect, but still changes are not being applied in the real situation. Judging from the field survey to several architectural cultural properties, there is no support can be seen from the central or local government in the field of architectural cultural properties. Several colonial churches in Jakarta, Bandung, Cirebon, and some old mosques in Central Java are protected and maintained by the administrator themselves without any help from the government.[5] Most of them have done the best they can do with their own capability, knowledge and way. Including changes and addition to the building that even though in the context of preservation is undermine the original building. This happen because government did not pay any attention and assistance to the building even had already registered and recognized as cultural properties. Although it is clearly mention in the current law, article 54, that every person has the right to get expert assistance from the central or local government to preserve their object of cultural heritage.

Other unlikely to be implemented from the UU No.5/1992 was what is written in the article 30, that all object of cultural heritage owned by personal should be registered to the government in two years after the law was issued. This obligation was also sounds absurd; hoping everyone by their own consciousness will register their property as cultural heritage without any reward in back. Take the case of Ohno resident preservation project in Japan as example. The government provide both technical support to those who own a registered cultural heritage, and also financial support for the restoration project up to 90% of the total cost.[6] The support from the government of Shiojiri city shown us a serious intention on preservation activity, and surely evoke the consciousness and spirit of people to participate in this action. Meanwhile the current UU No.11/2010 did not mention any financial support to facilitate a preservation project, and make the preservation activity hard to be implemented. This point should be elaborate further in the government regulation level.

It is understandable that in the time of the law was issued, the spirit of the UU No.5/1992 was to protect national cultural properties by claiming all the object as government property or under the government protection as mentioned in article 4, paragraph 1. Most probably the reasoning behind the production of the article at that moment was that the government believe they was the only institution that has the capability to protect, maintain and keep in save all object of cultural properties, at least they considered so. This condition was later fixed and softened in the UU No.11/2010. In the later law, government did not act as dominator but as ruler. Duties and authority of the government are well described in the chapter VII, make it clearer and more understandable for most people. So the owner of an object of cultural properties may ask support from the government based on what is written on the law.

Figure 1. Masjid Saka Tunggal, Wangon, Banyumas constructed in 1870's
Source: field survey, 2013

Figure 2. Gereja Kristen Pasundan, Cirebon, constructed in 1778
Source: field survey, 2014

Until this point, paper based, the UU No.11/2010 is comprehensive enough to be the main base of preservation activity on cultural properies. But in the real project, we need more than just those components mention in the article 1, such as expert team, preservation expert and curator to do the activity. Besides those three components of experts, there are also three parties mentioned in the law as the representation of formal institution, which are the central government, the local government and the minister of culture. There is no mention of professionals in the articles. Even most probably professionals are categorized as expert in this context. But in the architectural preservation project case, we need what is called professional workers that have the competency to build a building using traditional technique. For instance, skillful carpenters who understand traditional bracketing system is needed to do a wooden structure work. And more than that, they should also master modern technique as well, in case of reinforcement work. Basically, experts in the traditional construction methods and technique are in the same importance to those components mentioned in the law. For this purpose, government should control and provide medium for these construction experts to maintain and develop their knowledge and skill, so in the future the preservation work can be applied properly.

In Japan, besides *Bunkachō* (Agency for Cultural Affairs / ACA), who is responsible for all preservation project under the government in Japan, there are several professional association recognized by the government as official partner for the preservation project, such as: *Zaidan-hôjin bunkazai kenzôbutsu hozon gijutsu kyôkai* (The Japanese Association for Conservation of Architectural Monuments / JACAM), an association of professional carpenters with expertise in traditional wooden construction system; *Zenkoku shjito yanekôji gijutsu hozon-kai* (The National Association for the Preservation of Roofing Techniques for Temples and Shrines); *Nikkô ni-sha ichi-ji hozon-kai* (The Association for the Conservation of Cultural Properties Owned by Two Shrines and One Temple in Nikko), an association of professional workers for painting and wood protection. Learning from Japan, it is also possible for Indonesia to have similar institution for the sake of effectiveness and professionalism in the preservation work.

IV. Conclusion

The Undang-Undang RI No.11 Tahun 2010 tentang Cagar Budaya is suitable enough as a regulation to protect the cultural properties in Indonesia in the context of law. The law is on the right path for the better protection of cultural properties. Indeed, the law itself still needs further explanation and support for its application. The lack of some supportive institution, especially for the preservation work in architecture, such as professional association in traditional carpentry and other traditional construction technique, in the current law can be added in the government regulation level. Recognized association of professionals and specialized carpenters and workers is needed to assure the quality and the effectiveness of the preservation work. Certification in the preservation work is not only needed to be provided for individual experts, but also needed in the institutional level. The case of Japan preservation works in this study, although are not equal to cases in Indonesia in the term of ownership, still can be taken as example of the implementation.

The Law for the Protection of Cultural Properties of Japan probably is not perfect yet, but it is proven as one of the best in the world, especially on the implementation stage. The history shows the process of the law into its perfection in term of regulation, as well into its implementation. The process had taken almost one and half century and still in progress for evaluation and perfection. To produce a comprehensive law needs a trustworthy data as a basic information as the starting point. An inventory of all cultural properties in Japan was collected for over five decades. It was a very hard and long task, but armed with that complete and valuable database, the government soon issued the Law for the Preservation

of Ancient Temples and Shrine, that became turn over into modern law for cultural properties protection. The Japan experience proved the importance of a comprehensive and accurate database of cultural properties. Judging from that experience, an appropriate action can be taken, and it surely can be implemented in the future. A law for protection of cultural properties should be developed based on reliable database. Without a comprehensive database, it is impossible to manifest a proper regulation for the field implementation purpose. Formal institution should be prepared based on the real needs and to fulfill the law requirement.

Acknowledgement

The author would like to express his most profound gratitude to Professor Sasano Shiro and DR. Morita Masashi from Tokyo Institute of Technology, and DR. Bambang Setia Budi from Bandung Institute of Technlogy for their support on the field survey in Japan and West Sumatera. Gratitude should also address to the Japan Society for the Promotion of Science (JSPS) for the research support grant.

Endnotes

[1] Since Nara period to Meiji restoration, government agencies have the responsibility for the construction and repair of office buildings and important Buddhist temples. After the Meiji restoration government had more interest on politics and has preservation ideas left behind. (Larsen: 1994)

[2] Masjid Tua Pincuran Gadang (end of 17th Cen.), Surau Gadang Syaikh Burhanuddin (circa 17th Cen.), Masjid Tua Kayu Jao (unsurveyed, 1657).

[3] Surau Latiah (1902), Masjid Syaikh Karim Amrullah (early 20th Cen.), Surau Buya Hamka (circa mid 20th Cen.), Masjid Rao-rao (1913), Masjid Sa'adah (1917).

[4] The Ono family resident was constructed in 1831. Shiojiri city government helps the owner to restore the building into its original shape and performed some modern structural reinforcement to strengthen it. The additional structure is hidden and hardly being seen. The restoration project was started in 2005 and finished in 2013. The field survey was carried out in 2013.

[5] Survey on the colonial churches, registered as cultural heritage, in Bandung was conducted in 2013, in Jakarta and Cirebon in 2014. Survey on old mosque, registered as cultural heritage, was conducted in 2013 and 2014.

[6] Based on interview to the Shiojiri city preservation department officer in 2013.

References

1) JAPAN Government (1950, amended in 1975) *The Law for the Protection of Cultural Properties.*
2) INDONESIA Government (1992) *Undang-Undang Republik Indonesia Nomor 5 Tahun 1992 Tentang Benda Cagar Budaya*.
3) INDONESIA Government (2010) *Undang-Undang Republik Indonesia Nomor 11 Tahun 2010 Tentang Cagar Budaya*.
4) KAZUO, Nishi & Kazuo Hozumi (2012) *What is Japanese Architecture? A Survey of Traditional Japanese Architecture.* New York: Kodansha USA
5) LARSEN, Knut Einar (1994) *Architectural Preservation in Japan.* Trondheim: ICOMOS – Tapir Publisher
6) NOBLE, Allen G. (2009) *Traditional Buildings. A Global Survey of Structural Forms and Cultural Functions*. New York: I.B. Tauris & Co Ltd
7) SCHEFOLD, Reimar, Peter J.M. Nas, et.al. (eds) (2008) *Indonesian Houses, volume 2, Survey of Vernacular Architecture in Western Indonesia.* Leiden: KITLV Press
8) WIBOWO, Arif Sarwo (2013) *Sustainability in the Context of Traditional Architecture*. Proceeding: The 14th International Conference on Sustainable Environment and Architecture (SENVAR), pp. 51-56. Banda Aceh.
9) 塩尻市教育委員会、(2006) 重要文化財小野家住宅保存活用計画調査報告書

Historical and Heritage Context

Third Session Parallel Notes
Moderator: Adi Utomo Hatmoko

K1 Room 2nd Floor
16.30-17.30

Presenter	:	**Jamil Jusoh**
Title	:	**Challenges in the Management of Tourism Infrastructure in Melaka World Heritage Site: A Preliminary Evaluation**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

- Announced as World Heritage Site on 7th July 2008 by UNESCO.
- Malacca has developed over 500 years of trading and cultural exchanges between the east and the west.
- One of the uniqueness of Malacca is the city's display of the early stages according to the history of Malay Sultanate in the 15th century, and the Portuguese and Dutch in the 16th century.

Concept of sharing infrastructure provision
- Development projects about 20% is allocated for infrastructure spending and only 50% is allocated for residential and commercial construction.
- Infrastructure implemented by private agencies but managed by local authorities.

- Researcher found some constraint in conserving the heritage value: More than 50% of the buildings undergone renovations. (CAAP, 2001).
- There are no clear system for designating heritage buildings and sites, a system which provides clarity on the criteria applied.
- Lack of public participation and low level of understanding to participate in conservation.

Conclusion
- The status of World Heritage Site by UNESCO, Melacca granted new phase in the management of tourism infrastructure.
- The increasing number of tourists coming to Melacca, demand for the infrastructure.

Presenter	:	**Arif Sarwo Wibowo**
Title	:	**A Process of Ttranslating The Regulation Into Institution Support and Implementation Instrunent**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

- Indonesia has countless cultural heritages.
- According to UU RI no 5 thn 1992 about heritage palace. 602 National Heritage recorded in 2012.
- This article is based on literature study on the law for protection of cultural properties in Indonesia known as Undang-Undang No.11 Tahun 2010 tentang CagarBudaya.
- Researcher using method based on literature study on the law of protection in Indonesia.

- The Undang-Undang RI No.11 Tahun 2010 tentang Cagar Budaya is suitable enough as a regulation to protect the cultural properties in Indonesia in the context of law.
- The lack of some supportive institution, especially for the preservation work in architecture, such as professional association in traditional carpentry and other traditional construction technique, in the current law can be added in the government regulation level.
- Japan experience proved the importance of a comprehensive and accurate database of cultural properties. Judging from that experience, an appropriate action can be taken, and it surely can be implemented in the future.

DISCUSSION

Question : Do you know about Japan architecture? Why you choose Japan than the other countries?

Answer : Actually the database from the heritage of Japan was also supervice from American contry. Why I choose Japan because many similarities between 2 architecture, Indonesia and Japan mostly in traditional buildings. Its easier to take Japan as an example.

Question : Japanese learn from other, thereis still also need adapted to our. How do you look at this, i mean try to understand to adapted

Answer : Indonesia as a tropical contry has a problem with architecture. I'd like to say we can learn how japan organize the institution. Technically.maybe. in indonsia we can not say that aceh, java, has the same because every place has their own carachteristic. We should make a lot of , not only the concept but also how they develop the buildings.

City History and Image as Morphology Shaper in Malang City

Amandus Jong Tallo[1], Yulia Pratiwi[2]

[1]Magister Students, Urban and Regional Planning, Universitas Gadjah Mada
[2]Magister Students, Urban and Regional Planning, Universitas Gadjah Mada

Abstract

City will always grow and evolve as the social, cultural, economic and political lives underlying it develop. City development is strongly related to time function, it is reminiscent of the past in which historical aspect played an important part in shaping city morphology (Mumford, 1967). The developing city is the one with historical value and philosophical civilization becoming the basis of city shaping. City development in Indonesia tends to remove its 'identity' characteristic, so that the Indonesian cities loss their specific character (Budiarjo, 1982). It is because the historical aspect of city shaping is ignored so that the historical sustainability of an urban area is as if disconnected as a result of development control paying less attention to the area's morphological aspect. For that reasons, the objective of research was to identify the history and image of Malang City as the city's morphology shaper. The research method employed was a descriptive qualitative method by explaining in detail the history of Malang City as well as building heritage from kingdom age to post-colonial age becoming the image of Malang City. The result of research showed that Malang city is the one having developed since kingdom age to post-colonial age replete with physical shapes in the form of environment layout and buildings with historical values and could be raised as the specific character of Malang city area. Many heritage elements shaping the image of Malang city still survive now thereby affecting the morphology of Malang City. It could be used to prove that history highly affected the morphology of Malang City. The process of Malang City morphology creation derived from human physical shape or urban artifact in a relatively large scale accumulated into shape and time unity.

Keywords: *Malang City, History of City, Image of City, Morphology*

I. Background

Space is the image of population and activity. The permanent space with very dynamic activity and population (Doxiadis, 1968), leads to many problems. The problem of planning is how to put the activity and the population onto appropriate place corresponding to the allocation implied and included in the area space layout plan. In line with Doxiadis' thought, a famous architect, Jimmy Learner (1951), suggested that city is a solution, rather than a spatial problem. The process of spacing an area from a space considered as a traditional to be an urban space leads to a variety of dynamics that always penetrates into entire aspect of life.

Human being as subject and object in the space always uses mind to adapt to living environment. The ever-developing human mind construction results in the changing image of human residence. Caves and water source is the effective location for human residence, to stay and to establish a community. Human settlement structure keeps revolutionizing according to human's mindset and mind change embodied through human behavior, constituting one of important aspects in urban city study (Tallo: 2012). The image legacy of Indonesian cities is the cultural richness inherited from Hindu-Buddha civilization. The forms of artifact culture still becoming the witness if urban history particularly in East Java are the 14th century-temples using tile basic material (Tjahyono, 2002: 46).

The developing city is the one having historical values and philosophical civilization underlying city shaping. East Java is one of areas well-known for its variety of civilizations during Singosari, Majapahit, Kediri and other several Hindu kingdom ages. Malang is one of the second metropolitan cities after Surabaya leaving so many dynamics thereby making this city the appeal to Indonesian people. Historical evidence in rock site in Dinoyo, Malang is the part of Singosari Kingdom since 760 AD-1414 AD, with the kingdom

Amandus Jong Tallo
---Magister Students, Urban and Regional Planning,
Universitas Gadjah Mada Yogyakarta.
Email: mandustallo@gmail.com
Yulia Pratiwi
---Magister Students, Urban and Regional Planning,
Universitas Gadjah Mada Yogyakarta.
Email: yulia_twins89@yahoo.co.id

center located in River Brantas bend (Hadinoto, 1996; 12). In colonial era, when Dutch dominated Indonesia for 3.5 centuries, Malang city became a supplier of coffee and sugarcane for the colonialist (Hadinoto, 1996). Urban facility was intended to the colonial officials, the physical evidence of which still existed up to now in the form of Dutch heritage in Kayutangan and Ijen Street areas.

Malang had begun to grow and to develop since the Colonial Government came to Indonesia. Public facilities are planned well to require the colonial's family. Train transportation system had begun to develop on 1879. Several of social needs was increased especially the needs of space for doing activities. Historical overview of colonial settlementin Malang City can see in **Figure 1**.

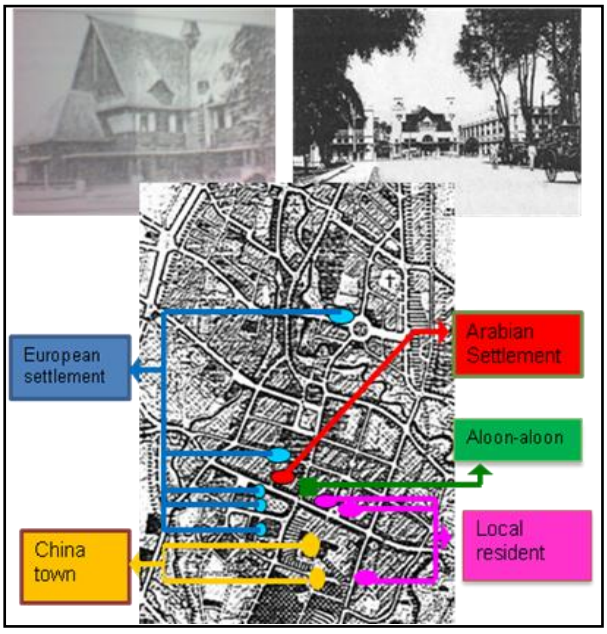


Figure 1. Historical Overview of Colonial Settlement in Malang

McGee (1991) in Hadinoto stated that development and urbanization process in Javanese cities after 1980, is characterized with internal restructuring. One of its characteristics is the shift of town center function from manufacturing to service and financial activities center. Slogan "*Tri Bina Citra*" underlying the development of Malang City, meaning the development of education, tourism and small-industry center cities, becomes the appeal to newcomers to stay either temporarily or permanently in that area. In the last ten years (2000-2010), there was an increase in the number of Malang City population by 7,029 people per year. Departing from the development of Malang city,

City development in Indonesia tends to remove its 'identity' characteristic, so that the Indonesian cities loss their specific character (Budiarjo, 1982). It is because the historical aspect of city shaping is ignored so that the historical sustainability of an urban area is as if disconnected as a result of development control paying less attention to the area's morphological aspect. For that reasons, the objective of research was to identify the history and image of Malang City as the city's morphology shaper.

this scientific work discussed the dynamic change and development of Malang city function from colonial age to the present. In the presence of dynamic change, development of Malang City function, so this research can analyzed about history and image of Malang City, the morphology of Malang city could be studied.

II. Literature Review

The dynamic change and development of city function discusses the temporal dimension of city and urban development method. Temporal dimension of city emphasizes on the shape of city that cannot be viewed from its three dimensions only, but temporal dimension can also be the element highly affecting the urban life, particularly in the present. Considering the history, it can be observed how the urban dynamic is affected by its community development and vise versa.

The urban development method emphasizes on the principle that since the city exists, its development also exists, either entirely or partially, toward both positive and negative directions. City is not something static because it is closely related to the life of its actor undertaken in time dimension.

Morphology consists of two syllables: morph meaning shape and logos meaning science. Urban morphology is an organic unity of city-shaping elements established through a long process. A city's morphology development is affected by the factors developing in it. Those factors generally have certain character affecting the city face in a very long period of time. The urban face complexity in time chronology is affected among other by history, structure style, regulation, road structure, construction technology, regional development, or cosmological foundation developing in an area.

Birkhamshaw, Alex J and Whitehand (2012) stated that the urban morphology aspects, the determination of urban characteristics from a variety of shapes is something fundamental particularly in relation to distinguishing and mapping the area with different policies. In the presence of such the theory, in an urban morphology research, a study on urban morphology is required with a variety of shapes or aspect. Conzen in Birkhamshaw, Alex J and Whitehand (2012), stated that urban morphology has three components: ground plan (road pattern, construction block), building shape (building type), and land/ building utility.

The factors affecting urban morphology were landscape or geographical, transportation, social, economic and regulation ones. Urban morphology, in addition to be viewed from the urban shape side and

the factors affecting it, can also be seen from the type of urban morphology. The type of urban morphology can be detailed by main land use (Philip James and Daniel Bound, 2009).

In the terms of city and architecture, morphology has two aspects: diachronic, related to idea changing in history, and synchronic, inter-part relationship in a period of time related to other aspect. Metamorphosis aspect is individual history of building and city, all of which should be conducted in morphological analysis. Uniformity and variability as the expression of created physical embodiment is the image meaning that identity will give meaning as a place's image shaper.

An analysis on a place's image is required as one of elements shaping urban morphology. The city image can be defined as a city's mental representation according to the average community perspective. City image analysis can be conducted by recognizing and identifying path, edge, district, node, and landmark (Lynch, 1969).

Path is the most important element in city image. Kevin Lynch, in his research, found that when this element identity is vague, most people are hesitant with overall city image. Path is the circulating routes the people commonly use to move generally, including road, main aisles, transit road, railway, channel and etc. Path has better identity when it has bigger objective (destination) (e.g. to station, monument, square, and etc), and there is a stringent appearance (e.g. façade, tree, and etc), or obvious bend.

Edge is the linear element not used/ viewed as path. Edge is on the border between two certain areas and serving as linear breaker, for example, beach, wall, border between railway, topography, and etc. Edge is more a reference. For example, coordinated axis element (linkage). Edge is a hindrance although sometime there is a place to enter. Edge is the end of a district and border of a district and another.

District is urban areas in two-dimension scale. A district area has similar typical characteristic (form, pattern, and shape) and typical border, in which someone feels that he/she should cease or initiate it. District in a city can be seen as either interior or exterior reference. District has better identity when its borders are established clearly in its appearance and can be seen homogeneously and clear in its function and position.

Node is a strategic area circle the directions or activities of which meet each other and can be changed into other direction or activity For example, traffic intersection, station, airport, bridge, city entirely in large macro scale, market, park, and etc. (note: not all road intersection is a node, what determines is its place image). Node is a place where people have feeling of "coming in" and "exiting out" of the sample place.

Landmark is an external element constituting the prominent visual shape of city, for example: mountain or hill, tall building, tower, high sign, worship place, tall tree, and etc. Five elements of city image can see in **Figure 2**.

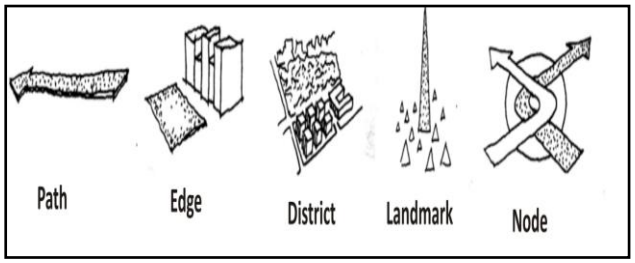


Figure 2. Elements of City Image
Source: Markus Zand, 2006

The elements of urban city have combination relationship. Those five elements are only fundamental element of an overall environment image. In reality, these five elements in the city can be seen separately, because of its existence against others. If it is the only way to represent the city image actually and really, the interaction of those five elements should be taken into account, as shown in **Figure 3**.

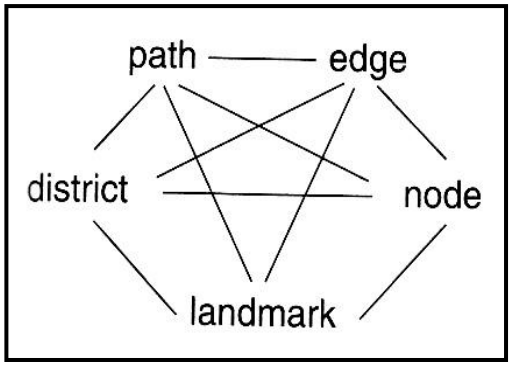


Figure 3. Combination of City Image Elements
Source: Markus Zand, 2006

III. Method

This study used a descriptive qualitative analysis intended to identify the history and image of Malang City. Elaborating the history of Malang City can identify the characteristic of space and physical shapes of environment creating the image of Malang City. In the presence of historical analysis and image of Malang city, the morphological pattern of Malang City could be found.

IV. Result and Discussion

4.1. History

a. Kingdom Age

Malang City, considering the inscription found in Dinoyo, is a center of political and cultural activities starting from Singosari Kingdom in 760 AD-1414 AD and has had sturdy cultural and government system. Singosari Kingdom is the prospect Majapahit Kingdom. Singasari Kingdom during Kertanegara King Reign (1268-1292), the last king of Singasari, was assumed successfully opening the north-south axis

well. This axis connected Malang areas to the sea in the north of Javanese island. One of concrete evidences is soldier dispatch from Singasari Kingdom to Malan in 1275 that was then called Pamalayu Expedition, through ocean route.[1]

Malang City as the kingdom center has been existing since 1400. It was located in River Brantas bend and a sturdy fortress had been built, Kutobedah. In 1661, Malang was subjugated by Demak Kingdom, and since then, it was under Islam rule. After Demak Kingdom's collapse, in 1686-1706, Malang was under Untung Surapati rule reigning in Pasuruan area. During Sunan Mataram's expansion to East Java, Malang was also subjugated. The people resisted Mataram soldiers and hindered (*malang-i* in Javanese) them, so that this area was then called Malang. Dutch dominated Malang in 1767 and then built fortress beside River Brantas, now becoming General Hospital [2]. (Malang Municipal after fifty years in Handinoto, 1996: 15).

b. Colonial Era

Colonial occupation time affected substantially the original development of Malang city. The development of colonial era can be divided into two: colonial time before Malang City was established as Stadsgemeente (during 1767-1914, Malang was the part of Pasuruan Residency) and colonial time after Malang was established as *Stadsgemeente* (post-1914). In 1767, Dutch came and established defense fortress (loge/loji) in Klojen area, now becoming Saiful Anwar General Hospital.

The location of Malang Kingdom center was in the bend of River Brantas, where a sturdy fortress was constructed, known Koeto Bedah. After 1530, Malang and the areas around River Brantas no longer made effective resistance, because of Demak Kingdom's expansion to East Java. At that time, the town center was established characterized with the presence of a fortress in the bank of River Brantas (this area was formerly known as Klojenlor), now Saiful Anwar Hospital and as shown in **Figure 4**.

In 1812, Malang City administratively is ruled by an assistant resident J.C. Hoffman, constituting the part of Pasuruan Resident. In 1824, The Dutch government established Malang Residence and at the same time constructed the government offices and settlement areas for the governmental servants in the areas of square, Pattimura terminal, and surrounding. In line with such the development, the need for rail transportation also increased, so that rail station and railway were constructed toward Surabaya in 1879.

Malang City has been existing since 1400, from Hindu-Budha kingdom age, Islam development in Java land, entrance of Chinese into Indonesia, to Dutch colonialism age. Cultural and architectural development, in either city or building from a variety of ethnics, had blended at those times, particularly in Dutch colonial age contributing positively to architectural development of Malang city, in both urban layout & area planning and construction designing becoming the characteristics of Malang City. Domination of colonial tunes provided typical color to architectural development in Malang City.

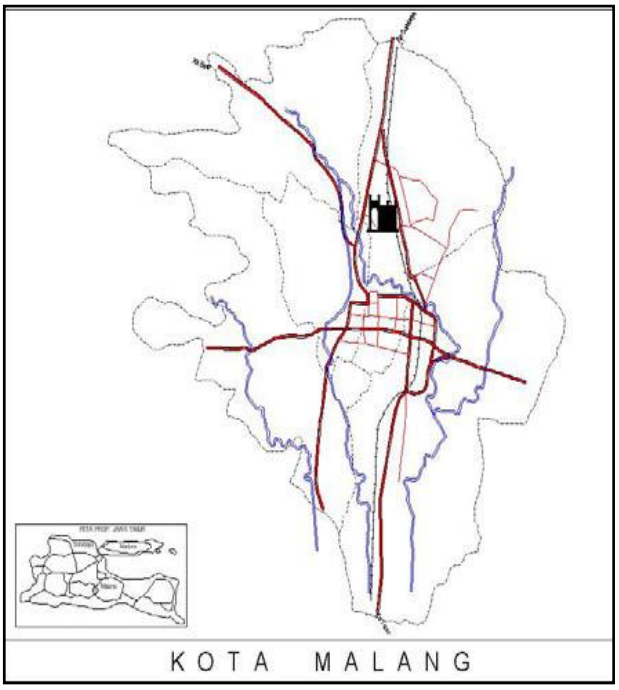


Figure 4. Dutch Bastion"*Loji/ Loge"*
Source: Hadinoto,1996

Malang was a part of Singosari Kingdom area, since the 13th century, Singosari Kingdom, was one of well-known kingdoms in Malang City. Several site heritages still exist: Badut temple, in Karangwidoro village, in the north of Malang City, Kidal temple in Rejokidal village, Tumpang, and Candirenggo Temple in Singosari Subdistrict, Malang Regency (about 10 kilometres from Malang City).

The fortress establishment became a natural defense against enemy's attack, particularly for the native people and facilitated the provision of colonial soldiers' logistics as well. The soldier headquarter was concentrated in the east of Rampal area, in the east of which there was a Military Hospital. To support the Dutch defense, a number of strategic bridges were constructed crossing River Brantas and constituting the intersection of road toward Surabaya and Ngantang, thereafter called *"Tjelaket"* and *"Oro-oro Dowo"*.

Since Governor General Daendles' reign (1808-1811), government system was divided into several regencies and residencies. Malang, Bagil and Pasuruan, were parts of Pasuruan residency[3]. In 1974, Karto Negoro was discharged from his position because he could not give something meaningful to the development of VOC, and replaced by Regent (Bupati) Bagil Suro Adi Widjoyo or the first Toemenggoeng (title of regent in colonial period)

from the member of Surabaya regent's family, Raden Karto Negoro. He settled in a square area, exactly on the right of River Brantas thereafter called Toemenggoeng area (Schaik, 1996).

Forced planting system (*sistem tanam paksa*) was assigned since Governor General J. Van Den Bosch's reign (1830). The land owners were responsible directly for paying tax to the Queen of Netherland, Malang area was obliged to plant coffee, and the forced planting system was enacted in 1824. Coffee plantation became one of main land use in Malang area, thereby attracted Maduranese to work there. Malang became one of temporary trading destinations for Chinese and Arab offspring. After the release of Sugar Law (*Suikerwet*) and Agrarian Law (*Agrarisch-wet*), the forced planting system was removed and the privates were authorized to play a part in trade. Plantation area in Malang was expanded with the shift of land allocation function from forest into coffee plantation. The marketing of coffee from Malang to Surabaya was getting smoother, supported by the construction of railway for Malang-Surabaya destination in 1879, warehouse existing in Pasuruan area. The difference of coffee plantation between Malang and other areas in Javanese Island lied in plantation field ownership, in which the coffee garden in Malang was planted on people-owned land, while in other areas it was planted on VOC-owned garden. The development of Malang city as plantation plant cultivation area was getting more famous until the 6th East Indies Plantation Congress. In 19th century, coffee leaf pest attacked. This pest led to declining coffee price until 1870 and sugarcane replaced the position of sugar (Kartodiro, 1991).

c. Post-Colonial Age

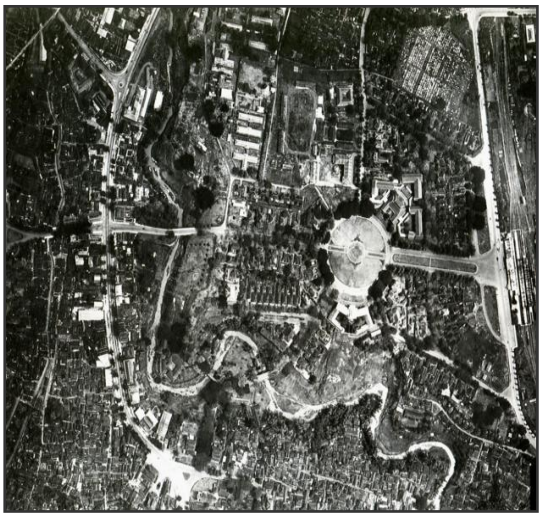


Figure 5. "Alun-Alun Bunder" in Malang City
Source: Documentation of Inggil-Malang

During Japan occupation in Indonesia, the face of Malang City did not change significantly. As the appreciation to the heroes, Taman Bahagia (Taman Makam Pahlawan Surapati) was constructed. In addition, Tugu Kemerdekaan was constructed as well, located in the center of Bunder Square (*Alun-Alun Bunder*) to symbolize the Republic of Indonesia's independence. The figure of Alun-alun Bunder in Malang City can see in **Figure 5**.

Political process occurring post-independence also affected the shape of Malang City's face, particularly for several historical buildings of colonial age heritage. During the First Dutch Military Aggression on July 21, 1947, such important buildings as Balai Kota Malang, telephone office located in Kayutangan street, De Javasche Bank office, headquarter of Mobile Police Officer Brigade in Semeroe Street, and etc were destroyed by the native people for preventing the colonial government from using it anymore. The Second Military Aggression occurring in 1948 was considered as the beginning of the destruction of Malang City designed by *Gemeente* Malang (City Government) with Garden City concept, because it was made the battle field to struggle for independence. Approximately more than a thousand buildings in Malang City were destroyed during the event, including several important building existing in Kayutangan, as shown in **Figure 6**.

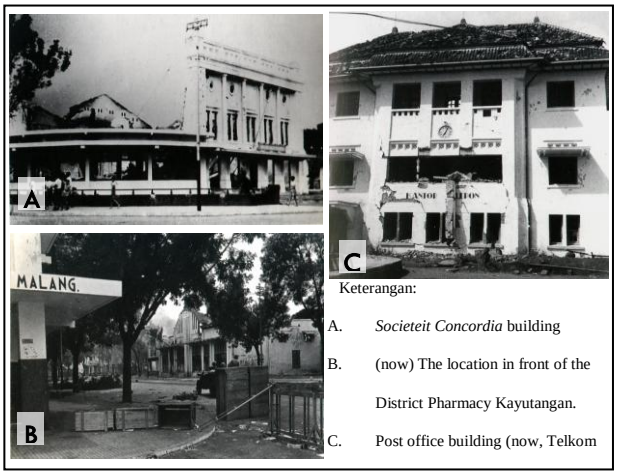


Figure 6. Several buildings in Kayutangan destroyed during the destruction event in 1947
Source: Documentation of Inggil-Malang

On March 2, 1950, there was a transfer of rule in Local Government between Federal Mayor (the one established by Dutch Government) and RI's mayor. Since the Japan occupation, the Malang City plan was added with two subdistricts: Kedungkandang and Blimbing. Since 1950, the transformation[4] was made gradually approved by Central Planology Agency dated on June 1, 1952 No. 2949/B/I/b as follows:

1) Park in Arjuno street into female Masjid (Mosque) building.
2) Sawahan Park in Ksatrian A.L.R.I into school.
3) Park in Sawahan/Sulawesi street into bus station.
4) Tjelaket/Klodjenlor Park into special building.

5) Housing land in Gajah Mada/Trunodjojo street into business site
6) Police Dormitory land in Menari Street in front of BPM into housing
7) Land in Sanan Village, behind the prison for hospital into housing.
8) Former horse racing field into police dormitory and general hospital
9) Land in Penanggungan Village in the west of Taman Bahagia previously intended to housing environment, into Senior Veterinary School.
10) As the continuation and the growth of city, the land between Glintung street in the east and the railway in the north up to Tumpang Street into "*gemengde buurt*".
11) *Betek* formerly used as housing was started to develop into shopping complex.

The planning of Malang City as industrial, education, and tourism city (*Tri Bina Citra*) was established in 1962. In line with this announcement, Malang City kept developing its self. A variety of infrastructure was constructed and the city layout was made continuously.

Generally, the development of city and architecture in Malang City during 1945-1970s did not show significant change, because the urban space structure had been created in the previous age. The main change occurred in the development of activity domination. The big market and Chinatown activities expanded and were getting closer to the Square, so did the settlement development. Economic development era was followed by the massive physical development particularly occurring in 1980-1997. The town center area has been dominated by dominant activity in trade sector strengthening its position as town center (urban activity center). The image of Malang City's government area lies in "*Alun-alun Bunder"*, while the development of settlement activity has also spread and penetrated into suburban area.

Such condition also occurred in other cities in Java during post-independence period. In this period, there was no a guideline to determine the town center pattern in the cities in Java. Most cities in Java until 1970s did not have significant expansion, despite increasing number of buildings established. Most Regency town centers located around the square in Java kept maintaining their existence. Only Resident's or Assistant Resident's Office was removed because it has colonial characteristic and is inconsistent with new government system.

After 1980s, there was an expansion in Indonesian towns generally and Javanese towns particularly. It was because of improved economic climate leading to many foreign investors investing in small-to-medium scale enterprises in suburban area such as Jakarta, Surabaya, Semarang, and Malang. The Development of land expansion in Malang City can see in **Figure 7**.

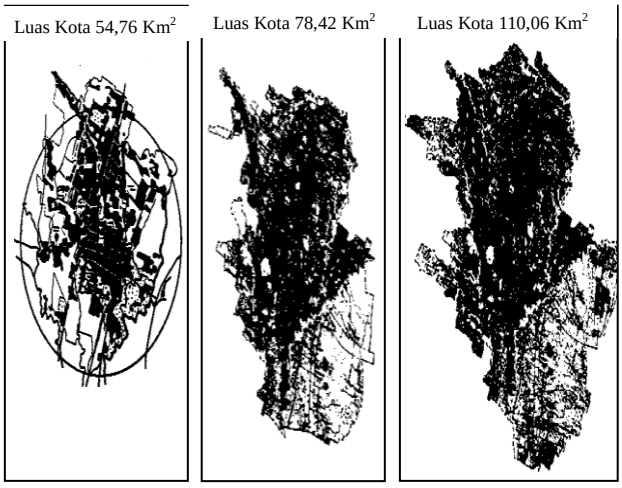


Figure 7. land expansion in Malang City
Source: Handinoto, 1996; BPN Malang

McGee (1991) in Hadinoto stated that development and urbanization process in Javanese cities after 1980an is characterized with internal restructuring. One of its characteristics is the shift of town center function from manufacturing to service and financial activities center. Manufacturing activity shifted to suburban areas. Physically, the restructuring was characterized with the massive transformation of land use, due to the emergence of industrial location in suburban areas that was then followed by the emergence of new housing areas. Big cities in Java such as Jakarta and Surabaya had grown into mega-urban ones, the development of urban area propagating to rural area and concentrated in the downtown. The small towns adjacent to big city played a role in the big city area expansion. The downtown could no longer accommodate the new development occurring. It is the representation of Javanese cities development relating to the downtown and suburban area post-1990s. In the end of 20th century, the role of motor vehicle and the notion of outer ring road and inner ring road became a very important means to get the downtown closer to suburban area.

d. Malang in The Present (2010-2014)

This increasingly developing city becomes an appeal to newcomers to stay either temporarily or permanently there. In the last ten years (2000-2010), there was an increase in the number of Malang City population by 7,029 people per year. The following is the increase of population number in Malang City.

The increasingly dense population generates either positive or negative effect. The problems occurring in Malang, considering the result of analysis conducted by the author, are as follows:

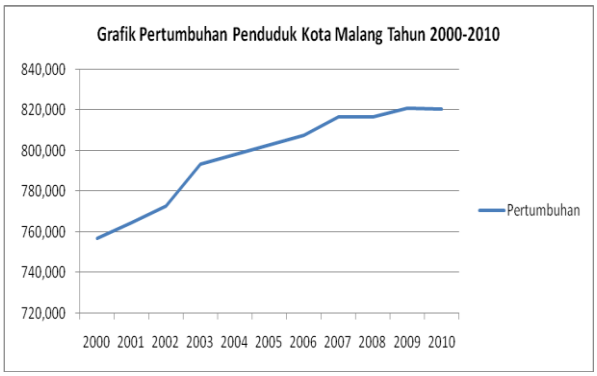


Figure 8. Population Growth in Malang City
Source: BPS of Malang City

1) Land function deviation or shift occurs widely and quickly particularly in highways inconsistent with the specified (ecological, hydrologic and environmental) functions.
2) Illegal space/land seizing in the bank of rivers and railway, and non-built eastern area of Malang City.
3) The unemployment rate in Malang City has been substantial, 25.73% out of productive age population number in 2007.
4) The problems of trading vehicle include unevenly distribution throughout Malang City
5) Traffic jams occurring in some roads in Malang City particularly in the rush hours due to increaseing road capacity.
6) Disorganized parking condition. It is because so many vehicles park on street leading to reduced road body.
7) Poor traffic sign management leading the vehicles from different directions to move concurrently. As a result, there is a delay in the intersection point because individual vehicles have conflict of interest.
8) Telecommunication vehicle location coverage particularly unevenly distribution of internet stall, and the growth of many cellular phone towers regardless the land use function and surrounding environment.
9) Excessively electricity use leading to reduce electricity power.
10) Problems related to rubbish system in Malang City including. There are four final disposal places (*Tempat Pembuangan Sampah Akhir/ TPA*) in Malang City but only one functions, TPA Supiturang, whose most cells are in inactive/full condition and limited condition of land. Rubbish disposal place (*Tempat Pembuangan Sampah Sementara/ TPS*) not reaching all areas of Malang City, inadequate rubbish transportation vehicles, and the community's less awareness of dealing with rubbish.

There are still so many problems that cannot be elaborated one by one. To deal with them, the government of Malang City has developed a regulation about spatial problem with the ratification of "*RTRW (Rencana Tata Ruang Wilayah*" of Malang City in 2010-2030, through the decree of Malang City Government's Local Regulation No.4 of 2011. This spatial layout regulation is divided into structure direction and spatial pattern. Spatial structure is the arrangement of settlement centers and infrastructure network system serving to support the social-economic activities of the community hierarchically having functional relation. In the term of spatial layout structure, the area of Malang City is divided into:

1) City Service Center as the center of any activities in local area exists in Klojen Subdistrict;
2) City Service Sub Center I exists in some area of Pandanwangi, Purwantoro, Bunulrejo, Jodipan, Oro-Oro Dowo, Lowokwaru, Mojolangu, Sukun, Bandungrejosari, Tunjungrejo, Karangbesuki, Pisangcandi, Sawojajar, Kotalam, and Mergosono;
3) City Service Sub Center II exists in Purwodadi, some area of Purwantoro, Pandanwangi, Sukoharjo, Kauman, Bareng, Kasin, Gadingkasri, Lowokwaru, Jatimulyo, Tulusrejo, Mojolangu, Dinoyo, Merjosari, Tlogomas, Sumbersari, Kebonsari, Bandungrejosari, Ciptomulyo, Pisangcandi, Kedungkandang, Lesanpuro, Madyopuro, Sawojajar Baru, Kotalama, Tlogowaru, and Gadang.

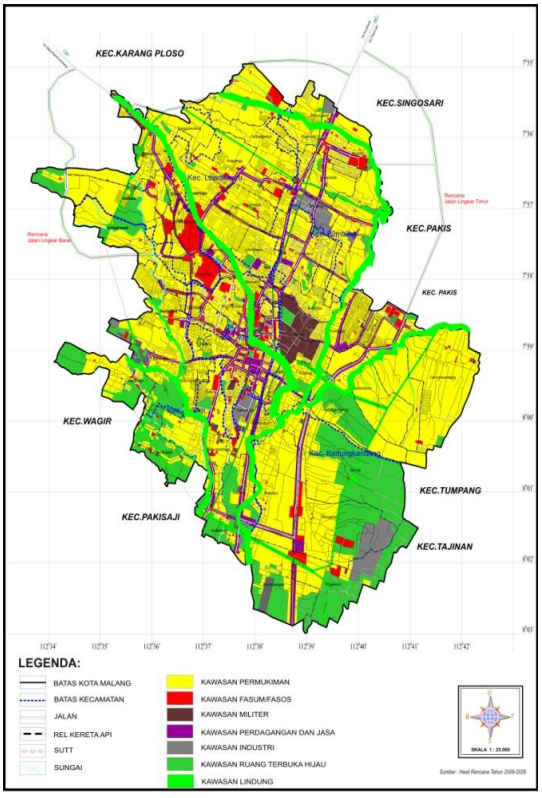


Figure 9. Map of Malang City's Spatial Pattern
Source: RTRW of Malang City

4) City Service Sub Center III exists in Blimbing, some area of Bunulrejo, Kesatrian, Bareng, Pe-

nanggungan, Rampal Celaket, Tunjungsekar, Gadang, Bandulan, Tulungrejo, Bumiayu, and Buring; and

5) City Service Sub Center IV exists in Balerajosari, Arjosari, Polowijan, Kiduldalem, Tasikmadu, Ketawanggede, Tunggulwulung, Bakalankrajan, Mulyorejo, Cemorokandang, Arjowinangun, and Wonokoyo.
6) The spatial pattern is the distribution of spatial allocation in an area encompassing the spatial allocation for protective function and for cultivation function. The protective area of an area is determined with the main function of protecting the living environment conservation including natural resource, artificial resource having historical value/national culture. Cultivation area is the one assigned with the main function of being cultivated on the basis of natural resource, human resource and artificial resource condition and potency. This area is utilized in planned and directed manner thereby providing benefit and value to life and human life. The following is the map of Malang City's Spatial Pattern:

4.2. The Image of Malang City

The discussion of city image consists of five elements: landmark, node, path, district, and edge. The image of Malang City cannot be apart from the history of city from Kingdom age to post-colonial time. During independence time, Malang area becoming the military area since colonial period was destroyed in the Dutch Military Aggression in 1947-1948. Garden City concept introduced by Ebenhezer Howard was very familiar with the image of several areas in Malang City: Ijen Street, "alun-alun bunder", and kayutangan areas. The road space with wakability concept becomes the primary priority for the road corridor. The well-maintained, broad boulevard with drainage facility inherited from the Dutch reign still exists today and this area's beauty is also supported by palm plant element increasingly symbolizing the city glory, making this area one of Malang City's images. Considering the history elaborated, an analysis on Malang City's image can be conducted as follows:

Figure 10. Ijen Street

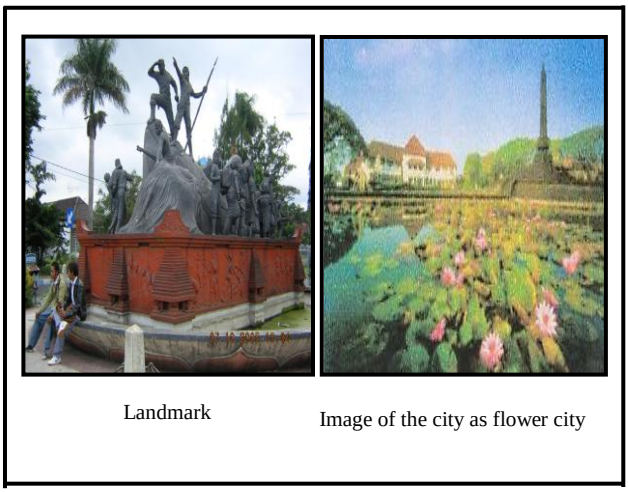


Figure 11. Malang City

Malang City's image in *Tugu* area is an element of the image of the city which tugu area as a district:

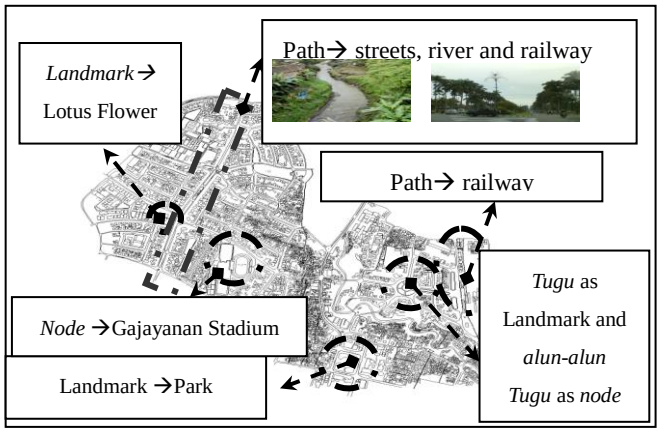


Figure 12. Five Elements of Malang City's Image

V. Conclusion and Recommendation

5.1. Conclusion

Malang city is the one having developed since kingdom age to post-colonial period replete with physical shape constituting environment and buildings arrangement having historical values. The buildings functions as the shaper of Malang City's specific character. The period of kingdom to Dutch colonial times becomes an important time because at that time, many heritage elements shaping the city image still survive until today thereby affecting the morphology of Malang city. City image still survive until today are tugu area as district; park, "tugu", lotus flower as landmark; railway as path,"alun-alun tugu", Gajayana Stadium as node. City image in Malang City can be used as the evidence that history highly affects the morphology of Malang City. For that reason, the conclusion of research is that the Morphology of Malang City was shaped by historical factor and image of Malang City.

5.2. Recommendation

The recommendation offered was to maintain and to strengthen the physical character and morphologic pattern of Malang city. By maintaining and strengthening the physical character and morphologic pattern, Malang City will not lose its identity.

End Note

[1] Nawa Tunggal, "*Kota Malang 89 Tahun Masih Menikmati Tata Ruang Kuno"*. Kompas Daily, March 31, 2003.

[2] Handinoto, Paulus H. Soehargo. 1996. *Perkembangan Kota dan Arsitektur Kolonial Belanda di Malang*. Yogyakarta: Andi, p. 15.

[3] Handinoto and Suhargo, H and Paulus. 1996 *Perkembangan Kota dan Arsitektur Kolonial Belanda di Malang*. Yogyakarta: Andi.

[4] Malang City after 40 years, "The Expansion of Malang City: Implementation"

References

1) Birkhamshaw, Alex J and Whitehand J.W.R, (2012), *Conzenian Urban Morphology And The Character Area Of Planners and Residents*, Urban Design International 17, 4–17. doi:10.1057/udi.2011.22
2) Doxiadis,C. (1968), *Ekistics, An Introduction To The Science of Human Settlements*. London:Hutchinson
3) Handinoto, Paulus H. Soehargo. 1996. Perkembangan Kota dan Arsitektur Kolonial Belanda di Malang. Yogyakarta: Andi., hal 15
4) Lynch, Kevin, (1969), The Image of The City. Cambridge, Massachusetts: MIT Press.
5) Philip James and Daniel Bound (2009), *Urban Morphology Types and Open Space Distribution in Urban Core Areas*, Urban Ecosyst 12:417:424 doi 10.1007/s11252-009-0083-1
6) Tallo, Amandus. 2012. Filosofi Ekologis dalam Konteks Permukiman Suku Atoni:Studi Kasus di Kampung Adat Tamkesi, Kabupaten TTU-NTT (dipresentasikan dalam Seminar Nasional Green Urban Housing Policy di Universitas Diponogoro Semarang, 4 September 2012)
7) Tjahjono, Gunawan.2002. Indoneisa Heritage seri Arsitektur.Jakarta:Ghalia Indonesia

The Outstanding Value of Cultural Landscape: Borobudur as a *World Heritage Cultural Landscape*

Dwita Hadi Rahmi*

Lecturer
Department of Architecture and Planning
Faculty of Engineering, Gadjah Mada University

Abstract

Cultural landscape is a complex expression of a lifestyle as a result of the synergy between cultural and natural heritages in a space and time unit, which creates a complex phenomenon with tangible and intangible identities. Cultural landscape reflects the way the people manage their environmental system to achieve the harmonious life with nature and maintain the cultural identity The outstanding values of a cultural landscape are the uniqueness of the area either in the history of the area, physical landscape, or culture of the community. To protect these values, UNESCO World Heritage develops criterias and conducts a selection for heritage cultural landscapes around the world which have an'outstanding universal value' to be world heritage cultural landscapes.

Borobudur area is a heritage cultural landscape with Borobudur Temple as the center of the area.The integration among historical potency, natural features, and village community culture has created a high quality and unique cultural landscape.The integration between the landscape and community culture results four cultural landscape heritage forms, wich are: a) land utilization pattern; 2) community life; c) architecture; and d) natural features. The integration of the four forms creates a scenic beauty which full of symbolic meanings, and the unity of them contains four outstanding values as the local values. They are: a) high quality of landscape structure; b) rich and continuity of local values; c) role of history and heritage resources; and d) content of education and science values.

The rich potencies of the landscape and culture of Borobudur, and also the strong unity of them, make this area as an outstanding heritage cultural landscape that meets the UNESCO criterias as the world heritage cultural landscape. Potencies of Borobudur area, and the continuity of the landscape and culture create a unique cultural landscape until today in the middle of on going changes of the area and the community culture.

Keywords: Cultural landscape, outstanding value, Borobudur

1. Introduction

The concept of cultural landscape is still relatively new to the field of architecture and urbanism. Studying cultural landscapes entails natural and man-made components of the environment and the ways in which they relate each other and have changed overtime. Cultural landscape reflects the way people cultivate the land and other sustainable natural resources. Many cultural landscapes reflect the existence and development of local community in managing their environment system, in order to achieve the life harmony with nature and sustainable cultural identity. Cultural landscapes are as an imprint of human history in interacting with nature. The form of cultural landscape has told us the achievements of our ancestors, and informed us values at present days and in the future. A cultural landscape is a window that shows our collective past time, our culture display (Taylor, 2003), so that understanding the form of the cultural landscape means understanding also the history and present time of the area.

UNESCO (United Nation for Education, Science, and Culture Organization), gives a World Heritage Cultural Landscape predicate to areas around

Dwita Hadi Rahmi, Dr., Ir., M.A.
Lecturer. Dept. of Architecture and Planning
Faculty of Engineering, Gadjah Mada University
Jl. Grafika 2, Sekip, Yogyakarta. Tel.: 62-274-580092,
Fax: 62-274-580854, e-mail: dwita_hr@yahoo.com

the world wich show the relationship between human and natural environment on the level of 'outstanding universal value'. Values include *universality*, *uniqueness* and *representativity* from a certain cultural landscape heritage phenomenon. That level can be met if the area has an *authneticity* and *integrity* values (UNESCO World Heritage, 2003, 2009). Authenticity is a truthful and that the area is a genuine and authentic representation of what it claims to be, whereas integrity is a wholeness, completeness, unimpaired or uncorrupted condition, continuation of traditional values and social fabrics.

Indonesia has a number of areas considered of high value in terms of heritage cultural landscape. These areas have strong historic values, archaeological sites, special geographical conditions, natural systems, landscape and are ongoing processes of socio-cultural changes. One of the areas considered as a heritage cultural landscape is Borobudur area in Magelang Regency, Central Java. In the middle of the area, a compound of three Buddhist temples, Borobudur, Mendut, and Pawon Temples was inscribed in the UNESCO List of World Heritage Sites in 1991 (UNESCO World Heritage, 2003), and those three temples are as the centre of the Borobudur cultural landscape. Borobudur area itself is a fertile area with beautiful scenery of villages and rice fields. In addition to the Borobudur, Mendut and Pawon Temples, this area is also rich in archaeological relics from the Hindu and Buddhist periods.

The rich potencials of Borobudur landscape and culture, and the strong relationship between them creates this area a unique cultural landscape that not every cultural landscapes has. Borobudur cultural landscape is certainly comparable with the world heritage cultural landscape in other places. Althoughofficially Borobudur has not been considered as a world heritage cultural landscape, its potencials and distinction can be said to be 'outstanding', comparable with other world heritage cultural landscape. This paper will become a part of a grand research on cultural landscapes in Indonesia. It tries to explore the understanding of cultural landscape and its outstanding universal value. Through this understanding, this paper tries toexplain the form and outstanding values of Borobudur cultural landscape, and discuss its possibility to be a world heritage cultural landscape.

2. Methods

This paper is based on aliterature study on cultural landscape and a part of theresearch findingof the dissertation on Borobudur cultural landscape. The main substance of this paper is divided into three sections, first, literature study on cultural landscape and outstanding universal value; second, Borobudur cultural landscape and its outstanding values; and third, discussion based on the first and second sections.For the first section, a narrative explanation method is used to explore the meaning of cultural landscape and world heritage cultural landscape from the view point of UNESCO. For the second section, which is Borobudur cultural landscape and its outstanding values is based on a research that was conducted for the dissertation. Method used to collect data was field observation, indepth interviews particularly to the local people of Borobudur villages, and secondary data in the form of maps, Borobudur history, pictures, and related literatures. Qualitative analysis including narrative and historical ones was used to find the form and outstanding values of Borobudur cultural landscape heritage.Finally, an explanation method is used in the discussion section, examining the possibility of Borobudur to be a world heritage cultural landscape.

3. Cultural Landscape

Cultural landscape (*saujana* in Indonesian language) is interpreted as a relationship between natural and cultural heritage in space and time unit, and a complex phenomenon with tangible and intangible identity (Plachter and Rossler, 1995; Piagam Pelestarian Pusaka Indonesia, 2003). The natural heritage are natural features, such as mountains, mountainous range, forests, rivers, lakes, and deserts. The cultural heritage is the result of human creativity, feeling, and work, such as traditions, beliefs and way of life. Thus, cultural landscape is a complex phenomenon with tangible and intangible identities. Furthermore, cultural landscapecan be interpreted as the product of human creativity in changing the landscape in a long time to achieve the life balance and harmony with nature. Cultural landscape is the mirror of culture created by the localcommunity (Plachter and Rossler, 1995). The integrationbetween landscape (nature) and culture is as figure below.

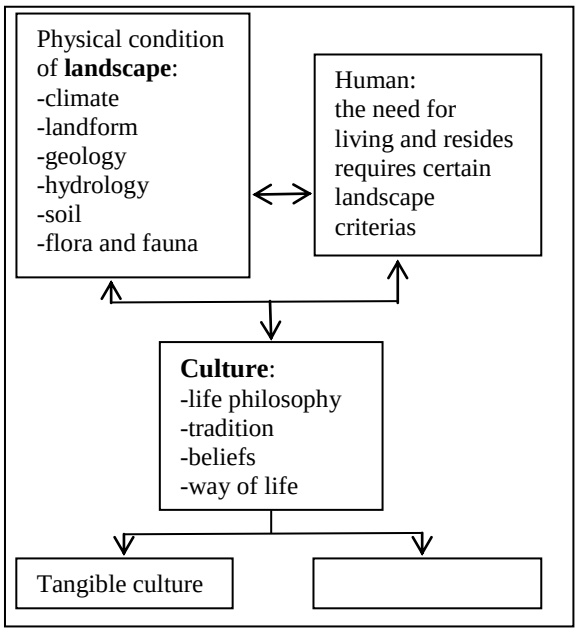


Figure 1 Integration between landscape and culture

In this sense, history plays an important role in the proccess of understanding the cultural landscape. The reality surrounding us now is the one that was built in the past, by individulas who had other training, other needs, other tastes, other types of technologies or ambitions. What we have today is part of the vision of those before us. Our present is what future meant for them, the need to build and construct for future generations. What may be old-fashioned today, or inefficient, in their present it was useful, pleasant and opportune(Lewis, 1979). Landscape is the witness of the changes occurred along the years, being the very scene of these changes (Meinig, 1979).

The term 'cultural landscape' has been introduced by Carl Ortwin Sauer since 1925 in his book "The Morphology of Landscape", where he wrote his critique about natural determinism. He tried to put culture as the center in geographical study as a science, and suggested a term "cultural landscape" as: "The cultural landscape is fashioned from the natural landscape by a cultural group. Culture is the agent, the natural area is the medium, the cultural landscape the result." (Sauer quoted in Wilson, 2003). In this concept, he argued that cultural landscape as a form of cultural diversity manifestation in a landscape. It is a form of human activities result which they do in a landscape, where geographic landscape condition is unique and will be different from other landscapes (Sauer, quoted in Wilson, 2003).

An area can be called a cultural landscape where there is human intervention in it, althoughthe percentage is too small. A cultural landscape is an object of conscience, a heterotopia, a mirror of the society. It is at the same time an expression of cultural values and a symbol (Backhaus, 2009), as well as the complex expression of a life style (Sarbu, 2011, in Calcatinge, 2012), as a result of the interaction of cultural factors with natural ones which determine together a specific structure with a strong symbolicsignificance. A cultural landscape is also a moral order (Ezra Park, 1926, in Calcatinge, 2012) or a landscape of power (Zukin, 1991, in Calcatinge, 2012). It is a cultural process (Hirsch, 1995). Lewis (1979) argued that all landscapes have cultural meaning. From the cultural point of view, Lewis (1979) claimed that there is no such thing as uninteresting landscape from the cultural, irrespective of how ordinary it may be.

> *"…all human landscape has cultural meaning, no matter how ordinary that landscape may be. (…) No matter how ordinary it may seem, there's no such thing as a culturally uninteresting landscape" (Lewis, 1979).*

The term 'cultural landscape', according to Lennon and Mathews(1996) is applied to those part of the land surface which has been significantly modified by human activity. Cultural landscape is then, applied in rural and urban settings (spaces) that people have settled or altered through time. They include cultural and natural elements of the ordinary, familiar, everyday landscape (Lenon and Mathews, 1996). Thus, according to Lennon and Mathews (1996), the cultural landscape is considered as a mosaic, consisting of three important human elements, which are: 1) natural elements, 2) physical components resulting from human activity, and 3) patterns created in the landscape over time.

In studying a cultural landscape, the unique elements of the landscape must be looked upon, but also the plain, ordinary ones, which tend to be neglected during the process of identifying and investigating the cultural landscape, precisely because of the simplicity and habitualness it represent. Thus, a cultural landscape is always related with locality, that describes the evolution of the communtiy to live all the time under physical threats and social, economical, and cultural changes (UNESCO World Heritage, 2009). A cultural landscape always associates with the traditions of the societies, that arises from the interactions and perceptions of landscapes. It is a mirror of cultures that has always been closed to the hearts of the people who

were born, grew up and lived together in the locality. A cultural landscape also gives a symbol and identity of the area as a region with unique land cultivation that has been going on from generation to generation (Cultural Properties Department, 2003).

4. Outstanding Value of Cultural Landscape

All areas as the product of the interaction between nature and human culture is cultural landscape, but in fact not all areas can be considered as the *heritage cultural landscape.* UNESCO World Heritage Center develops assessment criterias for an area to be considered as a world class heritage cultural landscape. These criterias are implemented to increase concern on heritage cultural landscape conservation. These assessment criterias of UNESCO show that heritage cultural landscape has a higher value than cultural landscape. The predicate "worldheritage cultural landscape" is given to the areas around the world which can show the uniqueness, integrity, and authenticity of the interaction between human and natural environment, and they are considered to have an outstanding universal value (UNESCO World Heritage, 2003).

The predicate "worldheritage cultural landscape " is internationally set by UNESCO *WorldHeritage Committee* through a convention. The aim of the convention is to convince the identification, maintenance, conservation, and inheritance of the natural and cultural heritages that has an "outstanding universal value" to the next generations. This value provides a link between universality,uniqueness and representativity of a certain culturalphenomenon or natural feature. An area is selected and inscribed by UNESCO as a World Heritage Cultural Landscape if the interaction betweenpeople and nature is of outstanding universal value.That level can be met if the area has an *authenticity* and *integrity* values (UNESCO World Heritage, 2003, 2009). Authenticity is a truthful and that the area is a genuine and authentic representation of what it claims to be, whereas integrity is a wholeness, completeness, unimpaired or uncorrupted condition, continuation of traditional values and social fabrics. Integrity in the context of cultural landscape is the extent to which the layered historic evidence, meanings and relationships between elements remains intact and can be interpreted in the landscape (UNESCO World Heritage, 2009)

UNESCO World Heritage Center developed assessment criterias for an area to be considered as a world heritage cultural landscape (Haber in von Droste, Plachter and Rossler, 1995; UNESCO World Heritage, 2009). Table 1 shows the criterias including all cultural heritage, both tangible and intangible cultural heritages, and natural heritage. All the world heritage cultural landscape have to meet one or more of those criterias.

Until 2009, 878 properties from 145 countries inscribed on the World Heritage List, 174 are inscribed under natural criteria (*World Natural Heritage*), 679 as cultural (*World Cultural Heritage*), 25 as mixed (recognized for both their natural and cultural values) (*World Natural and Cultural Heritage*), and 66 as cultural landscapes (*World Heritage Cultural Landscape)*. In Indonesia, the heritage cultural landscapes in fact have the same quality when compared with other world heritge cultural landscapes. In early 2014, the *subak* system in Bali Province was inscribed by UNESCO on the World Heritage List as the World Heritage Cultural Landscape.

Tabel 1 Selection criterias for World Heritage Cultural Landscape by UNESCO

Criteria Number	World Heritage Cultural Landscape criterias
i	Represent a masterpiece of human creative genius
ii	Exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design.
iii	Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared.
iv	Be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates a significant stage(s) in human history.
v	Be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change.
vi	Be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should

	preferably be used in conjunction with other criteria).
vii	Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.
viii	Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.
ix	Be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.
x	Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Source: UNESCO World Heritage, 2009

3. Borobudur Cultural Landscape

Borobudur area has a long and unique history, since the end of Tersier era two to one million years ago, when the volcanic formation and Borobudur basin emerged; and the ancient lake more than 22.000 YBP emerged until its vanishing in 660 BP. Geographically, the Borobudur area is a plain area located in a basin called Kedu, among several volcanoes, mountains, and a mountain range comprising the Merapi, Merbabu, Sumbing volcanoes, and Mounts Tidar, Telomoyo, Andong, and the Menoreh Mountain Range. The Progo and Elo rivers and other small rivers flow through this area as well. In the middle of the area as the centre of the cultural landscape, a compound of 9th Century Buddhist temples, Borobudur, Mendut and Pawon temples, was included in the UNESCO List of World Cultural Heritage Sites in 1991 (UNESCO World Heritage, 2003). Borobudur area itself is a fertile area with beautiful scenery of villages and rice fields. In addition to the Borobudur, Mendut and Pawon Temples, this area is also rich in archaeological relics from the Hindu period, such as the Selogriyo, Ngawen and Asu temples. In the Old Mataram Kingdom era with Hindu and Buddhist religions, temples, particularly Borobudur was used as a religious place. It was the center of the community activity and life. At this time, Borobudur Temple is still the center of the area, though with different function.

Borobudur is a historical landscape which is considered as a comprehensive document of historical area with high historical values. The emergence of mountains, mountain ranges, rivers and plain areas of Borobudur are the evolution process of a unique landform. The history of the ancient lake and ancient rivers in Borobudur plain are other potency of the area.The fertile land of Borobudur with the river streams was the consideration of the settlement establishment and development, even before the erection of Borobudur Temple. The erection of archaeological monuments especially Hindu and Buddhist temples in Borobudur area showed the high human culture at that time. This phenomenon also contains educational values on environmental science, particularly geomorphology and cultural history.

Figure 2 Location of Borobudur area

erection of Borobudur Temple. The erection of archaeological monuments especially Hindu and Buddhist temples in Borobudur area showed the high.

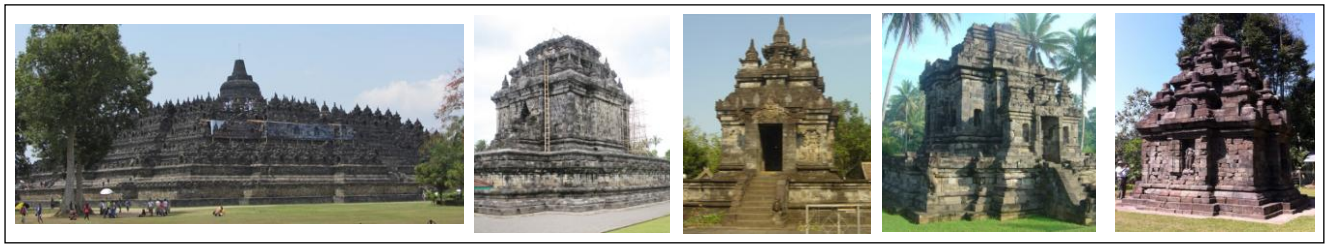


Figure 3(left-right) Borobudur, Mendut, Pawon, Ngawen, Selogriyo Temples
(Photo source: D.H. Rahmi, 2011)

Looking at the landscape and community culture of Borobudur, the good physical condition of the area (tropical climate, plain area, fertile land, good water condition) as well as the life philosophy of the local community have made the Borobudur community with unique social and cultural life, including their traditions, beliefs, their way of life and arts.The community utilize land for their settlements and plant various vegetation, so that an agrarian community has been developed. Land utilization based on life philosophy and a long time of adaptation to the environment has created a community culture. The land is traditionally cultivated as *sawah* (ricefield), dry field, and settlements in the vicinity of the agricultural land. In short, the integration between physical condition of the landscape and community culture in cultivating land mirrors the form of traditional agricultural landscape, as mentions by Plachter (1995). This form can be seen from the land pattern that suitable with the physical condition; the continuity of natural systems; community dependency on the natural resources to meet the needs of their life; and the use of traditional farming methods. Groups of settlement around the agricultural land also show the existence of interdependence between the houses and work places, which is based on the culture that agricultural activity is the heart of the rural people life, and houses are its supporting element (Rahmi, 2012).

Figure 4 Agriculture land and village settlement
(Photo source: D.H. Rahmi, 2011)

As an agrarian community with a good landscape condition, all the everyday activities of the community relate to the nature. Beside farming, traditionally people also use natural resource in their life. Examples are clay found in the soil is used for pottery making; big stones in the rivers are used for stone crafts; plants in the garden are for traditional food (tofu, palm sugar, cassava chips, and so on), or bamboo as raw material for bamboo crafts. All of those activities have been practiced from generation to generation, creating a community village culture.

Figure 5 (right-left) Pottery making; bamboo craft; stone craft; traditional food
(Photo source: D.H. Rahmi, 2011)

The integration between nature and culture is also seen in local traditions to achieve a balance in life. Traditions in the form of *selamatan* or traditional ceremony includes agriculture activities (harvest and planting tradition), religious activities (*ruwahan*, *rejeban*, *pengajian*, *bakdan*),birth-marriage-death activities, and also working together among neighbors (*gotong royong* and *kerja bakti*), and so on. Traditional

dances and music complete the life of the village community, as an effort to achieve a balance in life.

Figure 6 Traditional music and dance
(Photo source: D.H. Rahmi, 2011)

The most visually noticeable of the integration between landscape and culture is the traditional arcitecture of the houses and the environment of the village. The traditional architecture is as the mirror of the tropical climate, fertile and stable soil, and the good quality and quantity of water. That traditional architecture also is the mirror of the community life philosophy, that is simplicity and harmony with nature.This is apparent from the architecture of the simple houses of wood with tile roof; there are no houses that have a different shape to make it look more dominant;the utilization of local plants for garden and fences that grow naturally;as well as the atmosphere of the village with the agricultural land around the settlements.

Figure 7 Traditional houses
(Photo source: D.H. Rahmi, 2011)

The integration between nature (landscape) and community culture of Borobudur can be seen in the figure below.

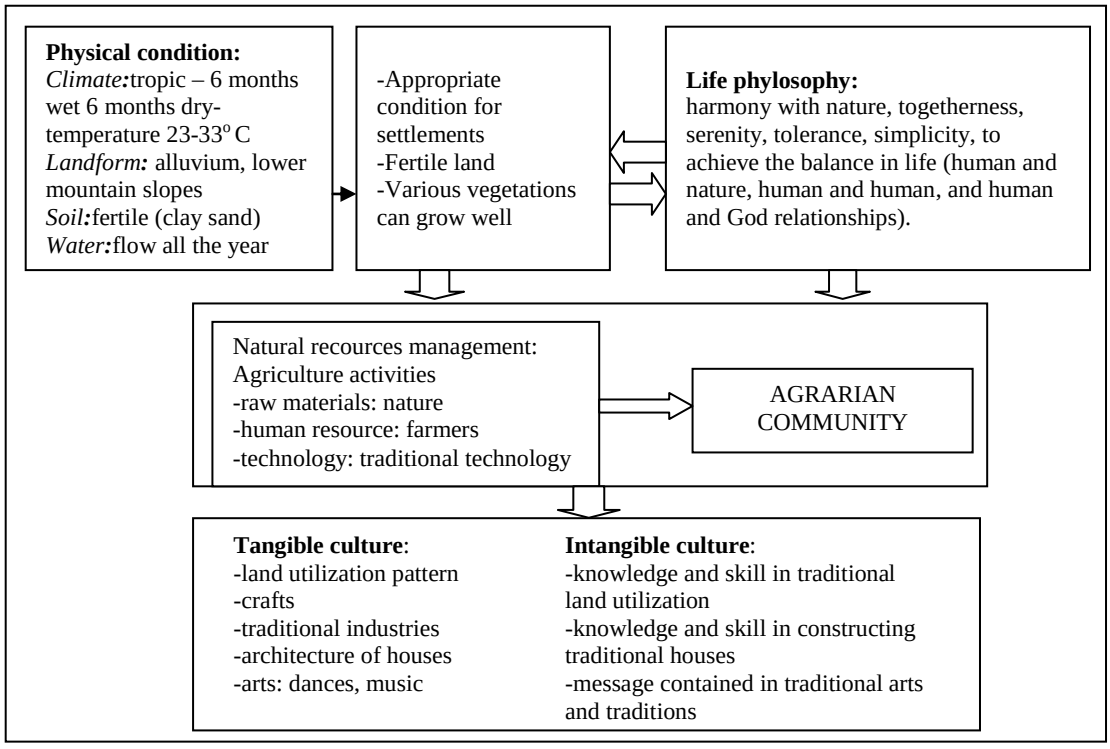


Figure 8 The integration between landscape and culture
Source: Rahmi,2012

Villages in Borobudur are a cultural landscape respectively called village cultural landscape. The form of a village cultural landscape is the integration between its elements, which are physical element (landscape) and the community culture. According to the research result done by Rahmi (2012), the unite of the village cultural landscapes, then, forms the Borobudur cultural landscape. In other word,

Borobudur cultural landscape is the integration between the landscape with its community settlements, rivers, mountains and mountainous range surround the area, and other natural features. Hindu and Buddhist temples which spread in the area complete the elements of Borobudur cultural landscape. In Rahmi (2012), Borobudur cultural landscape has the same forms as the forms of the village cultural landscape in a wider scale, which are: 1) land utilization pattern, 2) community way of life, 3) architecture, and 4) natural features. The interrelation of the four Borobudur cultural landscape forms, then, creates a scenic beauty of the area, with Borobudur Temple as the center of the area (Rahmi, 2012). The scenic beauty is the mirror of the integration between nature and human culture, which can be appreciated by anyone who enjoy to see the landscape.

4. Outstanding Values of Borobudur Cultural Landscape

Borobudur is an outstanding cultural landscape heritage. Rahmi's research found that the four forms of Borobudur cultural landscape contain four outstanding values, which are: the high quality of landscape structure; rich and continuity of local values; role of history and heritage resources; and rich content of education and science values (Rahmi, 2012). Each of them are described as follow:

1) The high quality of landscape structure

The landscape of Borobudur has a high quality structure, because of three factors, which are the stability of landscape; continuity of land unitization system; and high aesthetical value of panorama (view). *First*, the landscape of Borobudur are formed by mountains and a mountainous range as the background and surround the area; agricultural areas in the form of *sawah* (ricefield) and dryfarms;settlements that are scattered around the agricultural land; rivers that flow through the area; archaeological remains that are scattered throughout the area; and the wide variety of flora and fauna that are also scattered throuhgout the area. Each of them forms a landscape structure, making the integration and interdependence among them. The unite of the whole landscape structures then forms the Borobudur landscape structure. The variety of the Borobudur landscape structure elements shows te high quality of the landscape.

Second, Borobudur cultural landscape has the continuity in its land utilization system, which are: (a) traditional agricultural system that conserves paddy and *palawija* (one seasonal plants), and also conserves variety of local plants, such as bamboo, coconut, jackfruit, and banana; and (b) traditional agricultural system that manages and conserves land productivity, soil and water quality and quantity, and land cover quality maintenance.

Third, Borobudur cultural landscape has high quality of panorama, natural beauty and aesthetical values as a result of the interaction between nature and man-made environment. The beautiful panorama of the landscape, the blend of agricultural land mozaic, settlements, rivers, Borobudur Temple, and mountains as the background, is the rich asset of the Borobudur area that needs to be conserved.

2) The rich and continuity of local values

Borobudur cultural landscape hasrich and continuity of local values, which is formed in three things: (a) continuity and stability of cultural system of the local community in agricultural activities (agrarian); (b) unique land use pattern that has been continued until today; and (c) rich of local culture (tangible and intangible) that is the community response to natural environment based on their philosophy of life.

Rural traditional cultures (agricultural activity in traditional way, crafts with local materials, daily activities, belief, traditional arts, tropical architecture) show the unique culture that still exist and able to adapt with the environment changes. Those traditional cultures also give identity to the area. The strenght of Borobudur cultural landscape also lies in the strong relationship between tangible and intangible heritages. As an example, many Javanese traditional houses found in the villages in Borobudur area are the tangible heritages, whereas the experties of the people in designing and building those houses, the traditional ceremony in erecting the houses, and the meaning and values of the house design are the intangible heritages.

3) The role of history and heritage resources

This outstanding value of Borobudur cultural landcape includes two things, which are: the rich history of the area; and the role of temples on the environment and community life.The role of history and heritage resources can not be separated in forming the Borobudur cultural landscape, because heritage resources is one of the historical element of the area.*First*, Borobudur cultural landscape has a long

history, from the geological history including the emergence of the mountains and Borobudur basin; the history of the ancient lake and rivers; the history of the settlements and agricultural activity; and the history of the temples that are scattered in the area. All of those histories are the important data and information to understand the process of life and changes in the past.

Second, the heritage resources help to understand the history. In Borobudur cultural landscape, the heritage resources are archaeological remains, especially temples that still can be seen today. In the micro level of Borobudur cultural landscape, there are Pawon, Mendut, and Borobudur Temples; and in the macro level there are several temples, such as Ngawen, Lumbung, Asu, Pendhem, and Selogriyo Temples. The existence of those temples, especially Borobudur Temple, has brought an identity to Borobudur area as a historical area where archaeological objects were constructed in 8th - 9thCentury. Furthermore, Borobudur Temple with its special architecture is considered as the evidence of the high civilization in the past, and is considered as the masterpiece of architecture with its function and beauty.

The history of Borobudur is a heritage resource that should be conserved, so that the past evidence can be traced and recosntructed for the present and future needs. A temple has intangible relationship with the village community traditions. A temple becomes a part of life of the community that can not be separated.

4) The content of education and science values

Borobudur cultural landscape is a place for studying, because it contains so many education and science values. As stated by Taylor (2003), Borobudur is an "*open air museum and university*", where people from around the world can get lessons not only from the concepts and physical appearance of Borobudur Temple as an archaeological object, but also the surrounding environment – the people, village areas, and the whole environment. Tanudirjo (2008) also explained that Borobudur is a media for studying, a center of community education to be a "*creative genius"* and achieve a perfection as a human being, so that Borobudur area deserves to be a "*center of excellence*" in various fields. Added by Setiawan (2008) that as a place for studying, Borobudur needs to be maintained for anyone who want to learn a variety of things: arcaeology, history, geology, ecology, sociology, and economy.

Borobudur cultural landscape has four education and science values, which are: archaeology and history, landscape, socio-culture, and philosophy and religion. Each value is described as follows.

a) Education and science values on heritage and historical objects

Borobudur cultural landscape is a historical document, an imprint of human cultural history with its environment is full of learning. An area of the archaeological remains of the Hindu and Bhuddist period in 8th-9th Century gives knowledge about the culture and genius of the society at that time. Many things can be learned from the temples in Borobudur area. The building of temples contains knowledge on architecture and building tecnology, and also the way of life of the people in the past. Borobudur Temple is expected to be a center for stone conservation in South East Asia, a place to learn culture and science.

b) Education and science values on landscape

Borobudur cultural landscape has high ecological quality of its landscape which contains education and science values. Mountains, rivers, soils, forests, agricultural land, settlements, are cultural landscape elements interesting to be studied. Functional relationship among cultural landscape elements, ecological proccesses, and functional integration of land use at this time and in the future give a lot of knowledge to anyone who want to learn. The scenic beauty of the panorama of Borobudur area also gives inspirations to the arts creativity.

c) Education and science values on socio-culture

As a center for socio-culture studies, Borobudur is a place for learning many things which relate to the human interaction and the life of the society, as well as between human and the environment. As stated by Taylor (2003), Borobudur is an 'open air museum' where villages in Borobudur area as presenting their traditional life with a variety of traditions, arts, crafts, and way of life as the agrarian community. More specifically, the life of the village community is rich in education values about the Javanese traditional life philosophy to achieve the life balance and harmony.This also is reflected on their 'local knowledge' in environment conservation.

c) Education and science values on philosophy and religion

Borobudur cultural landscape is rich in intangible values, and one of the outstanding value is the value of the cosmological *mandala* which is interpreted in temples, landscapes, and the life of the community.The *mandala* values are knowledge that need to be known by people. As a *mandala*, Borobudur Temple teaches about life philosophy. It is a 'book' to guide people to acieve the perfect life (Tanudirjo, 2008). The reliefs of Borobudur Temple teaches about good lessons for human life, humanism and wisdom. Borobudur cultural landscape is a place to learn religion, especially Buddhist religion. Mendut Temple and its surroundingis still used as a place for the worship of Buddhism and school for the monks. The annual "waisak" ceremony held in Mendut, Pawon, and Borobudur Temples gives knowledge on the good examples of the Buddha, which is conveying *dharma* for the happiness life of the people in the world. In short, the four outstanding values of Borobudur heritage cultural landscape are seen Figure 8 below.

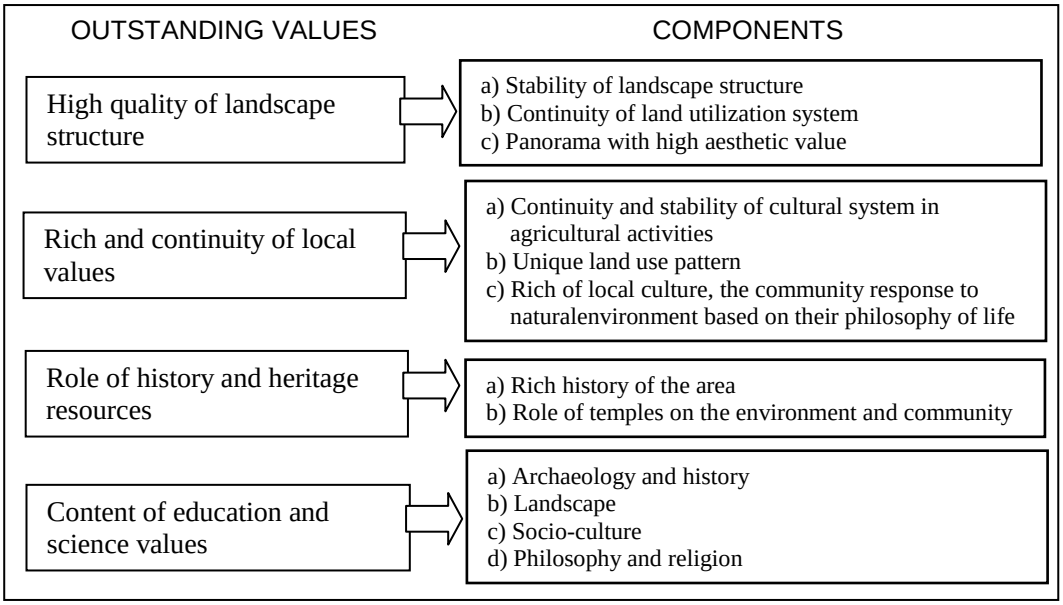


Figure 8 Outstanding values of Borobudur heritage cultural landscape
Source: Rahmi, 2012

The four outstanding values are owned by Borobudur cultural landscape heritage, and with those values Borobudur is able to be compared with other world class cultural landscape heritages. The sustainability of Borobudur cultural landscape depends on the sustainability of its outstanding values. Damage or loss of any value will influence the existence of the other values, that finally will make Borobudur has no more outstanding values. The quality of those outstanding values of Borobudur can be seen and felt from the cultural landscape heritage forms until today in the middle of environment and cultural changes.

Discussion

components of the environment Studying CL entails natural and man-made and the ways in which they have changed over time. From the above explanations, a cultural landscape is an integration between landscape and culture, so that an area or region considered as a cultural landscape if there is a human life on it. The landscape or nature has been modified or influenced by human activity over a long period.Thus, CL represents the evolution of human society and settlement over time. It shows the character of the society's culture, as also mention by Lewis (1979) that a cultural landscape is a clue to culture. Two regions can look different as a result of the cultural differences of the people living in these regions.

There are many cultural landscapes in the world and each of them has specific characters. A number of those cultural landscapes have uniqueness and outstanding values or even outstanding universal values that need to be conserved. Concerning this, UNESCO gaves consideration to the need to recognize the outstanding values ofcultural landscapes and to the

importance of protectingcultural diversity within cultural landscapes. Therefore, UNESCO has inscribed a number of cultural landscapes around the world which are considered to have an outstanding universal value in the World Heritage List.To be inscribed in the UNESCO World Heritage List is not an easy way for the cultural landscapes. Beside those cultural landscapes have to meet the criterias for the selection, they have to be ready with the consequences as the world heritage cultural landscapes.Inscription on the World Heritage List implies that a cultural landscape has adequate protection for its outstanding universal value and a management plan or well documented management system in place.

Concerning Borobudur cultural landscape heritage, questions arise: Does Borobudur cultural landscape heritage has universal values from its outstanding values and become an example for other cultural landscape phenomenon in other places? Does it deserves to become a World Heritage Cultural Landscape? The four outstanding values of Borobudur cultural landscape heritage (high quality of landscape structure; rich and continuity of local values;role of history and heritage resources; and content of education and science values) show that the area has extraordinary richness of culture and nature. Both its tangible physical identity and intangible identity are inextricably inter-woven with place meaning and significance for people.The four outstanding values of Borobudur cultural landscape heritage actually can be considered as the outstanding universal values. If UNESCO criterias for world cultural landscape are used for Borobudur, then, there would be three criterias met by Borobudur cultural landscape heritage, that are criteria i, iii, and iv:

(i) Represent a masterpiece of human creative genius
(iii) Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared.
(iv) Be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates a significant stage(s) in human history.

Characters, potentials and outstanding values of Borobudur cultural landscape heritage can actually be aligned with the characters, potentials and outstanding values of the world heritage cultural landscapes. One thing that still needs to be known and examined is the management of the Borobudur area, including the role of the local community in conserving the cultural landscape, and also the sustainability of Borobudur cultural landscape.Borobudur is currently under the treat of physical and social changes as the impacts of the development of tourism activities and development.The protection of Borobudur as a cultural landscape heritage is still questionable. Has Borobudur cultural landscape heritage been managed and planned properly and how is its management and plan? How far the role of the local community in cultual landscape conservation? How is the sustainability of Borobudur cultural landscape? These questions become a challenge for doing further studies on Borobudur cultural landscape. The answers and proof about the management, planning and sustainability of Borobudur cultural landscape will come to the conclusion whether Borobudur area is exceptional as a World Heritage Cultural Landscape.

5. Conclusion

Cultural landscape represents a continuum relationship between landscape and community culture that span many generations. The rich potencies of the landscape and culture of an area, and also the strong unity of them create this area as a unique cultural landscape with outstanding values, that is not every cultural landscape in other places has.The inscribtion of a cultural landscape with outstanding universal value as a World Heritage Cultural Landscape is an effort to protect and conserve its landscape, culture and their relationship.

Borobudur area is a cultural landscape heritage with Borobudur Temple as the center of the area. The interaction between the landscape and the community culture results four cultural landscape heritage forms, wich are: a) land utilization pattern; 2) community life; c) architecture; and d) natural features. The integration of the four forms creates a scenic beauty which full of symbolic meanings, and the unity of them contains four outstanding values as the local values. They are: a) high quality of landscape structure; b) rich and continuity of local values; c) role of history and heritage resources; and d) contents of education and science values.The forms and outstanding values of the cultural landscapes of Borobudur show the rich and high heritage value of the area, which become the community's collective identity.

The authenticity of Borobudur cultural landscape is in the originality of its characters, which is the local characters (*genius loci*), and the integrity is

in the continuity of the traditional values which still can visually be seen and interpreted in the area. Based on those two things, the outstanding values of Borobudur cultural landscape can be comparable to other world cultural landscape heritages in other places. It means that the uniqueness of Borobudur cultural landscape meets the criterias as a World Heritage Cultural Landscape. Nevertheless, to be a World Heritage Cultural Landscape, only having a uniqueness or outstanding universal value is not enough. Borobudur still needs proper and serious management and planning for its sustainable cultural landscape, the other requirement for a world class cultural landscape heritage that has not been proven by Borobudur. Therefore, the outstanding values of Borobudur cultural landscape need to be recognized, protected, and conserved under proper and responsive management and planning. Further studies on various aspects of Borobudur cultural landscape should be done for the basis in determining steps towards its sustainability.

Acknowledgement

I (the author) would like to thank to Professor Sudibyakto, Professor Sutikno, and Dr. Laretna T. Adishakti, promotors in my Doctorate Program in Environmental Studies, School of Pasca Sarjana, Gadjah Mada University, for their advices and supports during my research and dissertation completion.

Reference

Backhaus, G., Murungi, J. (2009), Introduction I; The problematic of grounding te significance of symbolic landscape. In: Backhaus, G. (ed.), (2009), *Symbolic Landscape*, Springer.

Calcatinge, A. (2012), *The Need for a Cultural Landscape Theory: an Architect's Approach*, LIT Verlag GmbH & Co., Wien

Cultural Properties Department, 2003, *The Report of the Study on the Protection of Cultural Landscapes Associated with Agriculture, Forestry, and Fisheries*, Agency for Cultural Affairs Japan

Hirsch, E.(1995), *Antropology of Landscape*, Clarendon Press, Oxford.

Lewis, P. (1979), Axiom for Reading the Landscape. In: Menig, D.W., (ed.), *The Interpretation of Ordinary Landscapes*, Oxford University Press, New York.

Meinig, D.W. (1979), The Beholding Eye. In: Menig, D.W., (ed.), *The Interpretation of Ordinary Landscapes*, Oxford University Press, New York.

Piagam Pelestarian Pusaka Indonesia, 2003, Jaringan Pelestarian Pusaka Indonesia.

Plachter, H., 1995, Functional Criteria for the Assessment of Cultural Landscapes,dalam Droste, Plachter dan Rossler (ed), *Cultural Landscape of Universal Value*, Gustav Fischer Verlag, Jena Germany.

Plachter, H., dan Rossler, M., 1995, Cultural Landscapes: Reconnecting Culture and Nature, dalam von Droste, B., Plachter, H., dan Rossler, M., *Cultural Landscapes of Universal Value*, Gustav Fisher Verlag, New York.

Rahmi, D.H. (2012), *Pusaka Saujana Borobudur. Studi Hubungan Antara Bentanglahan Dan Budaya Masyarakat*, Unpublished dissertation, Pasca Sarjana Universitas Gadjah Mada, Yogyakarta

Setiawan, B. (2008), *Managing Borobudur Cultural Landscape Heritage: from Restoration to Creation*,Paper presented in Research Seminar: South East Asian Landscapes, Department of Architecture, National University of Singapore, 15 Desember 2008.

Subroto, P. (1994), Pola-pola Zonal Situs-situs Arkeologi. In*Berkala Arkeologi Manusia dalam Ruang : Studi Kawasan dalam Arkeologi*, Tahun XVI, Edisi Khusus, Balai Arkeologi, Yogyakarta

Tanudirjo, D.A. (2008), Borobudur Sebagai Mandala: Masa Lalu dan Masa Kini, dalam *100 Tahun Pascapemugaran Candi Borobudur: Trilogi I Menyelamatkan Kembali Candi Borobudur*, Balai Konservasi Peninggalan Borobudur.

Taylor, Ken (2003), *Cultural Landscape as Open Air Museum: Borobudur World Heritage Site and Its Setting*, Humanities Research, 10 (2): 51-62

UNESCO World Heritage (2003), *Cultural Landscapes: the Challenges of Conservation.* World Heritage Papers 7

UNESCO World Heritage (2009), *World Heritage Cultural Landscapes: A Handbook for Conservation and Management*. World Heritage Papers 26

von Droste, B., Plachter, H., dan Rossler, M., 1995, *Cultural Landscapes of Universal Value*, Gustav Fisher Verlag, New York.

Wilson, C. (2003), *Everyday America. Cultural Landscape Studies after J.B. Jackson*, University of California Press, Los Angeles.

Historical and Heritage Context

Fourth Session Parallel Notes
Moderator: Diananta Pramitasari

K1 Room 2nd Floor
10.45-11.30

Presenter	:	**Amandus Jong Tallo (UGM MPKD)**
Title	:	**City History and Image As Morpholohy Shaper in Malang City**
Presentation Duration	:	**about 12 minutes**

PRESENTATION CONTENTS

- Ijen Malang as Major Landmark
- Malang famous for the Candi, from the historycal Malang very relevant with Majapahit Kingdom.
- Ijen street, in Sunday always car freeday.
- Built of collonial in Kayutangan

History of malang City

1. Kingdom Age : It was located near Brantas River, Brantas River as the most big river in East Java. Coming of Islam, persuade the building style in malang.
2. Collonial Age :
   a. Colonial time before Malang City was established as Stadsgemeente(1767-1914)
      - In 1767, Dutch came and established defense fortress (loge/loji) in Klojen area, now becoming Saiful Anwar General Hospital.
      - In 1824, The Dutch government established Malang Residence and at the same time constructed the government offices and settlement areas for the governmental servants in the areas of square, Pattimura terminal, and surrounding. In line with such the development, the need for rail transportation also increased, so that rail station and railway were constructed toward Surabaya in 1879.

   b. Colonial time after Malang was established as *Stadsgemeente* (post-1914).
3. Post Colonial Age : Japan has occupation in Indonesia. It change city image of Malang. As the appreciation to the heroes, Taman Bahagia (Taman Makam Pahlawan Surapati*)* was constructed. In addition, Tugu Kemerdekaan was constructed as well, located in the center of Bunder Square (*Alun-Alun Bunder*) to symbolize the Republic of Indonesia's independence.
4. Malang in The Present : This increasingly developing city becomes an appeal to newcomers to stay either temporarily or permanently there. In the last ten years (2000-2010), there was an increase in the number of Malang City population by 7,029 people per year. The following is the increase of population number in Malang City.

Image of Malang

- The discussion of city image consists of five elements: landmark, node, path, district, and edge.
- The image of Malang City cannot be apart from the history of city from Kingdom age to post-colonial time.
- During independence time, Malang area becoming the military area since colonial period was destroyed in the Dutch Military Aggression in 1947-1948. Garden City concept introduced by Ebenhezer Howard was very familiar with the image of several areas in Malang City: Ijen Street, "alun-alun bunder", and kayutangan areas.

Conclusion and Recommendation

Conclusion :

1. Malang city is the one having developed since kingdom age to post-colonial period replete with physical shape constituting environment and buildings arrangement having historical values.

2. The period of kingdom to Dutch colonial times becomes an important time because at that time, many heritage elements shaping the city image still survive until today thereby affecting the morphology of Malang city.
3. City image still survive until today are tugu area as district; park, "tugu", lotus flower as landmark; railway as path,"alun-alun tugu", Gajayana Stadium as node. City image in Malang City can be used as the evidence that history highly affects the morphology of Malang City.
4. For that reason, the conclusion of research is that the Morphology of Malang City was shaped by historical factor and image of Malang City.

Recommendation :
1. The recommendation offered was to maintain and to strengthen the physical character and morphologic pattern of Malang city.
2. By maintaining and strengthening the physical character and morphologic pattern, Malang City will not lose its identity.

Presenter	**:**	**Dwita Hadi Rahmi**
Title	**:**	**The Outstanding Value of Cultural Landscape : Borobudur as a World Heritage Cultural Landscape**
Presentation Duration	**:**	**about 14 minutes**

PRESENTATION CONTENTS

Outline of Presentation :
1. Introduction
2. Cultural landscape : culture landscape reflect the people manage their live; integration between landscape and culture.
3. Oustanding Value of Cultural Landscape :
   The outstanding values of a cultural landscape are the uniqueness of the area either in the history of the area, physical landscape, or culture of the community.
   Cultural landscapes with outstanding universal value is considered as a "World Heritage Cultural Landscapes" by UNESCO World Heritage
   Aim: to recognize the outstanding values of cultural landscapes and importance of protecting cultural diversity within cultural landscapes.
4. Borobudur Cultural Landscape : Located in Central Java, surrounded by several mountain(sindoro, merbabu, Sumbing, Merapi). Mountain as a boundaries. Ancient lake and Rivers history. Borobudur Temple the desaign like a Lotus Flower. Agriculture; life patern; performing arts; artistic expression; traditional Architecture. Uniqueness of borobudur Cultural Landscape; borobudur. Forms of Borobudur Cultural Landscape.
5. Outstanding Values of Borobudur Cultural Landscape
   a. High quality of landscape structure : Stabilty of landform structura, continuity of land utilization system, scenin beauty with high aesthetic value
   b. Potency and sustainability of local values : Contiunity of local cultural system in agriculture, uniqueness of land use patternm rich of tangible and intangible traditional culture
   c. Role of heritage history and resources : Historical potency of the area, role of heritage assets on the environment and community life
   d. Contens of education and science values : Archeology and history, landform, socio-culture, philosophy and religion
   e. Borobudur as a World Heritage Cultural Landscape. Borobudur cultural landscapes heritage has universal values and become an example for other cultural
6. Conclusion
   Cultural landscape represents a continuum relationship between landscape and community culture that span many generations. The inscription of a cultural landscape with outstanding universal value as a World Heritage Cultural Landscape is an effort to protect and conserve its landscape, culture and their relationship.

Discussion

Question	:	Do you have any idea to work on this management? Kinda strategy on this?
Answer	:	Quite manageable cause the government only to the temple because the tourism activity quite. Cultural landscapes is and for the temple it selfther are three menagemn sector, office, office of magelang city, and then Jakarta. The community round the temple don't have econ benefit from tourism activitis, there is some vilages try to develop themselves to involve in tourism. The recommendation for the planning , the giv should involve the commu to manage and then also for the temple it self because its to top down and ore benefitd go to the centre to jakata. So we need more role to the community. And this moment, actually gov has a prog to make bro national strategic area. It is good but still not work well.
Question	:	Is this world heritage what will you do to the vilages? How shold be approache?
Answer	:	Unesco is the management of the whole area. The gov has to protect conserve the area, rotect not mean it is cant change. But it is how to conserve the tradisitonal but also develop. Why it should be a world cultural heritage? Difficult to be reach and to maintain.

Disaster Resilience Context

Presentation Note Keynote Speaker: Miho Mazereeuw

Presentation Note Keynote Speaker: Yoshimitu Shiozaki

Housing Adjustment as Adaptation Strategy for the Future in Flood Prone Settlement Case Study : Muara Angke Settlement, North Jakarta
Juarni Anita , Wiwik Dwi Pratiwi

Innovations in The Temporary Housing Phase of Disaster Recovery: Wooden Temporary Housing in Japan After the 3.11 Great East Japan Earthquake and Tsunami in an International Comparative Context
Elizabeth Maly, Tomoko Matsushita

Inhabitants Adaptation in Drought Area Desa Seriwe, Kabupaten Lombok Timur
Mayang Rahmi Novita Sari; Agam Marsoyo; Yori Herwangi

Post-Disaster Housing Choices and Limitation According to Resident's Ownership Status: Indian Ocean Tsunami 2004 Thailand, Namkem Community.
Titaya Sararit, Elizabeth Maly, Tamiyo Kondo

Fourth Session Parallel Note Moderator: Ahmad Sarwadi

Disaster Resilience Context

Miho Mazereeuw

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 13.30 – 15.00
Moderator	: Laretna T Adhisakti
Presentation Duration	: 22 minutes

PRESENTATION CONTENTS

- Urban Risk Lab →design, research and technical arm to several institutions and governments. Some of the current projects : highlights flood area, earthquake area and cyclone zones
- As a process Urban Risk Lab aim to follow a similar method in each of the projects
  1. Regional understanding of hazards and their frequency coupled with increasedurbanization
  2. Zoom into hyperlocal understanding community and socialcapital
  3. Where possible, become the conduit between goverment / larger Institutions and Citizens groupsin spatial planning and design
- Projects :
  a. A National System of Evacuation Parks for Haiti
     - Supported by HDPC & world bank
     - Haiti has multi hazard exposure.
     - Scenarios :
       1. Stairwell for safe & secure egress
       2. Shelter as rural school
       3. Preventive infastructure & multi layer strategy
       4. Vegetation as erosion prevention system
       5. Park prototypes as model of evacuation infastructures across different degrees of risk and doubt.
       6. Play, pleasure and freedom from disaster as basic, spatial right
       7. Triple-porpuse infrastructure : security, shelter, livehood.
       8. Coupling economy and livehood overtime (This idea of coupling the emergency shelter with a women's dorm and market came from the field research where learned how the Madam Saras, the market women really control the situation)
       9. Disaster evacuation park as risk infrastructure
          Each one of the nine scenarios are coupled with an existing organization
  b. Orissa Department of Emergency Management emphasized their coastal evacuation strategy, which is very successful. Its just in areas which are currently un-inhabited, but in this region they are planning a new industrial city so then it becomes our responsibility as architects and planners to design this process properly.
  c. Urban risk lab working with the SF Department of Emergency Management, SF Planning department but then also with the Neighborhood Empowerment Network to make the larger composite multi-hazard maps and share powerpoint information about the hazards and the need social networks.
  d. Comparation in Indonesia : In past March, small visit to Surabaya→learned about Gotong Royong - mutual assistance concept of neighborhood cooperation.
     - RT: smaller neighborhood blocks, lead by RT leader which then form in a larger neighborhoods RW, led by an RW head.
     - Surabaya has several micro policies of strengthening this social capitalwhile improving things like cleaning and greening the Kampungs.

    - Surabayaaredeveloping faster than others.Thecurrent and most common development model are the highrise building typologies that line the major streets and in many ways suffocate the kampungs.
    - To preserve kampungs, we need to find more innovative methods for development which can make sure we don't loose the critical social capacity and find ways for evolutionary growth.
- An overview that was published in the Sendai report, Government of Japan and the world bank on the international development Financing over almost 20 years.91.2 billion USD went into International development Financing.
- Of that 91 billion, only 2 % (emergency response, recontruction and rehabilitation, disaster prevention and preparedness) when into disaster financing. So we need a culture of prevention, consuder prevention with development, embled risk reduction with urbanism.

- **Conclusions**
    - Encourage all architects and planners in the next generation to consider disaster risk prevention in all projects, in all development because our cities are getting denser,the economic disparities are increasing and the lower income population is getting pushed to live in more vulnerable conditions.
    - But in cities especially in Indonesia which are rich in social capital and community strength, we need to strive to find new and innovative ways of preserving the social capital while forging ahead into the future

Disaster Resilience Context

Yoshimitu Shiozaki

Place	: K1 Room, 2nd floor
Time	: Thursday, 21 August 2014, 13.30 – 15.00
Moderator	: Laretna T Adhisakti
Presentation Duration	: 25 minutes

PRESENTATION CONTENTS

- The great east Japan disaster are the multiple disaster (earthquake, tsunami, fire, lan slide, and nuclear power plant accident).
- It damage the facilites, access, and the nuclear contaminate the towns.
- Nuclear contamination and tsunami damage cause many local government offices move to other city and don't know when they can return.
- The earthquake cause the house damage until 128,931 units.
- Temporary Housing -> Permanent housing :
  - Temporary Housing :
    There are 3 types :
    1. Prefabricated housing
    2. Wooden temporary housing
    3. Apartment house as temporary housing.
       Public Housing :
       - It constructed by national and local government moneyThis system fit for victims needs, national government money for rent.
       - It has problems of public housing, it small space, no garden and farm, allocation by lottery system and far from town cause losing community.

       Self Reconstruction :
       - The best way to reconstruct the house as before. In this sense main measure to get permanent house should be support for victims to construct their own housing. It decrease the public housing with the financial support which quite limited.
  - Permanent Housing :
    Government makes tsunami simulation and proposes tsunami risk area map. Victims in the risk area have to decide their way to live under the landuse plan. Relocation program are suggested.

DISCUSSION

Questioner	:	Anita from Institut Teknologi Bandung ask Prof Shiozaki :
Question	:	How people do the traditional activity (festival, etc) in the temporary housing after the disaster?"
Answer	:	They try to do them in the temporary housing, of course it different from before, they try to make a comfort atmosphere like their own place.

Housing Adjustment as Adaptation Strategy for the Future in Flood Prone Settlement. Case Study : Muara Angke Settlement, North Jakarta

Juarni Anita[1] , Wiwik Dwi Pratiwi[2]

[1]Doctoral Student, Architecture Program, Institut Teknologi Bandung
[2]Lecturer, Architecture Program, Institut Teknologi Bandung

Abstract

Flood has become a threat in the northern part of Jakarta due to sea level rise, land subsidence, and extreme rainfall as impacts of climate changes. Muara Angke is a delta in North Jakarta surrounded by Java Sea in the north, Asin River in the east, and Adem River in the west, so that several times of flooding inundate this settlement. To overcome flooding, communities have been doing housing adjustment as adaptation strategy in order to remain living in this settlement. Housing adjustment has been a phenomenon recently to avoid flooding. The objective of this research is to identify techniques and designs of housing adjustment as adaptation strategy in flood prone settlement. This research was conducted with quantitative and qualitative methods to collect data from thirty five purposive respondents through observations and interviews. The results of this research shows that housing adjustment includes elevating the floor from the road, raise the ceiling, two-storey house, replace the floor and roof material. This adjustment has been contributing to avoid flood, and still allowing occupants to do their activities while flooding.

Keywords: *Adaptation, flood, future, housing adjustment*

I. The Threatening Flooding in Northern Jakarta

The coastal flooding became a big problem in the northern coast of Java Island, such as Jakarta, in the last two decades. It occurs due to several factors, such as: tidal waves, global sea level rise, storm surges, land subsidence, higher rainfall or water runoff from hinterland, and sediment deposition (silting) on the river bed and estuaries. Land subsidence in the period of December 1997 to September 2007 approximately was ranging from 1 to 15 cm/year in Jakarta (Abidin, et al., 2009). The greatest land subsidence can be found in Penjaringan, Tanjung Priok, and Cakung (Bimantara, 2012). Meanwhile, the sea level rise in the northen coast of Java average was 1.45cm/year during the years of 2005 to 2011 (Hadi, et al., 2012).

Muara Angke is a delta in North Jakarta where surrounded by Asin River in the east, Adem River in the west, and Jakarta Bay in the north. This delta had also several event of floods which be caused by land subsidence, heavy rain, spring tides, sea level rise, siltation of rivers and dike destroyed. The last major flood occurred in 1996, 1999, 2002, 2007, and 2013 (based on interviews with respondents). Due to current floods, the government has made a protection of settlements in the northen coastal of Jakarta, especially in Muara Angke, by building polder system. The government has provided levees, reservoirs, and pumps, in addition to having elevated the main roads in the settlements (Anita and Harun, 2013).

Fig. 1 . Flooding in Muara Angke Settlement

Flooding in Muara Angke, 2011
(Source : UPT Muara Angke)

Flooding in December 2012
(Source : foto.detik.com & merdeka.com)

Impact of the coastal flooding insists the communities to adaptive the hazards by adjusting their houses to avoid the flood, so that they can stay at home during the flood. This paper will describe result of a short study on the fishermen's houses that have been adjusted such as elevating house, expansion of house,

Juarni Anita
---Doctoral Student in Architecture
Institute Teknologi Bandung
Tel: 022-2504962
e-mail: anit@itenas.ac.id

using materials easily to be dismantled, and change facade as desired and according to their economic ability. Findings of this research will contribute to the knowledge on housing adjustment, as adaptation strategy for the future in flood prone settlement.

The following are the study objectives :
a) to identify how to elevate the house;
b) to identify ways of expanding houses;
c) to identify the material used.

The selected study area is complex of the houses built early in Muara Angke. The houses were planned by Jakarta local government for fishermen or people who work in the field of fisheries in North Jakarta. Block K and Bermis were chosen for this study (see **Fig.2**) because there has been no research on housing adjustment in this area. Furthermore, these blocks will be retained as landed housing in Muara Angke Master Plan, while the surrounding slums will be converted into flat housings.

These data were collected through observation, measurement, and depth interview with 35 purposive respondents (15 respondents in Block K and 20 respondents in Block Bermis) selected based on the criteria that they have lived more than 10 years and have been flooded several times, including the great flood of 2007, and their houses have been renovated at least within the last 2 years.

II. Housing Adjustment as Adaptation Strategy

Floodwater having the potential to cause damage to the structure of a building, it can also significantly impact the lives of the residents. Fast flowing water or weakened structures could cause injury or even death. Physical health may suffer if floodwater is contaminated. Flood events in neighborhoods can lead to stress in humans. People will strive to maintain the standard they have, trying to cope with the pressure or threats in the surrounding environment, so that they can change the environment to adjust with their wishes, in order to maintain comfort (Bell, 1990 in Iskandar, 2012).

If the residents feel there is a gap between the actual condition of the house and a decent house in his opinion, they feel dissatisfied being at home and will renovate their houses, which is called housing adjustment (Crull, et al.,1991). But housing adjustment has several constraints include family's ability to solve problems, limited income, skills, knowledge, and discrimination (Morris and Winter, 1986 in Crull, et al., 1991).

Meanwhile, adaptation refers to changes that take place in individuals or groups in response to environmental demands. The Oxford Dictionary of Science defines adaptation as any change in the structure or functioning of an organism that makes it better suited to its environment. Adaptation strategies are more proactive in a sense as they are put into place to avoid turning natural hazards into disasters. If you know an area is prone to flooding, adaptation strategies would involve moving the population from those areas, or building dykes to prevent flooding, or ensuring houses in the area are able to withstand flood water (IRIN, 2013).

Therefore, resident's efforts to improve their houses such as elevating house, extend house, replacing the material is the act of housing adjustment, and it is adaptation strategies undertaken by the residents, so that they can stay comfortably in Muara Angke, although the area is prone to flooding .

III. Muara Angke Settlement

Muara Angke is a delta in North Jakarta surrounded by Java Sea in the north, Asin River in the east, and Adem River in the west. Geomorphology of the beaches is soft so that low soil bearing capacity and seawater intrusion process become high. Therefore, several times flooding inundates this settlement. Protection against flooding has been constructed by government through a polder system, consisting of levee, two reservoirs, and several pumps.

Muara Angke area was marshes and mangrove forests until the 1970s. Muara Angke was built on July

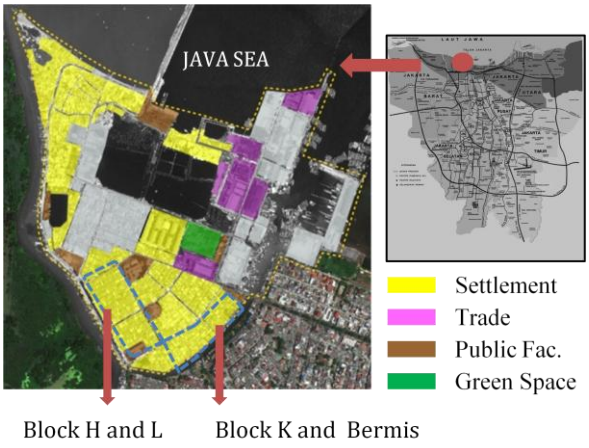


Fig. 2 . Muara Angke Settlement

Source: UPT PPKP and PPI Muara Angke, 2011

7,1977 by government of DKI Jakarta to accommodate the fisheries located in North Jakarta. This fishermen settlement was planned to be inhabited by owners of fishing boats, crews, fishing workers, salted fish laborers, and fish traders. Various facilities have been built such as market, terminal, schools, mosques, community health center, and fishing industries. The housing area is 21,16 hectares, while total land area of Muara Angke is 67 ha (UPT PPKP and PPI Muara Angke, 2011). There are some blocks of housing built by the government for fishermen in Muara Angke, such as Block H, L, K, and Bermis (Fig.2).

Previous research about housing adjustment in Muara Angke (Anita, J. and Harun, I. B., 2013), study location was Block H and L because these blocks were built earlier in Muara Angke about 1977. The size of houses that was originally 40m^2 had been increased to 100-170 m^2. Building coverage ratio that was initially 53% had been increased to 100%. All the rooms had been expanded (living, family, dining and kitchen) due to the increase of family members and the need to improve the comfort and safety against flooding. There are 40 houses of 319 houses (12.2%) in Block H and L with raising floor elevation more than 80 cm above the road to avoid flooding. According to 13 purposive respondents, the height of ceiling in ground floor is approximately 3,5 to 4,5 m (11 houses) because the respondents are confident that they will raise the floor again in the future. They used wood material for second floor (10 houses) because the cost is cheaper and easy to dismantle when they rise their houses in the future. Therefore, the common adjustment in Block H and L include the addition of rooms, enlarge the house; specially to avoid flooding include the elevate ground floor, ceiling, and elevate into two-storey house.

Block K and Bermis were chosen to be the research location for this study because there has been no research on housing adjustment in this area. Furthermore, these blocks will be retained as landed housing (include Block H and L) in Muara Angke Master Plan, while the surrounding slums will be converted into flat housings. Housings in Block K were built in 1978 and Block Bermis were built in 1988. Early Houses in Block K and Bermis were different from Block H and L. Wall material in Block K of brick (stucco wall in Block H and L) and roofing materials in Bermis of tile (tin roof in Block H and L).

IV. Analysis of Housing Adjustment in Block K and Bermis of Muara Angke

Initially there were 180 houses in Block K and 203 houses in Block Bermis. After several years, some houses were merged, two houses into one owner, so that the remaining houses are approximately 159 houses in Block K and 173 houses in Bermis. Initially all of houses were single storey houses, size of houses 24 m^2 with land area of 50 m^2 (4x 12,5 m^2) in Block K, meanwhile 21m^2 with land area of 60 m^2 (5x 12 m^2) in Block Bermis (see Fig.3).

Respondents were selected based on those who have lived more than 10 years to find their motivation why they change their houses and they have experienced flooding. Their houses were chosen as sample are the ones which have positive contribution for the occupants in terms of responding the flood. There were 35 respondents consisting of 15 respondents in block K (7 for single storey and 8 for two-storey houses) and 20 respondents in Bermis (9 for single storey, 9 for two-storey and 2 for three-storey houses).

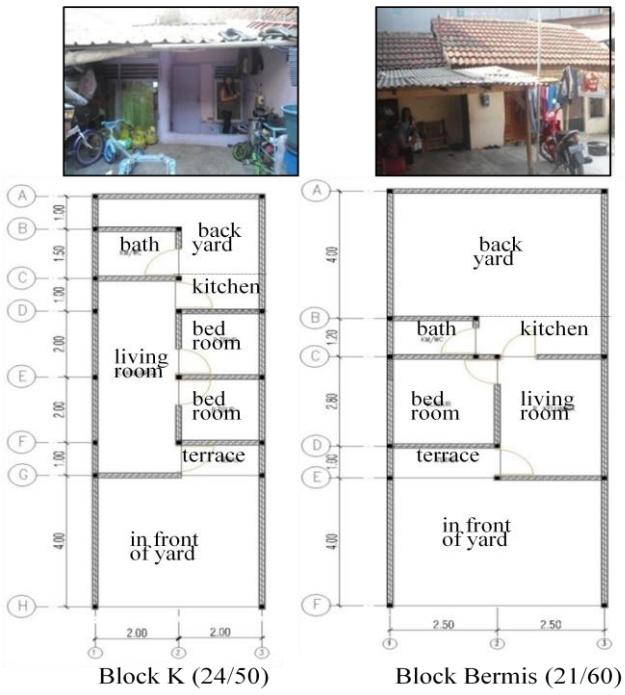


Fig. 3 . Original Floor Plan in Block K and Bermis

Source: Field Observation, 2013

All respondents said the main reason they changed the house because of flooding (100%) and they still want to stay at home despite flood. The next reason for the increase in family members, space requirements, and furnishings are not damaged, last reason for neighbors appreciated. Respondent characteristics are as follows :

- Respondent's income under 1.5 million rupiah per month (20%), 1.5-2.9 million (37.1%), 3-4.49 million (9%), 4.5-5.9 million (11,4%), above 6 million (5.7%).
- The livelihoods of respondents are fisherman (28.6%), entrepreneur (28.6%), do not have a job because they are old (21.4%), boat crews (10.7%), and port officials (10.7%).
- Heads of household are approximately 42-76 years old.
- Their educations were elementary school (60%), junior high school (14.3%), senior high school (22.9%), and baccalaureate (2.8%).
- The people come from different ethnicities, consisting of Bugis (40%), Java (31.4%), Banten (8.6%), Lampung (5.7%), Sunda (5.7%), Makassar (5.7%), and Chinese (2.8%).

4.1 Elevating Houses

a. Adjust house become two and three-storey house

The housing adjustment is done by occupants by elevating their homes to avoid flooding and they still want to stay at home despite flood. Generally they will change become two or three-storey houses if they have much money because they can live and carry out daily activities on the second floor in case of flooding.

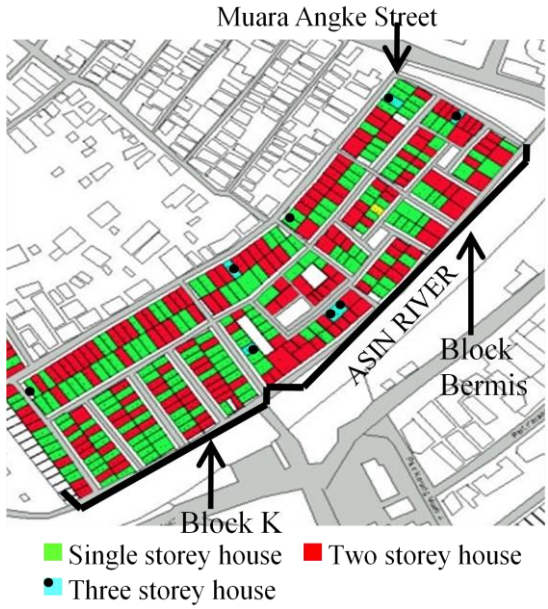


Fig. 4 . Distribution of Storey Houses in Block K and Bermis

Source: Field Observation, 2013

There are approximately 159 houses in Block K and 173 houses in Bermis; consist of single-storey houses only 52.8% in Block K and 46.8% in Bermis; meanwhile two-storey houses 47.2% in Block K and 47.9% in Bermis; 0% three-storey houses in Block K and 5% in Bermis (see **Fig.4**. and **Table 1**).

Table 1. Number of Storey House

Number of Storey House	Number of houses	
	Block K	Block Bermis
1 Storey House	84 houses – 52.8%	81 houses – 46.8%
2 Strorey House	75 houses – 47.2%	83 houses – 47.9%
3 Storey House	0 houses - 0%	9 houses - 5%

Source: Field Observation, 2013

b. Elevating floor elevation from the road level

In addition to increasing the storey of the houses, the occupants elevated the ground floor of their houses above the road, due to the government raising the roads. They had to elevate the floor elevation of their houses, so that the houses were not lower than the road to avoid flooding. The number of houses with elevating floor which is above the road level are amounted to as many as 90% in Block K (143 houses) and 85% in Bermis (147 houses), floor height details can be seen Table 2.

Meanwhile the number of houses which are under the road are 10% in Block K and 15% in Bermis, because the occupants do not have enough money to raise their houses. According to some respondents whose houses are under the road, their houses frequent seepage (water infiltrate through the floor and wall of the houses) when heavy rains.

Table 2. The Height of Ground Floor of the Houses

The height of ground floor above the road	Number of houses	
	Block K	Block Bermis
0-39 cm	67 houses – 42.1%	9 houses – 54.3%
40-79 cm	52 houses – 32.7%	39 houses –22.5%
80-119 cm	23 houses – 14.5%	13 houses -7.5%
> 120 cm	1 houses – 0.6%	1 houses – 0.6%
Ground floor under the road	16 houses - 10%	26 houses - 15%

Fig. 5 . The Height of Ground Floor Above the Road

Source: Field Observation, 2013

For houses elevated, enter to the house using a ladder and ramp for motorcycle and bicycle. Stairs leading to the terrace can be used by occupants as a place to sit and interaction with neighbours (Fig.5), because they no longer have a yard.

c. Elevating the ceiling of the houses

The ceiling of some houses are high enough. Referring to the 35 respondents, ceiling height 250 - 300 cm (17.1%), 300 - 350 cm (28.6%), 350 - 400 cm (31.4%), 400-450 cm (17.1%), 450-500 cm (5.7%). If the ceiling is high enough, the respondents would be easy to raise the floor of the house several times without having to dismantle the ceiling. All of respondents believe that they will elevate their houses in five to ten years later, because the road in front of their houses will be elevated to avoid flooding.

The high ceiling of the house is also beneficial to add coolness in the house because the temperature is hot enough in Muara Angke. Because of limited land, houses generally only have windows and vents in the front of the house, consequently fresh air coming into the house to be limited, moreover wide in front of the house only 4 meter in Block K and 5 meter in Bermis.

Commonly they use plywood ceiling, besides cheap, plywood ceiling can reduce the hot air from the roof and the noise from the sound of rain, it is also easily dismantled.

4.2. The Expansion of Houses

Building coverage ratio that was initially 48% in Bloc K and 35% in Bermis had been increased almost 100%. Limited land make residents spend all land to be built, so that there are no more yard to plant trees. According to 35 respondents, the size of houses that was originally 24 m^2 had been increased to 50 m^2 for single-storey houses and 78-200 m^2 for two-storey houses in Block K. There is a house which two plots are joined so that the size of house until 200m^2. Meanwhile in Bermis, it had been increased to 60 m^2 for single-storey houses and 120-372 m^2 for two and three-storey houses. There is a house which two plots are joined in three-storey house, the size until 372m^2.

All the rooms had been expanded (living, family, dining and kitchen). Houses which originally had 2 bedrooms in Block K and 1 bedroom in Bermis were modified to be 2-14 bed rooms. The bed rooms on the second floor can be rented by employee.

a. Single storey house

Generally single-storey house has living room, 2-3 bed rooms, kitchen, and one bath room (see **Fig.6**).

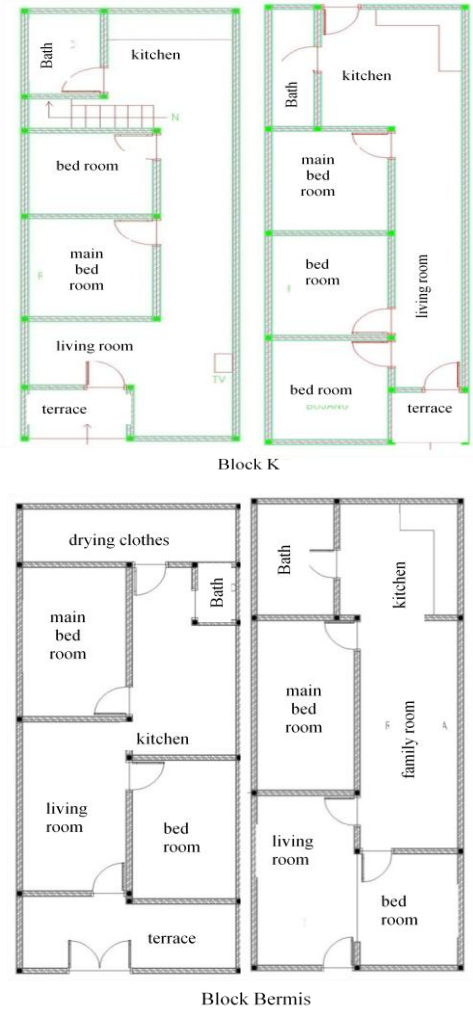


Fig.6. Models of Floor Plan in Single-Storey House
Source: Field Observation, 2014

Some houses have terrace, drying clothes in back of the house (although generally drying clothes in front of the house), and family room. Living room and family room are often merged into one room. Family members who live in the house 2-9 people. Respondents often gather in the living and family room to watch tv and chat, sometimes married children often watch tv in their bed rooms.

b. Two-storey house

Respondent's income per month is not sufficient to meet the needs of the family, let alone the many respondents who are old and not working anymore. They need the extra income. While recently a lot of restaurants and apartments are built around Muara Angke, so many employees who need the rented rooms. Therefore, several houses add economic function such as stall on the terrace and rented rooms on the second floor (see Block K in **Fig.7**). According to 35 respondents, there are 4 houses that have rented rooms of 8 two-storey houses in Block K, while 5 houses that have rented rooms of 9 two-storey houses in Bermis.

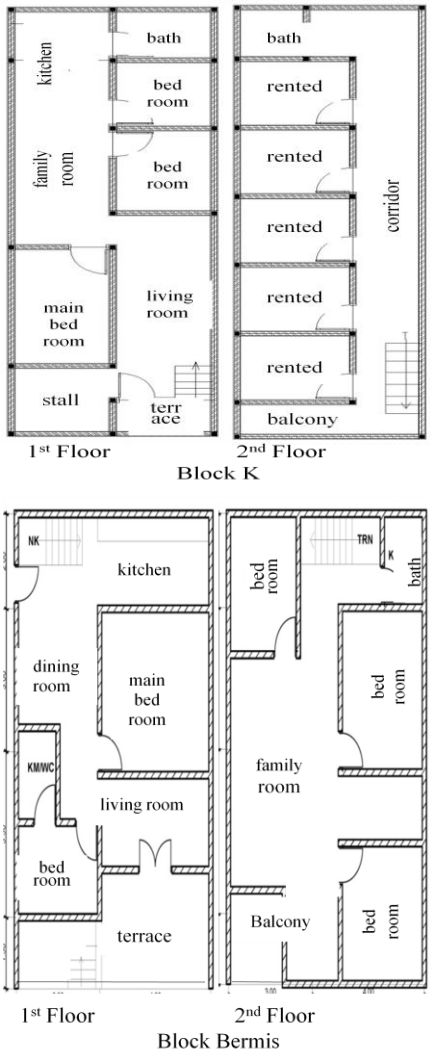


Fig.7. Models of Floor Plan in Two-Storey House
Source: Field Observation, 2014

House without economic function can be seen at Block Bermis in Fig.7, it consists of terrace, living room, two bed rooms, dining room, kitchen, and bath room in the first floor; three bed rooms, family room, bath room, and balcony in the second floor. Generally balcony is used for drying clothes.

4.3. Using Materials Easily Dismantled

Land subsidence is quite significant in Muara Angke, causing occupants elevated the ground floor for several times, even they had to dismantle the roof of the house several times. Therefore, they tend to use materials that are easily dismantled.

According to 35 respondents, there are 17 houses as two-storey and 2 houses as three-storey houses; from those storey houses, 11 houses use wood material for the second floor, 7 houses use concrete, and 1 house use steel decking. Wood material, besides cheap, it is also easy to be dismantled when the respondent would improve their houses in the future. All of the columns are made of concrete, but the beams and floor of the second floor are made of wood. All of respondents believe that they will elevate their houses in five to ten years later. This method will be cheaper than using the concrete floor, because the concrete floor should be destroyed when the house will be elevated.

Original material is zinc roof in Block K and roof tile in Bermis, while the floor of stucco in Block K and terrazzo in Bermis. Recently, respondents tend to use asbestos as roof material (65.7% of 35 respondents), besides cheap, it is also easy to be dismantled, can reduce heat of sun shine and noise of rain. They use roof tile (20%), roof tile and asbestos (5.7%), concrete (5.7%), and zinc roof (2.8%).

Respondents tend to use ceramic tile for ground floor (91.4%), besides cheap, floor becomes cooler, and it is also easy to be cleaned after the flood. The rich respondents use granite tile (5.7%), otherwise the poor respondent uses stucco floor (2.8%).

4.4. Facade Changes According to Ability and Desire

Architectural styles of the house facades are very diverse. Although located in flood prone areas, the facades of the houses reflect the economic ability of respondents, their knowledge about house design, and of course reflect the level of their social life. Low-income respondents, facades of their houses are simple, just featuring doors and windows without using architectural details. Windows and doors are useful to continue the day lighting and fresh air into the house. Middle-income respondents, facades of their houses are diverse, not only functional to carry day lighting and fresh air into the house, but consists of minimalist and modern design, using more expensive materials, therefore looks more neat and elegant.

Low-income people's image of home, house as shelter, a place that provides protection from potentially damaging or unpleasant condition, it is the most basic need in a biological sense. It is primarily for the middle class, home is a safe place, as a means for self-expression and self-realization, an effective way to reflect personal values and their image of self (Becker, 1977).

Fig.8. Facade Styles of Houses in Block K and Bermis
Source: Field Observation, 2014

House facades that respond to flooding are high form of the houses because of the high elevation of the ground floor and the ceiling. Some of the houses exposed the stairs in front of the two-storey houses. Vents are placed at the top of the window to beautify the high walls and also to enter fresh air and solar lighting into the house. Using of materials that are resistant to water, such as painted stucco wall and ceramic walls, painted frames of door and window to be resistant to water. The fences are also using painted stucco wall and painted iron so resistant to water.

V. Conclusion

Impact of the coastal flooding insists the communities to adaptive the hazards by adjusting their houses to avoid the flood. Housing adjustment as adaptation strategy for them, so that they can stay at home during the flood. They do not have to move to another place even though Muara Angke is prone to flooding. Respondents said that they are welcome to stay in Muara Angke (although prone to flooding) due to its strategic location, close to public facilities, close to downtown, easy to transport, and easy to make money.

Housing adjustments were made by respondents can be an example for other flood-prone settlements, especially fishing settlement with low and middle-income people. Several strategies for the design of

future settlements in flood-prone areas are as follows :

- Ground floor of the house should be high enough above the road level to avoid flooding.
- If possible, the house should have a second floor (two-storey house) that can be used as a place of refuge in the event of a large flood.
- The ceiling is high enough so that occupants can elevate the floor several times without having to dismantle the ceiling.
- Allows occupants to expand the house, if they need additional room and add the economic activity in the house, however they will be old and need the extra income, especially when their children come to live with them.
- Using materials easily dismantled as using wood or steel decking for the second floor.
- The building structure should be resistant to flooding such as using concrete columns, plastered brick walls, tiled floor so easy to clean it after flood.
- The facade of the house should consider openings such as door, window, vent, so that day lighting and fresh air can get into the house to reduce heat, however, the air temperature is usually quite hot in fishing settlement. House facades that respond to flooding are high form of the houses because of the high elevation of the ground floor and the ceiling.
- Houses should still have a yard to plant trees, there is strict control of the government so that the residents retain the yard as a green space to reduce flooding and increase the coolness in the environment.

References

1) Anita, J. and Harun, I.B. (2013). Raising Floor Elevation of Houses as Effort to Improve The Quality Housing in Flood Prone Settlement, Habitechno International Seminar, Bandung : ITB.
2) Becker, F.D. (1977). Housing Messages, Pennsylvania : Dowden, Hutchinson & Ross, Inc.
3) Crull S.R., Bode M.E., Morris E.W. (1991). Two Test of the Housing Adjustment Model of Residential Mobility, Journal of Housing and Society, Vol. 18, No.3, pp. 53-63.
4) Diposaptono S. (2011). A Collection of Thoughts of Disaster Mitigation and Climate Change Adaptation, Jakarta : Marine and Fisheries Ministry.
5) IRIN (2013). Climate Change : Coping Versus Adapting, a service of the UN Office for the Coordination of Humani tarian Affairs, (retrieve : http://www.irinnews.org /Report/95224), Mei, 2013
6) Iskandar, Z. (2012). Environmental Psychology : Theories dan Concepts, Bandung : PT Refika Aditama
7) Assembly Professors of ITB (2009). Managing Disaster Risk in Indonesian Maritime State, Bandung : Institut Teknologi Bandung.
8) UPT PKPP, PPI Muara Angke (2011). Profile of UPT Pengelolaan Kawasan Pelabuhan Perikanan and Pangkalan Pendaratan Ikan Muara Angke, Jakarta.

Innovations in The Temporary Housing Phase of Disaster Recovery: Wooden Temporary Housing in Japan After the 3.11 Great East Japan Earthquake and Tsunami in an International Comparative Context

Elizabeth Maly[1], Tomoko Matsushita[2]

[1]Tohoku University.
[2] University of Tokyo

Abstract

This paper considers the innovative use of wooden temporary housing in Japan after the Great East Japan Earthquake (2011) in comparison to two international examples of innovations in the temporary housing recovery phase: the temporary-to-permanent Mississippi Cottages used after Hurricane Katrina (2005) in the U.S.; and the transitional T-shelters and expandable core housing used after the Central Java Earthquake (2006) in Yogyakarta. Each of these three cases demonstrates significant innovation compared to the standard housing recovery process in the respective local context. The three cases are analyzed in the context of contemporary debates about temporary housing, including the concept of transitional housing and other concepts related to the adaptability and multi-functionality of temporary housing. The cases are also evaluated according to residents' ability to add/modify/extend the houses, which is a shared focus of these concepts. Potential application oflessons from the temporary housing innovations in the U.S. and Indonesia to to the case of wooden temporary housing Japan after the GEJE is also considered. The conclusion shows the importance of innovations in the temporary housing phase to be integrated with the overall recovery process, and considers the potential for these innovations to impact future housing policy.

Keywords: *housing, wooden housing, temporary housing, post-disaster housing reconstruction*

I. Introduction

On March 11, 2011, the magnitude 9.0 Great East Japan Earthquake struck off the northeast coast of Japan, and the massive tsunami that followed killed 18,500 people. Three years later, more than 260,000 evacuees are still receiving a variety of temporary housing assistance. After the GEJE there were new systems used for the first time to provide temporary housing to evacueeson a large scale, such as the use of private rental housing. However the role of newly built temporary housing still plays an important and established role in the post-disaster housing recovery in Japan. As an alternative to the typical pre-fabricated temporary housing units, one innovation after the GEJE is the large number of temporary housing units built with timber construction, in many cases using local materials. In Fukushima Prefecture, which has the largest number of wooden temporary housing—more than 6000 units out of 16,000 total temporary housing units in the prefecture—residents who evacuated from radiation face a longer period of displacement and uncertainty about the future of their hometowns as well as individual choices related to life recovery.

This paper considers the current example of wooden temporary housing in Japan in comparison to two other international cases of housing innovation in the transition from temporary to permanent housing recovery--the temporary-to-permanent Mississippi Cottages used after Hurricane Katrina (2005) in the U.S. and the transitional T-shelters and expandable core housing used after the Central Java Earthquake (2006) in Yogyakarta—and considers how lessons from these cases could be applied to the case of wooden temporary housing after the GEJE.

This paper considers these three cases of housing innovations in the context of current international debates about the role of temporary housing in the recovery process,including the concept of transitional housing and other concepts related to the adaptability and multi-functionality of temporary housing, such as Johnson's "second life" of temporary housing.One shared aspect of these concepts is the ability of residents to modify or reuse the house, which is considered as a key aspect with which to evaluate the three cases. One other crucial factor is the relationship of the innovative case to the overall housing recovery process, and the degree to which the case is integrated into housing recovery policy.

The long-term impact of the use of wooden temporary housing after the GEJE is unknown, but the cases from the U.S. and Indonesia may provide some suggestions for future directions.Wooden temporary housing in Japan represents a successful innovation,

Elizabeth Maly
---Tohoku University
Tel/ Fax: 022-795-4653
E-mail: maly@irides.tohoku.ac.jp

and preparations for housing recovery needs after future disasters should consider using and expanding on this program.

II. Role ofTemporary Housingin Recovery

Experts agree that there are several phases of housing recovery, which may overlap; disaster survivors will not necessarily experience each phase. Quarantelli described the phases as follows: 1) *emergency sheltering* immediately after the disaster; 2) *temporary sheltering* in the followingdays, when food and medicine are provided; 3)*temporary housing* when families can return to their daily life activities in a temporary location; andfinally 4)*permanent housing* (Quarantelli, 1995).The ultimate aim of housing recovery is for disaster survivors to regain permanent and stable housing.To provide continuity in the process through which disaster survivors try to recover their lives and reach this goal, temporary or transitional housing plays a critical role. Yet challenges of providing temporary housing after disaster have been well documented around the world and approaches have been debated for decades. The main point of contention has focused on the choice between 1-step or 2-step housing reconstruction-- whether or not to use temporary housing at all. More recently, experts and practitioners have increasingly been supporting the concept of transitional housingthat allows incremental conversion and upgrading.

2.1 One- or Two-step Housing Reconstruction

A 1-step housing reconstruction process provides permanent housing directly with no intermediate step. Davis called this this strategy "rapid reconstruction," and promoted it as a way to avoid wasting scarce resources on manufacturing prefabricated shelter of any kind of besides tents (Davis 1978). Potential advantages are financial and resource savings, and the fact the residents can theoretically be rehoused faster with fewer relocations. However, it often takes longer to plan and construct permanent housing, so residents are likely to have to endure uncomfortable emergency conditions longer. Although 1-step reconstruction only deals with permanent reconstruction, residents will likely experiencethe step between as a gap.

The 2-step housing reconstruction process has a separate temporary housing phase used for a limited time before permanent housing is available. The 2-step process aims to eliminate the gap between emergency shelter and permanent housing. On the other hand, it is expensive to pay for temporary housing that will be discarded, instead of investing in a permanent housing solution. As residents are relocated twice, there a greater chance that they will be displaced from their community.

Whereas the logic of 1 step housing recovery supports an efficient use of funding for quicker permanent housing (a long term investment), and temporary housing is expensive, an inefficient use of resources in the long term, and causes delays in housing recovery, the need for housing between emergency shelter and permanent reconstruction is difficult to avoid.

2.2. Transitional Housing Principles

In response to the debate surrounding the interim phases of housing provision after disaster, there has recently been increasing support for transitional housing with the international community of housing reconstruction practitioners. (World Bank, 2009 and Shelter Centre, 2011). The characteristics of transitional housing include the potential for the house to be:1) upgraded into part of a permanent house; (2) reused for another purpose; (3) relocated from a temporary site to a permanent location; (4) resold, to generate income for the household to support recovery; and/or (5) recycled for reconstruction. Transitional housing can include some or all of these characteristics; the essential idea behind this concept is that resources invested in transitional housing during this stage are not wasted, and that residents themselves have control over how their housing units can be modified to benefit their life recovery over the long term.

The three cases of housing innovation discussed in this paper include different aspects of transitional housing at varying degrees. Temporary-to-permanent Mississippi Cottages in the U.S. included the potential for upgrading, reuse, and relocation to a permanent location. In the case of Yogyakarta, the T-shelter is the epitome of transitional housing, including all five aspects, and the expandable core housing introduced as the start of permanent housing recovery also includes the transitional aspect of upgrading. Wooden temporary housing in Japan after the Great East Japan Earthquake includes some examples of plans for upgrading, reuse, and/or relocation, although it is not yet known to what extent these plans will be enacted.

2.3. Second Life of Temporary Housing

In "Planning for Temporary Housing," Johnson also considers the role of temporary housing in the recovery process, offering a concise analysis of the 1-step vs. 2-stem housing reconstruction debate. Johnson's conclusion is based on the need for an overall strategy for temporary housing, preferably in place before the disaster, but at the very least, based on a clear decision between one of 2 strategies:

1. In the case where permanent housing will be constructed quickly, make only minimal investment in very basic temporary structures, prioritizing most investment into permanent housing, similar to Davis's "rapid reconstruction."
2. If it will take 3 or more years before permanent housing can be built, invest in high quality temporary housing and services. (Johnson, 2009)

Similar to the conceptual framework of transitional housing, which tries to prevent wasteful investment in inflexible temporary housing, Johnson also calls for a temporary housing with a "second life"—i.e. temporary housing that can be reused or converted in the long term to benefit the residents beyond the short term temporary housing phase—which should be considered from the beginning planning stages. The"second life" uses could include:1) rental housing; 2) reuse; 3) recycling parts; 4) temporary houses as 'cores' for permanent houses; and 5) refurbishment of the units and storage for the next disaster (Johnson, 2009). Both the concepts of transitional housing and the second life include a focus on building forms that are flexible and adaptable, and support the ability of residents to reconfigure or change their houses in a variety of ways so that the structures are useful beyond the temporary housing phase.

III. Wooden temporary housing in Japan after the Great East Japan Earthquake

With a history of repeated natural disasters, reconstruction policies in Japan are based on an existing legal framework and established precedents for post-disaster housing reconstruction. The role of temporary housing is well established within the housing recovery process, and the size, design, funding, procurement, and length of use, are all specified by policy and legal regulations. Temporary housing is funded by the national government, constructed by the prefectural government, and managed by local government, who also selects beneficiaries. Most units are smaller than 30 $m^2$and officially intended for two years use, although this can be extended; after the Kobe earthquake, many people lived in temporary housing for five years. The Act for Support of Disaster Victims specifies requirements for temporary housing in terms of the size (19.8m2 - 39.6m2), duration of use (2 years) and cost (2.4 million yen), but size is the only condition that's kept; cost and duration of use tend to be extended in recent disasters. The government has issued a number of partial amendments; after the GEJE, the use limit has already been extended several times, currently until March 2015, and in Fukushima Prefecture it has already been extended until March 2016. Temporary housing is intended to fill housing needs before permanent housing is rebuilt, therefore the long time required for the large scale reconstruction means displaced residents will continue to live in temporary housing for a number of years to come.

Since the Kobe Earthquake in 1995, all 47 prefectures in Japan have signed agreements with Japan Prefabricated Construction Suppliers & Manufacturers Association (Pre-fab. Association) to provide temporary housing quickly in the case of disaster. However the massive and widespread damage after the GEJE and the need for temporary housing exceeded the ability of the pre-fab association.

Some wooden temporary housing has been builtin Iwate and Miyagi Prefectures, but the largest amount of wooden temporary housing is in Fukushima Prefecture, where even before the GEJE, there was an organization and system promoting the use of local timber. After the GEJE, Fukushima Prefecture was proactive in providing wooden temporary housing;

Table 1: Contracts for wooden temporary housing construction in Fukushima were awarded in 2 rounds

	Public Call 1	Public Call 1
Period of public call	2011.4.11 - 4.18	2011.7.12 - 7.19
Results announced	2011.4.22	2011.7.26
Number of housing units needed	4000 units	1000 units (later increased to 2,000)
Conditions for eligible applicants	1. Be able to provide more than 100 temporary housing units 2. Be able to complete and ready for moving in by the end of July 3. Have main office in Fukushima 4. Has built over 20 houses in the last 3 years	1. Be able to provide 50 units within 30 days after start of construction 2. For single applicant or JV applicant, all participating parties must have main office in Fukushima
Conditions for selection	1. Match the required specification 2. Cost should be max. 6 million yen for construction, 5.2 million yen for lease for 2DK 3. Consider using subcontractors in Fukushima 4. Consider hiring disaster-affected people as workers 5. Consider using local materials 6. Provide maintenance after residents moved in	1. Should be wood structure (including mixed structure) 2. Should be easily dismantled and relocated 3. Should consider accessibility for elderly 4. Cost should be max. 5.6 million yen for 2DK 5. Consider using subcontractors in Fukushima 6. Consider hiring disaster-affected people as workers 7. Consider using local materials 8. Provide maintenance after residents moved in
Number of applicants	27 contractors	36 contractors
Number of available units	16,226 units	13,620 units
Result of selection	12 contractors	15 contractors

when the prefab association could only build 10,000 of the 14,000 needed units, Fukushima Prefecture decided to build the remaining 4,000 (later increased to 6,000) using timber construction. Table 1 shows the two public calls for wooden temporary housing construction in Fukushima Prefecture and the results.

Figures 1-4 show various wooden temporary housing in use in Fukushima Prefecture. where residents would be displaced for longer and unknown periods because of radiation, wooden temporary housing provides a more comfortable living environment for longer-term evacuation. In another example of pre-existing promotion of local timber industry, the Mayor of Sumita Town in Iwate Prefecture organized the use of local timber materials to build small, single family detached wooden housing for residents displaced from the coastal area. In the Tohoku region of northeast Japan, there is a local carpentry tradition (called *Kessendaiku*) and a strong local timber industry, which made this kind of construction possible at a large scale.

Wooden temporary housing in Japan was implemented within the specific contextof Japan's the established national policy of temporary housing construction in this country, and the fact that regional and local systems for timber construction were in place made this project possible. In Fukushima Prefecture, the 6,500 out of 16,500 temporary housing units that were built by local builders with wood construction have the potential to be reused (recycled, relocated, etc.). So far, the project has has multiple effects: 1) help carry out reconstruction with a low cost, 2) promote use of local timber materials, 3) revitalize the housing industry, 4) reduce disposal cost, and 5) reduce industrial waste. Some of the projects include plans where multiple units could be combined, or units could be relocated for permanent use. Although the living environment in wooden temporary housing is much better than typical pre-fabricated temporary housing, the long term impact or benefit for the residents of wooden temporary housing is not yet know. Hopefully, the adaptability and potential to reuse these units will benefit residents directly.

IV. Mississippi Cottages: a housing innovation in the U.S. after Hurricane Katrina

4.1. TSA and FEMA Trailers

In the United States, "Transitional Shelter Assistance" (TSA) is provided according to the Stafford Act, the law that regulates all disaster response and recovery. TSA can include funding for house repairs, hotel rooms, or in-kind temporary housing, such as prefabricated housing units or travel trailers. The size of housing units is not specified. TSA includes the emergency phase (in Japan, the evacuation center phase) and interim housing phase (in Japan, temporary housing). Standard TSA is available for 18 months, but can be extended.

Making landfall on August 29, 2005, Hurricane Katrina caused the most damage of any disaster in U.S. history. More than 1,863 people lost their lives, more than 1 million were displaced, and 600,000 were in shelters one month later. One million housing units were damaged or destroyed, and the need for tempo-

Figure 1-4. Various examples of wooden temporary housing currently in use in Fukushima Prefecture

rary housing was unprecedented in the U.S. The Federal Emergency Management Agency (FEMA), decided to provide temporary housing in the form of travel trailers and mobile homes. There were no pre-existing agreements to procure trailers, and there were significant delays in getting trailers delivered to waiting residents. Trailers were placed on private residential lots (intended for homeowners to live in while they rebuilding) or in group lots on government property. Trailers were small, lacked cooking facilities, and were especially uncomfortable for large families. It was later discovered that the trailers were off-gassing chemicals including formaldehyde, causing serious health problems for inhabitants. FEMA's use of trailers was strongly criticized by residents, media, and policy makers because of their poor quality living environment, problems with procurement and delivery, and expense.

4.2. AHPP and MAHP

In response to widely recognized failures of FEMA's use of trailers as temporary housing after Hurricane Katrina, the Department of Housing and Urban Development (HUD), along with FEMA, introduced the Alternative Housing Pilot Project (AHPP) two years after Katrina. The AHPP had two separate goals: 1) to come up with better emergency housing that could transition into permanent housing and 2) to provide improved housing to disaster survivors still unable to find stable housing (many who were still staying in FEMA trailers) two years after Katrina. These disparate aims and the delayed timing several years into the post-disaster recovery process created unique circumstances and challenges for implementation; a similar program carried out from the beginning of a housing relief and reconstruction effort might have resulted in more successful outcomes.

The AHPP included 5 projects in 4 states; the largest was the Mississippi Alternative Housing Project (MAHP), Administered by the Mississippi Emergency Management Agency (MEMA). The MAHP included 2 unit types, the 462 square feet Park Model, a replacement for the travel trailer, and the Mississippi Cottage, which came in 2 sizes: the 812 square feet 2-bedroom unit or 924 square feet 3-bedroom unit (**figure 5**). In total, 3075 housing units were constructed using the $275.4 million grant for the Mississippi Park Model and Mississippi Cottages.

Although open to renters, in practice the program favored homeowners as land was not provided, and renters had to get an agreement from a landowner to allow placement of a cottage. From the spring of 2007 through the summer of 2008, MEMA installed the cottages on temporary piers (figure 6). At the peak, September 2008, more than 2805 households were living in the cottages as temporary housing. (Abt. 2009).

MAHP had planned that most cottages used for temporary housing would be transfers to the occupants

Figure 5. Mississippi cottage plans, including 3 designs

Figure 6. Mississippi cottage temporary installation

Figure 7. Prefabricated Cottage Expansions by Habitat for Humanity Bay Waveland (above) and stick built expansion by Habitat for Humanity Gulf Coast (below).

for permanent use and ownership. Insurance and utility costs meant that many households could not afford to own a cottage even if the cost of the cottage itself was reduced to $0. Lack of land for permanent placement was a significant obstacle as was local resistance to permanent placement. By March 2011, 1000 units (about 1/3 of the total) had been transferred to the owners, but many residents who wanted to keep their cottages were not able to do so.

Another option was the transfer of the cottages to non-profit or government affordable housing providers for reuse as rental or owned affordable housing.

Not targeted directly, survivors could still benefit from an increased supply of rental/owned affordable housing. Non-profits also struggled to accept the units (for free) due to other costs associated with their transfer. By March 2011, 451 had been transferred, and non-profit/developer partnerships have lead to the creation of several affordable rental housing developments, and creative reuse.

The remaining Cottages were sold at public auction, which was an easy and fast way for MEMA to dispose of large numbers of cottages quickly and be paid immediately. Yet each auctioned cottage at represents a loss of housing affordability, and potentially a disaster-stricken household who was living in the cottage and forced to move out.

4.3 Expansionof Mississippi Cottages

For the residents who were able to keep them permanently, the Cottages were transferred onto permanent foundations, elevated to levels keeping with local building codes. Many new owners of the Cottages created additions in the forms of decks and patios. The most significant examples of expansions were carried out by non-profits organizations: two Habitat for Humanity affiliates (figure 7). Habitat for Humanity Bay-Waveland (HfHB-W) added a custom built module 'tab,' to the cottage, increasing the square footage in line with local minimum requirements. To attach the tab, a hole was cut in the wall of the original Cottage, and both the Cottage and the tab set in place using a crane. Using this process, HfHB-W built 4 houses; 2 have been sold to homeowners. With the construction and crane rental this process proved to be more expensive than building a new house, although it might be more feasible if it was done on a larger scale.

Habitat for Humanity Mississippi Gulf Coast (HfHMGC) made stick built additions for the cottages, adding 2 rooms connected by an exterior deck to the side of the Cottage, and elevating the whole house as required. Along with 6 Cottages they have received, modified and sold to first time homebuyers, HfHMGC has also done similar additions for 2 households who already own their Cottages. The cost of these additions is similar to that of new construction, and along with the benefit of reusing the existing Cottages, the features and energy efficiency of the Cottage are improved during the modification. With the flexible way that HfHMGC is able to provide these additions for Cottages with various ownership patterns, towards the adaptation for long-term permanent housing, this flexible addition which HfHMGC is providing to cottage residents at low or no cost is a unique and significant contribution to broaden the long term benefit of the Cottages as affordable housing.

V. Housing innovations from Indonesia after the Central Java Earthquake

On May 27 2006, the Central Java Earthquake struck near Yogyakarta, Indonesia, killing 5749 people and destroying the homes of over 1,100,000. The Indonesian Government pledged aid to reconstruct 180,000 severely damaged houses through a community-based approach. There was a limited budget for temporary housing, and the government's plan focused on permanent housing. UN organizations, NGOs, and humanitarian organizations worked together to carry out a "roof first" strategy, proving at least minimum transitional shelters with roofs to protect residents from the elements, mostly made from bamboo.

5.1 T-shelters

With the 'roof first' strategy, different local, national, and international organizations and groups provided a range of transitional shelters, or T-shelters, to disaster stricken households. The various forms that the different organizations are depicted in figure 8, a typology done by Ikaputra, and published in the *Recovery Status Report: The Yogyakarta and Central Java Earthquake 2006,* compiled by the International Recovery Platform and Gadjah Mada University. These T-shelters, built of light-weight and locally-available bamboo, filled the gap for residents before permanent housing could be rebuilt, ensuring that they had a roof over their heads before the onset of rainy season. The T-shelters demonstrate all the characteristics of transitional housing outlined in section 2; residents could gradually upgrade the T-shelter to become part of a permanent house, reuse it for another purpose, or recycle the building materials and reuse them in the construction of a permanent house. Because most households had owned their home and land before the earthquake, and recovery did not require relocation, they could rebuild on their former -

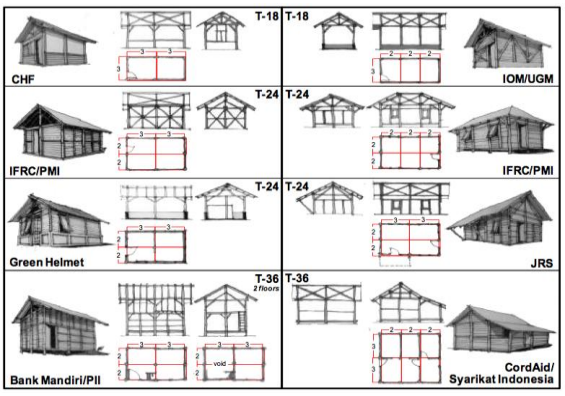


Figure 8. T-shelters used after the Central Java Earthquake. *Image: Ikaputra (2009), from Roychansyah (2009).*

housing, along with the reuse or modification of the T-shelters more feasible.

5.2 Permanent Housing Recovery

For permanent housing reconstruction, the local government decided that rather than hiring contractors, they would provide the money in cash for homeowners, distributed through community groups called POKMAS; facilitators were provided to give technical and social support to the community. Most local people already belonged to neighborhood groups before the earthquake, and have a tradition of 'gotong royong,' a way of working together to take care of a range of needs facing their communities. Community groups prioritized housing beneficiaries themselves; neighbors worked together to rebuild houses in turn. Most severe housing damage was in rural villages where people had lived in owned single-family detached houses on their own land before the earthquake. The reconstruction process could cover most disaster victims by focusing on homeowners and on-site reconstruction. The official government sponsored housing recovery program was basically complete (permanent housing reconstructed) within 2 years after the earthquake, and in many cases people were able to move into permanent housing even earlier.

5.3 Expandable Core Housing

As explained above, there were multiple aspects of the official government housing reconstruction policy and implementation that supported community and resident control over the rebuilding of their own houses. In addition, there were multiple examples of the use of an expandable core housing type of recovery housing. The core house concept, which has been used for many years in low-income housing upgrading projects, is based on the principle of providing a minimal and small, yet strong and safe house, which also supports the abilities of residents to expand this house as they wish in the future. In Yogyakarta, it was also crucial that rebuilt housing had seismic reinforcement, which was included in the core house modules. In addition, in cases were support for core house projects came from separate outside funding sources/donations, they could be combined with the official government support for housing recovery. In the case of Kasongan village, who received support for building core houses at an early stage, residents could use governmental support that arrived later to expand their houses (figures 9 and 10). Expansion of the core house relies on the availability of land as well as financial resources for building materials, and therefore the example from Yogyakarta also shows the importance of planning for these aspects from the beginning, and the potential impact of timing on the ultimate ability of residents to expand their houses. In some cases, such as the house in Kebun Agung, (**figure 11**), residents were not able to expand their house, even after several years. Although the core house is a permanent house, it incorporates the principle of transitional housing that calls for incremental upgrading, and it supports the underlying commitment to residents have control of their decision making processes for the construction/modification of their own houses.

Figure 9. Acore house in Kasongan after expansion (middle). The original core house is in front, painted a light color. The addition extends to the back, and is unfinished brick.

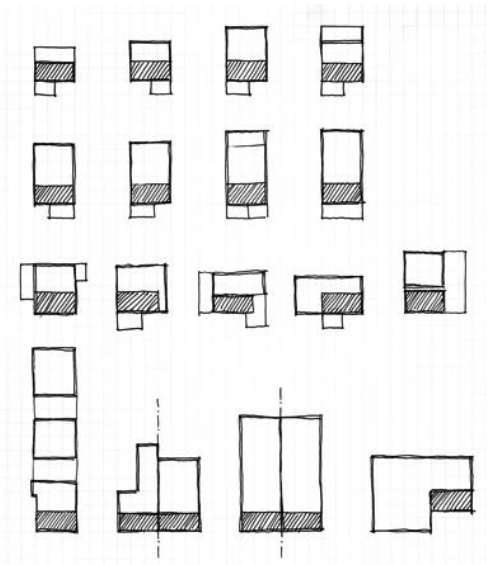


Figure 10. Diagrams of expanded core houses in Kasongan. The initial 3 by 6 meter core house is shaded.

Figure 11. A core house built in Tlogo, Kebon Agung remains in its initial unexpanded form)

Table 2: Comparisons of different aspects of the 3 international cases

	Wooden temporary housing in Japan after the Great East Japan Earthquake 2011	Temporary to Permanent Mississippi Cottage after Hurricane Katrina 2005	T-shelters in Yogyakarta after the Central Java Earthquake	Expandable Core House in Yogyakarta after the Central Java Earthquake
Material and construction method	Wooden construction, using high quality materials, compared to standard prefabricated temporary housing.	Prefabricated units	T-shelter: "roof first" strategy with lightweight bamboo structure	core house: reinforced masonry module that can be expanded
Compared to standard/ default temporary housing	Prefabricated temporary housing, usually barracks style, quality varies, often low quality and uncomfortable	Travel trailers or mobile homes used as temporary housing after Hurricane Katrina; small and uncomfortable, no kitchen, bedroom, not hurricane proof.	No temporary housing included in official government plan. T-Shelter introduced as a stop-gap measure	Core house system used to provide support to more beneficiaries, can be used to target residents left out of the office program
Livability and Comfort of Housing units (compared to the local standard, if available)	Wooden temporary houses are more comfortable for daily life, some are larger with more useable spaces. Detached units are more comfortable compared to standard barracks type of pre-fab.	Mississippi Cottages are more comfortable than travel trailers. Cottages have a full kitchen, separate bedrooms, porch. The can also be used as permanent housing, so residents don't have to move (if they can keep them for the permanent stage)	The T-shelter and core house programs, both using a combination of provision of basic structures/supplies, which could be complemented by additions/modifications chosen by the residents.	The T-shelter and core house programs, both using a combination of provision of basic structures/supplies, which could be complemented by additions/modifications chosen by the residents.
Introduced in response to what problem?	Need for more housing than the prefabricated builders could build. Need for improve over low quality prefab.	Need for a better system; need to provide another solution for people still living in trailers 2 years later.	Need for temporary housing not included in the recovery plan.	Need for more housing that included in the plan.
Promotes what benefits?	Local materials, local labor, housing industry, reduce waste	Can use the same house for temporary or permanent; movable cottage can be easier to reuse.	Local materials, system that residents can modify; accountable to residents' resources and priorities	Local materials, system that residents can modify; accountable to residents' resources and priorities
Ability of residents to expand/reuse/adapt	Wooden temporary housing may be reusable/adaptable.	Cottages have been reused in several ways (affordable rental housing, shops, affordable for-sale housing) by non-profit organizations. Some residents can expand	T-shelter is upgradeable; core house is expandable	T-shelter is upgradeable; core house is expandable

VI. Discussion: Comparisons of three cases

The three cases of post-disaster housing innovation were carried out in very different contexts in Japan, the United States, and Indonesia, respectively. In each case, a new approach to interim housing was part of an attempt to create an improved living environment for disaster survivors. Table 2 compares the different aspects and goals of each of the projects.

Each innovation was introduced in response to specific problems that were part of the standard approaches to this housing phase: low quality prefabricated housing (Japan) and trailers (the U.S.), and the challenge to provide the needed number of housing units (Japan and Indonesia). Each project promotes specific benefits for the residents or the housing program, including: the use of local materials (Japan and Indonesia); a smoother transition from temporary to permanent housing (U.S. and Indonesia). In reference to the ultimate outcomes of these housing units, important questions include: were residents able to keep them permanently or not? (US), or were residents able to expand or modify the units to match their needs (Indonesia, U.S, and Japan)?

The Mississippi Cottages were intended to improve on the standard, low quality trailers used for temporary housing at that time in the U.S. The Mississippi Cottages are prefabricated, which makes it difficult to compare their form with wooden temporary housing in Japan. However both these cases demonstrate that better living environments can be created within the constraints of the same floor area size and budget as the comparable standard temporary housing. Learning from the example of Japanese wooden temporary housing, a project like the Mississippi Cottages could increase the use of local labor and local companies. Like wooden housing in use in the Tohoku region of Japan, T-shelters in Yogyakarta used locally available materials;in the construction of both T-shelters and expandable core houses, residents could be directly involved in the building or expanding their

own houses. This is in contrast to the cases of wooden temporary housing in Japan as well as the Mississippi Cottages, where residents were not involved in decision-making or construction of the units. Although many residents would have liked to expand their Cottages, in practice this was difficult for individuals, and more success was had by organizations that reconfigured the Cottages in larger numbers.In Mississippi, residents were limited in what kind of modifications they could carry out, and it is not yet known to what extent residents in Japan may be able to modify their wooden temporary housing for potential long term use.

6.1 Local Participation/Local Materials

International guidelines for disaster recovery or international development often suggest the economic and cultural benefits of using local materials, and involving local residents in the construction process. 1However, in wealthy countries were residents are no longer in the habit of being directly involved in the building or repairs of their own homes, it is often not logical to expect that residents are able to build their own houses, or would be able to make use of a incremental system for upgrading or expansion.

In the case studies from three countries discussed in this paper, the residents of Indonesia, have the most capacity to be directly involved with the construction, customization, expansion, and upgrading of their own houses, including both the transitional T-shelters and expandable (permanent) core housing used after the Central Java Earthquake. In the case of the temporary-to-permanent Mississippi Cottages used after Hurricane Katrina in the United States, the fact that these small units were pre-fabricated limited the amount that residents could customize them. However, residents who were able to keep the cottages permanently have engaged in a number of expansions or adaptations, mostly limited to elations and deck additions. In the case of the wooden temporary housing after the GEJE, it is yet to be seen to what extent the housing units will be able to be expanded or reused by the residents in the permanent housing phases. These residents were not involved in the actual construction of their own homes, but much of the wooden temporary housing was built by local or regional firms using local timber building materials.

VII. Conclusion

The three cases of housing innovation after disasters in three countries each represent an alternative solution to standard post-disaster housing response in their respective contexts. In additional to specific improvements to living comfort and security, the comparison of three cases suggest three broad conclusions, discussed in more detail in the 3 sub-sections that follow. 1)Based on the conceptual frameworks of transitional housing principles as well as a “second life” of temporary housing, the importance ofresidents being able to expand/adapt/modify/reuse their houses. To differing degrees, and in various ways, the three cases each incorporate some level of adaptability, which contributes to the ability of the housing unit to be accountable to the needs of the residents. 2) It can be expected that innovative measures in the temporary housing phases will be most effective if they are considered holistically, in advance, and as part of the overall housing recovery process. In the three cases, the innovations were primarily ad-hoc, although they have some varying degree of interrelationship with the overall policy. 3) Towards to the goal for improving the process of housing recovery after future disasters, it is also important that innovative solutions be reflected back into recovery policy. The degree to which this has happen for the three cases vary, but hopefully can be improved upon.

7.1 Innovations vs. standard recovery local context

In the case of Japan, wooden temporary housing represents a significant improvement compared to typical pre-fabricated temporary housing. These improvements can be considered in the following categories: comfort and livability for residents; efficiency and cost or the procurement process; and other factors such as a positive impact on the local economy through the purchase of materials and/or hiring of local labor.

The Mississippi Cottages after Hurricane Katrina in the U.S. were also created as a direct response to the failures of FEMA trailers to support the temporary housing needs of disaster survivors. Like wooden temporary housing in Japan, Mississippi Cottages also represent a drastic improvement for residents’ living comfort along with increased quality of construction.

After the Central Java Earthquake, both T-shelters in the temporary phase and expandable core housing in the permanent reconstruction phase demonstrated improvements compared to the alternative; the T-shelters were introduced in response to a lack of official shelter response for this phase, and the core houses represent a method to increase seismic safety, while maximizing the number of residents who can benefit from limited funding support.

7.2 Expansion/adaption/modification

The principles of transitional housing support a smoother process for residents to pass through the phases of housing recovery, and a way for residents to have more autonomy over their own housing recovery (and through it, their life recovery). Similarly, Johnson’s concept of a“second life”of temporary housing echo these principlesand provide a framework to look at the use (and reuse) of the housing unit itself. One shared emphasis of both transitional housing principles and the second life of temporary housing includes the ability of the residents to adapt, modify, expand, or reuse their temporary housing unit.

In terms of modification and reuse, the 2 examples of the Mississippi Cottages and core houses in Yogyakarta may offer some hints for the potential to adapt/ re-use wooden temporary housing after the GEJEin the support of long term recovery. Although their design and structure do not specifically support modifications or adaptation, the Mississippi Cottages have proven to be adaptable and reusable in a variety of ways by a variety of actors, including residents, non-profits housing developers. In practice, the transition of the Cottages from temporary housing to permanent housing for disaster survivors was not as successful as hoped. However, the Cottages program demonstrates the viability of this concept, if the challenges of implementation in the local context are resolved. With the similarities in the US and Japanese governments' provision of temporary housing (for free) to disaster survivors, the transfer of temporary housing units to their residents for permanent use has the potential to significantly transform the role of wooden temporary housing in the recovery process.

In Yogyakarta, the T-Shelters and permanent core house both exemplify the ability of housing structures to be modified by their residents. After permanent housing was built, T-Shelters could have a second life as a storage space or additional living space, similar to the potential second lives that could be found for wooden temporary housing in Tohoku, Japan. For residents who could expand them successfully, core housesallow their residents to add on to these structures as they chose, when they have the resources to do so, and in some cases to combine the support from multiple sources. As a structural system that supports extension, the earthquake resistant core house is a technical solution for a way that housing can support residents' live recovery. Disaster survivors in Japan after the GEJE may be less likely to be involved in rebuilding their own houses, although there is a local carpentry tradition. Instead of multiple-phase gradual adaption, the wooden temporary housing in Japan could be modified or relocated and used for a new function, perhaps continuing to function as housing. In addition, the use of timber as a building material suggests the possibility of reuse. However, the wear over the last three years has already resulted in conditions of temporary wooden housing that many not be fit for re-use.

7.3 Temporary Housing Innovation within the Overall Reconstruction

In "Planning for Temporary Housing", Johnson also stresses the need for pre-planning in the recovery process, and that for effective use of temporary housing "*a strategy for the overall reconstruction is necessary at the outset and then planning for temporary housing can work within this strategy*" (Johnson, 2009). It is crucial to consider the 3 cases discussed in the paper in terms of the degree to which these innovative solutions were part of a comprehensive strategy for overall reconstruction. In each of these 3 cases, the innovations came from an ad-hoc process of decision-making, and lead to a one-time solution.

The implementation of wooden temporary housing on a large scale in Fukushima was possible because of pre-existing strategies to promote local timber in the prefecture. At the same time, this innovation resulted from demands that emerged *at that time* for a larger number of houses than could be provided using conventional reliance on the pre-fab association. The examples (and negative impacts) from prefabricated temporary housing that was provided en masse were well known from previous experience, such as after the 1995 Hanshin Awaji Earthquake in Kobe. However, although the use of wooden temporary housing after the GEJE incorporate some long-term concepts about re-use, expansion or conversion to permanent housing, the decision to select wooden temporary housing was not part of a pre-existing disaster response policy.

The Mississippi Cottages represent a significant improvement over the use of FEMA trailers for temporary housing for U.S. residents as well as housing providers, and a much improved solution for long term housing recovery outcomes. However, the implementation of the Cottage program, and especially the transition to permanent housing use was met with extreme local resistance and fell far short of what was expected. Part of the larger Alternative Housing Pilot Project, funded and implemented though the collaboration of FEMA and HUD, the Cottages were created 2 years into the housing recovery process. This made it much more difficult to smoothly incurporate the Cottages in a transitional housing recovery process; if the Cottages had been part of the housing recovery strategy from the beginning, they may have been more successful. In addition, the long term implementation of the AHPP was not clear to the related municipalities, especially the process for transition from temporary to permanent use.

In comparison to the examples from Japan and the U.S., the housing reconstruction examples from Yogyakarta after the Central Java earthquake demonstrate a higher level of integration with the overall housing recovery policy, even though they occurred in the context of more limited financial resources. The need for transitional T-Shelters to fill the housing gap before permanent housing could be constructed was well-understood by the local, national, and international actors involved in housing provision, many of whom who had recent experience in the housing recovery process in Aceh after the 2004 Indian Ocean Tsunami. The use of expandable core housing was also well know as part of low-income housing upgrading in Indonesia, as well as part of a established recovery strategy used in international disaster reconstruction. Both the T-shelters and expandable core housing was used to complement and compensate for gaps in the official housing recovery process.

7.4 Incorporation of Innovation into Future Policy

Along with the question about to what degree the housing innovations occurred within the overall recovery policy, it is also important to consider the reverse: to what degree could these solutions be incorporated into future recovery policy?

The five Alternative Housing Pilot Projects in the US (Cottages were 1 of these 5), were overall not very successful in demonstrating practical results, and this add-hoc pilot program has not be incorporated into standard US housing recovery policy. Several Mississippi Cottages have been used to house survivors from tornados in subsequent years, but there are no plans to repeat the program in the future.

Four years after the Central Java Earthquake, there was another disaster in the Yogyakarta area, the volcanic eruption of Mt. Merapi in 2010. Based on the lessons from the earthquake recovery, a similar reconstruction program introduced for Merapi, although it included a larger component of residential relocation. For residents who could stay on their former land, some transitional shelters were used, but for the many residents who were required to move to a less risky areas were housed in dense temporary housing barracks, or temporary bamboo houses, before moving into housing in permanent relocation site. Similar to the method of using expandable core houses after 2006, the permanent housing reconstruction in Merapi include ways to combine of official support with other sources or contribution of the residents themselves, who are also involved in the decision making and construction process. However, the use of relocation areas and restricted amout of available land means there is limited potential to expand many of these houses.

The use of temporary housing, especially at a large scale in Fukushima Prefecture demonstrates a departure from the standard process of procurement of post-disaster temporary housing through Japan's pre-fab associations. The use of wooden temporary housing has far-reaching benefits for the regional economy, benefiting local companies and support the local construction industry as well as local timber industry. Residents benefit from the improved quality of the housing and construction, better living environment, and improve house and side design. Although the long-term outcome is not yet know, wooden temporary housing has the potential to continue to support disaster survivors for many years, not only in its current role as temporary housing, but perhaps through a new form, function, or location. Through the use of wooden temporary housing after the GEJE, and the successful application of these housing units for long term sustainable use, Japan has an opportunity to both improve the lives of the disaster survivors who are currently living in evacuation, and also to create a precedent for a higher standard of temporary housing for future disasters.

References

1) Abt Associates. 2009a. "Assessing Quality of Life in the Mississippi Cottage: Interim Report on FEMA's Alternative Housing Pilot Program." Washington, DC: Department of Housing and Urban Development and Federal Emergency Management Agency.
2) Abt Associates Inc. and Amy Jones Associates Inc. 2009b. Developing a More Viable Disaster Housing Unit: A Case Study of the Mississippi Alternative Housing Program. Washington, DC: Department of Housing and Urban Development and Federal Emergency Management Agency.
3) ALNAP. 2010. Case Study No. 5: Transitional Shelter: understanding shelter from the emergency through reconstruction and beyond. ALNAP.
4) Corsellis T. and Vitale, A. 2005. Transitional Settlement: Displaced Populations in 2005, Cambridge: Oxfam.
5) Davis, I. 1978. *Shelter after Disaster.* Oxford: Oxford Polytechnic Press.
6) Geipel, R., 1982. *Disasters and reconstruction: the Fruilli (Italy) Earthquakes of 1976.* London,; George Allen and Unwin.
7) IFRC, UN-HABITAT and UNHCR. 2012. *Shelter Projects 2010*. Geneva: IFRC, UN-HABITAT and UNHCR.
8) Evans-Cowley, J. and Kitchen, J. 2011."Planning for Temporary-to-Permanent Housing Solution in Post Katrina Mississippi: The Story of the Mississippi Cottage." International Journal of Mass Emergencies and Disasters. 29(2).
9) Evans-Cowley, J., and Canter, A, 2011. "Hurricanes, Oil Spills, and Discrimination, Oh My: The Story of the Mississippi Cottage." Environmental Law Reporter. 41(2).
10) Ikaputra, 2008 "Core House: A Structural Expandability for Living: Study Case of Yogyakarta Post Earthquake 2006." Dimensi Teknik Arsitektur vol. 1. no. 1. July 2008: 10-19. 2008.
11) Ikaputra 2009. Shelter Post Yogyakarta Earthquake 2006: Design Typology and Its Implementation. Jurnal Arsitektur dan Perencanaan, III, 2
12) Roychansyah, Muhammad Sani, 2009."Role of Shelter in the Recovery Process," in International Recovery Platform, with Gadjah Mada University, 2009. Recovery Status Report: The Yogyakarta and Central Java Earthquake 2006, p., 9.
13) International Recovery Platform and Gadjah Mada University, 2009. Recovery Status Report: The Yogyakarta and Central Java Earthquake 2006, p. 5, 9, 11.
14) Jha, Abhas K. 2010. *Safer Homes, Stronger Communities: A Handbook for Reconstructing After Natural Disasters.*Washington D.C.: World Bank.
15) Johnson, C. 2009. Planning for temporary housing. In: G. Lizarralde, C. Johnson and C. Davidson (eds): *Rebuilding after disasters. From emergency to sustainability*. (pp 70-87) London: Taylor and Francis.
16) Miller, Michelle (2014) "Decentralized Disaster Governance: A Case for Hope from Mount Merapi in Indonesia?" Jan 12. 2014. available at: http://blog.nus.edu.sg/ariurban/2014/01/29/decentralized-disaster-governance-a-case-for-hope-from-mount-merapi-in-indonesia/
17) Quarantelli, E.L. (1995). Patterns of shelter and housing in US disasters. *Disaster Prevention and Management,* 4 (3) 43-53.
18) Shelter Centre, 2011. "Transitional Housing Guidelines." Shelter Center: Geneva.

Inhabitants Adaptation in Drought Area Desa Seriwe, Kabupaten Lombok Timur

Mayang Rahmi Novita Sari[1]; Agam Marsoyo[2]; Yori Herwangi[3]

Postgraduate Student of Universitas Gadjah Mada, Yogyakarta, Indonesia[1]
Lecturer of Universitas Gadjah Mada, Yogyakarta, Indonesia[2]
Lecturer of Universitas Gadjah Mada, Yogyakarta, Indonesia[3]

Abstract
This study focusses on the inhabitants adaptation to overcome the difficulties caused by drought. The inhabitants of Desa Seriwe, Kecamatan Jerowaru indicate the success of adaptation to drought performed within the arena of adaptation without displacement or withdrawal. The objective of this study are to find the adaptation strategies performed by the inhabitants. The research findings are called upon to provide input to the related government policies in handling the difficulties of drought. This research approach is qualitative with a single case study method. This research finds two concepts of adaptation.

Keywords: adaptation, drought, inhabitants.

1. Introduction

The economy of Kabupaten Lombok Timur rested on the primary sector, especially agriculture. Agriculture is the most sector contributed to GDP (constant). That is 34% of GDP and 1,5 of LQ index (BPS Lombok Timur, 2011). Meanwhile, some areas in this district affected by drought. The difference of natural resources, including water resources, especially in areas that rely heavily on the agricultural sector can lead to the disparity of regional development (Hirschman, 1970; Hoover in Friedman and Alonso, 1964; Rustiadi, *et al*, 2009; Muta'ali, 2011; Sjafrizal, 2012).

Drought conditions in Lombok Timur, which is also exacerbated by climate change, are particularly vulnerable to the life of local people. Climate change is caused by greenhouse gas emissions that are mostly generated by industrialized countries (IPCC, 2007). Ironically, the worst affected are the poor and developing countries. That is due to most of the people in developing countries live in rural areas and rely heavily on the primary sector. Various policies have been taken by many countries in the world to deal with climate change. However, most of the planning and policies to deal with climate change is still using a top down approach. It is rare that pays attention to people's experiences on climate change and how they overcome them. While according to Crate & Nuttal (2009), through an understanding of the risks, local knowledge, innovation, and adaptation practices performed by the local people, are actually tucked into the potential of local people to deal with the problem, including to drought and climate change.

Kabupaten Lombok Timur suffers the disparity of regional development, but not caused by the drought conditions (Sari, 2013). It implies that not all regions suffering drought lagger than other regions. One of the conditions is occurred in Kecamatan Jerowaru. Kecamatan Jerowaru experiences the most severe drought compared to other regions, but in the analysis of the regional economic typology, this district is not left behind in other regions. This condition indicates that there are adaptation efforts performed by inhabitants of the Kecamatan Jerowaru to the drought conditions. One of the most arid village in the district is Desa Seriwe. Located on the coast and not have a ground water basin caused the inhabitants are not just suffering in agriculture but also in meeting their daily water needs. However, the number of inhabitants in this village is increasing from time to time. That indicates the existence of adaptations performed by inhabitants. Adaptation itself is an important effort related to the completion of the problem through a bottom-up approach.

* Contact Author: Mayang Rahmi Novita Sari, Postgraduate Student of Universitas Gadjah Mada, Yogyakarta, Indonesia
Tel: +6281916644377
e-mail: mayang_ranosa@yahoo.co.id

According to the background stated, this study is carried out to answer the questions: 1) How do the adaptations performed by inhabitants in areas/regions suffering drought?; 2) From the depiction of adaptations performed, why adaptation was performed like that?

The research findings are expected to provide input to the related government policies in dealing with the drought in particular and the impact of climate change in general. The policies are expected to be in line with the adaptation of the local people which is built from indigenous knowledge, so that the output and outcome obtained would be maximal.

The remainder of the article is structured as follows: First, it reviews the extent literature relevant to adaptation. Then research methodology and data analysis techniques are presented. Next, findings are discussed and summarized.

2. Relevant Literature

2.1 Adaptation

Summarized of Berry (1976), Bell, *et al* (2001), IPCC (2007), Fishers in Halim *et al* (2008), and Taylor *et al* (2010) that adaptation is an adjustment effort to the stimulus to reduce the incompatibility between individuals / groups with stimuli that interfere, that is a change of environment. Adaptation is oriented in long-term, in contrast to the response (coping) which is short-term oriented. The term of adaptation and adjustment is also often used to be replaced for one another. According to Bell, *et al* (2001), adaptation is an attempt to change the response or responses to stimuli, whereas adjustment is an attempt to change the stimulus itself, or can be seen as a mechanism to change the environment. In this study, the adaptation is also incorporated with the adjustment.

The adaptation is carried out through adaptation strategies. According to Berry (1976), Bintarto (1989), and Sarwono in Widyastuti (2002), three forms of adaptation strategies are behavioral adjustment, physical adjustment, and withdrawal.

2.2 Drought

Drought occurs when an area/region do not have the ability to meet their water needs, that is for population and cultivated activities (Muta'ali, 2012). It is obtained by considering the availability of water resources and the water needs.

Based on the causes and impacts, drought can be classified into drought occured naturally and caused by human activities (Adi, 2011). Drought condition that occurred in this case is a natural drought. The natural drought is linked to meteorological drought (precipitation) and hydrological drought (the availability of surface water and ground water). Both forms of the drought led to the difficulties in the agriculture and daily water supply.

3. Methodology

3.1 Research Approach

This research approach is qualitative. The study of inhabitants of adaptation to drought in Desa Seriwe is basically a case study. Stated as a single case study because of the uniqueness that took place in this case. Desa Seriwe is the driest area in Kecamatan Jerowaru. However, based on the grand tour and interview, known that the population number of this village was increasingly growing due to in-migration. That indicates the existence of adaptations performed by inhabitants to drought.

3.2 The Unit of Analysis, Observation, and Information Collection

The unit of analysis of this research is inhabitants adaptation of Desa Seriwe, Kecamatan Jerowaru to drought. The unit of observation is Desa Seriwe's inhabitants. The unit of information collection is the household or family.

3.3 Data Collection Method

This study collected primary and secondary data. The primary data are obtained from interviews and direct observation. While, the secondary data is obtained from the documentation and archival documents. The interviews took 30 (thirty) informants by purposive and snowball. Informant selection criteria are: a) inhabitants who have lived at least 10 (ten) years in the Desa Seriwe; b) the head of the family (husband or wife) with a minimum age of 25 (twenty five) years old. Moreover, information was also completed by key informants as many as eight (8) persons, consisting of 1) employee of Kecamatan Jerowaru; 2) Head of Desa Seriwe; 3) Head of BPD Desa Seriwe; 4) local community leaders (3 persons); 5) Head of water observers of Kokok Gambir; and 6) the Director of PDAM Kabupaten Lombok Timur.

Types of observations carried out in this study is a non participatory observation. Observations of this research were conducted in 2 (two) phases. The first stage is the grand tour covering all the Kecamatan Jerowaru. The result of the grand tour is determining a more focused study location and Desa Seriwe chosen. The second stage is a more specific observation on Desa Seriwe.

In this study, secondary data (document) used is the Sasak calendar used as a local measure of the changing seasons. Archive document used is the statistics data of BPS Kabupaten Lombok Timur, new paddy fields program data from the Dinas Pertanian Kabupaten Lombok Timur, the data of ponds from Balai Wilayah Sungai I Provinsi NTB, and administrative/thematic map from the Dinas PU Kabupaten Lombok Timur.

3.4 Analyze Method

Analysis method of this study is the pattern matching technique by combining some general analysis strategies, such as based on theoretical propositions and building descriptions. In that technique of analysis, conducted 3 (three) stages of pattern formations, namely coding, categorization, and conceptualization.

4. Results

4.1 Adaptation Strategies

Based on predetermined limits of this study, the inhabitants adaptation strategies are related to the agricultural sector and the daily water needs. From the study results were also found other forms of strategies that performed by the inhabitants which are not directly related to adaptation in solving 2 (two) main problems related to agriculture and daily water needs.

Inhabitants adaptation strategies in this study related to the agricultural sector are water harvesting through private ponds, water harvesting through the public ponds, and the adjustment of cropping patterns. Inhabitants adaptation strategies related to the daily water needs are water harvesting through private ponds, water harvesting through the public ponds, water harvesting through basin, and the adjustment of water fulfillment based on the season. The categories of adaptation strategies are formed from units of information derived from the interview. Figure 2 is a summary of the categorization of each of the inhabitants adaptation strategy (Fig. 2).

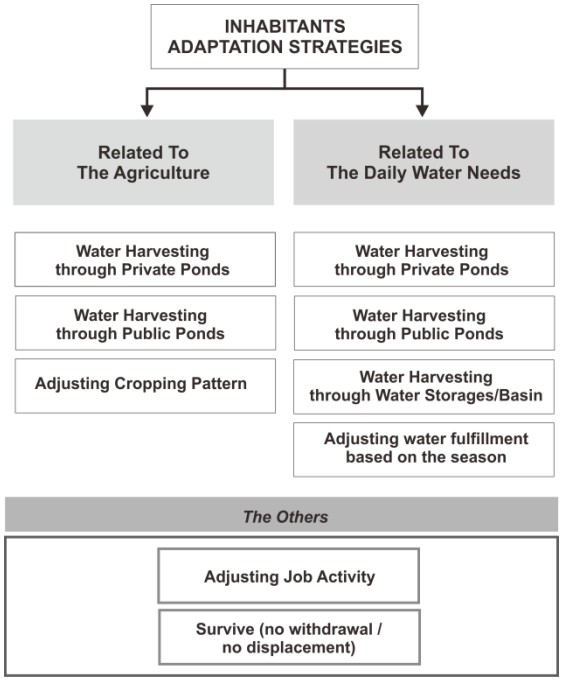


Fig. 1. The Research Findings of Inhabitants Adaptation Strategy to Drought at Desa Seriwe, Kecamatan Jerowaru (Source : Sari, 2014)

Private ponds and public ponds have an important role in overcoming the two main interests and difficulties, namely the agricultural sector and the daily water needs. The number of private ponds in Kecamatan Jerowaru reached 1097 units scattered in 15 (fifteen) village (Balai Wilayah Sungai I Provinsi NTB, 2011). The extents average of puddle of private ponds is 0.55 ha and the extents average of irrigation area is 1.78 ha. The number of private ponds at Desa Seriwe reached 68 units. Public pondss located at Kecamatan Jerowaru are 4 (four) units. One of them, namely Embung Temodo, is located in Desa Seriwe. Utilizing of private ponds and public ponds by the people is not restricted to the administrative boundaries of the village, but inter of villages. The following is data and public ponds distribution maps (Table 1 and Fig. 3).

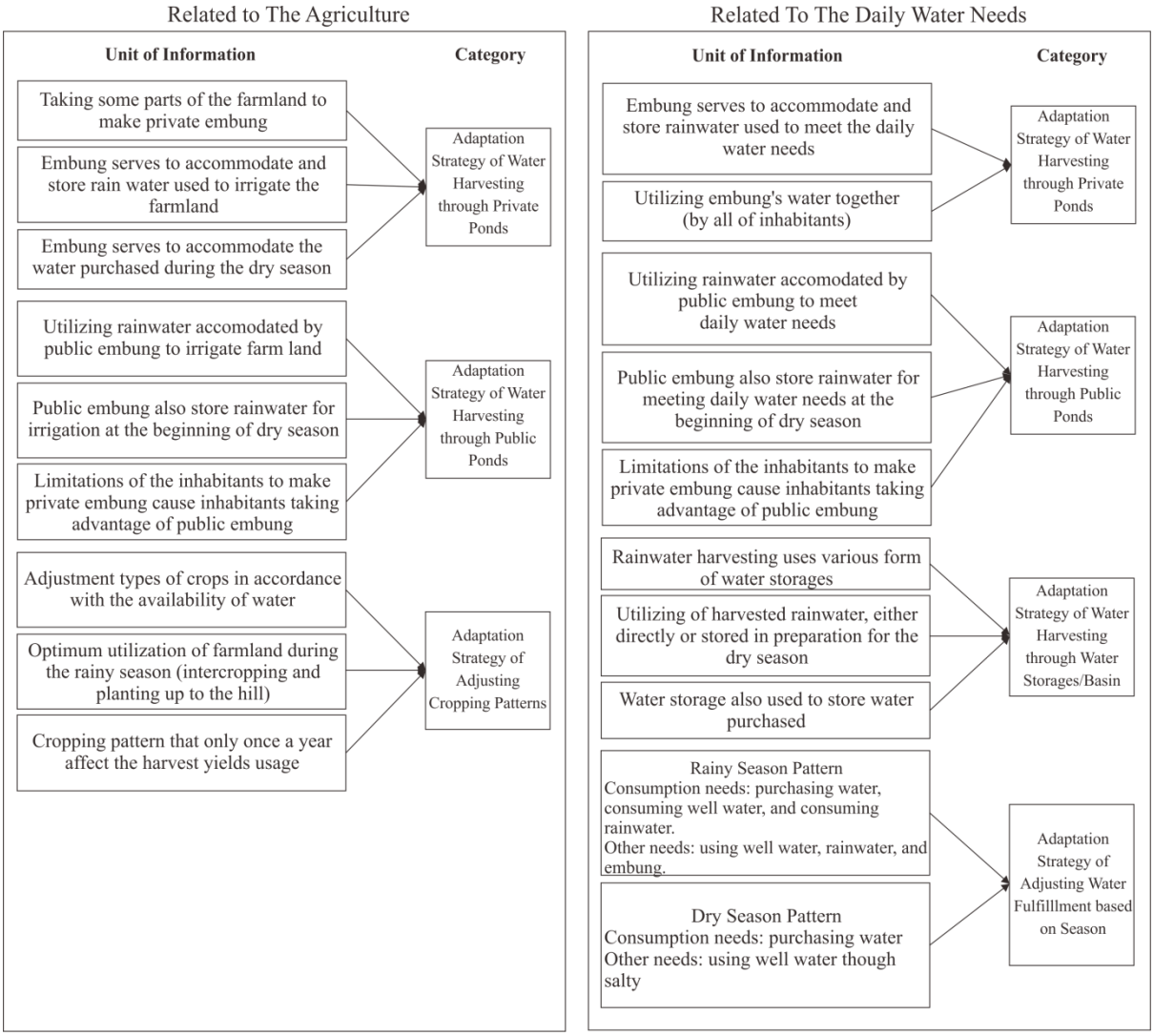


Fig. 2. Categorization of Adaptation Strategies Related To The Agriculture and Daily Water Needs
(Source : Sari, 2014)

Table 1. Data of Public Ponds at Kecamatan Jerowaru

No.	Name of Ponds	Location (Desa)	DAS	Built Year	Extents of Puddle (ha)	Volume (m3)	Type of Construction
1	Embung Jerowaru	Jerowaru	Rere	1999	1.5	100.000	River Stones
2	Embung Temodo	Seriwe	Pemongkong	1995	11.53	285.160	The heap of soil
3	Embung Kwang Rundun	Kwang Rundun	Pemongkong	1998	2	78.000	The heap of soil
4	Embung Ujung Gol	Pemongkong	Pemongkong	2007	5.5	66.907	The heap of soil

(Source : Balai Wilayah Sungai I Provinsi NTB, 2011)

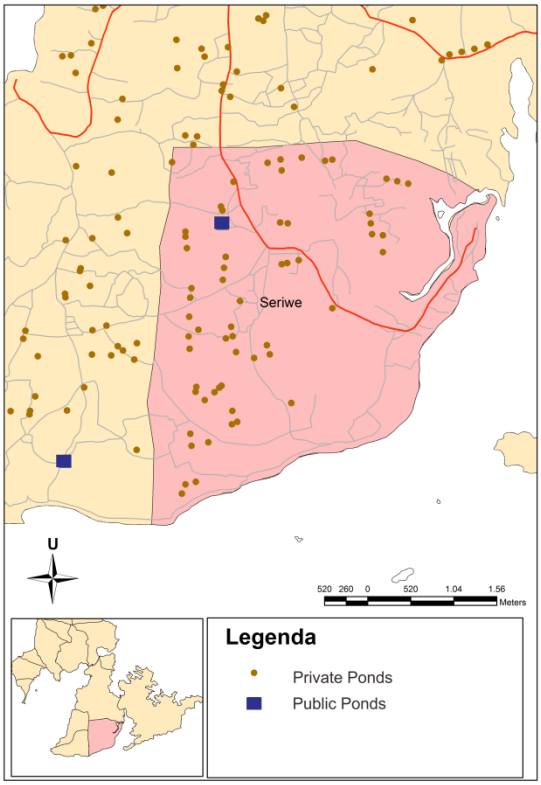


Fig. 3. Maps of Private and Public Ponds Distribution
(Source : Balai Wilayah Sungai I Provinsi NTB, 2011)

This study found that beside the adaptation strategies that have been described above, namely for the agricultural sector and daily water needs, inhabitants also perform other strategies that are not directly support the fulfillment of these two main interests. Other strategies are the job adjustment strategy and survival strategy (no withdrawal or no displacement). The job adjustment strategy helps the inhabitants to maintain revenue sources supporting the adaptation related to agriculture sector and daily water needs, such as manufacturing private ponds, manufacturing water storages/basin, and purchasing water. Survival strategies (no withdrawal or no displacement) also help and facilitate inhabitants in performing adaptations because they have reduced the assessment of the existing difficulties. It is easier for the inhabitants to perform the adaptation related to the interests of agriculture and daily water needs. The following is categorization of the two forms of the strategies described above (Fig. 4).

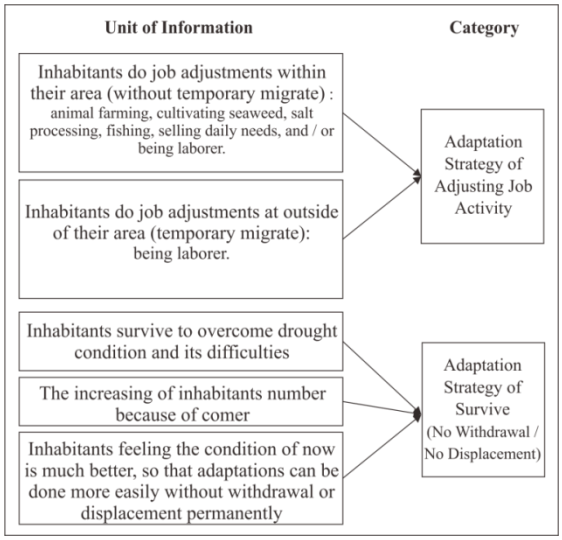


Fig. 4. Categorization of The Adjustment Job Activity Strategy and Survival Strategy (No Withdrawal / No Displacement)
(Source : Sari, 2014)

4.2 Research Findings

4.2.1 The Concept of Adaptation Strategies

In a further analysis, seven categories of adaptation strategies desribed above were forming two concept of adaptation strategies. Both concepts are divided based on scope of influence and type of action.

4.2.1.1 Adaptation based on Scope of Influence

The concept of adaptations based on the scope of influence consists of the direct adaptation and indirect adaptation. The concept of adaptation based on the scope of influence refers to the time range of the impact of adaptations that are felt and the target range of adaptation strategies that are affected. Direct adaptation is adaptation that performed to overcome the difficulties of drought directly or immediately and handling the nearest difficulties, which are related to the agriculture and daily water needs. The concept of direct adaptation is shaped by some of adaptation strategies that are water harvesting through private ponds, water harvesting through public ponds, adjusting cropping patterns, water harvesting through water storages/basin, and adjusting of water fulfillment based on season.

Indirect adaptation is adaptation that performed to overcome the difficulties of drought when the impact felt delayed or indirect and not handling the nearest difficulties. The concept of indirect adaptation is shaped by the job adjustment strategy and survival strategy (no withdrawal or

no displacement). The following is the conceptualization of adaptation strategies based on scope of influence.

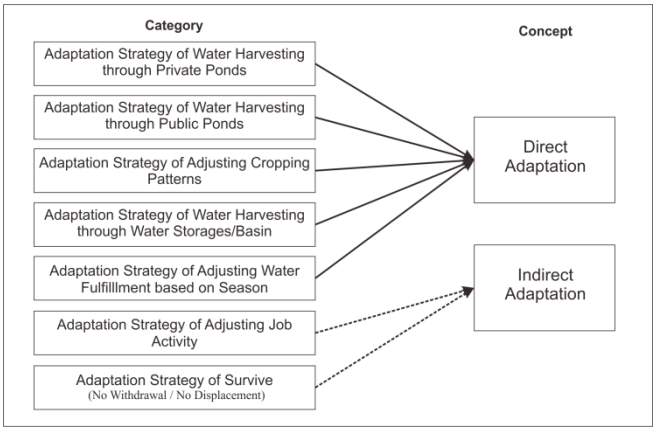


Fig. 5. Conceptualization of Adaptation Strategies based on Scope of Influence
(Source : Sari, 2014)

4.2.1.2 Adaptation based on Type of Action

The concept of adaptation based on the type of action consists of active adaptation and passive adaptation. Active adaptation is adaptation that performed by the inhabitants actively, intentionally, and planned to overcome the difficulties caused by drought. Active adaptation concept is formed by two sub-concepts of adaptation, that are behavioral adjustment and physical adjustment adaptation strategies. Behavioral adjustment adaptation strategies are formed by some adaptation strategies, that are adjustment of cropping pattern, adjustment of water fulfillment based on season, and adjustment of job activities. Physical adjustment adaptation strategies are formed by some strategies that are water harvesting through private ponds, public ponds, and water storages/basin.

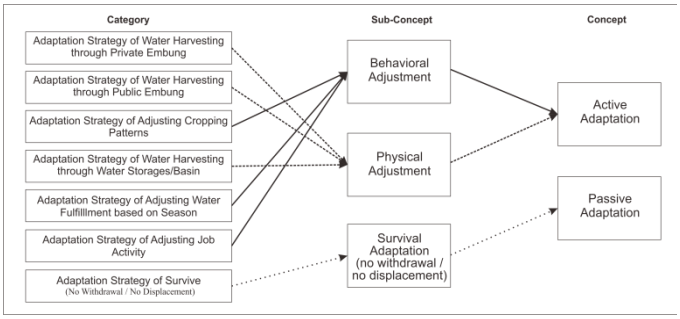


Fig. 6. Conceptualization of Adaptation Strategies based on Type of Action
(Source : Sari, 2014)

Passive adaptation is adaptation that not planned or occurring automatically in the life system, but be a part of the adaptation. Passive adaptation is formed by survival adaptation (no withdrawal / no displacement) as sub concept and also adaptation category. The following is conceptualization of adaptation strategies based on the type of action.

4.2.2 The Position of Research Findings in Theory of Adaptation

The research findings are related with the adaptation theory, especially the concept of adaptation strategies. Pelling (2011) proposes the concept of adaptation strategies based on the time range and the target range of adaptation strategies. The concept of adaptation strategies based on scope of influence found in this study summarizes the two concepts of Pelling. The scope of influence in this study refers to the time range of impact of adaptations and the target range of adaptation strategies. So, direct adaptation found in this study has relevance to immediate and proximate adaptation revealed by Pelling (2011). Indirect adaptation has relevance to delay and intermediate adaptation.

Based on the type of action, Carter, *et al* (1994) and Smith, *et al* (2003) divides adaptation into 2 (two) concepts, namely the active adaptation and passive adaptation. The findings of this study to be part of the adaptation concept revealed by them. Carter, *et al* (1994) and Smith, *et al* (2003) did not reveal the categories of adaptation strategies for forming the active and passive adaptation. The results of this study give detail on the categories which is forming the concept of adaptation strategies based on the type of adaptation. Active adaptation concept is formed by two sub-concepts of adaptation. That are behavioral adjustment and physical adjustment adaptation strategies. Behavioral adjustment adaptation strategies are formed by some adaptation strategies, that are adjustment of cropping pattern, adjustment of water fulfillment based on season, and adjustment of job activities. Physical adjustment adaptation strategies are formed by some strategies that are water harvesting through private ponds, public ponds, and water storages/basin. Passive adaptation is formed by survival adaptation (no withdrawal / no displacement) strategy. This study result found no displacement adaptation moving to outside of arena adaptation. More details can be seen in Figure 7.

5. Conclusion

Based on the analysis of research findings of inhabitants adaptation strategy to drought at Desa Seriwe, Kecamatan Jerowaru, we can conclude 3 (three) things. First, direct and indirect adaptation found in this study are adaptations formed by the scope of influence, both the time range of the impact of adaptations and the target range of adaptation strategies. Indirect adaptation is an effort to support a direct adaptation to overcome the difficulties caused by the drought.

Second, active and passive adaptation are adaptation formed based on the type of action. Both adaptations are performed within the adaptation arena. Adaptation of the inhabitants that is successful within the adaptation arena will not bring the option to exit or move from the arena of adaptation.

Third, the forms of inhabitants adaptation strategies could potentially be one of the inputs for the the bottom-up development approach.

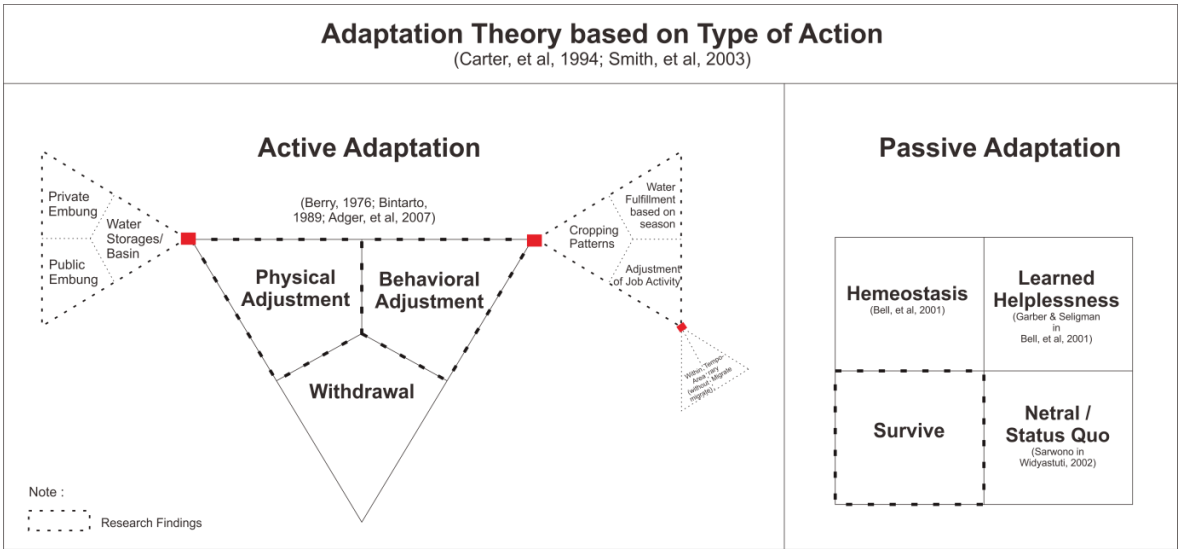


Fig. 7. The Position of Research Findings of Adaptation Strategies based on Type of Action in Theory of Adaptation
(Source : Sari, 2014)

References

1) Adger, W.N.; Agrawala, S.; Mirza, M.M.Q; Conde, C.; O'brien, K.; Pulhin, J.; Pulwarty, R.; Smit, B.; Takahashi, K. (2007). Assessment of adaptation practices, options, constraints and capacity. dalam M.L. Parry; O.F. Canziani; J.P. Palutikof; P.J. Van Der Linden; C.E. Hanson (Eds.) *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge, Cambridge University Press.
2) Adi, H. P. (2011). Kondisi dan Konsep Penanggulangan Bencana Kekeringan di Jawa Tengah. *Seminar Nasional Mitigasi dan Ketahanan Bencana*. Semarang, Universitas Sultan Agung.
3) Badan Pusat Statistik Kabupaten Lombok Timur. (2011-2012). *Kabupaten Lombok Timur Dalam Angka 2011/2012 dan 2012/2013,* Selong, BPS Kabupaten Lombok Timur.
4) Balai Wilayah Sungai I Provinsi Nusa Tenggara Barat. (2011). Data Ponds Rakyat dan Ponds Pemerintah. Mataram, BWS I Provinsi NTB.
5) Bell, P. A; Greene, T. C; Fisher, Jeffrey D; Baum, Andrew. (2001). *Environmental Pshycology (Fifth Edition),* Fort Worth, Harcourt College Publishers.
6) Berry, J. (1976). *Human Ecology and Cognitive Style,* New York, Sage Publications.
7) Bintarto. (1989). *Interaksi Desa-Kota dan Permasalahannya,* Jakarta, Ghalia Indonesia
8) Carter, T.P; Marry, M.L; Harasawa, H; Nishioka, N. (1994). IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations, London : University College London Press.
9) Crate & Nuttal. (2009). *Anthropology and Climate Change,* California, Left Coast Press, Inc.
10) Friedmann, J., & Alonso, W. (1964). *Regional Development and Planning.* United States of America: The M.I.T Press.
11) Halim, D. K. (2008) *Psikologi Lingkungan Perkotaan,* Jakarta, PT Bumi Aksara.
12) Hirschman, A. O. (1970). *Strategi Pembangunan Ekonomi.* Jakarta: Dian Rakyat.
13) IISD. (2007). Community Based Adaptation to Climate Change. *Second International Workshop on Community Based Adaptation to Climate Change.* IISD (International Institute for Sustainable Development).
14) IPCC. (2007). *Climate Change 2007: Impacts, Adaptation, and Vulnerability* Cambridge, Cambridge University Press.

15) Lang, J. (2007). Functionalism. dalam Carmona, M. T., S (Ed.) *Urban Design Reader*. Oxford, Elsevier and Architectural Press.
16) Muta'ali, L. (2012). *Daya Dukung Lingkungan untuk Perencanaan Pengembangan Wilayah*, Yogyakarta, Badan Penerbit Fakultas Geografi UGM.
17) Pelling, M. (2011). *Adaptation to Climate Change : From Resilience to Transformation*, London & New York, Routledge.
18) Rustiadi, E., Saefulhakim, S., & Panuju, D. R. (2009). *Perencanaan dan Pengembangan Wilayah.* Jakarta: Crestpent Press dan Yayasan Obor Indonesia.
19) Sari, M. R. N (2013) *Pengaruh Kekeringan terhadap Disparitas Wilayah di Kabupaten Lombok Timur.* Jurusan Teknik Arsitektur dan Perencanaan. Yogyakarta, Universitas Gadjah Mada. (tidak dipublikasikan)
20) Smith, Joel. B; Klein, Richard J T; Huq, Saleemul (Eds). (2003). Climate Change, Adaptive Capacity, and Development. London : Imperial College Press.
21) Taylor, A; Harris, K; Ehrhart, C. (2010). *Adaptation Key Terms*. London, Tiempo
22) Widyastuti, S. (2002). *Strategi Adaptasi Penghuni Guna Mengatasi Genangan Banjir pada Tempat Tinggal di Kawasan Perumahan Kota Surabaya*. Magister Perencanaan Kota dan Daerah. Yogyakarta, Universitas Gadjah Mada. (tidak dipublikasikan)

Post-Disaster Housing Choices and Limitation According to Resident's Ownership Status: Indian Ocean Tsunami 2004 Thailand, Namkem Community.

Titaya Sararit[1], Elizabeth Maly, Tamiyo Kondo

[1] Researcher, Graduate School of Engineering, Department of Architecture, Kobe University, Japan

Abstract

This study aims to evaluate resident's satisfaction with post-disaster housing projects in Namkem community, Phang Nga province, Thailand after 9 years of the Indian Ocean Tsunami 2004. These results are based on 115 questionnaires surveys conducted in Namkem village ,The study categorized residents from the background of house-ownership in 3 types: 1) land and house owner 2) rental house3) low-income rental room (illegal). Even if the government try to provide house for tsunami effected residents but still have problem that the backgrounds of house ownership are limit resident's choices for reaching new house .For example if resident have land right they can have up to 3 choices 1)Provided house on former land 2) Provide house in new land (non-tsunami-risk area) 3).Self-built house on former land with money support from government.Incontrast for the "low-income rental illegal room" they only have 1 choice to be participate in self-built housing project and land sharing. The limits choices relate to level of residents participation in housing recovery and also relate to satisfaction of residents in new housing recovery projects.

Keywords: *housing recovery,Indian ocean tsunami 2004,Resident's choice*

I. Introduction

After Tsunami strike to the Andaman coast the emergency situation started. Thai national government activated the existing "Civil defense emergency" system. The Prime Minister of Thailand commanded directly to 6 Keys/ministry to set up the Tsunami committee: (1) Ministry of Interior (2) Ministry of Health (3) Ministry of Foreigner Affaire (4) DDPM (Department of Disaster Prevention and Mitigation) (5) Thai Military force (6) Ministry of Social Development and Human Security. The priority was search, rescue, identify-bodies and sheltering for displaced. UN and international organizations also played an important role of providing support in recovery phases for housing, children and also supported economic recovery in the affected areas Many NGOs from all over the country and international NGOs donated for tsunami effected residents.

II. Namkem community

Location: The flat sand soil land, the beach locate along the west side and have shore-forest. This area used to be mine for lead mineral.

Titaya Sararit
---Researcher, Kobe University
Tel: +8180-3130-2529
E-mailTitayas@hotmail.com

North : Kao-kor Sub district/Thakua pha District
South : Village no.3 "Baan Bang Lud/Baan muang
East : Village No.4 Baan Bang Muang
West : Andaman Sea.

The community "Namkem" can be groups in to 2 Types:

1. Community lives near by the beach.
2. Community live in Shore forest

After Tsunami hit on 26 December 2004 at 10:00 am the water attack to Namkem community, many people lost their family member and their house. Villagers and Tourists evacuated to the nearest hospital. The death bodies being carried to The "Yanyao tample" and emergency center [tents] have established in "Bang muang sub-district, SAO". Princess Patchara kittaya Pha of Thailand donate for knock-down temporary house. Then, After 6 Month pass. Government clean up the area and people move to the new donated house, some villager can rebuild on their own land but the donated house is very small and poor quality.

Many low-income villagers were re-locating to the new place which far from the sea (for example "Prutiew" community).They has to change the way of living from fisherman to general labor.

From that problem. Some villager in Namkem group together to share and build their own house by themselves in Namkem area (near the sea). They can continue the fisher man life and also have good quality house that they decide together.

III. Housing Situation

There is previous research that has studied the housing recovery after disaster. In terms of housing recovery reported that the government provided 3,000 USD for construction of 32 square meter "shop house" This type of house is called by local people "Military house" because it was constructed by military force. Provided to residents who have own land title, most of these provided houses were built near by the shore as 70% of residents don't want to move inland. The government also provided an inland house project, Pru-tio for affected residents who did not have land ownership or wanted to move far from the sea. Most of effected people got **"provided house"** from government and donor within 6-12 months after disaster. CODI (Community Organizations Development Institute) was in charge to cooperate to assist affected residents who have no right for land titles to have permanent house. After 9 years most of the villagers still lived in provided houses they received from the government. Most houses constructed in the Namkem area are 1 story house because the cost of construction is cheap and it's easy to construct this type of house in a short time.

Some villagers extended or renovated their house. Most residents who live in military house have a problem with house construction; from interviews many residents said they have to fix the roof because it cannot resist heavy rain. Many houses were left unfinished and some of **P-NR** house are turn into garages. On the other hand **PR** houses seem to be in better condition, as the house quality is quite better but residents complain that they have to live separately for big family far from their work place and don't have very good relationships with neighbors.

The provided housing was given with priority for the residents who have official proof they are residents in the tsunami affected area. Many low-income villagers who used to live in slums cannot receive the donated house because have no land rights and some of them work in fishery business so they said it is impossible to live far from the sea. This group of residents was left behind. They grouped together with some villagers who are able to get the house on their own land, but were not happy with the provided house's quality or location. At the end the group decided to create "**Self-build**" housing project with support from CODI, and residents participates in every part of the process of construction from design process, land select decision, buying material and building their own house by themselves along with volunteer assistance.

Table 1: Housing construction by provinces

Province	Government agencies responsible for construction of houses
Krabi	Defense Ministry
Phang Nga	Army and Navy
Phuket	Private Companies/Constructors
Ranong	Air force
Satun	Provincial
Trang	National Housing Authority

IV. Resident's ownership background

These results are based on 115 questionnaires surveys conducted in Namkem village. The framework of questionnaire is focus group only for Thai residents who live in post-disaster recovery housing projects. Most of the residents (81%) are the house owner themselves and 19% are renters.

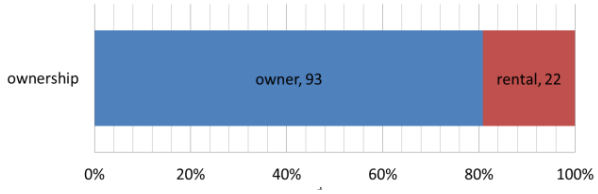


Fig.1 House ownership before tsunami

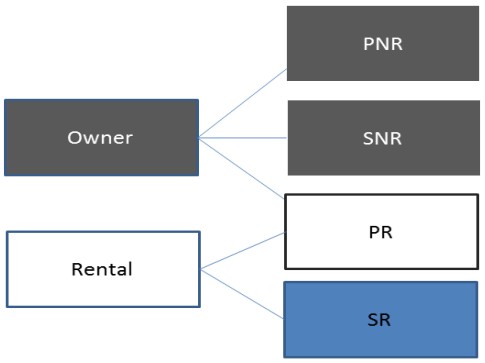
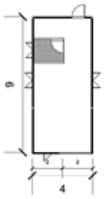
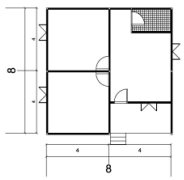
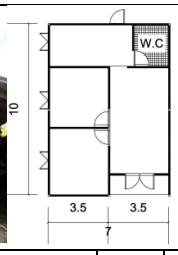
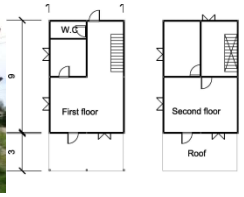


Fig.2 House ownership "before" Tsunami and residents choices "after" tsunami

This study grouped the house by residents' participation in housing recovery and land's location. "P" Provided house is the house that was given from a third party without resident's participation in construction. "S" self-built house is the house for which the resident participated in construction by themselves and also made decisions in the project planning process. "R" Relocate means the new house projects are not located in previous area of residents before tsunami occurred and "NR" Non-relocated meaning housing projects that were built on former land of residents without moving to new location after disaster. According to that Cytheria the types of house in this study are

Table 3 : Housing project in Namkem with stakeholders

P-NR Provided-Non-Relocate house :Military house	 						P-R Provided Relocate house : Pru-tio	 					
House No.**800** Household (51 samples) 1 stories shop house Concrete	Size: 6x6,9x4	segment	Gov.	NGO/ Other	Owner	detail	House No.720 Household (21 samples) 1 stories Concrete/ 2 stories concrete	Size: Not fix	segment	Gov.	NGO/ other	Owner	Detail
		construct	●	●	--	Military			Construct	--	●	--	Constructor
	Zone: A,B,C	Funding	●	●	--	Donors /Gov.		Zone: C	Funding	--	●	--	5 Donors
		Land	--	--	●	Former land			Land	●	--	--	vacant
		Cost	120,000						Cost	-	200,000	-	
		Total(THB)	120,000 (3,800 USD)						Total(THB)	200,000 (6,400 USD)			
S-NR 1 Self-built -Non-Relocate house: Nahwat							S-NR2 Self-built -Non-Relocate house						
Ho No. **23** Household (11 samples) 1 stories concrete house	Size: Not fix /about	Segment	Gov.	NGO/ other	Owner	Detail	House No.**11** Household (5 samples) 1 stories-up floor house Concrete and wood	Size: Not fix	Segment	Gov.	NGO/ other	Owner	Detail
		construct	--	--	●				construct	--	--	●	+fishing bridge
	Zone: A	Funding	●	●	●			Zone: B	Funding	●	●	●	
		Land	--	--	●	Former land			Land	--	--	●	Former land on water
		Cost	60,000	60,000	80,000				Cost	60,000	140,000	-	150,000 +2M
		Total(THB)	200,000 (6,400 USD)						Total(THB)	200,000 (6,400 THB)			
S-R 1 Self-built Relocate house: Project 1	 						S-R 2 Self-built Relocate house: Project 2	 					
House No.	Size: 7x10	Segment	Gov.	NGO/ other	Owner	Detail	House No. **56** Household (13 samples) 2 stories concrete house	Size:6x9 (x2)	Segment	Gov.	NGO/ other	Owner	Detail
		construct	--	--	●				construct	--	--	●	
	Zone: B	Funding	--	●	--	CODI,Sosa		Zone: B	Funding	--	●	--	CODI,NGO
		Land	--	●	--	sharing			Land	--	●	--	Sharing
		Cost	--	210,000	Loan	630 /m			Cost	--	210,000	Loan	340 /m.
		Total(THB)	210,000 THB (6,700 USD)						Total(THB)	210,000 THB(6,700 USD)			

grouped to 1.P-NR , 2.P-R ,3.S-NR 1 ,4.- 5.S-R 1 and S-R 24. Evaluation

Table.3 Household and samples

	Name	House -holds	Sample	Type	Location
1	PNR	800	51	Provide	No-Relocat e
2	PR	720	21	Provide	Relocate
3	SNR1	23	11	Self-build	No-relocate
4	SNR2	11	5	Self-build	No-relocate
5	SR1	50	14	Self-build	Relocate
6	SR2	56	13	Self-build	Relocate

This survey sample has 115 responses, 51 residents from Project PNR, 21 residents from project PR, 23 residents from SNR1 and 5 residents from SNR2 and 14 persons from SR1 and 13 residents from SR2.

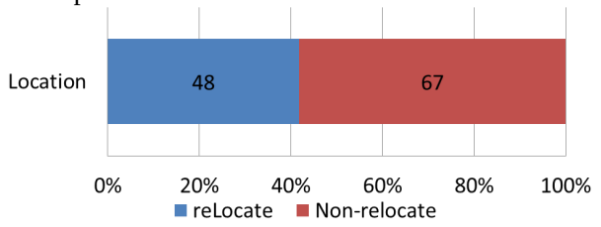


Fig.3 Location of house

67 residents did not relocate so they still in the same area as before disaster. On the other hand 42 residents relocated to a new place which means they have a new neighborhood. From interviews with residents in Pru-tio, the relocate project, residents said they know only people in same alley (about 10 houses) and rarely talk with their neighbors in another alley. Some of the residents have to stay far from their work place especially the fisherman, and some of residents have to change their job because it is too expensive to travel every day and they are worried about their boats in case of storm.

4.1 Income of resident

The average income of Namkem resident is about 10,000 THB (320 USD) per month. This is normal in non-urban Thailand, but because they work as fisherman in some seasons they cannot go fishing and they won't earn money. So in fact the income of resident is not stable. Without the support from government and many organizations they could not have rebuilt their own house. Although after the disaster they received a provide house for free, but because the houses are not good quality, residents still have to pay more money to fix the houses and in some cases resident cannot afford the reconstruction or fixing house so they leave the house vacant.

4.2 The satisfaction of residents

The satisfaction of residents is evaluated in each housing projects and is calculated by the questionnaire scale from low satisfaction 1- to maximum satisfaction 5.

Table.4 Total score in Economic and Social relation form every house types

Pre disaster ownership	Non-relocate		Relocate	
	Provided	Self-built	Provided	Self-built
Owner	2.94	3.55	3.00	-
Rental	-	-	2.2	3.7

V. Conclusion

Both case of post disaster ownership(Rental house or house owner): Provided housing gave residents less satisfaction compared to self-built housing in Economic and Social relation, Even though resident don't need to pay any construction cost they still have less satisfaction with building construction, disaster preparedness and economic and social relation. This is because residents have no connection to their own house and community. They don't have decision for the house construction and don't gains participate with their neighbor.

References

1) Kondo Tamiyo, Housing recovery by the type of resident involvement-Provide house vs mobilizing house (Ished conference) , 2012.
2) Elizabeth Maly and Yoshimitsu Shozaki, Toward a policy that support people-center housing recovery-learning from housing reconstruction after the Hanshin Awaji Earthquake in Kobe, International Journal of Disaster Risk Sci,2012
3) Namkem community, DDPM volunteer presentation andinterview, 2013

Disaster Resilience Context

Fourth Session Parallel Notes
Moderator: Ahmad Sarwadi

K5 Room 2nd Floor
10.00 – 11.00

Presenter	:	**Juarni Anita**
Title	:	**Housing Adjustment as Adaption Strategy for the Future in Flood Prone Settlement, Case Study : Muara Angke Settlement, North Jakarta**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

The threatening flooding in Nothern Jakarta

- The coastal flooding became a big problem in Jakarta (the last two decades)
- Muara Angke is a delta in North Jakarta had also several event of floods (caused by land subsidence, heavy rain, spring tides, sea level rise, siltation of rivers and dike destroyed)
- The last major flood occurred in 1996, 1999, 2002, 2007, 2011, 2012 and 2013

Housing Adjusment as Adaptation Strategy

- If the residents feel there is a gap between the actual condition of the house and a decent house in his opinion, they feel dissatisfied being at home and will renovate their houses, which is called housing adjustment (Crull, et al.,1991)
- Adaptation strategies are more proactive in a sense as they are put into place to avoid turning natural hazards into disasters. (IRIN, 2013)

Muara Angke Settlement

- Muara Angke area was marshes and mangrove forests until the 1970s, and built on July 7,1977 by government of DKI Jakarta to accommodate the fisheries located in North Jakarta
- The housing area : 21,16 hectares, total land area : 67 ha
- Block K and Bermis were chosen to be the research location because there has been no research on housing adjustment in this area. Furthermore, these blocks will be retained as landed housing (include Block H and L) in Muara Angke

Analysis of Housing Adjusment in Block K and Bermis of Muara Angke

- Initially, 180 houses in Block K and 203 houses in Block Bermis
- After several years, some houses were merged, so that the remaining houses are approximately 159 houses in Block K and 173 houses in Bermis
- All of houses were single storey houses
- Size of houses →Block K : 24 sqm with land area of 50 sqm (4x 12,5 m), Block Bermis : 21 sqm with land area of 60 sqm (5x 12 m)
- 35 respondents consisting →15 respondents in block K and 20 respondents in Bermis

Respondent characteristics are as follows:

- Respondent's income under 1.5 million rupiah per month (20%), 1.5-2.9 million (37.1%), 3-4.49 million (9%), 4.5-5.9 million (11,4%), above 6 million (5.7%).
- The livelihoods of respondents are fisherman (28.6%), entrepreneur (28.6%), do not have a job because they are old (21.4%), boat crews (10.7%), and port officials (10.7%).
- Heads of household are approximately 42-76 years old.
- Their educations were elementary school (60%), junior high school (14.3%), senior high school (22.9%), and baccalaureate (2.8%).
- The people come from different ethnicities, consisting of Bugis (40%), Java (31.4%), Banten (8.6%), Lampung (5.7%), Sunda (5.7%), Makassar (5.7%), and Chinese (2.8%).

Housing Adjustment in Block K & Bermis

a. Elevating Houses
   - Adjust house become two and three-storey house
   - Elevating ground floor elevation from road level
   - Elevating the ceiling of the houses
b. The Expansion of Houses
   - Single storey house
   - Two storey house
c. Using Material Easily Dismantled
   - Respondents elevated the ground floor for several times, even they had to dismantle the roof of the house several times. Therefore, they tend to use materials that are easily dismantled.
   - According to 35 respondents, there are 17 houses as two-storey and 2 houses as three-storey houses (11 houses use wood material for the second floor,7 houses use concrete, 1 house use steel decking).
   - Wood material→cheap,easy to be dismantled when the respondent would improve their houses in the future.
   - Recently, respondents tend to use asbestos as roof material (65.7% of 35 respondents)→cheap,easy to be dismantled, can reduce heat of sun shine and noise of rain.
   - Respondents tend to use ceramic tile for ground floor (91.4%)→cheap, floor becomes cooler,easy to be cleaned after the flood. The rich respondents use granite tile (5.7%) and the poor respondent uses stucco floor (2.8%).
d. Facade changes according to ability and desire
   - The facades of the houses reflect the economic ability and the level of their social life
   - House facades that respond to flooding are high form of the houses because of the high elevation of the ground floor and the ceiling.

Conclusion

Several strategies for the design of future settlements in flood-prone areas are as follows :

- Ground floor should be high enough above the road level to avoid flooding.
- If possible, the house should have a second floor (two-storey house) that can be used as a place of refuge in the event of a large flood.
- The ceiling is high enough so that occupants can elevate the floor several times without having to dismantle the ceiling.
- Allows occupants to expand the house, if they need additional room and add the economic activity in the house
- Using materials easily dismantled as using wood or steel decking for the second floor.
- The building structure should be resistant to flooding such as using concrete columns, plastered brick walls, tiled floor so easy to clean it after flood.
- The facade of the house should consider openings such as door, window, vent, so that day lighting and fresh air can get into the house to reduce heat.
- Houses should still have a yard to plant trees, there is strict control of the government so that the residents retain the yard as a green space to reduce flooding and increase the coolness in the environment.

Presenter : **Elizabeth Maly**
Title : **Wooden temporary housing in Japan after the 3.11 Great East Japan Earthquake, international comparison of temporary housing innovations**
Presentation Duration : **10 minutes**

PRESENTATION CONTENTS

The main topic

Wooden temporary housing that using in japan right now after the great east japan earthquake and then comparing it with 2 other examples from Indonesia and US.

Housing Recovery
1 step : no temporary housing → fast but can cause gaps
2 step : uses temporary housing → multiple relocations, critical moment is transition from temporary to permanent housing.

Temporary transitional housing
- Recently, many organizations and experts suggest transitional housing approaches as a way to use resources efficiently and support a smooth transition for residents.
- Transitional housing is in an incremental process.
- The value put into transitional housing is converted, not wasted
- Characteristics of transitional housing : upgradable, reusable, relocatable, reseleable, recycleable.

The "Second Life" of Temporary Housing
- Temporary housing that can be reused or converted in the long term to benefit the residents beyond the short term temporary housing phase.
- Reuse the temporary housing one more time for one more used."Second life" uses could include: rental housing, reuse, recycling parts, temporary houses as 'cores' for permanent houses, refurbishment of the units and storage for the next disaster.

Great East Japan Earthquake and Tsunami 2:46 pm, March 11, 2011
- 9.0 magnitude earthquake, tsunami-40 meters run up, fires, nuclear accident
- Almost 20,000 people died, 470,000 evacuated in the first days
- 3 years later, 267,000 people are still living in a temporary, interim situations. The temporary housing include :
  - ✓ 52,000 units of pre-fab temp. housing ("typical")
  - ✓ 13,000 units wooden temporary housing(largest number, 6,700, in Fukushima Prefecture) that can be reuse (second life).
  - ✓ 67,000 private apartments used as temporary housing (national government pays the rent)

Hurricane Katrina, in Mississippi State
- 1,000,000 housing units damaged/destroyed, more than 200,000 in Mississippi alone
- Temporary to permanent Missisippi Cottages
  1. Fema trailer : very terrible for the people, the program is poorly organized, very uncomfortable house, the material is very poor quality.
  2. Mississippi cottage
  3. Cottage-temporary use
  4. Cottage-permanent house
- The programe is not so succesful but good concept. The cottages reuse as affordable rental housing or conversion by human habitat for humanity.

Yogyakarta, Central Java Earthquake Magnitude 6.1,May 27, 2006, 5:55 am
- 1,100,000 people's homes were destroyed. Many died by unreinforced masonry houses collapsing.
- Temporary housing : T-Shelters/Transitional Shelters, Expandable Core Houses.

Comparisons of aspects of the 3 international cases in 3 different countries
What is the problems of the temporary housing in the 3 diffrerent country?
- Low quality of standard houses& large numbers of housing needed
  a. Wooden temporary housing in japan : need more housing than fabricatedbuilders could build. Need improve over low quality prefab.
  b. Temporary to permanent Mississippi cottage : Need a better system, need to provide another solution for people still living in trailers for 2 years later.
  c. T-Shelter & Expandable Core House in Yogyakarta : need for more housing than included the plan.

Benefit :
- Use of local materials
  a. Wooden temporary housing in japan : local material, local labor, housing industry, reduce waste
  b. T-Shelter & Expandable Core House in Yogyakarta : local materials

- Better transition temporary → permanent house
  a. Temporary to permanent Mississippi cottage : can use the same house for temporary or permanent, moveable cottage can be easier to reuse.
  b. T-Shelter & Expandable Core House in Yogyakarta : system that resident can modify, accountable to residents resources and priorities.
- Big Questions :
  a. Could residents keep them?
     - Wooden temporary housing in japan : may be reusable/adabtable
     - Temporary to permanent Mississippi cottage : reused in several ways such as rental housing, shops.
  b. Could resident modify houses?
     - Wooden temporary housing in japan : may be reusable/adabtable
     - Temporary to permanent Mississippi cottage : reused in several ways such as rental housing, shops.
     - T-Shelter & Expandable Core House in Yogyakarta : upgradeable, expandable

Conclusions

1. Based on transitional housing principles, and a "second life" of temporary housing, it is very important that residents can expand/adapt/modify/reuse their houses. (needs are matched better, satisfaction is higher)
2. Innovative measures in the temporary housing phases will be most effective if they are considered holistically, in advance, as part of overall housing recovery process.
3. To improve housing recovery after future disasters, it is also important that innovative solutions be reflected back into recovery policy.

DISCUSSION

Questioner : Aji (ITS)
Question : Who's the funding of transational housing?producer that provide materials of temporary housing?
Answer : Japan case → National goverment funding, US → national goverment funding, later on NGO's getting involved. The provider : some industry

---

Presenter : Mayang Rahmni N.S. (Universitas Gadjah Mada)
Title : Inhabitants Adaptation in Drought Area Desa Seriwe, Kabupaten Lombok Timur
Presentation Duration : 10 minutes

PRESENTATION CONTENTS

- Introduction → Many people in Indonesia work on agriculture sector
- Kabupaten Lombok Timur → 25% drought area, the economy rested on the primary sector (agriculture)
- Agriculture on GDP = 34%
- LQ of Agriculture = 1,5
- Agriculture 71%
- Agricultural land 53%

Relevant Literature

- Adaptation
  Summarized of Berry (1976), Bell, *et al* (2001), IPCC (2007), Fishers in Halim *et al* (2008), and Taylor *et al* (2010) that adaptation is an adjustment effort to the stimulus to reduce the incompatibility between individuals / groups with stimuli that interfere, that is a change of environment.

- Drought
  Based on the causes and impacts, drought can be classified into :
  - drought occured naturally
  - caused by human activities (Adi, 2011).

Research Method

Research Approach : Qualitative
Unit of information collection : the household.
Collection Information Method : in-depth interview, direct observation, document.

Results

Inhabitants Adaptation Strategies
- Related to the agriculture → water harvesting through private ponds & public ponds, adjusting cropping pattern
- Related to the daily water needs →adjusting water fullfillment based on the season, water harvesting through private ponds, public ponds, and water storages

Research Finding

The concept of adaptation strategies
a. Adaptation based on scope of influence
   - Direct adaptaion
   - Indirect adaptation
b. Adaptation based on type of action
   - Active adaptation → behavioral adjustment, physical adjustment
   - Passive adaptation → survival adaptation (no withdrawal/no displacement)

Conclusion

- Direct and indirect adaptation found in this study are adaptations formed by the scope of influence, both the time range of the impact of adaptations and the target range of adaptation strategies.
- Active and passive adaptation are adaptation formed based on the type of action. Both adaptations are performed within the adaptation arena.
- The inhabitants adaptation strategies could potentially be one of the inputs for the the bottom-up development approach.

Presenter : Titaya Sararit (Kobe University)
Title : Resident's Ownership Status: Indian Ocean Tsunami 2004 Thailand, Namkem Community
Presentation Duration : 10 minutes

PRESENTATION CONTENTS

Background
- Indian Ocean Tsunami 2004
- Tsunami (2004) in south of Thailand 26/12/2004 or Boxing day tsunami was recorded as the most destructive disaster in term of number of people killed.
- 8,345 people died from this disaster.

Background of Namkem
- These results are based on 115 questionnaires surveys conducted in Namkem village.
- Most of the residents (81%) are the house owner themselves and 19% are renters.
- The 4 types of housing recovery
  - P-NR → Provide no relocate housing
  - PR → Provided relocate housing
  - S-NR → Self built no-relocate housing
  - SR → Self built relocated housing

- Housing project locate according to risk map
  According to the risk map zone, most recovery housing projects in Namkem are still in the risk area. Only project 2.PR (Pru-tio) and project 5.SR-1 (Ruamsuk taweesub) relocated to a safer area, far from the sea.
- PR: Provide Relovate type / Pru-tio
  - PR project has a total of 720 households which received provided land by government and relocated 10 km away from Namkem
  - Houses constructed in PR are better quality compare to PNR
  - The design of house depended on donors with maximum 5 people for 1 house
- SNR: Self-built Non-relocate house
  - 1.House of Mr.Maitri, one Namkem community leader
  - Locate near temple
- SR: Self-built Relocate/Rumsuk-taweesab-mankong
  - Each house has a different design
  - Basic house look and resident will decorate more by themselves
  - Some residents sold their house to new people

Relocate and No-Relocate
- 48 Residents didn't relocated so they still live in the same area as before disaster.
- 42 Residents relocated to a new place which means they have a new neighborhood.

The satidfaction of residents → is evaluated in each housing projects and is calculated by the questionnaire scale from low satisfaction 1- to maximum satisfaction 5

Conclusion
- In both case of post-disaster ownership status (Rental house or house owner)
- Provided housing gave residents less satisfaction compared to self-built housing in terms of economic and social relations.
- Even though residents don't need to pay any construction costs they still have less satisfaction with building construction, disaster preparedness and economic and social relation.
- This is because residents have no connection to their own house and community.

Environmental and Green Context

Presentation Note Keynote Speaker: Jatmika Suryabrata

Implementation of Green Building Concept in Commercial Buildings: Malls and Trade Center in Jakarta
Mohd Syarif Hidayat

Adopting Transport Strategies for Sustainable Green Campus At Universiti Sains Malaysia, Penang, Malaysia
Hassim Mat, Abdul Ghapar Othman

Third Session Parallel Note Moderator: Deva Fosterharoldas Swasto

Outdoor Thermal Comfort in Tugu - Kraton Street Corridor Yogyakarta City
Ardina Putri Rahtama, M. Sani Roychansyah

Future Compact Cities in View of Global Warming for ASEAN Countries
Abdul Malek Abdul Rahman, Izatul Asyikin Nordin, Karam M. Al-Obaidi

Addressing Climate to Make Better Places, Thermal Comfort in Outdoor Open Space in Mega Kuningan Superblock, Jakarta
M Donny Koerniawan, Weijun Gao

Third Session Parallel Note Moderator: Arif Kusumawanto

The Availability of Green Open Space to Absorb CO_2 Emissions in East Surabaya
Erma Fitria Rini, Haryo Sulistyarso, Adjie Pamungkas

The Urgent of Catchment Area in the Upstream for the Urban Housing in the Downstream (Case Study: Balikpapan City)
M. Santosa

Zero Waste Concepts on *Pantai Baru Pandansimo* Master Plan by Applying Portable – Reuse Material for Subsurface Flow Constructed Wetland
Arif Kusumawanto, Zulaikha Budi Astuti, Agung Eka Syaputra

Fourth Session Parallel Note Moderator: Agus Hariyadi

Environmental and Green Context

Jatmika Suryabrata

Place	: K1 Room, 2nd floor
Time	: Friday, 22 August 2014, 08.00 – 09.30
Moderator	: T. Yoyok Wahyu S
Presentation Duration	: 30 minutes

PRESENTATION CONTENTS

Green Building Parameter

- Land Efficent; energy; water; local and envirofriendly material; healthy indoor air
- Energy production and reserve : the energy resource in Indonesia is a half
- Energy Crisis : energy demand grow up; supply down. Energy subsidi in Indonesia so hard and much.
- Property Development in Indonesia make emission
- Energy demand in Buildings(Indonesia) : growing up in time series graph(based on ppt)
- Mapping macro drivers : Where is the biggest demand?
- Asian as low cost but high carbon grid;
- Energy performance comparisons : Compare energy comparisons Jakarta and Japan
- Energy use for Building in Jakarta : Good design can reduce demand more
- People perseption in Jakarta counting on new construction
- Face lift : transforming old building into curtain glass wall. Glass wall most wanted building design.
- Most of people wanted glass building. People who live in glass houses.
- Building form and orientation : Tropical radius from the sun. It can know by temperature of the building
- Windows with perforated metal shading on west sideGreat design and construction can reduce use of energy.
- Glass walls building : can daylight with lightself; outer/wide range from windows still can see outside the building.
- Integrated vertical transportation>Encoureag the use of stairs
- Energy for ecofriendly environment
- PT. Pan Brothers Head Office, Boyolali : Great building and construction(green bulding concept/glass walls building. Cross ventilation.
- Energy efficent even in Indonesia.
- How architect; Civil; and mechanical engineering work together(integrated). Morph the design into the reality!

Implementation of Green Building Concept in Commercial Buildings: Malls and Trade Center in Jakarta

Mohd Syarif Hidayat [*1]

[1] Lecturer, Department of Architecture
Faculty of Planning Engineering and Design ,
Mercu Buana University, Jakarta

Abstract

Development which is less attention to the environment, inefficient use of energy as well as the increasingly dense city make space for the concept of green building to grow even more in Indonesia . The purpose of this study was to determine the extent to which the implementation of green building principles in commercial buildings. There are three buildings complexes that were examined in this study that is Mal Puri Indah, West Jakarta , International Trade Centre Permata Hijau , South Jakarta and International Trade Centre Cempaka Mas , Central Jakarta . The method used is descriptive with respect to some aspects of building of green aspects such as open space planning, sources of clean water , utility systems, energy management in buildings , refrigerant management and indoor air quality. The results show that the three complexes of buildings are already implementing the provisions for open space areas such as building coverage and infiltration wells. However, the open space is still widely used for parking space. Site drainage is still directed to the city utilities. In terms of energy, these three building are still use refrigerant for air conditioning systems.

Keywords: green buildings , commercial buildings , green building criteria

1. Introduction

The definition of green building does not not only cover the building itself but also the environment in which the building is exist. Thus, the successful of the building performance is also determined by its environmental performance. According to United States Environmental Agency (US EPA, 2012), green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high performance building (www.usepa.org, 2012).

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation

According to Green Building Council Indonesia, (GBCI, 2012) there are six factors which caharacterizes green building, that is:

1. Appropriate Site Development;
2. Energy Efficiency and Conservation;
3. Water Conservation
4. Material Resources and Cycles
5. Indoor Health and Comfort
6. Building Environmental Management

Appropriate Site Development is the first category of criteria that emphasize the importance of keeping the city green areas to benefit the environment. Therefore this category encourages the preservation of green areas and development in the area of non-existing green. Selecting sites linked to the transport network, in particular the public transport system with the possibility of the use of bikes entered into the criteria, because it will result in less energy use for transportation and a lighter ecological impact. Landscaping a building site is important to maximize the environmental benefits derived from green land. Human comfort through quality microclimate around the building and the site is also considered as a target

* Contact Author:
Lecturer, Department of Architecture
FTPD, Mercu Buana University
Tel: 6221 700 15 484 Fax: 6221 587 0727
e-mail: syarifh5@gmail.com

of appropriate land. Other criteria are the quality of runoff rain water drainage system to reduce the burden of the environment

Energy Efficiency and Conservation defines criteria for energy savings and environmental and economic benefits. Installation of electrical sub-meter is seen as the basis for further energy management. The overall thermal transfer value (OTTV) between the building and environment is the criteria that determine energy usage for thermal comfort in building. Other measures to make energy use more efficient give plus points. It can be derived from the efficient use of energy for artificial lighting, vertical transportation systems and air conditioning. Energy savings can be done to further the optimal use of natural lighting and natural ventilation in public spaces. The reduction of CO2 emissions will provide additional points. Points are also awarded if there are renewable energy generated on the building site

Water Conservation category using water meter to measure water usage in the building operations as a basis for better water management. Reduction in water use by implementing austerity measures are considered as criteria. To achieve this goal, the necessary actions such as using water-efficient fixtures, recycling of water used for example water and rain water. Points are available if the water comes from sources other than groundwater or Water Company (PAM) is used to irrigate landscaping.

The criteria of Material Resource and Cycle uses materials that have a high impact on ozone depletion are not recommended. The use of waste materials, green materials, certified wood, pre-fabricated materials is recommended. Materials with components from Indonesia and materials of the area within a radius of 1000 km from the construction site are eligible for additional points.

Indoor Health and Comfort attributes Green Building. It is because emphasizes the importance of building occupants. To maintain a certain quality of indoor air is advice to have a sufficient air exchange with the outdoor. Indoor air quality is maintained by monitoring the concentration of CO2, smoke control and reduction of chemical pollution. The high level of occupant comfort is achieved through the criteria as views to the outside of the building, visual comfort, thermal comfort and humidity, as well as a comfortable noise level.

The last category is Environmental Management Building. Simple waste separation in the building that will simplify the recycling process gets extra points. Two criteria to encourage the reduction of construction waste and waste management include how garbage should be managed. The presence of a Professional GREENSHIP during the design process will contribute to a positive rating. The actual operation of the initial planning to be accompanied by commissioning system is good and right. Submission of green building data, the application of green building principles for the fit-out activities and conduct user surveys of buildings will give you more points for this category

The principles of green building or sustainable building is important to be implemented considering the problems related to buildings and environments that require serious attention from the government and society. Among these problems are the shortage of energy supply, inefficient use of energy in buildings, water supply shortages, inefficient use of water in buildings and waste from the building both during construction and use of buildings.

The paper will highlight the problems in the implementation of green building in Indonesia, especially in Jakarta.

2. Materials and Methods

This paper is qualitative which describes the building characteristics using the six main green building criteria. However, these criteria did not imply purely. The objects of the study are: Puri Indah Mall, Permata Hijau Trade Centres, and ITC Cempaka Mas. Puri Indah Mall is located in Kembangan, West Jakarta, while Permata Hijau Trade Centres in South Jakarta, and ITC Cempaka Mas in the North Jakarta. These three samples are taken by random sampling. The purpose of this paper is not to determine whether the building is green or not. But, this is to estimate a building tends to green building for a common people.

The main six criteria have more detailed sub criteria. However, it is not all criteria used in this paper. The criteria used are: Appropriate Site Development (ASD); Energy Efficiency and Conservation (EEC); Water Conservation (WC); Indoor Health and Comfort (IHC) and Building Environmental Management (BEM). Variables examined were carried out through observation and some measurements, like air temperature.

The thermal environment, especially air temperature and humidity, are taken because it is the important factor of thermal comfort of the occupants. It is also a crucial factor in building that uses air conditioning. The measurements are taken in three to four level of the building.

3. Results and Discussions

Appropriate Site Development (ASD)

The details criteria of Appropriate Site Development (ASD) are; Community Accessibility, Public Transportation, Bicycle, Site Landscaping, Micro Climate and Storm Water Management

Generally, these three commercial complexes are located in and around housing estate. It means that the access is not a problem, so far. However, these complexes are not so close to the housing complexes. It needs ten to fifteen minutes to reach these commercial complexes. This is because the commercial complex is surrounded by shop houses complexes. Sometimes, the residents may use transport

to reach this building.

The three cases have good accessibilities where their locations are very close with the public transport. However, Puri Indah Mall is only passed by small vehicles (non-bus transport), while the two other malls are public transport (bus). The Puri Indah Mall and The Cempaka Mas ITC are also passed by toll-road, while Permata Hijau ITC is not.

Fig. 1. The situation of Puri Indah Mall (block at the centre) in Kembangan, West Jakarta (source: http://www. streetdirectory.co.id/)

The area for bicycle is not available for the three commercial complexes. The uses of open space in these three malls are used for car and motorcycle parking and circulation. The rest is used for landscaping. The area for landscaping in Puri Indah Mal is better than Permata Hijau ITC and Cempaka Mas ITC. The Permata Hijau is the least to provide landscaping.

Fig. 2. The situation of Permata Hijau International Trade Centre (block in red colour) at Kebayoran Lama, South Jakarta (http://www.streetdirectory. co.id/).

The availability and characteristic of green open space is of course affecting the micro climate around. The micro climate at Puri Indah Mall and Cempaka Mas is moderate. While at Permata Hijau ITC the micro climate is slightly warmer.

The three malls already provide some open spaces to fulfill the local regulation requirements. These open spaces are used circulation, parking lots and landscaping. Open spaces is also used as a means of absorbing water and the aesthetics purposes. Puri Indah Mall buildings have Building Coverage (KDB) coefficient of 50%. It means that the rest of the open space should be at 50%. However, the rest of the open space not only be used as a green open space, but as circulations and parking lots. Thus, the source of absorption is reduced because of solid ground surface and does not penetrate water. Nevertheless, the Mal Puri Indah already provides a number of infiltration wells for rainwater catchment.

In contrast to the Puri Indah Mall, green open space (RTH) at Permata Hijau ITC is somewhat hard to achieve. Permata Hijau ITC Building, Building Coverage coefficient (KDB) is same as Puri Indah Mall, i.e., 50%. The outdoor space is almost entirely used for buildings and street parking. Thus, the source of absorption is reduced because of the solid ground and is impermeable to water.

Cempaka Mas ITC actually has considerable land area, about 30 HA. However, this area is not only used as trade center, but other commercial buildings such as shop houses, apartment etc. despite this area is traversed river. So, the area is reduced.

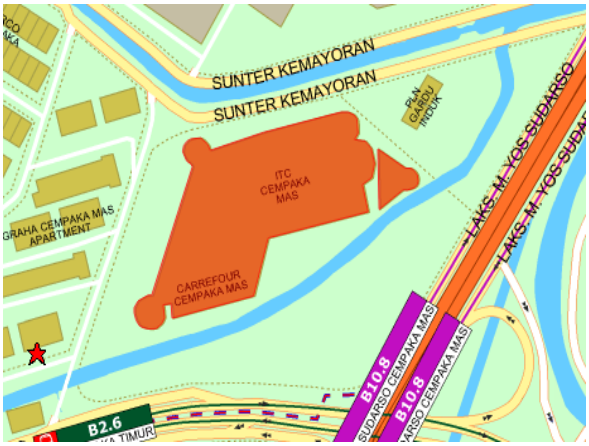


Fig.3. The situation of Cempaka Mas International Trade Centre (block at the at the centre) Sunter Jaya, North Jakarta (source: http://www.streetdirectory.co.id/).

Drainage system is already implemented in these three commercial buildings. Rain water, surface water and wastewater are directed to municipal sewer. Storm water is also uses this channel. There is a good example in Mal Puri Indah in Kembangan, West Jakarta. Drainage system is directed to some point of infiltration wells.

Drainage system has two roles: First, as channeling rainwater and grey water from buildings, second, as a

supplier in the event of flooding. The current problem is inadequate drainage capacity, almost all surface rainwater discharged into the channel. Supposedly, there is a mechanism by which rain water can be absorbed into the ground or soil through infiltration wells.

At Permata Hijau ITC, drainage system has been implemented. This channel is usually directed to channel rainwater city (riol city). Channel has not been channeled rainwater seepage into the pit.

From the observations, almost the entire surface of the ground cover is made from hard surface (interlocking block). The problem is that almost all the water dumped rain on the soil surface to the channel. Perhaps, there is a mechanism in which rain water can diffuse into the soil through the grasslands or seepage pit.

Drainage system at Cempaka Mas ITC is already implemented. Different from those in Puri Indah Mall and Permata Hijau ITC, in this location, drainage system is also directed to Sunter River. So, the amount of water flows to the channel becomes less.

Energy Efficiency and Conservation (EEC)

Energy Efficiency and Conservation (EEC); The parameter of Energy Efficiency and Conservation are Natural Lighting, Ventilation, On Site Renewable Energy (Bonus). However, this paper is not involved all the parameters. It is only Natural Lighting and Ventilation (natural) discussed.

Fig. 4. The situation of the Puri Indah Mall land building complexes. The outdoor is used mainly as car parking and circulation.

In discussing the usage of energy in the building, the overall thermal transfer value (OTTV) between the building and environment is one of the criteria that determine energy usage for thermal comfort. The other criteria are the selection of air conditioning system.

The use of natural light in malls and commercial complexes are somewhat difficult because most of the spaces are used for selling area. The selling areas really need displays for items or articles to be sold. As a consequence, artificial lighting is a prerequisite. The location of selling area, whether in ground, first, second or third floor use this condition (artificial lighting).

In Puri Indah Mall natural light is used at some of ground floor area, such as lobbies, restaurant, coffee shop and others. The selling area in ground floor is still using artificial lighting. While, in Permata Hijau ITC, the use of natural light is only at main lobby. Most of the shop has special entrance (directly to outside). Similar with Permata Hijau ITC, Cempaka Masa ITC also lobbies which using natural light. The other areas which are selling items keep using artificial light.

From the energy efficiency point of views, closing opening with selling items or whatever, will increase energy use in building. On the contrary, this situation will reduce solar radiation coming into the building. Another use of ventilation, especially natural ventilation, is used for additional ventilation in basement parking.

The other aspect of energy efficiency is the use of natural ventilation in building. Natural ventilation in building, especially in commercial building is very rare. This is because they need a specific condition which is suitable for occupant comfort. Natural ventilation also bring in polluted air

Figure 5. The space between the buildings in the complex ITC Permata Hijau especially allocated for vehicle circulation and parking.

Elevators and escalators are two facilities which are usually used for commercial buildings. Escalator is used because there is a continuous of people moving from one floor to another. For the commercial building surveyed, all the escalators are moving all the time. It means that electrical energy used continuously. The more efficient system is responsive escalator, that is escalator which is working only if passengers come.

Puri indah Mall has two elevators and four escalators each floor. The elevators working if the there is passenger come, while elevators always working eventhough there is no passenger coming. In Permata Hijau there is also four escalators in each floor and

three elevators. The mechanism is similiar with Puri Indah Mall. Besides escalators, in Permata Hijau has stairs to complement the circulation systems. In Cempaka Mas ITC so far, similar with the previous commercial complexes. However in this complex stairs is located nearby the selling area, not for emergency exit.

Water Conservation (WC);

The details of Water Conservation are: Water Metering, Water Calculation, Water Use Reduction, Water Fixtures, Water Recycling, Alternative Water Resource, Rainwater Harvesting, Water Efficiency Landscaping

From case studies is known that the source of water is from local water company (PAM) of 26,000 m3 per month. Groundwater which has 200 m deep is used as backup. However the Jakarta Government warned that the main source of water to keep using PAM, while groundwater sources just for backup.

The observation in these three locations is not up to meter data. This is because some of the data is to be confidential.

The reduction of water consumption data is not obtained at the moment. However, the concept of water use reduction has been implemented especially through the use of water fixtures such as taps, sink and closet. This concepts has been implemented in Puri Indah Mall, Permata Hijau ITC and Cempaka Mas ITC.

Fig. 6. Cempaka Mas ITC Complex has a fairly broad area that includes apartment buildings, home stores and ITC.

Concerning with water recycling, only Puri Indah Mall has water recycling facilities which at cost of one billion rupiahs. This facilities are used to process blackwater from the building. The outcomes will be used as a water sprinkler plant.

There is no alternative water resource, except groundwater resource. Water resource can be obtained like from rain water through rain water harvesting. This kind of water harvesting is popular in some other country which is rain is rare. In Indonesia, rain water harvesting is a bit odd. Because Indonesia has a season of dry and wet. Even, for the same season of dry and wet occurs simultaneously. So, if the

Rain water harvesting is not availabe in the three malls. However, in Cempaka Mas ITC are river pass through.

The efficient use of water has implemented in practice, particularly for new buildings. This can be seen from the use of utility fixtures such as closet, sink and urinal.

There should be restriction even banning the use of ground water in the vast building or tall building. Because it will cause an impact on the environment in the long term. Water company can increase its role in the provision of potable water source for the city residents.

From the results of field data, water usage data for building utilities, such as the toilet and sink is quite small. Water usage is very prominent for the consumption of the chiller. From the survey it is known that for a chiller needs 500 m3 of water per day!. If there are 5 chiller means it takes 2500 m3 of clean water. So that it takes 75,000 m3 a month.

In the Permata Hijau ITC found that the main source of water is from PAM. Water originated from ground water, but is only used when the emergency. The depth of the wells is 200 m. Keep in mind that South Jakarta is regional water conservation. So efforts should be continued seepage pit manufacturing encouraged.

Efficient use of water have been carried out at ITC Permata Hijau. It is seen from the use of utility features such as sink and faucet urinal.

In relation with the infiltration wells, in the Permata Hijau ITC known that they already carry rainwater catchment wells.

From the results of field data, water usage data for public utilities, such as the toilet and sink is quite small. Usage is very prominent for the consumption of the engine coolant chiller.

The principle of efficient use of water has been carried out at ITC Permata Hijau. This is evident from the use of features such as tap water utility sink and urinal. Actually the problem is the water consumption for commercial buildings such as shopping malls, hotels and an office building for lease with occupancy distribution is fair enough or not. The point is that no matter how big the amount of water consumed by a mall, for example, would be paid. But of course there is a limit residential building.

Data field of ITC Cempaka Mas found that the main source of water is from the PAM. The water comes from deep wells are also available , but is only used if the circumstances emergency. Deep wells dug to a depth of 200 m . Even for Mal Puri , warnings from the government of Jakarta not to use ground water .

From the field data, water usage data for public utilities, such as the toilet and sink is quite small . Usage is very prominent for the consumption of the

engine coolant chiller

Fig. 7. The top floor (second floor) there is a culinary facilities. In this space there is a skylight (roof light) that serves to illuminate the space and dining (restaurants).

Indoor Health and Comfort

The details of Indoor Health and Comfort are: Outdoor Air Introduction, Environmental Tobacco Smoke Control, Outside View, Visual Comfort, Thermal Comfort, and Acoustic Level.

From the three commercial buildings complexes, it identified that central air conditioning is used. So, air introduction is used for air circulation system. While, air introduction for other facilities are almost hardly be considered.

Control of tobacco smoke has been implemented with the regional regulations on the prohibition of smoking in public places. With these rules then almost the entire building in Jakarta has applied this rule to apply no smoking zone by zone smoke.

Outside view of the building is used in some facilities, such as lobbies and restaurants. In Puri Indah Mall, there is good view form inside to outside, especially form lobbies and other facilities, such as coffee shop and restaurants. People in these rooms can enjoy the view outside, as people and car moving and other scenery.

In Permata Hijau ITC, the view outside is only enjoyed from lobby. The other facilities have no qualities like lobby, especially in second and third levels. In level four, there is another facility, i.e. restaurant that can enjoy the view outside. All these conditions are hardly find in Cempaka Mas ITC.

Ventilation for conditioners (AC) obtained from from outside the building. Puri Indah Mall building has the shape of the radial mass both in terms of acquisition of outside air for ventilation.

Ventilation systems in buildings are usually used to supply fresh air conditioning and ventilation for a bathroom / wc, and kitchen. Ventilation uses an exhaust fan to the outside of the building and then diaslurkan.

Thermal comfort has six variables, such as air temperature, humidity, mean radiant temperature, and air movement, level of activities and clothing resistant. One of the main vasiable, ie. air temperature and humidity are measured. In general, there are air temperature at Puri Indah Mall is thermally comfortable. It can suit to comfortable temperature limit, i.e. in the range of 24 0C - 26 0C. However, the level of humidity rather large difference, i.e., from 55 % to 74 %. The thermal environment of the mall is shown below:

Table 1. The thermal environment of the Puri Indah Mall, Kembangan, West , Jakarta.

No.	Floor Level	Use	Air Temp	Humidity
1	Ground floor	Shops	24.5	55 %
2	First floor	Shops	25	72 %
3	Second floor	Food court	26	76 %

Fig. 8. The situation of the fourth level used as culinary centre at Permata Hijau ITC.

The temperature on the third floor warmer due to proximity to a source of natural light through the roof lighting (skylights), which is also a source of heat.

In contrast to air temperature, air humidity in this three floors, it tends to vary much moist in the second and third floor. This condition can be explained that in the second and third floor there are more people than in first floor.

In Puri Indah Mall, natural lighting is used as a secondary source. This is done on the lighting in the ground floor (Ground Floor), especially for the main entrance lobby. Then the lighting is also used for lighting that illuminates the atrium ground floor, the second floor to the third floor. Atrium roof lighting using light (sky light).

At Permata Hijau ITC, general indoor air quality control is still dominated by the use of solar air systems (AC). As the air quality in it is also very influenced by this system. Actually there are other things that influence, that the ventilation system, used furniture, the dust in the room.

Operation of tobacco smoke has been implemented

with the local regulations on the prohibition of smoking in public places. With these rules then almost the entire building in Jakarta has applied this rule to apply no smoking zone by zone smoke.

Ventilation systems in buildings are usually used to supply fresh air conditioning and ventilation for a bathroom / wc, and kitchen. In addition to these purposes, the ventilation is also used to supply clean air to the central air conditioning.

.

Fig. 9. As with almost most of the mall, Cempaka Mas ITC use central air conditioning system. This is done to ensure comfort for building users. The mall is dense enogh with a tenant that looks a bit dark.

Indoor air temperature in the ITC Permata Hijau are in accordance with the regulation of Ministry of Energy i.e the interval between 24 0C to 26 0C. So that could be an efficient use of energy. More complete temperature data is as follows:

Table 2. The thermal environment of the ITC Permata Hijau, Kebayoran Lama, South Jakarta

No.	Floor Level	Use	Air Temp	Humidity
1	Ground floor	Shops	26	75 %
2	First floor	Shops	25	83 %
3	Second floor	Shops	24	83 %
4	Third floor	Food court	25	83 %

There is a great difference with Puri Indah Mall air humidity. In Permata Hijau ITC is very high. From the discussion before, it is logical because there is more visitors in this building. Everyone will release its latent heat so the humidity is higher.

Natural lighting in buildings, especially applied to the main entrance or the side. There is no roof lighting (skylights), thereby reducing the flux of solar radiation from the roof.

Indoor air quality in ITC Cempaka Mas is still dominated by the use of HVAC systems (AC). So the quality of air in it is also strongly influenced by this system. Actually there are other things that influence, ie ventilation systems, used furniture, state of the dust in the room.

Control of tobacco smoke has been carried out with the local regulations regarding the prohibition of smoking in public places. Given these rules then almost the entire building in Jakarta have applied this rule to apply the zone should not be permitted to smoke zone.

Ventilation systems in buildings are usually used to supply fresh air conditioning and ventilation for a bathroom / wc, and kitchen

The condition of thermal comfort found in Cempaka Mas ITC is somewhat higher than that set by the Minister of Energy and Mineral Resources of between 24 to 26 C. More detailed data on air temperature at the mall are as follows:

Table 3. The thermal environment of the ITC Cempaka Mas, Cempaka Putih, Central Jakarta

No.	Floor Level	Use	Air Temp	Humidity
1	Ground floor	Shops	28.5	85 %
2	First floor	Shops	28	82 %
3	Second floor	Shops	28	82 %
4	Third floor	Food court	27	84 %

Building Environmental Management (BEM)

The details of Building Environmental Management (BEM) are Basic Waste Management, Pollution of Construction Activity, Advance Waste Management, Proper Commissioning, and Occupant Survey. Only the aspects of basic waste management and advance waste management would discuss.

Waste water disposal system in Mal Puri Indah is by using recharge wells. Infiltration wells in Mal Puri Indah used for rainwater catchment. Infiltration wells made extending adjusted to the volume of water that will be absorbed and the construction site. While the waste disposed of by using the services of Jakarta Sanitation Department (Dinas Kebersihan DKI Jakarta).

It should be continuous efforts to monitor the implementation of infiltration wells, especially when the building was constructed before regulations existed. For those who do not have a building infiltration wells, especially for large and tall buildings such as malls and office buildings, then for them is required to make a large catchment wells in accordance with the building area. Likewise, waste treatment facilities and wastewater processing.

With regard to the large building infiltration wells, recharge wells to be seen whether made proportional not to the clean water needed. Infiltration wells not only serves to absorb rain water, but also can absorb water that has been treated and discharged into the environment deserves. Still from the same case, Mal Puri Indah already have tools for processing water that can be reused for watering plants.

Sewerage system at ITC Permata Hijau is to use municipal utilities. Not seen any facilities for sewage treatment.

Wastewater treatment system has not implemented at Permata Hijau ITC. Waste or garbage is conventionally processed with the transport by part sanitation.

Wastewater treatment system in Mal Puri Indah already implemented in some buildings, especially commercial. The system used is the Waste Treatment Plant (WTP) or Sewage Treatment Plant (STP).

For trash, still using the conventional way, ie by collecting garbage and then transported by garbage trucks every two days. Used truck has a capacity of 4 m3. so the waste transported month 60 m3.

Wastewater treatment system has been implemented in several buildings, especially commercial. The system used is the Waste Treatment Plant (WTP) or Sewage Treatment Plant (STP), as implemented in ITC Cempaka Mas .

Waste Management is still using the conventional way , ie by collecting garbage and then transported by garbage trucks every two days . Used truck has a capacity of 4 m3 . so the waste transported month 60 m3.

4. Conclusion

From the results of this study can be concluded that some aspect of green building defined in Greeship have been implemented in these three commercial complexes, such as (must be edited):

Appropriate Site Development (ASD)

Community Accessibility for the three cases was no problems at all. However the distance from the malls to the housing estate/ settlement still should use transport, especially private transport. In front of and around the malls and shopping centres, public transports were available. Bicycle still rare to be used, Site Landscaping is still aiming for aesthetics only. Trees for shade are rarely found. Almost of the outdoors were used for parking and circulation. This condition lead to the outdoor thermal environment becomes warmer. As building permit has been issued by the authority, the malls complex has a system of drainage. However, this drainage is still directed to the urban drainage.

Energy Efficiency and Conservation (EEC)

As usual, the layout of the malls is dominated by goods and items displayed. Thus the use of natural lighting was lacking. Almost of the building envelope was blocked by these goods. Natural lighting was mainly used in main entrance area. The use of ventilation, especially natural ventilation, was only use in building utilities, such as toilets, store, mechanical and electrical rooms, parking area and basement. The renewable energy was not available in these three areas.

Water Conservation (WC);

The concept of water use reduction has been implemented through the use of water fixtures, such as sink taps, urinals and closet. However the process of water recycling only implemented in Puri Malls. , Alternative or back up water resource use deep well. It is used only when there is an emergency. The implementation of rainwater harvesting mainly use in catchment wells. Plantations use for landscaping was mainly for aesthetic purpose. It means that these plants were still use regular irrigations.

Indoor Health and Comfort

Outdoor Air Introduction is only implemented for air conditioning. Fresh air for spaces is only used for utility room. Generally, in Jakarta there is a regulation for no smoking area, including public facilities, such as malls. Outside view was implemented in leisure area, such as restaurant and children playground. The interplay of lighting was used in the area of restaurant and games to achieve visual comfort. The level of thermal comfort generally is the rage of comfort level, i.e. 24 C– 26 C. However, the level of humidity is slightly higher because the density of the occupants.

Building Environmental Management (BEM)

The implementation of Waste Management was not new issue. The use of Waste Treatment Plant (WTP) and Sewage Treatment Plant (STP) has been implemented for years. The issue of pollution of construction activity was also including in the local regulation.

References

1) Adiwoso, Naning (2010). *Towards Indonesia's Sustainable Future through Sustainable Building and Construction.* Conference on Sustainable Buildings South East Asia (SB10SEA) "New Green opportunities and Challenges". Kuala Lumpur Malaysia, 4th – 6th May 2010
2) ASHRAE Standard 55-1992 Thermal Environmental Conditions for Human Occupancy. American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc, Atlanta.
3) Communications Department of the CEC Secretariat (2008) Green building in North America: Opportunities and Challenges. Commission for Environmental Cooperation. Printed in Canada.
4) Fanger, P.O. (1976) "Thermal Comfort: Analysis and Applications."dalam "Environmental Engineering." New York: McGraw Hill Book Company.
5) Green Building Council Indonesia (2005), *Doksmen Perbandingan antara Greenship New Building versi 1.0 dengan Greenship New Building versi 1.1*. departemen Rating Development, Direcktorat Rating dan Teknologi, Green Building Council Indonesia, Jakarta
6) http://www. streetdirectory.co.id/ downloaded at June, 4th 2014.
7) Pemerintah Daerah Provinsi DKI Jakarta (2012), *Peraturan Daerah. No. 1 tentang Rencana Tata Ruang DKI Jakarta tahun 2030*, Jakarta.
8) Pemerintah Daerah Provinsi DKI Jakarta (2010), *Peraturan Daerah No. 7 tentang Bangunan Gedung*, Jakarta.
9) Pemerintah Daerah Provinsi DKI Jakarta (2010), *Peraturan Gubernur No. 38 th 20127 tentang Bangunan Hijau*, Jakarta.
10) United States of Environmental Protection Agency (2012), *Definition of Green Buildings.* downloaded at June, 2nd 2014.

Adopting Transport Strategies for Sustainable Green Campus At Universiti Sains Malaysia, Penang, Malaysia

Hassim Mat[1] , Abdul Ghapar Othman[2]

[1]Associate Prof. Dr., Town and Regional Planning, School of Housing, Building and Planning, Universiti Sains Malaysia
[2] Senior Lecturer, Town and Regional Planning, School of Housing, Building and Planning, Universiti Sains Malaysia

Abstract

Many universities are exploring a range of environmentally appealing solutions to alleviate congestion and improve safety concerning air quality, increasing congestion, lack of land for parking, high cost of constructing parking structures, pressures to reduce traffic's impact on surrounding neighborhoods and constraints on financial resources. Universiti Sains Malaysia is one of the universities in Malaysia that use 'healthy campus' as their approach for community development. Betterment of health and well-being of the community become one of the goals of community development. Thus this approach creates and improves those physical and social environments to achieve that aim. One of the elements in this approach is quality of the environmental conditions. Good quality of environment can sustain people to live and work there. Nevertheless, USM still unable to overcome shortage of parking spaces, traffic congestion and noise caused by private vehicles. One of the strategies that could solve the problem is changing the mode of commuting from private vehicles to public transport among the citizens. There are two objectives identified for this paper; to identify the mode of commuting pattern among the staff and to identify the demand for public transport (bus) services. Quantitative and qualitative analysis were used in this research. A total of 929 staff; supporting and academic, were surveyed using a constructed questionnaire beside personal interviews with some officers in the campus and management of Rapid Penang Bus. Almost 90% of the respondents commute to USM on private vehicle and about 57.8% (537) are willing to use public transport (bus) service or Rapid Penang Bus service if there are significant improvements in the bus services.

Keywords: *healthy campus, community development, commuting pattern and public transport.*

I. Introduction

Many Malaysians depend on private vehicle transportations to cater their daily travel needs which inevitably leads to an over infiltration of vehicles into the urban area. "Automobile Dependency" has always been viewed as a potential threat to Malaysia's urban areas, as it contributes to the increase in traffic congestion, higher accidents rate, inefficient usage of urban land, environmental pollution, economic impacts, urban sprawling and reduces the overall quality of public transportation. All this negative impacts deteriorate the Quality of Life of urban dwellers (Barter, 2000; Jamilah, 1993; Iles, 2005). The vicious cycle of high levels of automobile dependency as illustrated in Figure 1.1 contributes to the increase of traffic volume thus contributing to an inevitable vicious circle of increasing traffic congestion, accident rate, inefficient urban land use and environmental pollution and creating a cycle of diminishing public transport that directly interrelates with the urban dwellers' Quality of Life. Universiti Sains Malaysia (USM) is exploring a range of environmentally appealing solutions to alleviate problems such as congestion, public safety, poor air quality, lack of land for parking, high cost of constructing parking structures, pressures to reduce traffic's impact on surrounding neighborhoods and constraints on financial resources. USM is also one of the universities in Malaysia that adapt the 'healthy campus' concept for its community development. One the strategy which was implemented is limiting the usage or owning of private vehicles among the students and providing the commuter bus service. Nevertheless, USM still unable to overcome shortage of parking spaces, traffic congestion and noise caused by private vehicles. Thus, other strategy that could overcome the problems is to reduce private vehicles dependency among its staff and promote the usage of public transportation to achieve a sustainable green campus or healthy campus.

Hassim Bin Mat
--- Assoc. Prof. Dr., School of Housing, Building and Planning, Universiti Sains Malaysia
Tel: +604 6532844, Fax: +604 6576523
E-mail: hassim@usm.my

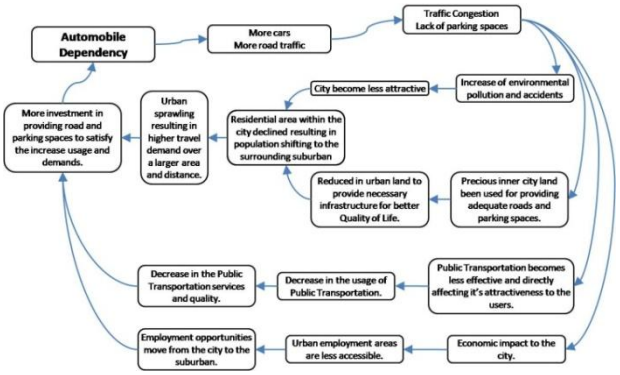


Figure 1.1: The Vicious Cycle of Urban Transportation in Malaysia
Adopted from (UITP, 2001)

II. Objective of The Study

There are two objectives for the study:

i. To identify the transport mode among the staff.
ii. To identify the demand for public transport (bus) services among the staff.

III. Literature Review

Nowadays, concept of sustainable development has been used to counter many problems due to uncontrolled or over developments. University Sains Malaysia also tries to ease the problems that occurred due to the usage of transportation. Sustainable development refers development that meets the needs of the existing society/community without compromising the right of future generation (Newman, 1999). In detail, UN World Commission on Environment and Development has state that sustainability has been defined through the United Nations as a global process of development that minimizes environments resources and reduces the impact on environmental sinks using processes that simultaneously improve the economy and the quality of life.

The concept of sustainable can be adapted with the decreasing usage of private vehicles (Anders, 1991). The irony in USM is that, almost all staff own and used private vehicles and this releases poisonous gases to the air. In addition, the presence of large number of private vehicles has forced USM to allocate large areas for parking. The lack of parking spaces in some areas of the university has resulted vehicles being parked along the road sides, thus blocking the smooth flow of other vehicles and reducing the capacity of the accessible road. Because of this, traffic congestion occurred in the campus especially during peak hours.

One of the strategies to achieve a sustainable university is to reduce the number of vehicles in USM. The lower number of vehicles in USM means less poisonous gas release will to the air. The usage of public transportation is one of the alternatives to decrease the number of vehicles. If 40 staff uses their own vehicles to commute to USM, there are 40 vehicles moving into and within USM which this can be replaced with the usage of only one bus. In terms of parking spaces, the ratio of public bus with private vehicle is 1:40 which means that with one only bus, there will be 40 new vacant parking lots in USM. We know that the traffic congestion happen anywhere in any place but by using public transportation the level of congestion can be reduced. Besides that, the concept of "Green Campus" in USM is actually adapted from concept of sustainability. Policies were formulated to make sure the aim of 'green campus' can be achieved. The overall concept is to enhance the usage of public transportation as one of the ways to achieve or to move toward sustainability and also to create sustainable university.

Transportation is a service that must be utilized immediately by providing a transport supply. The numerous activities will generate a movement that will affect the transport system (Kasipillai and Chan, 2008). According to Rodrigue (1998), the demand and supply of transportations are derived from infrastructures movements and movement interdependency. Transport supply is the capacity of transportation infrastructures and modes, generally over a geographically defined transport system and for a specific period of time. Supply in transportation can be expressed using a terms such as infrastructures (capacity), services (frequency) and networks. Commonly, the number of passengers, the volumes (for liquids or containerized traffic), or mass (for freight) that could be transported per unit of time and space in the quantifying transport supply. Transport demand on the other hand, is a transport needs, even if those needs are satisfied, fully, partially or not at all. It is also expressed in terms of number of peoples, volumes, or tons per unit of time and space. Bruton asserted that transport demand derives from the needs of people to travel from one place to another to carry out the activity of their daily lives. He identified three factors that affected demand for movement:

a) The location of the home, workplace, shopping, educational and other activities.
b) The nature of the transport system available
c) The demographic and socio-economic characteristic of the population.

Transport demand functions vary according to the nature of what is to be transported. In studying demand of passengers, demands are influence by demographic attributes of the population such as income, age, standard of living, race and sex, as well as modal preferences. These factors affected travel characteristic of passengers. According to Jansen (1993), travel characteristics are dependent on factor that influences the travel. The factors are:

a) Location, land users and distance

People tend to feel tired and bored in long distance daily travel. The improvement in daily

travel distance need to be implemented as it can reduce the travel time.

b) Availability of transport mode

Availability of transport mode depends on the development of transport planning. Making public transport more attractive and responsive to the needs of citizens will give more accessibility to the citizens besides reducing the congestions (Rosaa rio Macaa rio, 2001)

c) Income

Factors which proved to be significant discriminators among trip chain types included life cycle stage, marital status, gender, employment status, education, income, the presence of children and the residential density (Starthman et al., 1994)

d) Work schedule

Time is an important determinant in travel planning. The choice of travel mode is based on time because it will make life easier.

e) Fuel cost

Fuel price are increasing and thus will make the driver think twice to use private transport or public transport.

f) Impact of Travel

The smooth travel will give more positive impact like easy to travel, stress-less, save the time and money while traffic congestion will put a people in a stress, waste time and fuel.

g) Time/delay

Every single time is very valuable and for some people, every minute can produce a lot of money. Direct negative effects of commuting are obvious and include hours lost from work and/or leisure activities.

h) Cost

Every single commuting will need cost but the different is the high cost or low cost and it depends on type of commute and the distance of commuting.

i) Congestion/factor

Traffic congestion issues have led to more complex problems.

Generally, a growth of the transport demand increases the load factor of a transport network until transport supply is reached. Speed and transit times drop afterwards. The same journey can thus have different durations according to the time of the day. Relationships between transport supply and demand continually change, but they are mutually interrelated. From a conventional economic perspective, transport supply and demand interact until an equilibrium is reached between the quantity of transportation the market is willing to use at a given price and the quantity being supplied for that price level (Paulley et al., 2006; Steg & Gifford, 2005).

IV. The Case Study

Universiti Sains Malaysia (USM) main campus is located on the Penang Island in the northern part of Peninsular Malaysia. It is bounded by Jalan Sungai Dua and Jalan Bukit Gambir as shown in Figure 4.1. It covers an area of approximately 142.5 hectare comprising of several land uses (**Table 4.1**). At present there are about 3,518 staff working in USM main campus (1,001 administrative and 2,517 academic). A total of 20,842 full time students are studying at the main campus. USM has currently 24 schools conducting academic programmes and more than 20 centers of excellence specializing in research activities.

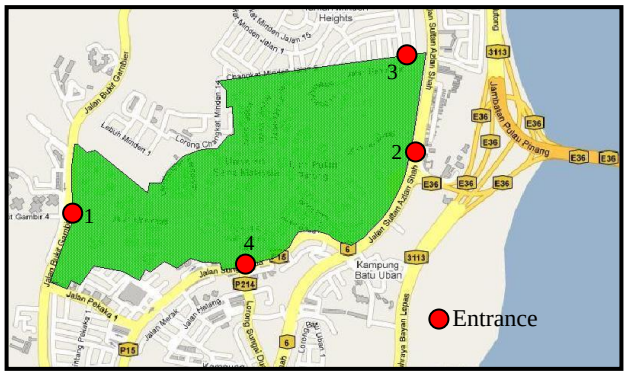


Figure 4.1: USM in Penang Island

Table 4.1: Land Use Types of USM Campus

	Land Use Types	Hectare	%
1	Academic	36.5	25.7
2	Administration	4.04	2.8
3	Housing	37.16	26.2
4	Facilities	1.53	1.1
5	Recreation	26.87	18.9
6	Conservation	31.14	21.9
7	Religious area	4.74	3.3
Total		142.5	100.0

Source: Development Office USM 2012

There are four main entrances to USM. They are Bukit Gambir(1), Batu Uban(2), Gelugor(3) and Sungai Dua(4). The existing road system on campus is inherited from the British Army. All buildings are accessible and connected to the road networks.

To control the entrance of vehicles into campus, each vehicle should have a sticker. Students and staff who use private vehicles in a campus can apply for sticker from the Security Department. The provision of stickers for students is limited and not all applications are successful. On the other hand, USM provides shuttle (commuter) bus to transport students to all parts of the campus. At the moment, there are 15 shuttle (commuter) buses servicing the campus. All

registered students are compulsory to make payment of RM60 per semester for the commuter service.

V. Methodology

The methodology of this study is divided into four main phases:

i. Initial stage of study
ii. Data collection
iii. Data analysis
iv. Summary and suggestion

In the initial stage of this study, it begins with identifying issues and problems about the topic selected. Issues that have been identified are issues of sustainability such as the increasing number of private vehicles, traffic congestion and unsafe environment (air pollution). Readings on public transport and related issues were accumulated in a form of literature review. The literature review helps in identifying the objectives, methodology and scope of the study. It also improve the study by looking into previous research design and questionnaires, which will give the researchers some insight into how they can proceed effectively with the study (Naoum, 1998)

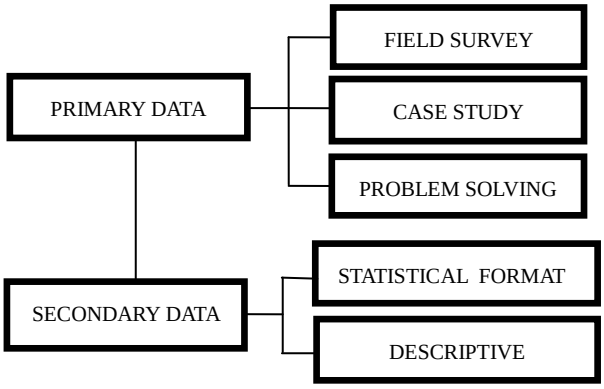


Figure 5.1: Methods of Data Collection

As shown in Figure 5.1, the methods of data are field survey approach for primary data and descriptive documents for secondary data. The field survey is done through questionnaire form delivered to respondents. Interviews were also conducted to some of the respondents. Respondents include all supporting and academic staffs of USM. Table 5.1 below shows the technique to collecting data for this study.

Table 5.1: Data Collection Techniques

Item	Technique	Respondent
Primary Data	Questionnaire	USM Staff
Primary Data	Interview	Rapid Penang
Secondary Data	Descriptive Doc.	-
Sampling	-	USM Staff

Secondary data are collected from websites and the university library. Data from websites include journal articles, government agencies and Rapid Penang website. References were also made to reports on previous studies, books, thesis and alike.

VI. Data Analysis and Finding

Collected primary data is keyed-in and analyzed using SPSS statistical package. The data is edited, coded and verified to minimize error. This study applies quantitative and qualitative data analysis. The primary data is analyzed using of quantitative method after considering the research design and the first objectives of this study that is to know the demand of public transportation among USM staff. The second objective which is to identify the impact of the implementation of public transportation in USM will be analyze using qualitative method base on secondary data gathered from the various sources. The techniques used in analyzing data include frequencies and cross tabulation analysis.

Table 6.1: Breakdown of Respondents

Staff Category	Number of Respondent	%
Admin Staff	798	85.9
Academic	119	12.8
Missing	12	1.3
Total	929	100

As shown in Table 6.1, there are 929 respondents participated in this study which include supporting and academic staff. About 798 respondents are supporting/management staff while the other 119 are academic staff.

The mode of transport to USM among the respondents showed that about 833 respondents (89.7%) use owned private vehicles, 67 respondents (7.2%) commute by car pooling and 27 respondents (2.9%) use public transportation (Refer to Figure 6.1). Private vehicle include motorcycle and all vehicles that are in the same category as car. This shows a high dependency on private vehicle usages among USM staff. As a result, it has generated many traffic problems such as congestion during peak hours, lack of parking spaces in high populated areas, illegal and double parking, polluted air and noises. To alleviate some of these problems, switching to public bus might be one of the solutions.

Table 6.2 below shows the type of responds on using the Rapid Penang bus as a mode of transport to USM. Out of 929 respondents surveyed, 518 respondents (55.8%) are willing to use the Rapid Penang bus while 383 respondents (41.2%) will still remain with their private vehicles due to various reasons. Currently, there are 19 respondents (2%) taking Rapid Penang buses to USM.

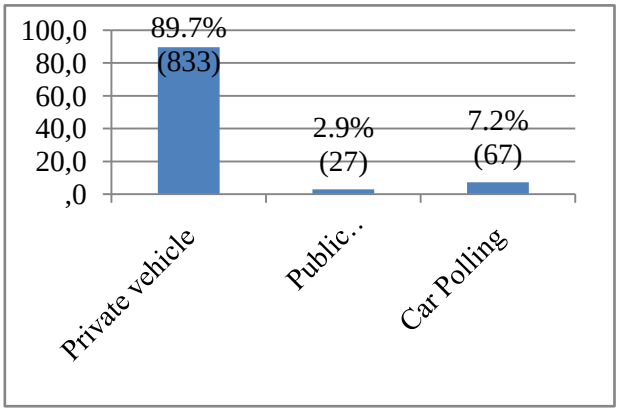


Figure 6.1: Mode of Transport to USM

Table 6.2: Responds views on Rapid Penang

Types of Respond	Number of Respondent
Willing To Use	518
Refuse To Use	383
Existing User	19
Missing	9
TOTAL	**929**

As shown in **Table 6.3**, several factors were identified as important to respondents when choosing public bus as mode of transport to work. About 212 respondents feel that punctuality of bus arrival and departure according to the time scheduling is a priority. This is followed by faster in term of journey time with 196 answers and send direct to destination (department and school) with 180 answers, minimum transportation cost of RM150 per month with 176 answers, more comfortable with 115 answers, and maximum 20 minutes travelling time with 98 answers. The unpopular answer is other factor such as when their private vehicles are unavailable or break-down and the public bus is the only alternative.

Table 6.3: Pulling Factor of Rapid Penang Bus Service

Factors	Respondent
Punctual	212
Faster	196
Sent direct to school/office	180
Minimum cost RM150	176
Comfortable	115
Minimum 20 minutes traveling time	98

VII. Discussion

Many researchers try to identify what are the criteria that users feel most important when choosing public transport especially public bus as their mode of transport. These criteria can indirectly switch their mode of transport to work from private vehicle to public bus as well as improving the bus service (Levinson, Zimmerman and Clinger, 2002; White, 2009). Generally, the pull factor of public bus is very much associated with 3C (Convenient, Comfort and Cheap). A public bus service will be effective and efficient if it can integrate these three aspects. As shown in Table 6.3, the study has listed several pull factors/criteria that the respondents identified as being important when choosing public bus service. Being punctual and fast service to the door steps are among the top factors in addition to being comfort, cheap and minimum travelling time. Since majority of the respondents use private vehicle to USM, switching them to public bus becomes a challenge for the transport planner at Rapid Penang to plan their bus routes and trips. As highlighted by Jansen (1993), factors such as location (origin-destination), availability of transport mode, schedule, time/delay, cost and congestion should be applied as check and balance with the pull factors identified above in this study.

In addition, more than half of the total respondents are willing to use the Rapid Penang bus service as the mode of transport to USM. This will of course greatly reduce the number of private vehicle in campus, thus resulting in lower traffic congestion and more available parking spaces. The university should allow Rapid Penang to serve within the campus ground during the morning and evening peak hours while the university buses operating at regular hours. Pick-up and drop-off points (bus stop) should be designated within the campus road and pedestrian walkway network. Upgrading of roofed bus stop and pedestrian walkway is essential. For short distance journey within the university, students and staff are encouraged to walk or use bicycle. The university and Rapid Penang need to plan and work together on adopting and implementing these strategies for a sustainable green campus.

VIII. Conclusion

Findings from the study will be able to assist USM in formulating and implementing policies to encourage its staff to switch to Rapid Penang bus as their mode of transport to work while improving and upgrading some of the transport facilities within the campus ground. Furthermore, a proposed USM bus route for Rapid Penang bus services should be produced and planned for. The results of this study can be a guide for Rapid Penang management to understanding the needs and expectations of its clients, expanding and improving their service around Penang, providing chartered bus service ferrying staff to USM and back to their home. It is also to support the University's policies of creating a sustainable green campus or healthy campus through reducing the usage of private vehicles thus reducing the emission of CO2 in the campus.

References

1) Anders, R. (1991), The sustainable cities movement. Working paper no. 2, *Institute for Resources and Security Studies*, Cambridge, MA, USA.
2) Barter, P.A. (2000). Urban Transport in Asia: Problems and Prospects for High Density Cities. *Asia Pacific Development Monitor, 2, 1*, pp: 33-66.
3) Iles, Richard. (2005). *Public Transport in Developing Countries*. Elsevier Ltd, Oxford, United Kingdom
4) Jamilah Mohamad, (1993), Social Dimensions in Transport: A Retrospective View of the Relevance View of the Social Science. *Journal of faculty Art and Social Science.* Vol 10.
5) Jansen, G.R.M., (1993), Commuting: home sprawl, job sprawl, and traffic jams, in Salomon, I., Bovy, P. and Orfeuil, J.P. (Eds), *A Billion Trips a Day, Kluwer, Dordecht*, pp. 101.
6) Kasipillai, J. and Chan, P. (2008). Travel Demand Management: Lessons for Malaysia. *Journal of Public Transportation, Vol. 11, No. 3*, pp: 41-55
7) Levinson, Herbert S., Zimmerman, Samuel, and Clinger, Jennifer (2002), Bus Rapid Transit: An Overview. *Journal of Public Transportation.* Volume 5, No. 2, 2002, 8-37.
8) Michael J. Bruton, (1985), Introduction to transportation planning. *Hutchinson Group (SA) (Pty) Ltd. South Africa*.
9) Naoum, S.G., (1998). Dissertation Research and Writing for Construction Students. Butterworth-Heinemann
10) Naoum, S.G., (1998). Dissertation Research and Writing for Construction Students. Butterworth-Heinemann
11) Newman, P., Kenworthy, J., (1999), Sustainability and Cities: Overcoming Automobile Dependence. *Island Press*, Washington, DC.
12) Paulley, N.; Balcombe, R.; Mackett, R.; Titheridge, H.; Preston, J.M.; Wardman, M.R.; Shires, J.D.; White, P. (2006) The demand for public transport: The effects of fares, quality of service, income and car ownership. *Transport Policy*, 13(4), pp.295-306.
13) Rodrigue, Jean-Paul, (1998), The Geography of Transport Systems. *Department of Global Studies and Geography*. Hofstra University.
14) Rosaa Rio Macaa Rio, (2001), Upgrading quality in urban systems. *Managing Service Quality*, 11 (2), 93-98
15) Strathman, J.G., Dueker, K.J. and Davis, J.S. (1994), Effects of household structure and selected travel characteristics on trip chaining. *Transportation (1986-1998)*, 21 (1), 23.
16) Steg, Linda and Gifford, R. (2005). Sustainable Transportation and Quality of Life. *Journal of Transport Geography Vol. 13*, pp: 59-69
17) UITP Union Internationale des Transports Publics (International Association of Public Transport) (2001). Better Mobility in Urban Areas- *Problems - Solutions - Good Practices.*
18) White, Peter (2009), Public Transport: Its Planning, Management and Operation. Routledge: London

Environmental and Green Context

Third Session Parallel Notes
Moderator: Deva Fosterharoldas Swasto

K5 Room 2nd Floor
16.30 – 17.30

Presenter	:	**Moh. Syarif Hidayat (Universitas Mercu Buana Jakarta)**
Title	:	**Implementation of Green Building Concept in Commercial Buildings : Malls and Trade Center in Jakarta**
Presentation Duration	:	**15 minutes**

PRESENTATION CONTENTS

Introduction:

1. Green Building is the practice of creating structures and using processes that area environmentally responsible and resource efficient throught a building's life cycle from siting to design, construction, operation, maintenance, renovation and deconstruction
2. Green Building : building; environment

Green Building Council Indonesia(GBCI)

1. Appropriate site development
2. Energy efficiency
3. Water conservation
4. Material resources and conservation
5. Indoor health and comfort
6. Building environmental management

Issues :

1. The shortage of energy supply
2. Inefficient use of energy in buildings
3. Water supply shortages
4. Water in buildings and
5. Waste from the building both during construction and use of buildings
6. Problem in the implementation of green building in Indoensia, especially in jakarta

Problem

What to estimate a building tends to be green building for a common people

Materials

Qualitative through observation and simple measurement
The cases:

- Puri Indah Mall, West Jakarta
- Permata Hijau Trade Centres, South Jakarta and
- ITC Cempaka Mas Central Jakarta

Result

Appropriate Site Development :

- Three commercial complexes are located in and around housing estate.
- The three cases have good accessibilities where their locations are very close with the public transport.
- The area for bicycle is not available
- The uses of open space are used for car and motorcycle parking and circulation. The rest is used for landscaping.

- The micro climate a little bit warmer

Energy Effieciency and Conservation(EEC) :
- the overall thermal transfer value (OTTV)
- The use of natural light in non rentable area contraste
- Natural ventilation is very rar

Water Conservation(WC) :
- Implemented
- reduction of water consumption
- Excreduction of water consumption
- Excep t for Air condiitoning
- water harvesting

Indoor Health and Comfort :
- air introduction is used for air circulation system.
- Control of tobacco smoke
- Outside view of the building is obstructed
- Ventilation for conditioners (AC)
- Ventilation systems in buildings are usually used to supply fresh air conditioning and ventilation for a bathroom

Building Environmental Managemen(BEM) :
- Basic Waste Management,
- Advance Waste Management, and
- Occupant Survey.

Conclusions :
- Appropriate site development; BC fitted with regulation, infiltration well.
- Energy efficiency and conservation ;natural lighting, view,
- Water conservation ; wc, water taps
- Indoor health and comfort: according to standar,d tobacco, temperature
- Building environmental management : STP, WTP are already available, Water recycling

---

Presenter	:	**Hassim Mat (Universiti Sains Malaysia)**
Title	:	**Adopting Transport Strategies for Sustainable Green Campus at Universiti Sains Malaysia, Penang, Malaysia**
Presentation Duration	:	**17 minutes**

PRESENTATION CONTENTS

The case of study in Universiti Sains Malaysia, using research methodology.

Present Scenario :
In 2006 – 2012 the total number of registered vehicles in the campus increased, while the total number of parking lots limited.

Problem :
- Demand for parking more than supply
- Illegal parking along main road
- Inefficient shuttle bus service
- Too depedant on private vehicle and cause the environmental pollution.

Exising the green campus policy : limit the usage privat vihacle (car,motorcycle,etc) for students.

Strategies :

- Introducing Shuttle Bus Service, give the better services and facilities.
- Undergraduate students NOT allowed to drive and ride in the Campus
- Limit the ISSUE of vehicles stickers to undergraduate students
- Clamping of illegal parked vehicles
- Introducing ECO-VAN which use electrical energy for students and staff

Use the 3Cs Public transport Services (Cheap, Convenience, and Comfortable)

Conclusion :

Achieving > Green Campus Environment

- Resulted a proposed bus route for Rapid Penang bus services to ferry USM staff.
- As a guidance to Rapid Penang management in expanding and improving their service around Penang.
- Support the USM policies of creating a sustainable green campus or healthy campus through reducing the usage of private vehicles.
- Less car in the campus, less pollution& demand of parking
- Less demand for parking, less land being converted to parking lots
- Thus reducing development costs.

DISCUSSION

Questioner	:	**Anita (ITB)**
Question	:	Will the staff be punished when they use the privat vehicles? How about the student from a far place?
Answer	:	The staff may use the privat vehicles, the punishment just for the students because students may not use them before they graduated from the university.

Outdoor Thermal Comfort in Tugu - Kraton Street Corridor Yogyakarta City

Ardina Putri Rahtama[1], M. Sani Roychansyah[2]

[1] Urban and Regional Planning, Gadjah Mada University
[2] Lecturer, Architecture and Planning Department, Gadjah Mada University

Abstract

The research of outdoor thermal comfort in Tugu-Kraton Street Corridor Yogyakarta City is important to do. Urban heat island makes thermal comfort declined. Outdoor is a place often used carrying out social interaction. Outdoor thermal comfort is depended on its enclosure. Study has objectives to measure thermal comfort degree and identify its factors. In addition, study also identifies enclosure's influence towards outdoor thermal comfort. Study uses a mixed deductive method. Quantitative analysis is used to measure thermal comfort. Qualitative analysis is used to relate enclosure's influence to microclimate condition of the corridor. Study got 256 respondents who have been doing activity in Tugu-Kraton Street Corridor. Interpretation of microclimate data and respondent's characteristic was done in the same time. The result of study indicates that Tugu-Kraton Street Corridor isn't comfortable. It is indicated by PET value 37,96°C. PET value shows outdoor thermal comfort standard in Tugu-Kraton Street Corridor at person in the age of 35 years old, 57 kg in weight, and 170 cm in height when he/she is doing activity as big as 1,1 met with clothes 0,52 clo, air temperature 31°C, mean radiant temperature 39°C, solar radiation 51,11 W/m^2, air humidity 57,47%RH and wind velocity 0,11 m/s. Youngster prefer colder microclimate than children and old people do. Thermal comfort in Tugu-Kraton Street Corridor is mostly influenced by air temperature, air humidity, and wind velocity. Comfortable outdoor tends to have bright colored buildings, wide setback, a lot of wide crown trees, paved floor, a lot of street furniture, and closed sky view factor.

Keywords: *outdoor thermal comfort, corridor, factors, enclosure*

I. Introduction

Global warming effect is felt by people around the world. Global warming is an increasing of mean temperature at atmosphere, ocean, and land in the earth (Sangkertadi, 2013). The increased temperature is caused by the burning of fossil fuel and other non-renewable fuel. The burning of nonrenewable fuel releases carbondioxide that causes the solar radiant is emitted back to the earth. One of the part of global warming is urban heat islands. Urban heat islands is a condition which causes the downtown temperature higher than suburb temperature (Sangkertadi, 2013). According to Givoni in Satwiko (2008), urban heat islands is depended on the balance of netto radiation, saved solar energy at building, centered heat source, evaporation at the lower area, and usage of air conditioner.

Ardina Putri Rahtama
---Urban and Regional Planning, Architecture and Planning Department, Faculty of Engineering
Gadjah Mada University
Tel: +62 8564786 0593
e-mail: ardinaputri14@gmail.com

The development of built area in town causes its temperature higher than the past. Urbanization to the town causes an increasing of housing which makes built area to grow larger than the past. Today, there are many housing that closes land and decreases open space. Housing development makes an increasing air temperature around there causes uncomfortable condition. Uncomfortable outdoor condition causes people prefer to have activity in indoor. Whereas activity in outdoor can increase a social interaction which can create a social harmonization between societies.

The phenomenon of urban heat islands also happen in Yogyakarta City specifically for the downtown (Hutama, 2011). According toSurtiani (2006), Damayanti and Handinoto (2005), and Clayin Surtiani (2006) the downtown is an important part of living at the town. The downtown is an activity center. The Yogyakarta City's down town is Tugu-Kraton Street Corridor. Tugu-Kraton Street Corridor has 4 sections that is Marga Utama Street, Malioboro Street, Marga Mulya Street, and Pangurakan Street. Tugu-Kraton Street Corridor has many activity such as economic, administration, and tourism. As an activity center, it has more quantity of people having activity than other

areas. People in Tugu-Kraton Street Corridor not only has activity indoor but also outdoor.

One part in Tugu-Kraton Street Corridor that is always used by people to do their activity is the pedestrian. The pedestrian is an activity center in Tugu-Kraton Street Corridor which is especially used to tourism activity. The pedestrian design creates enclosure that influences user comfort. According to Carmona (2003), Trancik (1986), Kusmawanto (2005), Hough (1984), Givoniin Satwiko (2008), and Sangkertadi, 2013) enclosure's element of corridor space are wall, floor, and roof. The elements can be seen from the building façade color, setback, vegetation, floor material, street furniture, and sky view factor. Enclosure is made from combined design of mentioned elements. Perfect design will make theuser feels pleasant in the corridor.

Some comfort definitions are expressed by Boedojo (1986), Fanger (1992), ISO 7730 (1994), Atkinson (1996), Weisman in Listianto (2006), andSangkertadi (2013). Comfort's definition is linked with comfortable concept and human perception. The comfort is a human's feeling which depend on stimulation given by surroundings. One of the most significant comfort that can influence human feeling to have activity in outdoor is thermal comfort (Karyono, 2001). Thermal comfort'sdefinition is expressed by ISO 7730 (1994), Sangkertadi (2013), Auliciems and Szokolay (1997), Sastra and Marlina Maidinita (2009), Wonorahadjo and Koerniawan (2008), Zambrano, et al (2006), Satwiko (2008), Frick, et al (2008), and Lippsmeier inMaidinita (2009). Thermal comfort is a human's feeling toward thermal condition which they are gotten.

Thermal comfort usually can be counted by using empirical or theoretical thermal comfort index. Empirical thermal comfort index is gotten from the result of field study. Some empirical thermal comfort index are expressed by Auliciems and Szokolay (1997), Chai (1981), Gagge, et al (1972), Adebamowo and Adeyemi (2013), Pourmahabadian, et al (2008), Nicol and Humphreys (2002), Madsen, et al (1984),Christensen (2008), Walsberg and Wolf (1996), and Tahbaz (2011). While theoretical thermal comfort index is gotten from the result of the scientific calculation. Some theoretical thermal comfort indexs are expressed by Auliciems and Szokolay (1997), Chai (1981), Adebamowo and Adeyemi (2013), Pourmahabadian, et al (2008), Unger (1999), Zambrano, et al (2006), Sangkertadi (2013), ISO 7730 (1994), Deb and Ramachandraiah, (2010), Gulyas and Matzarakis (2007), and Tahbaz (2011).

Each thermal comfort index has strength and weakness. The study use *Physiologically Equivalent Temperature* (PET) index. The research about PET is ever done by some researchers from various country. The research is ever done by Hoppe (1999), Monteiro and Alucci (2006), Gulyas and Matzarakis (2007), Honjo (2009), Ng, Ren, andKatzschner (2009), Cheng, Ng, and Chan (2010), as well as Monteiro and Alucci (2012).The factor that influences thermal comfort interpretation are air temperature, radiant temperature, solar radiation, air humidity, wind velocity, human's age, gender, height, weight, clothing value, and activity value.

The phenomena of the global warming and the urban heat islands createuncomfortable outdoor space. That condition makes people are prefer to have activity in indoor area. One of the area, which is experienced urban heat islands, is the Yogyakarta's downtown. While Tugu-Kraton Street Corridor is uncomfortable, activity must be on going as the tourism's support. The enclosure design is a factor that influences comfort especially thermal comfort in Tugu-Kraton Street Corridor.

The study purposes to identify the enclosure's influence toward thermal comfort in Tugu-Kraton Street Corridor. The explanation begin with discussing about the result of thermal comfort degree and the most influenced factor of its in Tugu-Kraton Street Corridor. The last is discussing the enclosure's influence toward thermal comfort. The field survey did in three days because of the permission limitation of the equipment. That case makes microclimate data in each segment is not measured along day. Besides that, the study can't verified PET index in each segment because of the lack of respondents. The limitation makes the influence of enclosure can't be detailed in this study.

II. Research Method

The research of outdoor thermal comfort in Tugu-Kraton Street Corridor Yogyakarta City was a deductive research. The research was done to know outdoor thermal comfort degree, its factor and the influencing enclosure. The research was begun by deducting theories about outdoor thermal comfort. The research used PET index as tool to measure thermal comfort in Tugu-Kraton Street Corridor. The result of theory deduction was PET index which had two parts that were PET value and thermal interpretation.

PET value was a mean radiant temperature standard. PET value depended on air temperature, radiant temperature, solar radiation, wind velocity, and air humidity. While thermal interpretation was thermal sensation felt by body at certain condition and time. Thermal interpretation depended on air temperature, radiant temperature, solar radiation, air humidity, wind velocity, human's age, gender, height, weight, clothing value, and activity value. After theory deduction was done, the researchers prepared to collect data. The researchers prepared a list of needed data, tools, and number of respondents.

The data collecting was done in every segment of Tugu-Kraton Street Corridor Yogyakarta City which was divided into 8 segments. A segment was west sideof Marga Utama Street. B segment was east side of

Marga Utama Street. C segment was west side of Malioboro Street. D segment was east side of Malioboro Street. E segment was west side of Marga Mulya Street. F segment was east side of Marga Mulya Street. G segment was west side of Pangurakan Street. H segment was east side of Pangurakan Street.

In each segment, the researchers collected enclosure data by field survey, climate data by measuring, and human characteristic data by questionnaire distributing. Enclosure data, which were collected, were qualitative data about wall, floor, and roof by concerning their parameters. The wall's elements were building façade color, setback, and vegetation. Building façade color data were collected by recording façade pictures. Setback data were collected by creating of street fragment maps. Vegetation data were collected by creating of vegetation distribution maps.

The floor's elements were floor material and street furniture distribution. The material data were collected by seeing floor material which was used. Street furniture data were collected by field survey and creating of street furniture distribution maps. While the data of the roof's element were sky view factor, data were collected by recording sky view factor in each segment which was using a fisheye lens camera. Sky view factor was seen reticence ratio in each segment.

The measuring of microclimate and questionnaire distribution data was done at the same time. The measuring collected air temperature, radiant temperature, solar radiation, wind velocity, and air humidity data. The air temperature data measures by thermometer. The radiant temperature measures by globe thermometer. The solar radiation measures by solar power meter. The wind velocity measures by anemometer. The air humidity measures by hygrometer.

The measuring was done until gets 32 respondents in each segment. The measuring used detail level to minute. While questionnaire was used to get data about human's age, gender, height, weight, clothing value, and activity value. Respondent filled out the questionnaire with what they felt about the comfort. After microclimate and respondent characteristic data were collected, both of them were merged by seeing when the questionnaire and the microclimate measuring were done. The measurement and questionnaires distribution was done as long as morning (around 08.00 AM) until afternoon (about 05.00 PM). The climate condition was clear and not overcast during measurement.

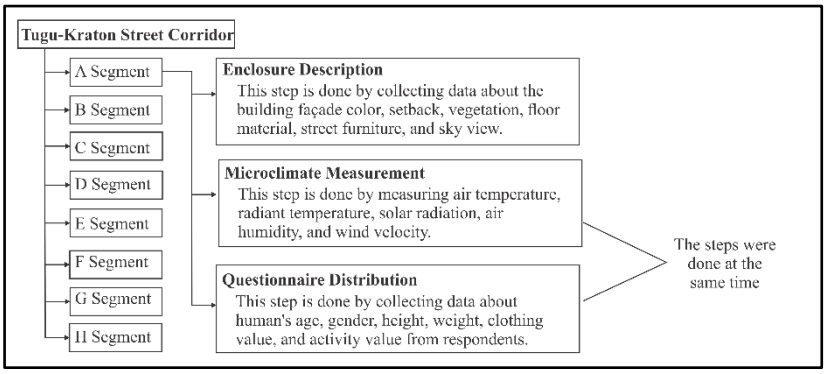


Fig.1 Field Survey Method
Source: Researcher, 2014

The sample interpretation was done by cluster accidental sampling technique. The cluster sampling meantdividing research location into 8 segment. In each segment sample was picked at the same number which was totaled 32 respondents. Accidental sampling mean everyone who had activity in Tugu-Kraton Street Corridor had a same opportunity to be respondent. The total of respondents in the research were 256 people. The confident level of the research was 95% with 5% of error degree.

The analysis was done on 3 stages. The first stage analyzed one variable that was thermal comfort. The first stage used univariate quantitative analysis. The thermal comfort degree analysis was done by mean counting of PET value and mode counting of thermal interpretation. On the second and third stages used a multivariate quantitative analysis. The second stages analyzed the relationship between thermal comfort and its factor. The thermal comfort was a dependent variable and its factor was an independent variable. The multiple regression analysis was used to identify the most influenced factor of PET value. The ordinal regression logistic analysis was used to identify the most influenced factor of thermal interpretation.

On the second stage, there was its factor first and influenced thermal comfort. While on the third stages analyzed the relationship between thermal comfort's factor and enclosure. The thermal comfort's factor was a dependent variable and enclosure was an independent variable. That meant enclosure was there first and influenced the thermal comfort's factor. The third stage used a qualitative analysis. The qualitative analysis was done by comparing each segment enclosure with thermal comfort's factor. The enclosure elements, which were analyzed, were the building façade color, setback, vegetation, floor

material, street furniture, and sky view factor. The result of analysis was the most influenced enclosure elements toward thermal comfort in Tugu-Kraton Street Corridor.

III. Result and Discussion

The thermal comfort in Tugu-Kraton Street Corridor is based on modified PET index. PET index is a theoretical outdoor thermal index which grows and uses in Germany. In addition, PET index was already considered an influenced of solar radiation. However, PET index has weakness. PET index can be only usedif activity value was less than 80 W and clothing value was less than 90 clo. On PET index, there are PET value and thermal interpretation. PET value is a standard for thermal interpretation which is felt a comfort degree.

The measuring of thermal condition determines that air temperature is around 31,20°C, radiant temperature is around 38,86°C, air humidity is around 58,37%, solar radiation is around 48,81 W/m^2, and wind velocity is around 0,16 m/s. The consideration of thermal comfort has 256 respondents having activity in Tugu-Kraton Street Corridor. The respondents are women and men from 11-80 years old. The respondents are approximately 27-93 kg in weight and 65-180 cm in height. The activity, which is doing, is valued approximately 0,7-1,2 met. The clothes, which is used, is valued approximately 0,26-1,16 clo.

The PET index modification was done by counting the effect of solar power more intensive than the past. This concept is important to do because outdoor thermal comfort in moist tropic climate which was intensive influenced by solar power. In addition, the research also do with PET index verification which is done by collecting objectively thermal sensation data.

The Tugu-Kraton Street Corridor has PET value as big as 37,96°C. The PET value is seen by both study result and PET index used as the Germany Standard. In the study result, the PET value indicates hot thermal sensation. In the Germany Standard, the PET value also indicates hot thermal sensation. The result shows that Tugu-Kraton Street Corridor is not comfortable for its users. The uncomfortable outdoor can reduce number of people who has activity at Tugu-Kraton Street Corridor. The consideration of outdoor thermal comfort can be showed by this equation:

$$Y1 = -10.812 - 0.099X1 + 0.050X2 + 0.004X3 + 0.057X4 - 0.732X5 + 0.039X6 + 0.013X8 - 0.006X9 + 5.224X10 + 2.349X11$$

$$Y2 = -2.806 + 0.939X1 + 0.467X2 - 0.113X4 - 0.444X5$$

Explanation:

Y	Thermal Interpretation	1
Y	PET value	2
X	Air temperature	1
X	Radiant temperature	2
X	Solar radiation	3
X	Air humidity	4
X	Wind velocity	5
X	Age	6
X	Height	8
X	Weight	9
X	Clothing value	10
X	Activity value	11

The equation is a thermal comfort equation for Tugu-Kraton Street Corridor. Based on the equation, outdoor thermal comfort standard can be counted. Outdoor thermal comfort standard in Tugu-Kraton Street Corridor is fixed at person in the age of 35 years old, 57 kg in weight, and 170 cm in height when he/she is doing activity as big as 1,1 met with clothes 0,52 clo, air temperature 31°C, mean radiant temperature 39°C, solar radiation 51,11 W/m^2, air humidity 57,47%RH and wind velocity 0,11 m/s. An equation and standard can be used as generally in Tugu-Kraton Street Corridor. An equation and standard for each segment can't be counted because the lack of sample. Statistical analysis, which is used to analyze thermal comfort, is multiple regression and ordinal regression logistic. In ordinal regression logistic, the total sample which must be collected is more than 50. While the number of sample which are collected in each corridor are only 32.

Fig.2 F Segment of Tugu-Kraton Street Corridor's Condition
Source: Researcher, 2014

Thermal comfort which is felt by the certain group is different between the age groups. There are about 6 age groups which have activity in Tugu-Kraton Street Corridor that they are elementary school, junior high school, senior high school, collage, adult, and seniors. Elementary school group is everyone who has age as equal as elementary school's student. Junior high school group is everyone who has age as equal as junior high school's student. Senior high school group is everyone who has age as equal as senior high school's student. Collage group is everyone who has age as equal as collage's student. Adult group is everyone who has productive age which is from 22 till 58 years old. Seniors group is everyone who has unproductive age which is more than 58 years old.

Elementary school and junior high school groups have hot thermal preference. Elementary school and junior high school groups feel comfort at a high PET value and they are still feel comfort at a high thermal condition. While senior high school and college groups are more comfortable in a cool thermal condition with low PET value. While adult and seniors groups prefer to middle thermal condition. If all groups have given the same thermal condition and PET value, at the middle thermal condition for example, elementary school and junior high school groups will feel cool, senior high school and collage groups will feel hot, adult and seniors will feel comfortable.

Table 1 Thermal Comfort of Age Group

Group	Comfort	Weight (kg)	Height (cm)	Activity (met)	Clothing (clo)	PET (°C)
Elementary school (7-12 years old)	Cool	27-59	125-146	1.20	0.66	43.18
Junior high school (13-15 years old)	Comfortable	45-78	158-165	1.14	0.72	40.85
Senior high school (16-18 years old)	Slightly warm	35-47	100-143	1.20	0.58	35.29
Collage (19-22 years old)	Slightly warm	40-75	145-183	1.05	0.63	36.54
Adult (22-58 years old)	Comfortable	36-156	65-180	1.09	0.55	38.11
Seniors (>58 years old)	Comfortable	40-78	150-170	1.09	0.51	38.90

Source: Researcher analysis, 2014

Generally, Germany PET index can be used in Yogyakarta City. However, if it is looked in detail, not all of each segment agree with it. From 8 segment of Tugu-Kraton Street Corridor, only two segment that agree with Germany PET index. The segments are segment B and F. Unlike them, the others has different thermal interpretation between field survey result and Germany PET index. The differential is happen because of the lacking sample. The research of thermal comfort in each segment of Tugu-Kraton Street Corridor shall do to count the equation and standard in them. The study is not only to determine the effect of enclosure towards thermal comfort but also to verify Germany PET index in moist tropic climate.

Table 2 Comparison between Thermal Interpretations

Location	PET Value	Thermal InterpretationAccording to PET index	Thermal Interpretation According to Field Survey
Tugu-Kraton Street Corridor	37,96°C	Hot	Hot
A Segment	38.02°C	Comfortable	Hot
B Segment	37.29°C	Hot	Hot
C Segment	34.97°C	Hot	Warm
D Segment	32.82°C	Slightly cool	Warm
E Segment	35.9°C	Slightly cool	Hot
F Segment	35.67°C	Hot	Hot
G Segment	45.95°C	Hot	Very Hot
H Segment	43.02°C	Hot	Very Hot

Source: Researcher analysis, 2014

Thermal comfort contains PET value and thermal interpretation. Both of them can be used to determine factor that most influencing of thermal comfort. In Tugu-Kraton Street Corridor, PET index is most probably influenced by radiant temperature. In addition, thermal interpretation is most probably influenced by air temperature. Air temperature and radiant temperature have positive effect toward thermal comfort. The higher value of them, the less comfortable outdoor thermal comfort is. Both of them are influencing thermal comfort because of their shelf intensity. Air temperature in outdoor space is more difficult to be controlled than in indoor space. It happens because air temperature in indoor space can be controlled by using air conditioner. In the contrary, using air conditioner in outdoor space is difficult

because outdoor air temperature is more complex than indoor air temperature. While radiant temperature in outdoor space also has intensively influenced, it directly hits human body and its intensity is more than that human body gets in indoor space.

Despite Tugu-Kraton Street Corridor's PET value is most influenced by radiant temperature, each segment also hasdifferent most influencing factor. The influencing PET value is different between each segments. It shows if the most influencing factor in Tugu-Kraton Street Corridor, it not always be the most influencing factor in each segments. The eight segments in Tugu-Kraton Street Corridor is majority influenced by air temperature. It influences five of eight segment which are A, C, D, E, and H segments. While B and F segments are influenced by air humidity, G segment is influenced by radiant temperature which is same as Tugu-Kraton Street Corridor's factor.

The most influencing factor of thermal interpretation in Tugu-Kraton Street Corridor is air temperature. Same as the influencing PET value, it also has different factor in each segments. A and F segments are most influenced by wind velocity. B and C segments are most influenced by activity. D segment is most influenced by height. E and H segments are most influenced by solar radiation. G segment is most influenced by radiant temperature. If the influencing factors of PET value and thermal interpretation are combined, it will determine segment in Tugu-Kraton Street Corridor which has more than one of the most influencing factor. The eight segments have two most influencing factors except G segment that only has one most influencing factor is radiant temperature.

Table 3 Comparison of Most Influencing Factor

Location	PET Value	The Most Influencing Factor	Thermal Interpretation	The Most Influencing Factor
Tugu-Kraton Street Corridor	37,96°C	Radiant temperature	Hot	Air Temperature
A Segment	38.02°C	Air temperature	Comfortable	Wind Velocity
B Segment	37.29°C	Air Humidity	Hot	Activity
C Segment	34.97°C	Air Temperature	Hot	Activity
D Segment	32.82°C	Air Temperature	Slightly cool	Height
E Segment	35.9°C	Air Temperature	Slightly cool	Solar Radiation
F Segment	35.67°C	Air Humidity	Hot	Wind Velocity
G Segment	45.95°C	Radiant temperature	Hot	Radiant temperature
H Segment	43.02°C	Air Temperature	Hot	Solar Radiation

Source: Researcher analysis, 2014

Except those factors, there are other factors that are influencing thermal comfort in Tugu-Kraton Street Corridor. That factors are factors that also are influencing thermal comfort based on both of PET value and thermal interpretation's statistical analysis. Tugu-Kraton Street Corridor has four factors that are influencing thermal comfort which are radiant temperature, air temperature, air humidity, and wind velocity. Although, the four factors are generally influencing the Tugu-Kraton Street Corridor's thermal comfort, they are not always influencing in each segments. Each segments of Tugu-Kraton Street Corridor has certain combination of influencing factor (see table 4). Based on both general and detail analysis, there are three factors which always influence thermal comfort. They are air temperature, air humidity, and wind velocity. That can be inferred those three factors are the most influencing the research of thermal comfort.

Although thermal comfort is influenced by its factor, it is actually depending on outdoor design which is influencing its enclosure. The eight segments of Tugu-Kraton Street Corridor have a certain design with certain enclosure. Their differences makes a different effect on thermal comfort among the segments. Enclosure elements, which are influencing thermal comfort, are building façade color, setback, vegetation, floor material, street furniture, and sky view factor. Each element is giving a different effect in thermal comfort. There are elements which are giving positive effect and the opposite.

Table 4 Matrix of Influencing Factor

	Air Temperature	Radiant Temperature	Solar Radiation	Air Humidity	Wind Velocity	Height	Activity
Tugu-Kraton Street Corridor	v	v		v	v		
A Segment	v	v		v	v		
B Segment	v	v		v	v		v
C Segment	v			v	v		v
D Segment	v	v		v	v	v	
E Segment	v	v	v	v	v		
F Segment	v			v	v		
G Segment	v	v		v	v		
H Segment	v		v	v	v		

Source: Researcher analysis, 2014

Table 5 Comparison Each Segment's Enclosure

	A	B	C	D	E	F	G	H
Thermal Comfort								
PET value*	38.02°C	37.29°C	34.97°C	32.82°C	35.9°C	35.67°C	45.95°C	43.02°C
Thermal Interpretation**	Comfortable	Hot	Hot	Slightly Cool	Slightly cool	Hot	Hot	Hot
Most Influencing Factor**	Air temperature and wind velocity	Air humidity and activity	Air temperature and activity	Air temperature and height	Air temperature and solar radiation	Air humidity and wind velocity	Radiant temperature	Air temperature and solar radiation
Enclosure								
building façade color***	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored	Inclined Bright colored
Setback***	Narrow	Narrow	Narrow	Narrow	Wide	Wide	Narrow	Narrow
Vegetation***	A lot of small crown trees	A lot of small crown trees	Some canopies	Wide crown tree and canopies	Many wide crown trees	A lot of wide crown trees	A lot of palms	A lot of shrubs
Floor Material***	Asphalt and paving	paving	Asphalt and paving	paving	paving	paving	Asphalt and paving	Asphalt and paving
Street Furniture***	Many	Many	Moderate	Many	Many	Many	Moderate	Many
Sky view factor***	Open end	Open end	Open end	Closed	Closed	Closed	Open end	Open end

Explanation: xxx* = measuring's data; xxx** = questionnaire's data; xxx*** = field observation's data

Source: Researcher analysis, 2014

The thermal interpretation in each segment can be counted despite it has low precision because of the lacking sample in each segments. In spite of the lacking, enclosure's effect towards thermal comfort can be explained. The effect of enclosure can be seen in segment which has the coldest and warmest sensation. The coldest segments are D and E segments while the warmest segments are G and H segments. Those things happen because enclosure's elements of D and E are integrating to make a cool condition with giving positive influenced. While enclosure's elements of G and H are giving negative influenced, it makes a hot sensation in them.

It can be inferred that cool and comfort outdoor can be changed by enclosure engineering. In addition, it can be inferred that comfortable outdoor tends to have bright colored buildings, wide setback, a lot of wide crown trees, paved floor, a lot of street furniture, and closed sky view factor. Bright colored building can pervade heat from solar power so that only a little of solar ray is reflected. Wide setback flesh out the space to air circulation so that there is more blowing wind than others. Paved floor has less tight than asphalt so that radiative heating can be decreased.

Street furniture like a bench can reduce energy which is produced by influencing selected human activity such as sit down or walk. Wide crown trees can reduce hot effect in outdoor. It can protect people who is under the trees from solar radiation. Closed sky view factor makes people who is under it more comfortable than in other space. Closed sky view factor can be obtained from canopy or wide crown tree. Design which is followed those criteria can make people who has activity in that outdoor space feel comfortable. The comfortable outdoor can increase human desire to have activity outdoor especially in Tugu-Kraton Street Corridor.

IV. Conclusion And Recommendation

In general, Tugu-Kraton Street Corridor is uncomfortable for major users. While the senior high school and college group prefer to colder condition than youngster and adults. In the early lifespan, a person inclined choose a hot condition then decrease into coldest condition and then increase to warm condition in seniors ages. There are three factors which generally influence a thermal comfort. The factors are air temperature, air humidity, and wind velocity. The comfortable outdoor tends to have bright colored buildings, wide setback, a lot of wide crown trees, paved floor, a lot of street furniture, and closed sky view factor. In addition, themost influencing element to thermal comfort is sky view factor.

The development or redesign of Tugu-Kraton Street Corridor shall follow the comfort outdoor characteristics. It can be designed with adding wider crown trees or canopies than there is now. While in outdoor for youngster, design shall make it to be cool thermal condition. The next research can validate the Germany PET index in each segment and can learn more detail the enclosure's effect than this research.

References

1) Adebamowo, M.A, &Adeyemi, O,. (2013). 'Do Architects Design for Thermal Comfort? A Case Study of Some Houses in Lagos'. *International Review of Social Sciences and Humanities* Vol. 5, No. 1 (2013), pp. 255-264
2) Atkinson. (1996). *Pengantar Psikologi.* Jakarta: Erlangga.
3) Auliciems, A. & Szokolay, S.V. 1997, *Thermal Comfort*, PLEA (Passive and Low Energy Architecture International), Australia.
4) Boedojo, (1986). *Psikologi Manusia dengan lingkungan*. Jakarta: Gramedia Pustaka Utama.
5) Carmona, M. (2003). *Public Places-Urban Spaces: The Dimensions of Urban Design*. Oxford: Architectural Press.
6) Chai, C. (1981). *The Assessment of The Ability of Various Heat Stress Indices to Predict Safe Work Behavior*. Thesis S2, Texas Tech Univetsity, Texas.
7) Cheng, V., Ng, E., & Chan, C. (2010). 'Outdoor thermal comfort study in a sub-tropical climate: a longitudinal study based in Hong Kong'. *Int J Biometeorol*.
8) Christensen, J.E,. (2008). 'A Method for more specific Simulation of Operative Temperature in Thermal Analysis Programmes'. *Building Physics 2008 - 8th Nordic Symposium.*
9) Clay, (1979). "*Neighborhood Renewal",* dalam Surtiani (2006)., *Faktor-Faktor Yang Mempengaruhi Terciptanya Kawasan Permukiman Kumuh di Kawasan Pusat Kota (Studi Kasus: Kawasan Pancuran, Salatiga).* Thesis S2, UniversitasDiponegoro, Semarang.
10) Damayanti, R. &Handinoto, (2005). 'Kawasan "Pusat Kota" Dalam Perkembangan Sejarah Perkotaan di Jawa', *Dimensi Teknik Arsitektur Vol. 33, No. 1, Juli 2005: 34-42.*
11) Deb, C. & Ramachandraiah, (2010). 'The significance of Physicological Equivalent Temperature (PET) in outdoor thermal comfort studies', *International Journal of Engineering Science and Technology*, Vol. 2(7), 2010, 2825-2828.
12) Fanger, PO. (1972). *Thermal Comfort*. New York: Mc-Graw-Hill.
13) Frick, H. et al. (2007). *Ilmu Fisika Bangunan.* Yogyakarta: Penerbit Kanisius.
14) Gagge, A.P, et al. (1972). 'An Effective Temperature Scale Based on a Simple Model of Human Physiological RegulatiryRespon'. *AHRAE TRANSACTIONS, Vol. 77, Part I, by permission of the Amefican Society of Heating, Refrige Fatingqnd Air Conditioning Engineers, Inc.*
15) Givoni, (1998). "*Climate Considerations in Building and Urban Design*", dalam Satwiko (2008)., *Fisika Bangunan*. Yogyakarta: Penerbit Andi.
16) Gulyas, A., Matzarakis, A. (2007). 'Selected Examples of Bioclimatic Analysis Applying The Physiologically Equivalent Temperature In Hungary'. *Acta Climatologica et Chorologica Universitatis Szegediensis*, Tomus 40-41, 2007, 37-46.
17) Honjo, T. (2009). 'Thermal Comfort in Outdoor Environment'. *Global Environmental Research*, 13/2009:43-47.
18) Höppe, P. (1999). 'The Physiological Equivalent Temperature – A Universal Index For The Biometeorological Assessment Of The Thermal Environment'. *Int J Biometeorol* 43, 71–75
19) Hough, M. (1984). *City Form and Natural Process: Towards a New Urban Vernacular.* New York:Van Nostrand Reinhold Company.
20) Hutama, I.A.W. (2011). *Pengaruh Bentuk Fisik Ruang Kota Pada Kawasan Permukiman Terhadap Pembentukan Suhu Udara Ruang Luar di Pusat Kota Kotagede Yogyakarta.* Skripsi S1, Universitas Gadjah Mada, Yogyakarta.
21) ISO 7730, 1994, "*Moderate Thermal Environments-Determination of the PMV and PPD indice and Specification of the conditions for thermal comfort*", Geneva: International Organization for Standardization.
22) Karyono, T.H. (2001). 'Penelitian Kenyamanan Termis Di Jakarta Sebagai Acuan Suhu Nyaman Manusia Indonesia'**,** *Dimensi Teknik Arsitektur* Vol. 29, No. 1, Juli 2001: 24- – 33.
23) Kusmawanto, A. (2005). *Pengendalian Arsitektural terhadap Kondisi Kenyamanan Termal Ruang Luar di Kawasan Urban Studi Kasus: Koridor Kawasan Malioboro Yogyakarta*. Disertasi S3, Institut Teknologi Bandung, Bandung.
24) Lippsmeier, (1994). "*Bangunan Tropis*", dalam Maidinita (2009)., 'Pola Ruang Luar Kawasan Perumahan dan Kenyamanan Thermal di Semarang'**,** *Riptek*, Vol.3, No.2, Tahun 2009, Hal.: 21 – 26.
25) Madsen, T.L, et al. 1984. *Comparison between Operative and Equivalent Temperature under Typical Indoor Conditions*, ASHRAE. Meeting Atlanta.
26) Monteiro, L. &Alucci, M., 2006. *Calibration of outdoor thermal comfort models*, PLEA2006 - The 23rd Conference on Passive and Low Energy Architecture, Geneva, Switzerland, 6-8 September 2006.
27) Monteiro, L.M., &Alucci, M.P. 2012. *Outdoor Central Areas of Sao Paulo, Brazil Possibilities of thermal comfort*, PLEA2012 - 28th Conference, Opportunities, Limits & Needs Towards an environmentally responsible architecture Lima, Perú 7-9 November 2012.
28) Ng, E., Ren, C., &Katzschner, L., 2009. *Urban Climatic Mapping in Hong Kong*, 2nd International Conference on Countermeasures to Urban Heat Islands, 21-23 Sept 2009 – Berkeley, California, USA.
29) Nicol, J.F, & Humphreys, M.A,. (2002). 'Adaptive thermal comfort and sustainable thermal standards for buildings'. *Energy and Buildings 34 (2002)* 563-572.
30) Pourmahabadian, et al. (2008). 'Heat Exposure Assessment In The Working Environment of A Glass Manufacturing Unit'. *Iran. J. Environ. Health. Sci. Eng.,* Vol.5, No. 2, pp. 141-147.
31) Sangkertadi, T. (2013). *Kenyamanan Termis di Ruang Luar Beriklim Tropis Lembab*. Bandung: Alfabeta.
32) Sastra, S. & Marlina, E. (2006). "*Perencanaan dan Pengembangan Perumahan"* dalam Maidinita (2009)., 'Pola Ruang Luar Kawasan Perumahan dan Kenyamanan Thermal di Semarang'**,** *Riptek*, Vol.3, No.2, Tahun 2009, Hal.: 21- – 26.
33) Satwiko, P. (2008). *Fisika Bangunan*. Yogyakarta: Penerbit Andi.
34) Surtiani, E.E. (2005). *Faktor-Faktor Yang Mempengaruhi Terciptanya Kawasan Permukiman Kumuh di Kawasan Pusat Kota (Studi Kasus: Kawasan Pancuran, Salatiga).* Thesis S2, Universitas Diponegoro, Semarang.
35) Tahbaz, M,. (2011). 'Psychrometric chart as a basis for outdoor thermal analysis'. *International Journal of Architectural Engineering & Urban Planning*
36) Trancik, R. (1986). *Finding Lost Space-Theories of Urban Design.* New York:Van Nostrand Reinhold Company.
37) Unger, J,. (1999). 'Comparisons of urban and rural bioclimatological conditions in the case of a Central-European city'. *Int J Biometeorol* (1999) 43:139–144
38) Walsberg, G.E, & Wolf, B.O,. (1996). 'An Appraisal of Operative Temperature Mounts as Tools for Studies of Ecological Energetics'. *Physiological Zoology 69(3);*658-681.
39) Weisman, (1981). "*Evaluating Architectural Legibility: Way-finding and the Built Environment, Environment and Behavior*" dalam Listianto (2006),. Thesis: Hubungan Fungsi Dan Kenyamanan Jalur Pedestrian (Studi Kasus Jl. Pahlawan Semarang). Universitas Diponegoro, Semarang.
40) Wonorahadjo, S. &Koerniawan, D., 2008. *Pengaruh Bentuk Bangunan pada Lingkungan Thermal Kota Bandung,* Proceding Seminar Nasional Peran Arsitektur Tropis dalam mewujudkan Kota Tropis.
41) Zambrano, et al., 2006. *Thermal Comfort Evaluation in Outdoor Space of Tropical Humid Climate*, PLEA2006 - The 23rd Conference on Passive and Low Energy Architecture, Geneva, Switzerland, 6-8 September 2006.

Future Compact Cities in View of Global Warming for ASEAN Countries

Abdul Malek Abdul Rahman[1], Izatul Asyikin Nordin[2], Karam M. Al-Obaidi[3]

[1]Lecturer, Architecture, School of Housing, Building & Planning, Universiti Sains Malaysia,
[2]Master student, Architecture, School of Housing, Building & Planning, Universiti Sains Malaysia,
[3]PhD student, Architecture, School of Housing, Building & Planning, Universiti Sains Malaysia,

Abstract

Many countries are getting hot, flat and crowded at different rates of progress causing global warming that requires counter measures. Rapid growth in cutting-edge technologies has become the mainstream. Information Communication Technology improved multi-fold thereby hastening business decisions influence the rate of development everywhere in the world. Population increased due to improved health conditions and better hygiene. The economic development and population increase are fast trending the demand for physical development to cater for the economic activities become acute on land-use. Land can only increase by reclaiming the seashores. There are evidences that land is constricting due to sea level increase and by erosion of the beaches and river banks. Thus land-use for ASEAN countries is a long-term built environment future problem. This paper identifies common criteria for countries facing such challenges and proposes a conceptual solution to rethink the development policies of individual countries. The real challenge is to maintain indigenous culture and traditions as national identities are equally important. ASEAN countries face these problems at different rates because of the geographical nature being either peninsulas or islands namely Malaysia, Singapore, Indonesia and the Philippines. The challenge is to identify existing trends that may influence the success or failure of preferred future scenario.

Keywords: *compact cities; population increase; built environment; global warming, efficient technology*

I. Introduction

Hot, flat and crowded are the three major occurrences in the world today. What is of grave concern is the uncontrollable growth of the population in the world that would predictably reach to nine billion by the year 2050 (United Nations, 2009). The world is 'hot' i.e. the greenhouse effect caused by the high content of carbon dioxide in the atmosphere. It is human daily activities that releases toxic gases aggravating the atmospheric content with predominantly carbon dioxide followed by methane gas, etc. Population growth is happening everywhere at every corner of the world and is difficult to curb. South-East Asia is facing this grave sociological problem because of the geographical factors that the nature of SEAsia is basically either peninsulas or islands. Unless land is reclaimed, the boundary between land and sea changes easily over time. But population is growing. This will lead the demand for land. If nothing is done the situation would create the socio-economic politico problems.

Population growth depends a lot on sophisticated and latest technologies due to the competitiveness in life and the most effective technology is in the sophisticated information communication technology (ICT). Such technology helped make quick decisions due to the vast amount of information made readily accessible for decision-making in the socio-economic sectors. Business abound hence generating heat by the fast movement of people, transport and machines. Virgin land cleared for more business development and thus the natural environment became gradually transformed into built environment. As Marina Gorbis (2013) stated in her book;

"*We've put in place a new technology infrastructure, and now this technology is reshaping the landscape of our lives. Like the invention of the steam engine, which ushered in the Industrial Revolution, the architecture of the Internet, with its unique distributed communication nodes, is revolutionizing our social and economic landscapes, reshaping how we live, produce, trade, and innovate*." and

"*Mahatma Gandhi once said, 'India is to be found not in its few cities but in its 700000 villages.'*

Abdul Malek Abdul Rahman
---Lecturer, Associate Professor, PhD., Architect, School of Housing, Building & Planning, Universiti Sains Malaysia
Hp: 0194480205
email: malik@usm.my

Though that may at one time have been true, it is no longer the case." (Sarwant Singh, 2012).

Population explosion will affect several trends and these trends can be of mega scales. The United Nations predicts that 60% of the world's population will live in cities by 2030 (UNFPA, 2007). But Frost & Sullivan (2010) forecasted a rate faster than the UN's prediction i.e. the world urban population will reach 4.6 billion by 2025.

Though the rates of population growth differ in different countries the problems would be more acute in South East Asian countries as was mentioned earlier. Hence the need for a new paradigm in future designs of the ASEAN built environment. This rapid rise in urbanisation in major cities of ASEAN will lead to a redefinition of ASEAN cities and societies.

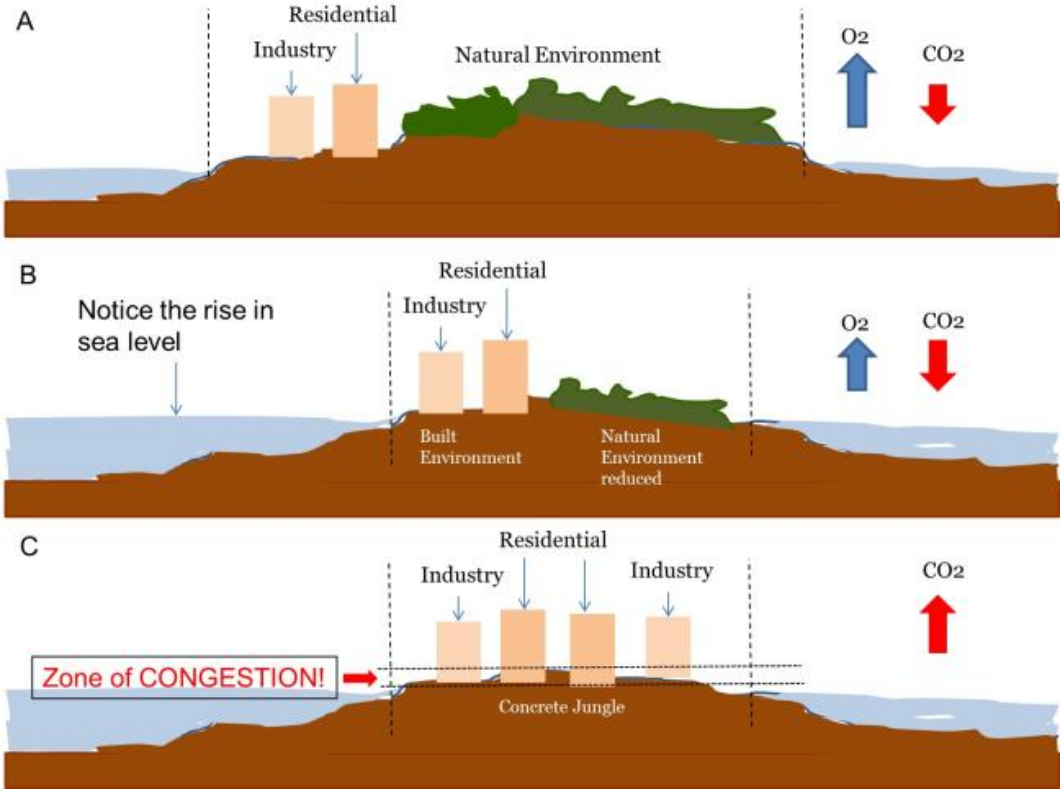


Figure 1: Natural environment versus the built environment

II. Problem Statement

This redefinition of the built environment must take into consideration the impact of climate change and future proposals in designing future cites. It must effectively reduce further aggravation of climate change. Otherwise unnecessary nation's monetary allocations have to be disbursed for repairs from massive physical damages by inclement weather conditions.

The population of Malaysia was only 5 million when it got its independence. By including Sabah and Sarawak population increase up to 6 million. Today it is about 29 million and at the current it is predicted to increase to 38 million by 2030 (Alagappa, 2013). The pattern can be said to be the same for other ASEAN countries.

Referring to the diagrammatic illustration in Figure 1, 'A' shows the normal situation when population was tolerable and a typical land-use is divided for industry, residential and agriculture (including the natural environment).

Due to global warming sea level rises thus constricting useable land area necessitates that the natural environment to be cleared to make way for more civilized human settlement as in 'B'. The natural carbon dioxide uptake by the natural environment has been reduced allowing for more toxic gases being released into the atmosphere. Thus the greenhouse effect that caused the warming of the globe. And because more buildings are needed to meet urbanization demand, gradually green areas disappear. More high-rise buildings are built to absorb the growing population. Hence, congestion exists everywhere in all Asian cities. Land-use at ground level was not wisely planned and traffic jams have been a commonplace. Native land has been continuously cleared for new roads thus inviting more cars filled in by the increased number of new young drivers. A vicious cycle deteriorates further the already worsening situation – a typical scenario of major ASEAN cities.

Being made up of islands, peninsulas and mountains, ASEAN cities need to bring the city planning polices to the next level of implementation, otherwise in many years to come they may face consequences that predictably can be overwhelming to overcome.

Java Island in Indonesia has 1,117 people/km^2, Malaysia has 86, Thailand 130 and Singapore at 7,669 people/km^2. Zooming down to the major cities they would be as follows:

Jakarta	18,676 people /km^2
Bandung	14,676 people /km^2
Yogyakarta	12,000 people /km^2
Surabaya	8,458 people /km^2
Singapore	7,669 people /km^2
Kuala Lumpur	6,891 people /km^2
Bangkok	5,300 people /km^2
Penang	1,500 people /km^2
Medan	1,500 people /km^2
Melaka	689 people /km^2
Johore Baru	735 people /km^2
Seremban	489 people /km^2

Having identified that settlements are getting crowded, global warming problems and the fast pace of technologies, the trend is a cause of concern for future generation.

Figure 2: Merging the natural and built environments

III. Foresights and insights

As stated in **Figure 1** above, the only way if building up to reduce congestion. This is the first foresight. A compact city is now the way forward where in the same land area there can be a more humane city living by merging the natural and the built environment together. **Figure 2** shows the concept.

Figure 3: Marina Bay, Singapore
Source: http://www.art-days.com

Bringing in the ground level activities and environment to the literally the next level can be seen as a precursor for future development in the Marina Bay, Singapore (**Figure 3**).

In his book entitled "New Mega Trends – Implications for our future lives" Sarwant Singh (2012) listed seven key parameters that will define a smart city to relief the problems associated with growing population. And this approach can last for many generations with little impact on the natural ecology which relies heavily on high end technology. Energy, Mobility, Technology, Healthcare, Buildings, Infrastructure and Citizen are ingredients that make up the definition of a Smart City. These ingredients are stipulated by Sarwant Singh (2012) and fully substantiated in many ways and expressions from different authors of *Blue Ocean Strategy by W. Chan Kim & Renee Mauborane (2005), Microtrends by Mark J Penn & Kinney Zalesne (2007), The Power of Pull by John Hagel III, John Seely Brown & Lang Davison (2010), Physics of the Future by Michio kaku (2011), The Nature of the Future Marina Gorbis (2013), The Future by Al Gore and The New Digital Age by Eric Schmidt & Jared Cohen (2013).*

3.1 Energy

Currently many countries use conventional

energy (i.e. energy from burning fossil fuels) that releases toxic gases into the atmosphere causing climate change due to global warming. It is now overdue to look back at how energy being consumed. Energy efficiency, energy conservation and energy saving initiatives are now the order of the day. These are to reduce the worsening condition caused by global warming. Renewable Energy (RE) is slowly making inroads into the supply of energy for the daily lives of the people the world over. Depending on the geographical and climatic locations or zones, RE can be tapped readily by technologies that make it necessary. High wind areas would tap the wind energy using horizontal air wind turbines (HAWT) and for low windy conditions the vertical air wind turbine (VAWT) would suffice (Chong et al., 2013). Compact cities have high rise buildings and by law of physics the higher the altitude the faster the wind and for countries in the tropical zones where wind characteristics does not allow predictable wind conditions (Akorede et al., 2013). A wind turbine extracts energy from moving air by slowing the wind down, and transferring this energy into a spinning shaft, which usually turns a generator to produce electricity. The VAWT would be the best installations at strategic locations. These can be located on top of high rise buildings for consistent movement of strong wind conditions. According to IRENA (2012) a small wind turbine production facility will cost less than a photovoltaic factory of the same capacity. In fact, they may not be able to provide RE for the whole of the tower blocks but can help subsidize a number of storey floors. For a compact city the total savings would be colossal.

Solar electricity is a promising type of renewable energy and its usage is catching up popularity in the share of world's energy supply. The ASEAN region is well endowed with sun energy and this is a must-have for every country in the region. Malaysia as one of ASEAN region is exposed to a substantial degree of solar insolation, with an average of approximately 1,643 kWh/m^2 per annum (Haris, 2008) and more than 10 hours of sun exposure per day (Amin, Lung and Sopian, 2009). The irony is that Germany is the market leader in solar electricity when its own country has only a few months of the much needed sunlight.

Apart from solar energy there are other types of renewable energy namely, wind power, wave energy, biomass and geothermal energy. Countries with many volcanoes can capitalize on this technology using its gas power from under the earth. Indonesia and Philippines are such countries that may possibly utilize this energy. Sun energy can be utilized by all ASEAN countries. Wind power must be of a certain speed and above for economic installation of the horizontal wind turbine. Characteristically countries in the tropical zone do not have ample wind that is constant and consistent for wind turbines unless at certain locations such as by the sea or up mountain tops but then the distance to settlements is a deterrent (Akorede et al., 2013; Al-Obaidi et al., 2014a; 2014b). The tropical wind is unpredictable, erratic and multi-directional and frequently at low wind speeds (Abdul Rahman, 1994). Further away from the Equator the wave energy can be tapped as the waves are much dynamic and aggressive able to generate electricity by its sheer up and down constant and consistent movement. Biomass can be shared by all as all countries have food waste to be recycled so that food waste can be converted into methane gas for energy (Boyle, 2004). By hybridizing these renewable energy technologies many permutations of energy supply can be configured, adapted and geared for specified usage.

3.2. Smart Mobility

At present and common to all countries in the world, movement of humans and goods takes in a conventional way i.e. the transport system sees the vehicles as separate entity. Cars, heavy vehicles such as buses, lorries and trucks, motorbikes, light rail transport all have their own systems that requires their own infrastructure in order to function efficiently. But when force to share the same piece of land, there would compromises and problems arises. A simple mathematical calculation below shows the numbers;

(a) Average 5 passenger car size of 2.5m x 4.8m = 12m^2. Assumed 100 cars as a base for comparison. Therefore 12 x 100 = 1200m^2 transporting 6000 people.
(b) Average 44 passenger bus size of 3m x 12m = 36m^2. Therefore for 100 buses = 3600m^2 transporting 158400 people. A 26.4 times more people than 100 cars
(c) Average 1 carriage LRT same as bus size also carrying 44 passengers (not including standing passengers) and same size. Normally 4 carriage jointed to one another in one trip. So,1 carriage at 36m^2 x 4 carriages = 144m^2. Since 1 carriage carries 44 pax thus 144 x 44 = 6336. Therefore 100 LRTs carries 633600 people. The benefit is four times more than that of a bus but 105.6 times more than that of a car.

There are other modes of transportation such as motorbikes, bicycles, cable cars, water taxis (Brisbane CityCat Ferry system is a good example), sedgeways, all the '–lators' – travellators, escalators and elevators. The elevator at Taipei 101 goes up from 5th floor to 89th floor in exactly thirty seconds without any sensation of speed.

Smart mobility talks about moving from starting point to destinations in a combination of different transport vehicles in a seamless mode of fashion (*e-mobility*). Getting there smoothly is the top most

priority and owning cars would gradually fade away. With the successful implementation of the bicycle-sharing in Taiwan, this idea is now being carried out for car-sharing using electric vehicles. It is now in its infant stage to study and overcome teething problems. Researches in future public transportation infrastructure is badly needed (Evers, 2007). High speed trains would be more suitable for intercity travel and also stretch the idea further international intercity travel as well. For example, Singapore – Kuala Lumpur – Penang – Haadyai – Bangkok - Siem Reap – Cambodia - Ho Chih Minh – Hanoi - Shanghai and Beijing. These cities would compete for the economic reasons by branding themselves. As for branding in the ASEAN region very inexpensive goods can attract people in the ASEAN region (PwC, 2012). Bandung is traditionally known for its factory outlets so is Ben Tahn market in Cambodia and Chatuchak market in Bangkok apart from other things. The whole region will become as one when travelling gradually becoming fast, easy and cheap.

The dynamic transportation system should also be supplemented with efficient design of static passive system such as appropriate corridors, walkways, elevated road systems. Creating elevated road systems to first floor levels to receive people from LRT stations would create economic value at that level as the need to capture the crow first has always been the first law of business strategy. This would relieve of the pressure at ground floor level from congestion and environmental hazards.

3.3. Technology

Smart technology is the real catalyst behind the rapid growth of trends. The integrated communication technology (ICT) is the underlying technology that made several sectors for the convenience of humanity possible. It is what differentiates the conventional civilization with the high end civilization. Schools are not the same anymore compared to school system decades ago. In Malaysia, the Education Ministry is gradually introducing internet usage for all schools so that knowledge abound can be easily accessible for sophisticated decision making needed to solve problems encountered in the new era of civilization. Laptops and notebooks will be provided for school going children with the hope that will improve learning experience (Ministry of Education, 2013).

Hand phones are now very sophisticated developing from 3G to 4G and later to several Gs in the future. How it would look and its capabilities are opening to imagination.

The world's famous ASIMO (Advance Step-in Innovative Mobility) (**Figure 4**) have shown sophisticated and human-like robotic movement that can simulate several human natural bodily movements. Over time they may actually do all the work that humans find boring and. 'Tiredness' is not in their vocabulary.

Figure 4: Founders and co-founders of ASIMO

Smart technology catalyzes connectivity and convergence. The increasing use of mobile telephones and devices for data communication drives the need from the market for a fast, reliable and available infrastructure (Cushnie et al., 2000). Handphone used to be just storing phone numbers and making calls, then the need to connect people, not only the mode of calling but also the mode of texting popularly known as 'short message sent (sms)' and this is converged into the handphone. Now there are iPad, iPod, iCloud that can download all the numerous choice of Apps. One just cannot imagine the possibilities of technology advancement that is value add the quality of human life (Michio Kaku, 2011).

3.4. Healthcare

Healthcare system is moving closer to the patient, and a host of technologies (capable telehealth systems and the internet) allow patients to enhance their own care (Warren et al., 1999). Ruyter and Plgrim (2007), anticipate that the next generation of healthcare systems to be essentially grounded on the homecare concept, thereby extending healthcare from clinics and hospitals setting to the patient's house. The idea of smart homecare applications is to deliver assistive technologies for supporting people by improving physical spaces with communication, information and sensing technology (Röcker and Maeder, 2011).

These technologies, combined with the migration of the health care industry to electronic patient records, show unprecedented potential for delivering highly automated, intelligent health care in the home while at the same time decreasing the cost of care (Sandia National Laboratories, 1996). Home automation products offer home networks potentially useful for health care device interconnectivity. Current desktop telemedicine platforms (Kinsella, 1997;

1998) are integration of smart devices and automated care supply in the home as shown in **Figure 5**.

These systems utilize medical peripherals, video conferencing, store-and-forward capabilities, electronic patient record management software.

In the houses of the future, some devices will contribute physiological information about the patient (e.g., heart rate, blood pressure), while other devices in and around the house will contribute information about the patient's environment (e.g., humidity, temperature, carbon monoxide level).

These physiological and environmental data will be gathered to evaluate the patient's state of health and to identify external factors that may influence that state. An example Home Layout Sensor and system layouts in the home of the future may appear in **Figure 6**. Future houses will have smart spaces that utilize many technologies to track behavior and state-of-health (Pentland, 1996; Paradiso et al., 1997).

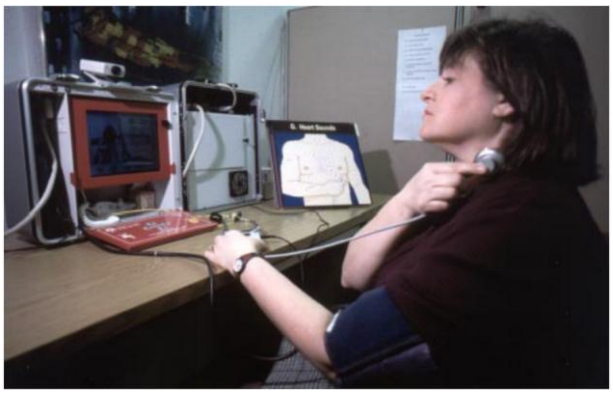


Figure 5: Desktop telemedicine system
Source: Warren et al., 1999

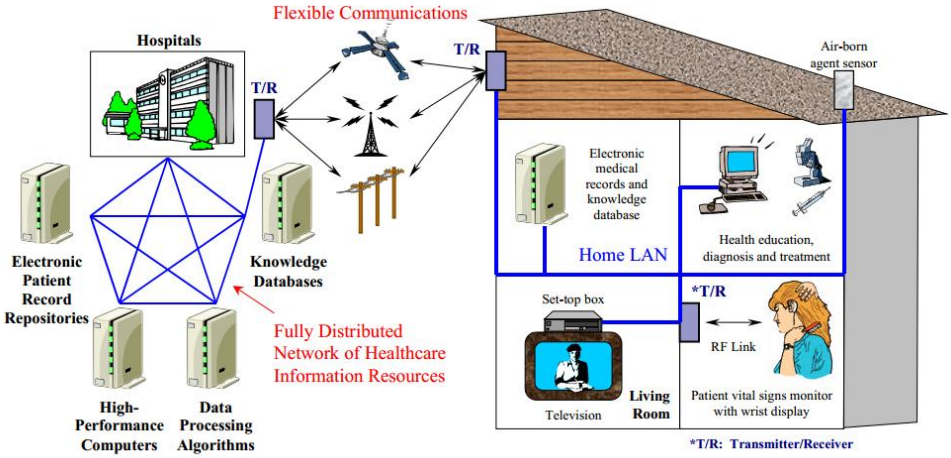


Figure 6: An example of smart concept in the home of the future (Warren et al., 1999)

3.5. Buildings

In any human settlement two components are the most conspicuous in a typical built environment, namely, buildings and the transport system. E-mobility has been mentioned above and the same can be said of the buildings, that they are to be intelligent buildings while at the same time be eco-friendly. Recent advances in data gathering and analysis are opening up new possibilities for smart building technology. The term smart buildings are commonly associated with technology solutions such as Building Management Systems (BMS). However moving forward the potential for smart buildings should encompass a wider set of considerations such as health, well-being, comfort, productivity, building design and operation, interaction with users and being environmentally responsible (Louis et al., 2012).

In conventional building design it was reported that they consume at least 20% of a country's energy consumption. With population rising, buildings need to be built to house these newcomers and therefore the need to prevent a lot more CO_2 emission from buildings. The 'Green Building' concept is now the direction to go to prevent further deterioration of the environment. Where the building once stood were trees and vegetation that absorbed CO_2 and give O_2 to humans. Replacing the trees and vegetation means this basic biological function for survival will be lost.

Many countries all over the world have their own energy rating tools for building starting with the first is LEED (Leadership in Energy Efficiency Design from USA. Several others now in existence is BREEAM (UK), CASBEE (Japan), Green Star (Australia & New Zealand), Green Mark (Singapore), Green Building Index (Malaysia) and the most recent to come on board is the Greenship (Indonesia). There are others from Thailand, the Green Leaf but specifically only for hotel designs and not comprehensive for other buildings. Now is the time to implement the energy rating tools and should not be an option any longer. Singapore has made them as mandatory.

All these ratings have one thing in common, i.e. to prevent further deterioration of the environment

and the criteria covers basically the same items namely, energy efficiency, indoor environmental quality, site planning & management, material & resources, water efficiency and innovation.

The challenge is the future provision of natural and built environment for a balanced ecology in a limited space. This would be the challenge for space utilisation for the next generation. For a limited land to house population growth, it seems like there is no other way but to build vertically and relieve the ground level from being congested. Future building designs would be demanded for being green as there would make no sense if they release a lot more CO_2 emissions making unhealthy living condition for the population.

3.6 Infrastructure

This runs parallel with the Smart Building and Smart Mobility. The connectivity and convergence relies heavily on this smart infrastructure (**Figure 7**).

Figure 7 shows a conceptual proposal for future living renewable energy provides clean electricity, high-rise apartments or condominiums to house the people, offices and commercial at lower floors due to the accessibility for all nearer the public areas are especially at transport stations. This is to capture the public attention for commercial reasons. At ground level would be where the heavy industries for obvious reasons that their core business involves heavy equipment and bulky supplies and deliveries. Also at this level routes for emergency movement would be ideal as there would not be any congestion. Hospitals would be wise to be located at this level as the trees and vegetation would be therapeutic for healing.

3.7. Citizen

It is obvious that all developments are meant to serve humans. For a sophisticated society, education plays an utmost important role to develop a literate society.

Citizens of a locality must be smart enough to embrace smart and green solutions in order to lead a healthy and satisfying and wholesome life.

Smart Citizen is a platform to generate participatory processes of people in the cities. Connecting data, people and knowledge, the objective of the platform is to serve as a node for building productive and open indicators, and distributed tools.

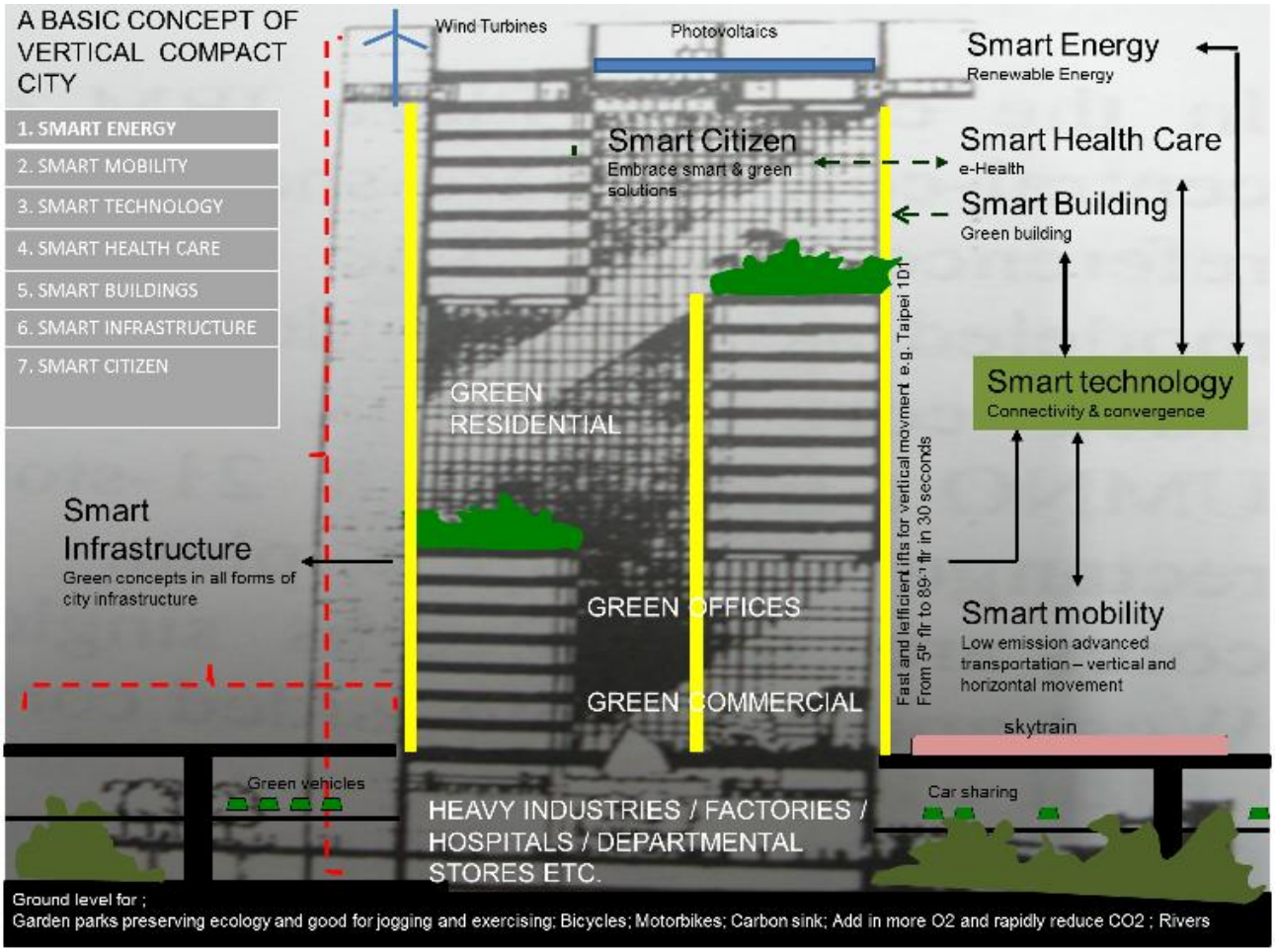


Figure 7: The combination of all the smart sectors forming a smart infrastructure

The Smart Citizen is based on geo-location, Internet and free hardware and software for data collection and sharing, the production of objects; it connects people with their environment and their city

to create more effective and optimized relationships between communities, technology, resources, services and events in the urban environment (Goteo, 2012).

To overcome the effects of global warming and at the same time the increasing population in major cities means that we have to change the way we live our lives.

The perception of life would be seen from a different light altogether. The age of convenience must be discarded and adopt the behaviours that lead to the age of sustainability. In fact, the concept is currently being deployed as initial phase in Barcelona city

IV. Challenges ahead

Of course to achieve utopia would face challenges ahead. Challenges that is endemic to socio-economic politico situations. It is the digital technology that made whatever conceivable possible to be achievable. In the future, information technology will pervade almost everywhere very much the same as electricity. It will make billions more people connected in the technological fold and technology would also, we know, be intertwined with every challenge of the world (Eric Schmidt & Jared Cohen, 2013). There will be unscrupulous people to take advantage and use it to suit greed rather than for the good of the people. Once in the hands of terrorist would prove to be dangerous. Thus future jobs would not be as what we see now as specifications would be more stringent when it comes to IT.

Other challenges are the government policies addressing to the needs of the people. The more opportunities given the more sophisticated it becomes in implementing ideas to gradually change the physical built environment. There will be resistance due to lack of knowledge and understanding. Therefore a knowledgeable and society with wisdom may see the light at the end of the tunnel. Trouble abound when there is inequality in all the stages of society. Problem is there will always opposite definitions in decisions made by the government.

Education at all levels is imperative for the mindset to change for the better. Campaigns and awareness must at first and foremost be in the forefront until assurances of acceptance by society without a tinge of any suspicious of corruption, an economic virus that proved to be a widespread cause for most of the troubles the government machinery is facing. A strong leadership is required, unlike that of North Korea, to make things happen for the society watching things happening rather saying ‘what happened?’.

V. Conclusion

Foresight Technology (W. Chan Kim & Renee Mauborne, 2005; Mark J Penn & E. Kinney Zalesne, 2007; John Hagel III et.al. 2010; Sarwant Singh, 2012; Marina Gorbis, 2013) is a method that allows you to see what would happen in the future when the cues are happening at present. Some present conditions when extrapolated can give predictable future and when a society is not geared for any preparation for the future scenarios, it will face many more socio-economic and political problems that may be more expensive to undo than taking the proactive approach.

What has been argued in above sections was identified by future thinkers from several Institutes of Future Studies all over the world. Asia has now become the main impetus of world economy which means that the rhythm and momentum of world economic growth. Two events must be borne in mind whenever making decisions for all aspects of life in future, namely, global warming and increase in population. These two will greatly influence the need for space in the next generation.

References

1) Abdul Rahman AM. (1994). Design for natural ventilation in low cost housing in tropical climates. Phd thesis, University of Wales College of Cardiff.
2) Akorede MF, Mohd Rashid MI, Sulaiman MH, Mohamed NB, Ab Ghani SB. (2013). Appraising the viability of wind energy conversion system in the Peninsular Malaysia. Energy Conversion and Management, 76, 801-810.
3) Alagappa, M. (2013). Obama's visit a golden opportunity. The edge Malaysia. http://carnegieendowment.org/files/Alagappa_081213.pdf
4) Al-Obaidi, K. M., Ismail, M., & Abdul Rahman, A. M. (2014a). A review of the potential of attic ventilation by passive and active turbine ventilators in tropical Malaysia. *Sustainable Cities and Society*, *10*, 232-240.
5) Al-Obaidi, K. M., Ismail, M., & Rahman, A. M. A. (2014b). A comparative study between unvented and vented attics powered by the hybrid turbine ventilator in Malaysian houses. *International Journal of Sustainable Energy*, (ahead-of-print), 1-13.
6) Amin N, Lung CW, Sopian K. (2009) A practical field study of various solar cells on their performance in Malaysia. Renewable Energy, 34(8), 1939-1946.
7) Boyle, G. (2004). *Renewable energy*. OXFORD university press.
8) Chong, W. T., Poh, S. C., Fazlizan, A., Yip, S. Y., Chang, C. K., & Hew, W. P. (2013). Early development of an energy recovery wind turbine generator for exhaust air system. *Applied Energy*, *112*, 568-575.
9) Cushnie, J., Hutchison, D., & Oliver, H. (2000). Evolution of charging and billing models for GSM and future mobile Internet services. In *Quality of Future Internet Services* (pp. 312-323). Springer Berlin Heidelberg.
10) Evers, J. (2007). Discussion note by Prof. Joop Evers: Profile of new intercity transport. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.ejtir.tudelft.nl /issues/2007_03/pdf/2007_03_06.pdf
11) Frost & Sullivan (2010), Impact of urbanization and development of megacities on personal mobility and vehicle technology planning’.
12) Goteo. (2012). SMART CITIZEN. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://goteo.org/project/smart-citizen-sensores-ciudadanos?lang=en
13) Haris AH. (2008) MBIPV Project: Catalyzing Local PV Market. Finance & Investment Forum on PV Technology. Kuala Lumpur, Malaysia.
14) IRENA. (2012). RENEWABLE ENERGY TECHNOLOGIES: COST ANALYSIS SERIES (Wind Power). [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.irena.org/DocumentDownloads/Publications/RE_Technologies_Cost_Analysis-WIND_POWER.pdf

15) John Hagel III et. al.,(2010), The power of pull – how small moves, smartly made can set big things in motion, Basic Books, ISBN 978-0-465-01935-9
16) Kinsella, Audrey. (1997). Home Healthcare: Wired & Ready for Telemedicine, Information for Tomorrow.
17) Kinsella, Audrey. (1998) Home Healthcare: Wired & Ready for Telemedicine. The Second Generation.
18) Louis, J. N., Pongrácz, E., Caló, A., Juuso, E., & Sørensen, B. R. (2012). Smart buildings to improve energy efficiency in the residential sector. Master thesis, University of Oulu.
19) Marina Gorbis (2013), The nature of the future – dispatches from the socialstructed world, Book, ISBN 978-1-4516-4118-9, Free Press A division of Simon & Schuster, Inc.
20) Mark J. Penn & E. Kinney Zalesne, (2007) Microtrends – the small forces behind tomorrow's big changes, New York Boston, ISBN 978-0-446-19524-9
21) Michio Kaku, (2011), Physics of the future – how science will shape human destiny and our daily lives by the year 2100, Penguin Books, ISBN 978-1-846-14268-0.
22) Ministry of Education. (2013). Preliminary report Malaysia Education Blueprint 2013 - 2025. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.moe.gov.my/userfiles/file/PPP/Preliminary-Blueprint-Eng.pdf
23) Paradiso, Joseph, Craig Abler, Kai-yuh Hsiao, and Matthew Reynolds. (1997). The Magic Carpet: Physical Sensing for Immersive Environments. Association of Computing Machinery, Computer-Human Interaction, March 22-27, Atlanta, Georgia
24) Pentland, Alex P. (1996). Smart Rooms. Scientific American.
25) PwC. (2012). Southeast Asia Investment Opportunities – Tax and other incentive. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.pwc.com/th/en/publications/download/south-east-asia-web.pdf
26) Röcker, C., & Maeder, A. (2011). User-Centered Design of Smart Healthcare Applications. *Electronic Journal of Health Informatics*, *6*(2), e11.
27) Ruyter, B. D., & Pelgrim, E. (2007). Ambient assisted-living research in carelab.*interactions*, *14*(4), 30-33.
28) Sandia National Laboratories. (1996). Strategies for the Future: The Role of Technology in Reducing Health Care Costs, SAND 60-2469, DOE Distribution Category UC-900. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.matmo.org/pages/library/papers/papers.html.
29) Sarwant Singh. (2012), New Mega Trends – Implications for our future lives, Book, Palgrave Mcmillan, ISBN978-1-137-00808-4
30) United Nations. (2009). WORLD POPULATION TO EXCEED 9 BILLION BY 2050. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.un.org/esa/population/publications/wpp2008/pressrelease.pdf
31) UNFPA. (2007). Unleashing the Potential of Urban Growth', State of the World Population. [Online], [Accessed 3rd June 2014]. Available from World Wide Web: http://www.unfpa.org/swp/swpmain.htm
32) W. Chan Kim & Renee Mauborane, (2005), Blue ocean Strategy – How to create uncontested market space and make the competition irrelevant, Harvard Business School Press, ISBN 978-1-59139-619-2
33) Warren, S., Craft, R. L., & Bosma, B. (1999). Designing smart health care technology into the home of the future. In *Workshops on Future Medical Devices: Home Care Technologies for the 21st Century* (Vol. 2, p. 667).

Addressing Climate to Make Better Places, Thermal Comfort in Outdoor Open Space in Mega Kuningan Superblock, Jakarta

M Donny Koerniawan[1,2], Weijun Gao[3]

[1] PhD Candidate, Department of Architecture, The University of Kitakyushu Japan
[2] Associate Professor, Department of Architecture, Institute Technology of Bandung, Indonesia
[3] Professor, Department of Architecture, The University of Kitakyushu Japan

Abstract

One proposed definition for a better place in the outdoor space is the extent to which outdoor space is friendly to the presence of people activity. In the tropical humid climate, outdoor spaces are used during the year, and they must provide proper levels of thermal comfort. The thermal comfort in open spaces is important for evaluation studies and to guide urban and landscape architectural projects. An extremely important to the planner is to promote the user's comfort and understanding of the activities that will take place in a given space. The usage of open space is more numerous if they propose thermophysiologically comfortable microclimate. The city development, population growth and urbanization can be recognized at least in part to its climate. In this research the field measurements have been conducted. The quality of these spaces may contribute to people's life quality or, on the other hand, generate isolation and social abandon. This research proposes a computational approach to model the urban microclimate and assess the thermal comfort of open space in some existing superblocks in Jakarta that can change how outdoor space use to make better space. Two softwares were using in this research, Rayman software is used to determine the location of field measurement by calculating SVF (Sky View Factor) to choose eight points which represent shaded area, partly shaded area, and unshaded area. Envimet software was used to analyze the models of outdoor thermal comfort. The results show in a tropical humid climate city like Jakarta, thermal comfort is difficult to achieve with respect to open spaces, low air velocity, high humidity and high air temperature are experienced during the daytime. Super block, like Mega Kuningan, with a lot of high rise buildings creates heat trapped in the night time, which affected thermal comfort in the beginning of the day quickly rise.

Keywords: *outdoor; urban open space; thermal comfort; super block; computational.*

I. Introduction

Cities changes because of buildings and facilities development from the past to the present, increasing the build environment such as apartment, residences, road, and industrial facilities change the albedo of the cities from the natural environment to be concrete and asphalt, and generates new climate condition in the cities called Urban Climate [1][2][3].

Heat island is one of phenomenon of Urban Climate when the temperature is appeared higher in the urban than its surround. The temperature in the urban increases gradually, Shudo at al.[4] Proved that the temperature in urban higher 2^{o}C than in cropland and forest. It happens because of transformation surface covered from natural to be artificial environment such as concrete and asphalt [5][6][7].

Mochamad Donny Koerniawan
--- Phd Student Department of Architecture
The University of Kitakyushu
1-1 Hibikino, Wakamatsu Kitakyushu, Japan 8070135
Tel: +818043100564 Fax:
e-mail: mdkoerniawan@gmail.com

According to Valsson (2008)(8), microclimate is the climate pattern in a relatively small area, microclimate can occur during spot under the shade of a tree, the area around the pool or in open space areas that have similar climate patterns. Microclimate is influenced by climatic variables: temperature, humidity, wind speed and wind direction, season, time, and physical characteristics of the region.

Several definitions of thermal comfort are exist. ASHRAE (2001a)[9], Highlights its subjective and psychological dimension by describing comfort as a condition of mind, which expresses satisfaction with the thermal environment,

A more rational definition relates comfort to energy gains and losses and describes the state of comfort as satisfied when the heat flows to and from the human body are in equilibrium [10].

Thermal comfort is defined as a state of mind which expresses satisfaction levels of human to environmental thermal conditions.

Researchers clarify the build environment could affect microclimate in the urban [11][12][13]. During the daytime the builds environment cause the heat fast absorbed and will release slowly during the night-time

these formations recognized as the Urban Heat Island effect where the hot region enclosed by the cooler contiguous area.

In improving thermal comfort in urban, there are three usual stages, first avoiding the addition of heat (heat avoidance), if it has not reached the desired state then entered into the second stage is the passive cooling. Passive cooling is an effort with nature's way to reach a condition of the human thermal environment when the ambient temperature increases. The last step taken is active cooling when the passive cooling is not enough to achieve the desired conditions, such as using mechanical cooling. In urban condition active cooling is very difficult to achieve, therefor urban design and planning is the first step to address climate to make better and comfortable place in the city.

Many ways in a passive cooling to achieve desired conditions, e.g. cooling the buildings and the environment naturally, shadowing the open space, flowing the wind among the buildings, or shifting the thermal comfort zone by changing the people's behavior, activity and the way they use the cloth, so the high temperature condition could be moved in the desired thermal comfort criteria. Passive cooling depend on the weather and climate conditions of each place.

II. Methodology

This research is evaluation study, refers to the systematic evaluation of the outdoor thermal comfort. To obtain a systematic evaluation of outdoor thermal comfort, this research used explorative methods. Explorative method was done by conducting a literature study of outdoor thermal comfort and direct observations in the field using measurement tools. Measurement tools were used to obtain quantitative data. Quantitative data obtained was used as an aid to the interpretation of the study data using tables and graphs. Interpretation of the study is a tabulation of the data and graph can be analyzed to provide an overview of the thermal comfort of outdoor space.

The variables used in the field to measure the level of thermal comfort of outdoor space are:
1) Temperature / temperature (Ta, ^{o}C),
2) Humidity (Rh,%)
3) Air velocity (v, m / s).

These variables were measured to see the difference because of the influence of radiation. This variables were measured on 1.5 m above the ground at each point. The combination of variables were calculated using the Rayman software to get thermal comfort value.

The value of thermal comfort used PET index. PET is very well corresponding to the human biometeorological evaluation of the thermal component in different climates and widely uses to measure thermal comfort in outdoor space. PET base on the human energy balance of the human body, therefore thermophysiologically significant and reproducible [14][15][16]. PET is well known because use familiar unit of temperature degree Celsius in its value.

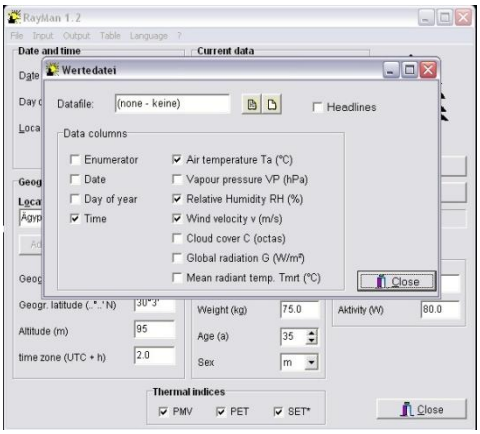


Fig.1. Rayman 1.2 Interface.
Source: Matzarakis and Mayer 2007

PET index has point scales, from very cold to very hot, combining individual parameters (metabolism and clothing resistance) and environmental parameters (air temperature, air humidity, air temperature and radiant temperature), the scale can be calculated and get the result which can be seen in **table 1**.

III. Case Study

Located on 55 ha land, Mega Kuningan super- block is one of the famous superblock in Jakarta. This superblock is at the south east of Jakarta city on the site of Golden Triangle of the business district. The concept of the Mega Kuningan superblock is split the site into smaller superblocks to interlink between them easily. The pedestrian circulation system in the center is used to integrate smaller superblock as well as vehicles. Circular is the main form of the Mega Kuningan superblock, every block of the building is facing the main circular road in the center of the site. The business function is located in the center of the superblock as the main focus as it is also the main entrance of the superblocks [17]. The main entrance accesses are from. Jl. Satrio and Jl. Rasuna Said. See **figure 2**.

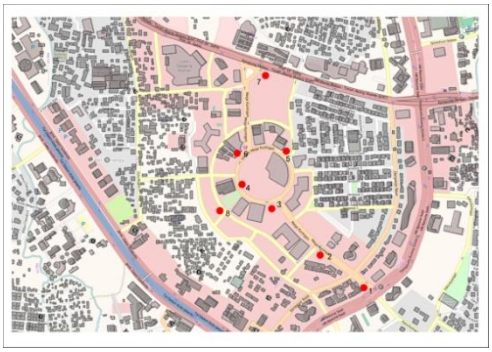


Fig 2. Mega Kuningan superblock 2013 and the points of field measurement
Source: Koerniawan, 2014

Table 1. PET Index
Source: Lin and Matzarakis (2008)

PET (Sub) Tropical Region (°C)	Thermal Perception	Grade of Physiological Stress
14	Very Cold	Extreme Cold Stress
18	Cold	Strong Cold Stress
22	Cool	Moderate Cold Stress
26	Slightly Cool	Slight Cold Stress
30	Comfortable	No Thermal Stress
34	Slightly Warm	Slight Heat Stress
38	Warm	Moderate Heat Stress
42	Hot	Strong Heat Stress
	Very Hot	Extreme Heat Stress

The 8 point of measurement in the site were conducted on 3 February and 10 October, 2013, in the condition of clear sky, during 24 hours, from 0.00 to 23.00. The field measurement conducted using the following equipment: Thermo Recorder RT 13 to measure temperature, LM 8000 to measure temperature and wind speed; and EM 528A to measure Surface temperature. All sensors installed on 1.5 above the ground.

The points of measurement were chosen on the condition of shaded area, half-shade areas, and openness, to promote different possibilities of thermal conditions. The points of measurement can be seen in **figure 2**.

Regarding to the condition of the chosen area, Sky View Factor was used to calculate the position of point measurement. Using Rayman software the shaded area, half-shaded area, and openness area can be determined.

IV. Result and Discussion

Mega kuningan super block is located in Jakarta city where Jakarta is located at 6° 13' S 106° 50' E. The city is 7 meters above sea level. Officially, the area of the Jakarta is 662 km^2 of land area and 6,977 km^2 of the sea area. According to the meteorological data in 2011-2013, Jakarta is hot and humid equatorial/tropical climate (Af) base on Köppen climate classification system. Located in the western-part of Indonesia in South Equator, Jakarta's wet season rainfall peak is January with average monthly rainfall 400 millimeters (16 in), and dry season low point is August with a monthly rainfall average 70 millimeters (2.8 in). Average daily temperatures range from 25° to 36°C, which the hottest month is October and the coldest month is January. Jakarta area has average wind speed 3 ms-1 with west direction annually, see **figure 3**.

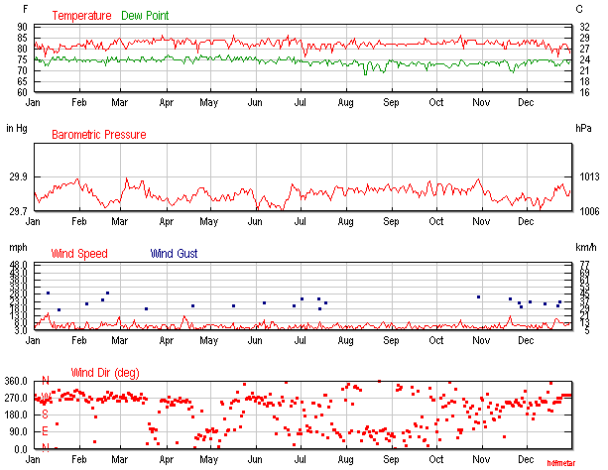


Fig 3. Seasonal pattern of temperature, air velocity, and relative humidity in Jakarta, 2013
Source: wunderground.com, 2014

Figure 4 shows PET value in all points measured were uncomfortable either in October or in February. According to PET values in tropical region (Lin and Matzarakis 2008) started at 9.00 h PET values tend to be in a slight warm condition, about 32 ^{o}C, and hot at 13.00, in about 40 ^{o}C PET.

The PET value affected by the Tmrt value which began rise sharply at 9:00 and at 13:00 h reached in top value. The rising of Tmrt value because of the ambient temperature at night time was still high, 24 ^{o}C average, while the wind was not strong enough to force away the heat around the areas become cooler.

Point 7, in **figure 4**, PET value in October and February is really different, point 7 is located in the north of Mega Kuningan the north side of this point is highway and a row of highrise buildings, south of this point is open space, west side is sparse density highrise commercial buildings. The top value of PET value of point 7 in October was 42 ^{o}C at 13:00 h and 31 ^{o}C in February at 12:00 h. It happened regarding to Jakarta Weather condition, wind speed in October tends to be low, and arrive from the North-East (90^o) carried hot air from the highway and a row of highrise (see **figure 2**). Meanwhile, in February Jakarta has high wind speed, 5 m/s average, carrying cold air come from West–South West side (225 ^{o}) where the highrise building is more odd and there were many parks (see **figure 2**).

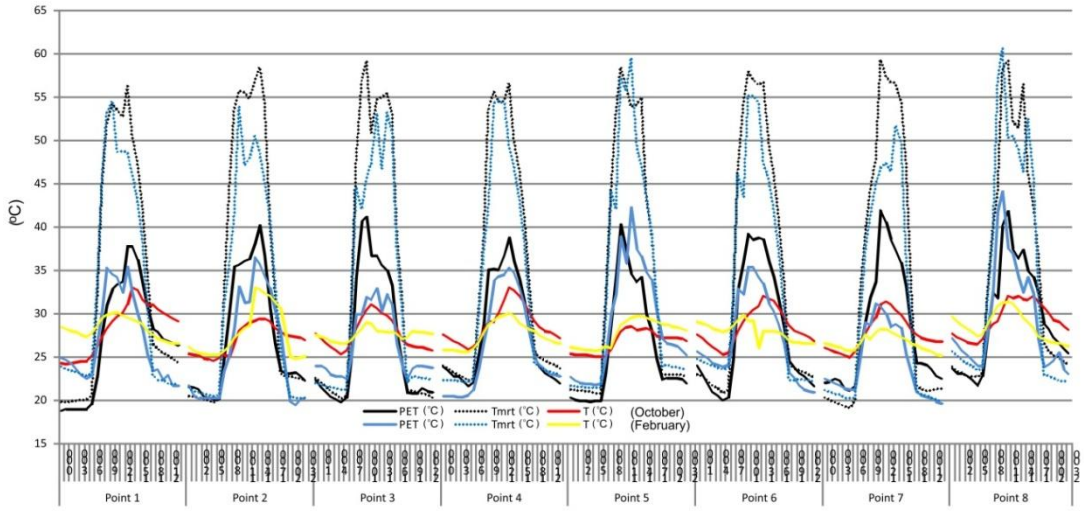


Fig 4. The result of PET of 8 points measurement

V. Analysis using EnviMet Software

EnviMet software, now is famous software to simulate outdoor thermal comfort. ENVImet is best known a three-dimensional microclimate software. It use a model with typical resolution of 0.5 to 10 m in space and 10 second in time to simulate the interaction of surface-plant-air in urban environment. EnviMet can be used to simulate a typical areas like Urban Climatology, Architecture, Building Design or Environmental Planing [[18]].

The EnviMet simulation has limitation, therefore the simulation was limited by the boundary of 800m x 800m. The initial condition of simulation can be seen in **table 2**.

In general, from the field measurement data, the average value of PET of all the points was similar, both in February and October. The the thermal comfort could not achieve in the outdoor space between the buildings in Mega Kuningan Superblock, one reason can be informed was because of the heat trapped (Tmrt) amongst the buildings as shown in the simulation of figure 5 at night time was still high. The heat trapped at night time affected the temperature in the morning, the temperature could increase quickly start at 8.00 h because of the solar radiation directly came through the area and heat up the albedo of the area which most of asphalt and concrete.

The advantage of the superblock is the highrise building, in the day time the buildings can block the sun's radiation through the open space around the the building, accordingly the temperature was not signifycantly increase. But the disadvantage of the highrise building is can block the wind speed and distribution among the buildings make the wind speed around the buildings is less than in the open space. The open space has the disadvantage because get direct solar radiation.

All of the conditions that inform above can be simulated. The result of simulation can be made in image or quantitative data which can be analyzed using spreadsheet software. As seen in **figure 5** using EnviMet software, made by Michael Brush, the condition of Mega Kuningan can be analyzed using image.

Table 2. Initial condition of simulation

Boundary Model	800m x 800m
Grids	200x200
Start Simulation at Time (HH:MM:SS):	6:00:00
Total Simulation Time in Hours:	24
Save Model State each ? min	30
Wind Speed in 10 m ab. Ground [m/s]	3
Wind Direction (0:N..90:E..180:S..270:W..)	180
Roughness Length z0 at Reference Point	3
Initial Temperature Atmosphere [K]	296
Specific Humidity in 2500 m [g Water/kg air]	16.5
Relative Humidity in 2m [%]	80
[PMV] Settings for PMV-Calculation	
Walking Speed (m/s)	0.9
Energy-Exchange (Col. 2 M/A)	116
Mech. Factor	0
Heattransfer resistance cloths	1
[SOLARADJUST]	
Factor of shortwave adjustment (0.5 to 1.5)	1
[BUILDING] Building properties	
Inside Temperature [K]	293
Heat Transmission Walls [W/m²K]	1.94
Heat Transmission Roofs [W/m²K]	6
Albedo Walls	0.65
Albedo Roofs	0.75

[SOILDATA] Settings for Soil Initial Temperature Upper Layer (0-20 cm) [K]	301
Initial Temperature Middle Layer (20-50 cm) [K]	301
Initial Temperature Deep Layer (below 50 cm)[K]	301
Relative Humidity Upper Layer (0-20 cm)	60
Relative Humidity Middle Layer (20-50 cm)	70
Relative Humidity Deep Layer (below 50 cm)	70

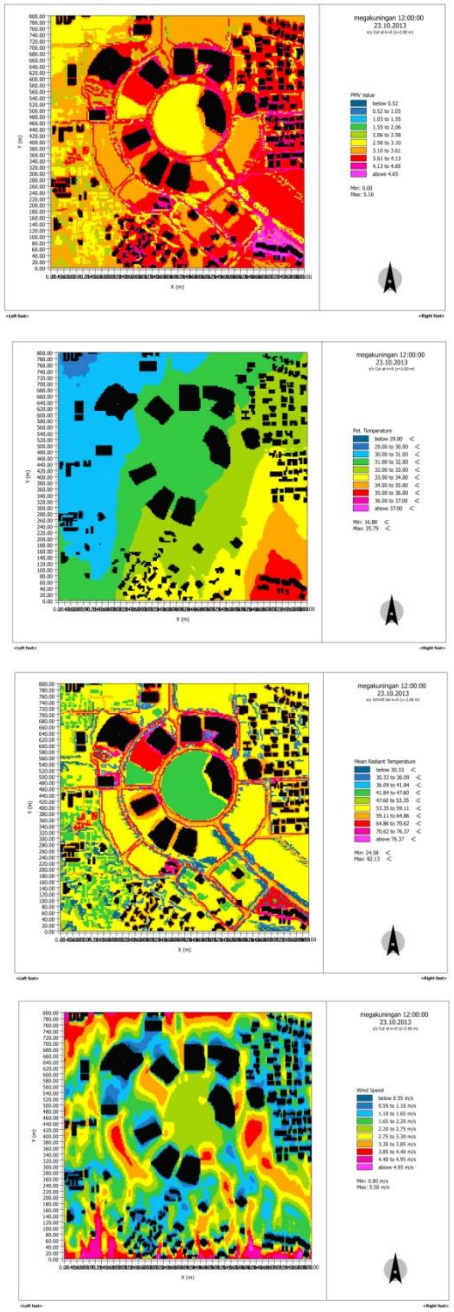


Fig 5. The analysis using EnviMet Simulation of Megakuningan Super block

VI. Conclusion

Microclimate apparently worked very unique which can only feel when all these climate variables is assessed in a unity, this is the way how the assessment of thermal comfort. Assessment of thermal comfort can give the full picture of how this micro-climate variables affect. In addition to the assessment of thermal comfort can be obtained the relationship with macro-climate and the influence of the transformation of build environment.

Wind plays an important role in thermal comfort in the city, regarding making the area in the lower temperature condition, wind speed and direction will race against the time, with the sunlight which come through to the surrounding area causing radiation. Closure area in the city will obstruct the temperature rise in the region and could achieve thermal comfort quickly, if it is followed by the wind state in the region, the good thermal comfort can be maintained in a state of comfortable throughout the day.

Shaded area proved to be more comfortable than unshaded area. The openness area always starts with a better thermal comfort, because of the wind speed in the morning is bigger in openness area than shaded area and bring cold temperatures.

The night temperature affect thermal comfort in the beginning of the day. The heat trapped by the buildings in the night time affect the temperature in the morning could affect the thermal comfort during the day.

The thermal comfort in open spaces is important for evaluation studies and to guide urban and landscape architectural projects, the computational approach nowadays is easy to use regarding analysis and design study. Computer simulations related to the thermal comfort study and urban structure has not been widely used. Though the results are very useful in determining and deciding a good design. With the development of personal computer both speed and the graphic display these simulations will be more easily used and developed as a tool to determine the design decisions promptly.

Acknowledgments

Thank you for all who took part in this work and helped in the collection of the data. This work is part of PhD research at The University of Kitakyushu, Japan, financially supported by DIKTI Indonesia. Thanks to Professor Weijun Gao for the discussions that preceded this field work. Finally, we would like to also thank the Faculty of Environmental Engineering, University of Kitakyushu, Japan; School of Architecture, Planning, and Policy Development, Institute Technology of Bandung, Indonesia.

References

[1] Landsberg, H.E. (1981), The Urban Climate, Academic Press, New York.

[2] Oke, T.R. (1987), Boundary Layer Climates, Routledge, New York.
[3] Oke, T.R., Zeuner G. and Jauregui, E. (1992), The surface energy balance in Mexico City. Atmospheric Environment, 26B, 433-444.
[4] Shudo, H., Sugiyama, J., Yokoo, N., and Oka T. (1997), A study on temperature distribution influenced by various land uses, Energy and Buildings, 26, 199-205.
[5] Lee, H.Y., (1993). An application of NOAA AVHRR thermal data to the study of urban heat islands, Atmospheric Environment, 27B(1), 1-13.
[6] Gallo, K.P., Easterling, D.R., and Peterson, T.C., (1996), The influence of land use/land cover on climatological values of the diurnal temperature range, Journal of Climate, 9, 2941-2944.
[7] Gallo, K.P., Owen, T.W., Easterling, D.R., and Jamason, P.F., (1999), Temperature trends of the U.S. Historical Climatology Network based on satellite-designated land use/land cover, Journal of Climate, 12, 1344-1348.
[8] Valsson, Ar. Valsson and Bharat, Dr. Alka (January 2008), Natural and Man-made Parameter induced Spatial Variation in Microclimate, ENVIRONMENT-ARCHITECTURE Time Space & People. Dept. of Architecture, LAD College, Nagpur, and Dept. of Architecture & Planning, MANIT Bhopal, India.
[9] ASHRAE (2001): Chapter 13 – Measurements and instruments, In: Handbook of Fundamentals, American Society for heating Refrigerating and Air Conditioning, Atlanta: 13.26 –13.27. USA
[10] Fanger P.O. (1970): Thermal comfort, Danish Technical Press. Copenhagen.
[11] Landsberg, G.H., (1981). "The Urban Climate". Academic Press, New York.
[12] Eliasson, I. (2000). "The use of climate knowledge in urban planning". Landscape and Urban Planning 48: 31-44.
[13] Oke, T.R. (2006), Initial Guidance To Obtain Representative Meteorological Observations At Urban Sites, World Meteorological Organization (WMO), Instruments And Observing Methods, Report No. 81.
[14] Mayer H, Höppe PR (1987). "Thermal comfort of man in different urban environments". Theory Application Climatology 38:43–49
[15] Höppe PR, (1999). "The physiological equivalent temperature – a universal index for the biometeorological assessment of the thermal environment". Int J Biometeorol
[16] A Matzarakis, H Mayer, MG Iziomon (1999) Applications of a universal thermal index: physiological equivalent temperature, International Journal of Biometeorology 43 (2), 76-84
[17] Pengelola Mega Kuningan, "Master Plan". Accessed May 20th, (2013). http://megakuningan.indo.asia/concept.html.
[18] Envi-met 3.1 manual online, Accesed July 3rd (2013), http:// envi-met.com/

Environmental and Green Context

Third Session Parallel Notes
Moderator: Arif Kusumawanto

K4 Room 2nd Floor
16.30 – 17.30

Presenter	:	**Ardina Putri Rahmana (Universitas Gadjah Mada)**
Title	:	**Outdoor Thermal Comfort in Tugu – Kraton Street Corridor Yogyakarta City**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Introduction
- Global warming is an increasing
- Part of it is urban heat
- Because in Yogyakarta city

The main purpose :
- To identify the enclosure's influence toward thermal comfort in Tugu-Kraton Street Corridor.
- Enclosure description
- Microclimate Measurement
- Questionare Distribution
- The equipment : Solar power meter, anemometer
- Result : People in the (di ppt)

Presenter	:	**Abdul Malek Abdul Rahman (Universiti Sains Malaysia)**
Title	:	**Future Compact Cities in View of Global for ASEAN Countries**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

Three factor that are happening in the world today (the problems):
1. Rapid population
2. Global warming
3. New digitale

Future scenario to face the problems
Smart City
Key parameters that will define a smart city in 2020
a. Smart Energy : renewable energy
   e.g : trees vs clean energy Kuala sawah, Melaka
b. Smart Mobility : infrastructure supporting low emmision advanced mobility. There should be information regarding time factor comparison commuting from point to point by car, bus, light rail transport, cable car, commuter trains, airplanes and water
c. transport.
   e.g : lrt, mrt, monorail
d. Smart technology : Connectivity and convergence
   e.g : internet, asimo (advance step-in innovative mobility)

e. Smart Healthcare : e-Health
f. Smart Building : Green building
g. Smart Infrastructure : Green concept in all form of city infrastructure
h. Smart Citizen : Embrace smart & green solutions
e.g : online shop

A basic concept of vertical compact city : applying parameters in smart city
- Smart energy : wind turbines, photovoltacs
- Smart mobility : skytrain, car sharing, green vehicles, fast and effisien for vertical movement.
- Smart building : green office, green residential, green commercial

---

Presenter : **M. Donny Koerniawan (University of Kitakyushu)**
Title : **Addressing Climate to Make Better Places, Thermal Comfort in Outdoor Open Space in Mega Kuningan Superblock, Jakarta**
Presentation Duration : **10 minutes**

PRESENTATION CONTENTS

Introduction
- One proposed definition for a better place is the extent to which poutdoor space is friendly to the presence of people activity.
- The thermal comfort in open spaces is important for evaluation studies and to guide urban and landscape architectural projects.

City Development
- Cities changes → because of buildings and facilities development from the past to the present, increasing the build environment.
- Heat island → phenomenon of Urban Climate when the temperature is appeared higher in the urban than its surround.
- The temperature in urban is higher 2^{o} C than in cropland and forest.

Type of urban climate
- Mesoscale
- Local scale
- Microscale

Case study
Mega Kuningan → one of the famous superblock in Jakarta
- According to the meteorological data in 2011-2013, Jakarta is hot and humid equatorial/tropical climate (Af) base on Köppen climate classification system.
- Average daily temperatures range from 25° to 36°C, which the hottest month is October and the coldest month is January.

Rayman Software
EnviMet Software → to simulate outdoor thermal comfort, can be used to simulate a typical areas like Urban Climatology, Architecture, Building Design or Environmental Planin.
The EnviMet simulation has limitation, therefore the simulation was limited by the boundary of 800m x 800m.

Conclusion
- Microclimate worked very unique which can only feel when all these climate variables is assessed in a unity
- Wind plays an important role in thermal comfort in the city
- Shaded area proved to be more comfortable than unshaded area

- The night temperature affect thermal comfort in the beginning of the day.
- The thermal comfort in open spaces is important for evaluation studies and to guide urban and landscape architectural projects, the computational approach nowadays is easy to use regarding analysis and design study.

The Availability of Green Open Space to Absorb CO_2 Emissions in East Surabaya

Erma Fitria Rini [1], Haryo Sulistyarso[2], Adjie Pamungkas[3]

[1] Graduate Student, Urban Development Management, Civil and Planning Engineering Faculty
Sepuluh Nopember Institute of Technology
[2,3] Lecturer, Urban Development Management, Civil and Planning Engineering Faculty, Sepuluh Nopember Institute of Technology

Abstract

Air pollution is an issue that has the greatest pressure and urged for Surabaya city to look for the right solution to deal with. CO_2 gases have the greatest concentration in the atmosphere than other greenhouse gases which is about 55%. One of the great ways to naturally absorb CO_2 is to provide adequate green spaces. Residential development is rapidly growing in East Surabaya. Meanwhile, the public green spaces in East Surabaya are only amounted to 2.37% of the total land area of East Surabaya. Therefore, it is necessary to know the needs of urban green space to absorb the CO_2 emissions from housing sector in East Surabaya and factors affecting availability of green spaces. This study used the satellite image classification analysis incorporating secondary and primary facts to find out green spaces availability. Mathematical calculation is used to calculate the capabilities and needs of green space in absorbing housing CO_2 emissions. Content analysis is used to find factors affecting availability of green spaces. The result shows that Gubeng, Tambaksari, and Rungkut District still need green open space to absorb the CO_2 emissions from housing activities. Besides, there are some factors that affecting the availibility of green open space in East Surabaya.

Keywords: *green open space; CO_2 emissions; housing*

I. Introduction

Urban areas are particularly vulnerable to climate change's impact due to its large population, intensive infrastructure usage, high economic activity, as well as the concentration of poor people. The impact of climate change in urban areas could potentially lead to the threat of sea level rise on the city which located in coastal areas, extreme storms and increased temperatures that hit coastal towns, and destroyed the social and economic infrastructure, and low-income people in the town to be the most vulnerable to the impacts of climate change because of limited resources and the capacity to anticipate these impacts (Parasati, 2012).

Viewed from the environmental issues in Surabaya City air pollution issue has the greatest pressure and urge to look for the right solution (Environmental Department of Surabaya, 2011). Urban air pollution is generally caused by the emissions generated by Industrial activities, transportation, and waste generation in large quantities. These activities generate air contaminants such as CO_2, CH_4, and NO_2 which is a Greenhouse Gas (GHG). CO_2 gas has the largest concentration in the atmosphere than other greenhouse gases which is about 55%. CO_2 is now a matter of global attention because as it was rumored to be the main cause of global warming (Samiaji, 2009).

IPCC emissions by sources divide into 5 categories: energy; industrial processes and product use; agriculture, forestry, and land use; waste; and others. The energy sector is the most important sector in contributing to greenhouse gas emissions, one of them is the use of energy in household activities (IPCC, 2006). In this research, LPG is used to measure the use of energy in main household activities such as cooking activities. The energy sector contributed most greenhouse gases, especially CO_2, which is sourced from the housing in the household sector (KNLH, 2009).

The green area (vegetation and mangroves) in Surabaya in the last ten years (2000-2009) has been reduced by 43.2 km^2 or 12.9% (Hasyim, 2011). According to data from the Environment Agency, the green open spaces Surabaya City is currently listed area of 6460.38 hectares or about 19.5% from the total area of Surabaya City (consisting of protected areas, parks and green belts, urban forests, sports fields and cemetery). According to data from 2008 State of Environment Report of Surabaya City document and the 2008 Spatial Planning of Surabaya City document, public green open space in East Surabaya is currently only amounted to 2.37% of the total land area of East Surabaya consisting of city parks, playgrounds, courts sport, cemeteries, and mangroves. The arrangement of green open space appropriately can improve the

Erma Fitria Rini
--- Graduate Student, Sepuluh Nopember Institute of Technology, Sukolilo, Surabaya
Tel: 031-5927290 Fax: 031-5996972
E-mail: ermafitriarini@yahoo.co.id

quality of the city's atmosphere, freshen the air, decrease city temperature, swept the city surface dust, reduce levels of air pollution, and reduce noise (Hakim and Utomo, 2003). Therefore, this research is needed to determine the need for green space to absorb the CO_2 emissions of the housing and the factors that affect its availability.

II. Literature

The availability of green space is influenced by several factors that can be known from the literature and previous research. This factors was later used as the material of in-depth interviews to stakeholders in the content analysis.

Table 1. Factors Affecting the Availability of Green Open Spaces from Literatures and Previous Researches.

Indicators	Sihite & Isman (1997)	Fattah (2001)	Muis (2005)	Lestari (2007)	Aurelia (2010)	Dinariana (2011)	Olaleye et al (2013)	Joga (2013, 2009)	Brodhead (2009)	Mc Donald et al (2010)	Prihatiningsih et al (2013)	Ernawati & Silas (2013)
Immigrants	-	-	-	-	√	-	-	-	-	-	-	-
Population growth	-	-	-	-	-	√	-	-	-	√	-	-
Population density	-	-	-	-	√	-	-	-	√	-	-	-
Limited land	-	-	-	√	-	√	√	-	-	-	-	-
Private land ownership	-	-	-	√	-	-	-	-	-	-	-	-
Health facilities	-	-	-	-	√	-	-	-	-	-	-	-
Education facilities	-	-	-	-	√	-	-	-	-	-	-	-
Surrounding environment	-	-	-	-	-	-	√	-	-	-	-	-
Housing density	-	-	-	-	-	-	√	-	-	-	-	-
Commercial areas	-	-	-	-	-	-	-	√	-	-	-	-
Changes in land use function	-	-	-	√	-	-	-	-	-	-	-	-
Program finance	-	√	-	-	-	-	-	-	-	-	-	-
Price of land	-	-	-	√	-	-	-	-	-	-	-	-
Economy	-	-	√	√	-	-	-	-	-	-	-	-
Limited funds	-	-	-	√	-	-	√	-	-	-	-	-
Vague concept allocation of green open space in spatial planning	√	-	-	-	-	-	-	-	-	-	-	-
Weak policy	-	-	-	√	√	-	-	-	-	-	-	-
Constantly changing of policy	-	-	-	-	-	-	√	-	-	-	-	-
Basic Green Coefficient	-	-	-	-	-	-	√	-	-	-	-	-
Incentives and disincentives	-	-	-	-	-	-	√	-	-	-	-	-
Coordination among agencies	√	-	-	-	-	-	-	-	-	-	-	-
Weak institutional and legal certainty of the open space area	√	-	-	-	-	-	-	-	-	-	-	-
Program executors	-	√	-	-	-	-	-	-	-	-	-	-
Supervision and control of land use	-	-	-	√	-	-	-	-	-	-	-	-
Political influence of government	-	-	-	-	-	-	√	-	-	-	-	-
Corruption	-	-	-	-	-	-	√	-	-	-	-	-
Lack of planning tools	-	-	-	-	-	-	√	-	-	-	-	-
The quality and quantity of government	-	-	-	-	-	-	√	-	-	-	-	-
Coordination between government agencies and developers	-	-	-	-	-	-	√	-	-	-	-	-
Concept offered by developers	-	-	-	-	-	-	-	√	-	-	-	-

Table 1. Factors Affecting the Availability of Green Open Spaces from Literatures and Previous Researches.

Indicators	Sihite & Isman (1997)	Fattah (2001)	Muis (2005)	Lestari (2007)	Aurelia (2010)	Dinariana (2011)	Olaleye et al (2013)	Joga (2013, 2009)	Brodhead (2009)	Mc Donald et al (2010)	Prihatiningsih et al (2013)	Ernawati & Silas (2013)
Community participation	√	-	-	-	-	-	-	√	-	-	√	-
Public awareness	√	-	-	√	-	-	-	√	-	-	-	-
The influence of community leaders	-	-	-	-	-	-	√	-	-	-	-	√

III. Methods

The purpose from this descriptive study is to create a description or overview of situation or event, explain the relationships between phenomena, as well as the meaning and implications from a problem to be solved. The quantitative analysis in this study is used when analyzing the capabilities and the needs of green space to absorb CO_2 emissions housing. 100 respondents drawn from the formal housing and kampong as a sample to calculate the CO_2 emissions from residential LPG usage. Qualitative analysis is used to analyze the factors that affect the availability of green space to reduce CO_2 emissions by content analysis. Content analysis conducted in depth interviews with the stakeholders. Stakeholders who selected in this study include governments, private sector and academics, and society.

IV. Results and Discussions

The research area is the eastern part of the Surabaya covering 9020.41 ha. The administrative area covers seven Districts of East Surabaya such as Tambaksari, Gubeng, Rungkut, Tenggilis Mejoyo, Gunung Anyar, Sukolilo, and Mulyorejo District.

Based on the data obtained, the number of houses of housing settlement housing much more than formal, which amounted to 68%. East Surabaya consists of 64.031 formal housing and 138.027 house unit of kampong.

4.1 CO_2 Emissions from Housing

The amount of CO_2 emissions are calculated based on the use of fossil fuels in housing. In this research, the fossil fuels used by citizens is covering the use of LPG for cooking and heating water. The formula used to calculate the primary CO_2 emissions from the residential sector based on 2006 IPCC Guidance were as follows:

Fig.1. East Surabaya Area.

$$CO_2 emissions = FC \times EF \times NVC$$

FC = amount of LPG used (kg/month)
EF = emission factor of CO_2, which is 63.1 for LPG (g CO_2 /MJ)
NVC = Net calorific Volume (energy content) per mass unit or fuel volume, which is 47.3 for LPG (MJ/kg)
CO_2 emissions = amount of CO_2 (g/month)

Here is the result of CO_2 emissions calculations from LPG usage for household activities in formal housing and kampong.

Table 2. CO2 Emissions Calculations from LPG Usage for Household Activities

District	LPG Usage		NVC	EF	House Unit		CO_2 Emissions		Total Emissions
	Formal	Kampong			Formal	Kampong	Formal	Kampong	
Gubeng	18.75	12.50			8796	25328	492240.10	944933.86	1,437,173.96
Gunung Anyar	17.25	10.00			7271	6526	374346.47	194776.95	569,123.43
Mulyorejo	17.40	10.50			19292	11413	1001882.99	357667.61	1,359,550.60
Rungkut	17.14	10.50	47.3	63.1	13192	11732	674969.81	367664.63	1,042,634.44
Sukolilo	19.20	9.86			9408	13325	539124.46	392020.49	931,144.95
Tambaksari	0	10.14			987	58476	0	1769365.24	1,769,365.24
Tenggilis Mejoyo	18.00	10.80			5085	11227	273183.18	361891.16	635,074.35
								Total	7,744,066.96

Based on the calculations, it can be seen that the housing CO_2 emission in Tambaksari District is the largest among others. This is because the number of houses in this district is also the largest compared to other districts in East Surabaya. Although the average use of LPG per month in Tambaksari District almost the same as the other districts, but the number of houses which a lot more is what makes the CO_2 emissions in the Tambaksari District larger than the other districts.

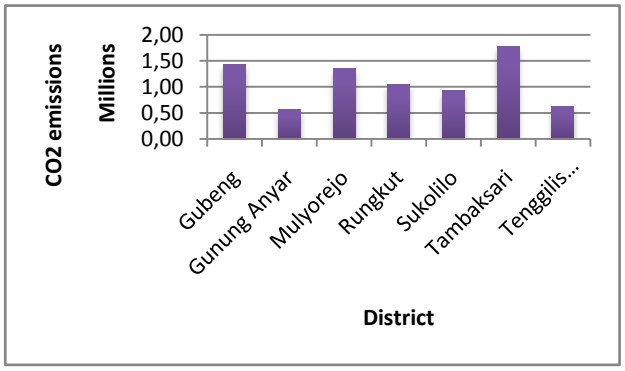


Fig.2. Comparison of Housing CO_2 Emissions among Districts.

4.2 The Availability of Green Open Spaces

Through supervised image classification analysis, all pixels in the Landsat 8 image bands are grouped according to the needs of research. In this research, the vegetation is grouped into two classes, namely trees and shrubs. In supervised classification analysis, a ground truth is performed to determine the accuracy of image with the existing condition. Identification of green open space availability is also equipped with the data from Department of Hygiene and Garden of Surabaya City and primary surveys. This is done to complement the green open spaces of data which is not detected by the satellite images of Landsat 8. East Surabaya has mangrove areas, so some of the result of classification grouped into mangrove class based on the primary surveys and secondary data.

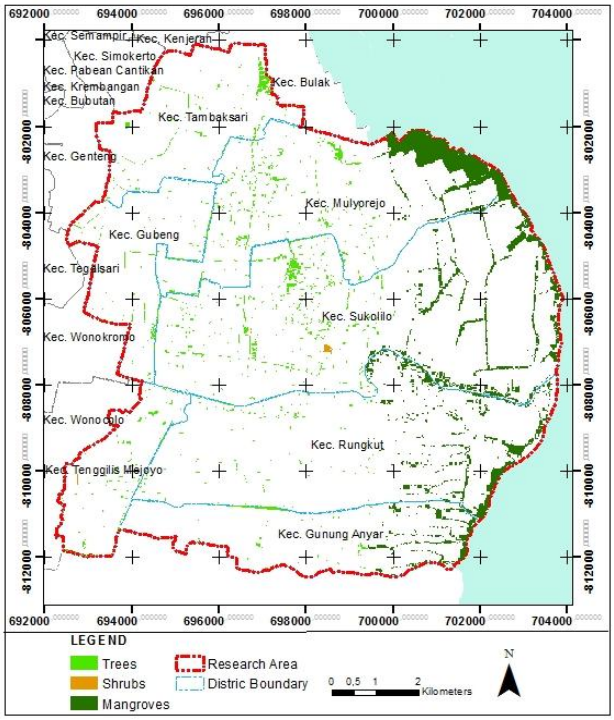


Fig.3. Green Spaces in East Surabaya Based on the Vegetation Type.

Table 3. Total Area of Vegetation in East Surabaya.

Type of Vegetation	Area (ha)
Mangrove	441.98
Tree	197.95
Shrub	4.49
Total	644.42

4.3 Green Open Space's Ability to Absorb CO_2 Emissions

Based on green open space area gained through the analysis of the availability of green open space, then calculated the amount of CO_2 emissions that can be absorbed by the green open space. The analysis resulted in mangroves, trees, and shrubs. This research focused on the needs of green open space to absorb CO_2 emissions released by the housing sector. Therefore, green open space area which is calculated in order absorption of housing CO_2 emissions do not include mangrove areas. So the type of vegetation which subsequently analyzed to determine the ability of absorption of housing CO_2 emission is trees and shrubs. The area of open space is multiplied by the absorption capacity standards of each type of vegetation to generate CO_2 emissions absorption capabilities from each type of green open space. Here is the absorption of green open space based on vegetation types.

Table 4. Absorption Capacity.

Type of Vegetation	Absorption Capacity (kg/ha/month)
Tree	46771.2
Shrub	4521.6
Source: Prasetyo et al (2002) in Adiastari (2010)	

Green open space found in East Surabaya is still not spread evenly. Each district has a different area of green open space. Based on the amount of green open space owned by each districts in East Surabaya, we can calculate the green open space ability to absorb CO_2 emissions in each district.

Table 5. The Green Open Space Ability to Absorb CO_2 Emissions in Each District.

District	Vegetation Area (Ha)		Absorption (kg/month)		Total (kg/month)
	Tree	Shrub	Tree	Shrub	
Gubeng	12.47	0	583005.29	0.00	583005.29
Gunung Anyar	12.16	0.40	568848.68	1823.01	570671.69

Table 5. The Green Open Space Ability to Absorb CO_2 Emissions in Each District.

District	Vegetation Area (Ha)		Absorption (kg/month)		Total (kg/month)
	Tree	Shrub	Tree	Shrub	
Mulyorejo	51.78	0.06	2421676.52	260.60	2421937.12
Rungkut	17.04	0	796851.62	0.00	796851.62
Sukolilo	67.95	3.53	3178072.15	15967.63	3194039.78
Tambaksari	22.74	0.06	1063624.90	259.33	1063884.23
Tenggilis Mejoyo	13.82	0.44	646230.00	1988.88	648218.89
Total	197.95	4.49	9258309.17	20299.45	9278608.62

Based on the absorption in the green open space owned by each of these districts, it can be calculated the adequacy to absorb CO_2 emissions of housing in each district. Adequacy of green open space to absorb CO_2 emissions are calculated based on the deviation between the absorption of green open space and the amount of housing CO_2 emissions. Adequacy green open space in each district in East Surabaya to absorb CO_2 emissions can be seen in the following table.

Table 6. Adequacy of Green Open Space to Absorb CO_2 Emissions in East Surabaya

District	CO_2 Emission (kg/month)	Absorption (kg/month)	Deviation	Adequacy
Gubeng	1.437.173,96	583.005,29	-854168,7	Inadequate
Gunung Anyar	569.123,43	570.671,69	1548,3	Adequate
Mulyorejo	1.359.550,60	2.421.937,12	1062386,5	Adequate
Rungkut	1.042.634,44	796.851,62	-245782,8	Inadequate
Sukolilo	931.144,95	3.194.039,78	2262894,8	Adequate
Tambaksari	1.769.365,24	1.063.884,23	-705481,0	Inadequate
Tenggilis Mejoyo	635.074,35	648.218,89	13144,5	Adequate

4.4 The Needs of Open Green Space

The calculation performed by dividing the CO_2 emissions with tree (46771.2 kg CO_2 /ha/month) and shrubs (4521.6 kg CO_2 /ha/ month) absorption capacity. Trees have a higher absorption than shrubs, but not all areas have enough land to plant trees. Therefore, the following was presented the area of green open space needed for both trees and shrubs.

Table 7. The Needs of Green Open Spaces

District	Deviation	Trees Area (ha)	Shrubs Area (ha)
Gubeng	-854168,67	18,26	-188,91
Gunung Anyar	1548,26	-	
Mulyorejo	1062386,52	-	
Rungkut	-245782,82	5,26	-54,36
Sukolilo	2262894,83	-	
Tambaksari	-705481,00	15,08	-156,02
Tenggilis Mejoyo	13144,54	-	-
	Total	38,60	-399,29

4.5 Factors Affecting the Availability of Green Open Spaces

Factors affecting the availability of green open space from the literatures above was obtained through in-depth interviews with stakeholders. These factors asked for both types of housing, the formal housing and kampong. These factors also asked to the stake-holders by considering at the existing conditions in East Surabaya. The results of these interviews were analyzed using content analysis techniques. Through content analysis, the factors obtained by researchers through a literature review can be confirmed and ex-plored if there are other factors based on stakeholders' opinion. The following is a synthesis of interview's results with stakeholders regarding the factors that affect the availability of green open space in East Surabaya.

Table 8. Factors Affecting the Availability of Green Open Space in East Surabaya

No.	Factors	Kampong		Formal Housing	
		Nodes	Confirmation	Nodes	Confirmation
1	Population density	3	Not Confirmed	3	Not Confirmed
2	Population growth	2	Not Confirmed	2	Not Confirmed
3	Limited land	13	Confirmed	4	Not Confirmed
4	Housing density	12	Confirmed	-	Not Confirmed
5	Commercial areas	2	Not Confirmed	-	Not Confirmed
6	Changes in land use function	15	Confirmed	-	Not Confirmed
7	Limited funds	5	Confirmed	-	Not Confirmed
8	Price of land	3	Not Confirmed	2	Not Confirmed
9	The allocation of green open space in spatial planning	27	Confirmed	13	Confirmed
10	Reforestation/green program	23	Confirmed	23	Confirmed
11	Basic Green Coefficient	18	Confirmed	18	Confirmed
12	Incentives and disincentives	7	Confirmed	7	Confirmed
13	Coordination between government agencies and developers	-	Not Confirmed	23	Confirmed

No.	Factors	Kampong		Formal Housing	
		Nodes	Confirmation	Nodes	Confirmation
14	Concept offered by developers	-	Not Confirmed	28	Confirmed
15	Supervision and control of land use	7	Confirmed	15	Confirmed
16	The quality and quantity of government	6	Not Confirmed	8	Not Confirmed
17	Political influence of government	2	Not Confirmed	1	Not Confirmed
18	Community participation	28	Confirmed	18	Confirmed
19	The influence of community leaders	12	Confirmed	6	Confirmed
20	Public awareness	26	Confirmed	31	Confirmed
21	Communities	21	Confirmed	16	Confirmed
22	Reward in green/reforestation programs	6	Confirmed	6	Confirmed
23	Facilitators	7	Confirmed	7	Confirmed
24	The diversity of greening innovation	9	Confirmed	9	Confirmed

Factors affecting the availability of green open spaces in East Surabaya are different between kampong and formal housing. In formal housing, the coordination between government agencies and developers and the concept offered by developer factors are affecting. While in kampong, there are some factors such as limited land, housing density, changes in land use function, and limited funds which affect the availability of green open spaces. For both of kampong and formal housing, factors from institutional, policy, and social aspects are affecting. Those factors are:

1) the allocation of green open space in spatial planning;
2) reforestation/green program;
3) basic green coefficient;
4) incentives and disincentives;
5) supervision and control of land use;
6) community participation;
7) the influence of community leaders;
8) public awareness;
9) communities;
10) reward in green/reforestation programs;
11) facilitators; and
12) the diversity of greening innovation.

V. Conclusion

Based on this research, we can conclude that East Surabaya is still need green open space to absorb the CO_2 emissions from housing in some district. The needs is about 38.60 ha of green open space with tree vegetation type. From content analysis we also find out factors affecting the availibility of green open space in East Surabaya. These factors is different between factors in formal housing with factors in kampong. In formal housing, we found that the developers of housing is also affecting the availability of green open space. Therefore, we have to pay attention to the coordination between government agencies and developers and the concept offered by developers. But in kampong, some factors such as limited land, housing density, changes in land use function, and limited funds affect the availability of green open spaces. For both of kampong and formal housing, factors from institutional, policy, and social aspects are affecting. Those factors can be used as a consideration for the government in providing green open space in East Surabaya.

References

1) Aurelia, W (2010), *Analisis Perubahan Luas Ruang Terbuka Hijau dan Faktor-Faktor yang Mempengaruhinya di Jakarta Selatan*, Undergraduate Theses, Institut Pertanian Bogor, Bogor
2) Brodhead, F (2009), *Green Space Development: A Literature Review of Research on the Benefits of Urban Green Space, and What Green Space Can Become*, West Broadway Development Corporation
3) Dinariana, D (2011), *Model Pengelolaan Ruang Terbuka Hijau Sebagai Daerah Resapan di Wilayah DKI Jakarta*, Graduate Theses, Institut Pertanian Bogor, Bogor
4) Ernawati, R and Silas, J (2013), "*Liveability of Settlements by People in the Kampung of Surabaya*", World Building Congress 2013, http://www.conference.net.au/cibwbc13/papers/cibwbc2013_submission_98.pdf
5) Fattah, Q (2001), *Analisis Keberadaan Ruang Terbuka Hijau (Green Open Space) dalam Upaya mendukung Kota Medan Sebagai Kota Metropolitan*, Graduate Theses, Universitas Sumatera Utara, Medan
6) Hakim, R and Utomo, H (2003), *Komponen Perancangan Arsitektur Lansekap: Prinsip-Unsur dan Aplikasi Disain*, Bumi Aksara, Jakarta
7) Hasyim, A.W., Hariyanto, T., dan Sulistyarso, H. (2011), "Urban Land Use Change Analysis using Temporal Multispectral Imagery and Image Difference", *International Journal of Academic Research*, Vol.3, No.3, page. 246-251.
8) Intergovernmental Panel on Climate Change, (2006), *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan
9) Joga, N (2009), *"Membangun Rumah di Kota Hijau"*, Kompas, 22 Oktober 2009
10) Joga, N (2013), *Gerakan Kota Hijau*, Gramedia Pustaka Utama, Jakarta
11) Lestari, Suci B (2007), *Faktor-Faktor Penyebab Kurangnya Ketersediaan Ruang Terbuka Hijau Kota di Surabaya Pusat*, Undergraduate Theses, Institut Teknologi Sepuluh Nopember, Surabaya.
12) McDonald RI, Forman RTT, Kareiva P. (2010), '*Open Space Loss and Land Inequality in United States'* Cities, 1990–2000. PLoS ONE 5(3): e9509. doi:10.1371/journal.pone.0009509
13) Muis, Bos A (2005), *Analisis Kebutuhan Ruang Terbuka Hijau Berdasarkan Kebutuhan Oksigen dan Air di Kota Depok Propinsi*

Jawa Barat, Graduate Theses, Institut Pertanian Bogor, Bogor
14) Olaleye, D.O., Ayoade, O.J., dan Omisore, E.O. (2013), "A Multivariate Analysis of Factors Influencing Green Space Provision in Residential Neighbourhood of Sub-Sarahan African Cities", *Journal of Environment and Earth Science*, Volume 3, No.5
15) Parasati, H (2012), "Kebijakan Perkotaan Terkait Perubahan Iklim Hijau", Badan Koordinasi Tata Ruang Nasional, *Buletin Tata Ruang*, 1st edition of 2012, page 15.
16) Prihatiningsih, Y., Buchori, I., Hadiyanto. (2013), "Kajian Perencanaan Ruang Terbuka Hijau Pemukiman di Kampung Brambangan dan Perumahan Sambak Indah, Purwodadi", *Prosiding Seminar Nasional Pengelolaan Sumberdaya Alam dan Lingkungan*, page 429-433
17) Prihatiningsih, Y., Buchori, I., Hadiyanto. (2013), "Kajian Perencanaan Ruang Terbuka Hijau Pemukiman di Kampung Brambangan dan Perumahan Sambak Indah, Purwodadi", *Prosiding Seminar Nasional Pengelolaan Sumberdaya Alam dan Lingkungan*, page 429-433
18) Samiaji, T (2009), "Upaya Mengurangi CO2 di Atmosfer", *Majalah Ilmiah Semi Populer: Berita Dirgantara*, Volume 10, No.3, page 92-95
19) Sihite, J and Ismaun, I (1997*), Konsepsi pembangunan Ruang Terbuka Hijau Kota*, Paper on "Musyawarah Nasional IV Perkumpulan Pecinta Tanaman", Bali

The Urgent of Catchment Area in the Upstream for the Urban Housing in the Downstream (Case Study: Balikpapan City)

M Santosa[1]

[1] Lecturer, Architecture and Planning Department, Engineering Faculty, Gadjah Mada University

Abstract

In the tropical area, upstream region is very important to be protected. Tropical rain fortest in this region is an actor for protecting downstream from some problems, i.e. flood on the rain season, and the difficulties of fresh water on the dry season. Land cover in the tropical rain forest influences the protection level in the area and the downstream area. Urban sprawl of Balikpapan City has indicated that the development of urban housing is very fast. On the other side, infrastructure for its development should be considered. The urban infrastructure for the New Balikpapan Urban Housing also needs good capacity on fresh water, drainage, and sewage water system. Water Catchment Area in the upstream for the urban housing in the downstream is very important to be considered. To protect upstream as water catchment area by describing tropical rain forest, is one of the environmental wisdom to protect Balikpapan Urban Housing in the downstream, and also accomodate fresh water, drainage, and sewage water system.

Keywords: water catchment area – upstream - tropical rain forest – Balikpapan.

I. Introduction

In the urban context, the population increase of the urban area influences the number of the building, which automatically effect to the building coverage in the urban area. Some public facilities have built in the urban area as public services. Urbanization is one of the reason, in the last decade urban housing become the most important public sector. The changing of the agricultural area to the housing area moves faster and faster, which means that the water conservation in the urban area is decreasing. The new problem is "how do the urban area get the freshwater for the public demand?", and "how do they protect the urban area from flood as an urban disaster?".

In Balikpapan City, the changing of land use is happened; the decrease of forest to agriculture land, from agriculture to non-agriculture i.e. residential area grows too fast. In urban area it is begin difficult to get fresh water, because some water resources are not conserved, and the areas are covered buildings. By considering the problem, questions in architectural urban design are: "What kind of urban regulation can protect the water conservation in the urban area? How do we arrange urban landscape as a part of sustainable urban design?"

Traditional urban design has embodied land planning, new developmental and existing urban context, pedestrian and traffic patterns, architectural and engineering elements, water courses, facilities and recreation, land forming, and landscaping. Every part and element of urban design has an effect upon the whole. The whole has its effect upon the smallest parts and elements of the design (Crowther, 1992). Water retention and drainage are factors that should not be over waked. In most dry and relatively dry climates the grading, type of soil, and type of planting for maximum water retention is desirable. Building coverage in the medium size cities of Indonesia has various number, generally is very high. The conditions may cause the urban water conservation in these areas became decreased.

Soil in Balikpapan City is not suitable for water infiltration. Drainage in its cities is one of urban infrastructure problems. Plants as the biological natural resources have the specific performance to conserve the storm water. Leaves of trees can keep the storm water when rainfalls, it also needs the water for photosynthesis. Root of trees can keep the groundwater, even the big tree. Therefore,

M Santosa
--- Lecturer, Architecture and Planning Department, Engineering Faculty, Gadjah Mada University
E-mail: mochsantosa@gmail.com

water runoff and the groundwater flow become decreased. On the rain season, flood is one of problem in Balikpapan City. It is caused by the great runoff from upstream area and the difficulties of rain water infiltration in its area.

To review land use planning of upstream area is a wise action for reducing the problem in the downstream area, especially urban housing of Balikpapan City.

II. People Density and Land Use of Balikpapan City

The areas of Balikpapan which comprise 503,3 km2 of land areas is located between 116,5 East Longitude and 117,0° East Longitude and between 1,0° South Latitude and 1,5° South Latitude. Balikpapan divided into 5 (five) district then 27 sub district. Those districts are Balikpapan Selatan, Balikpapan Timur, Balik-papan Utara, Balikpapan Tengah and Balikpapan Barat. Balikpapan borders on Kutai Kartanegara regency in the north, Penajam Paser Utara (PPU) in the west also Makassar Strait in the south and in the east. Balikpapan has a various topography, inclination also its altitude from sea surface. Because there are coastal area with 0 meter in height and hilly area with 100 meter in height. Mostly, about 42,33 % area has 15% until 40 % slope class, cause a labile land area (Balikpapan in Figures, 2012).

Population of Balikpapan in 2011 is 557.579 people, increase from a year before 554.577 people. Most of population lives in Balikpapan Selatan district, 191.737 people, about 34,39 percent, then least of population occupied in Balikpapan Timur district, 60.664 people, or about 10,88 percent. The population density is centralized in the downtown, which is in the area of Balikpapan Tengah district. Balikpapan Tengah district which comprise 11,07 Km2 occupied by 98.552 people, in the other words it has 8.902,62 persons per square kilometers in population density. Compared with Balikpapan Barat district which has the widest area, 179,95 Km2, occupied only by 83.412 people, or 463,53 people per square kilometers in population density.

Table 1. Population of Balikpapan by District, 2001-2011

Tahun/ *Years*	Balikpapan Selatan	Balikpapan Timur	Balikpapan Utara	Balikpapan Tengah	Balikpapan Barat	Jumlah/ *Total*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2001	155 358	47 444	88 155	103 963	77 721	472 641
2002	155 960	48 204	87 128	110 503	80 778	482 573
2003	162 854	47 546	90 514	102 783	82 883	486 580
2004	166 116	48 597	94 028	103 770	82 803	495 314
2005	168 768	49 010	94 184	104 810	83 634	500 406
2006	173 040	49 665	94 433	106 184	84 798	508 120
2007	177 133	49 906	96 103	106 776	85 611	515 529
2008	180 923	51 311	98 541	108 056	88 132	526 963
2009	183 858	52 611	102 471	109 754	89 831	538 525
2010	190 529	60 088	122 098	98 498	83 364	554 577
2011	191 737	60 664	123 214	98 552	83 412	557 579

Source: BPS – Statistics of Balikpapan

Table 1 above is indicated that population increase of Balikpapan City from 2001 to 2011 at about 18%. It means the increase of housing of Balikpapan City also the same level. Distribution of population in Balikpapan City is concentrated in Balikpapan Tengah District and Balikpapan Selatan District.

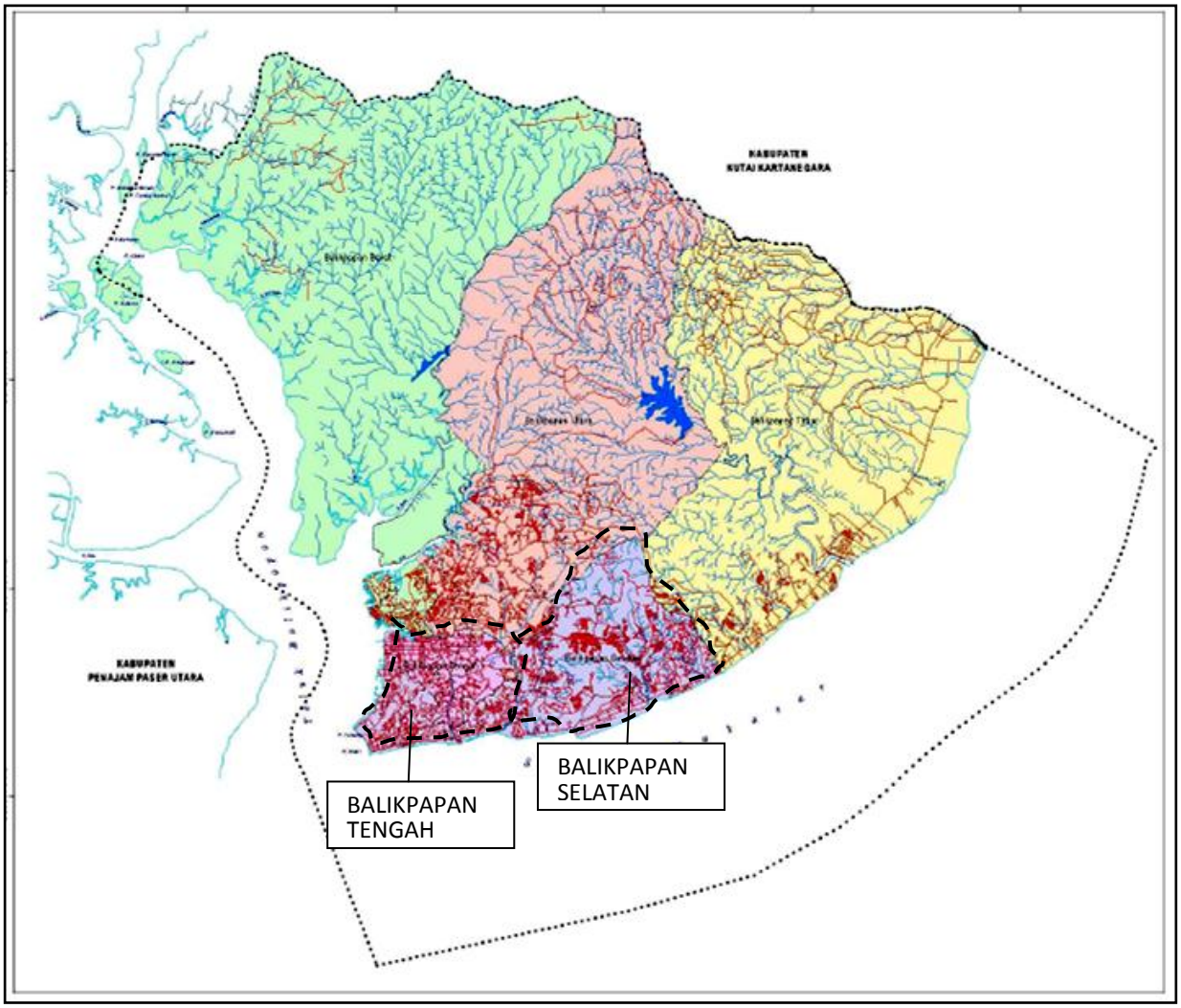


Fig 1. Map of Balikpapan City

Source: RTRW Balikpapan, 2012-2032

III. Water Catchment Area in Balikpapan City

Water catchment area in Balikpapan City is Sungai Wain Water Catchment Area. Sungai Wain currently covers about 10,000 ha, an area encompassing the basins of two rivers called Wain and Bugis. According to Fredriksson & de Kam (1999) the protection of the Sungai Wain forest has a clear functional purpose in guaranteeing the safety of a water-catchment area, which supplies the necessary freshwater for the city and the local oil processing industry. The importance of the forest was recognised as early as 1934, when the sultan of Kutai12 declared a large part of the current protected area to be *Hutan Tutupan* – Closed Forest.

The *Bataafsche Petroleum Maatschappij* constructed a reservoir and pump installation in the Wain basin in 1947 and these were later taken over by national oil company Pertamina. They use the water for drinking, electricity (steam turbines), oil pumping and cooling of the refinery equipment. This history of company involvement largely explains why Sungai Wain is free from human inhabitation today, besides some encroachment (a few hundred people) on the east side of the forest, next to the Balikpapan-Samarinda highway. One village, which is also called Sungai Wain, was relocated outside of the forest by Pertamina in the 1970s. (Fredriksson & de Kam, 1999) A *Hutan Produksi* or Production Forest (PT Inhutani I Batu Ampar) neighbours the protection zone from north to west. The southwestern corner of Sungai Wain Protection

Forest almost touches an unprotected mangrove forest, which in turn borders Balikpapan Bay. South- and eastwards the forest is surrounded by small-scale agriculture catering the city.

Sungai Manggar Basin is also water catchment area in Balikpapan City. Sungai Manggar Basin is located in the east of Sungai Wain Basin. Those river basin (Sungai Wain and Sungai Manggar) are located at the area, where the inclination area between 15% to 40% slope. Those river basin are also located in the upstream of Balikpapan City.

Tabel 2. Location, Border, and Area of Balikpapan

INCLINATION		HEIGHT	
Slope Class (%)	Area (ha)	Height (meter)	Area (ha)
0 – 2	7.505	0 – 10	6.980
2 – 15	3.325	10 – 20	17.260
15 - 40	21.305	20 – 100	26.090
> 40	18.650	> 100	-
Total	50.330	Total	50.330

Source: BPS – Statistics of Balikpapan

Balikpapan City to be committed to the conservation of the forest with a certain determination. For instance, within the municipality borders there is also a no mining and no-palm oil policy. The government is still perceives a certain pressure to justify why Sungai Wain is actually protected by them. It is unclear whether the pressure is really there, but many mechanisms have been put in place to deal with it. By using the sun bear as a mascot, the city attempted to incorporate the forest in its very own identity.

One of the biggest threats to Sungai Wain is a highway construction plan (*Pulau Balang*) of East-Kalimantan province. The plan to connect the entire province with a new road has been casting shadows over the forest for more than a decade already. As it is currently projected, the highway would closely border the Protection Forest from the south all the way around to the northwest. This would entail further encroachment on almost all sides of the forest. It would also mean the destruction of the mangrove forest which connects Sungai Wain to (and protects it from) the salt water of Balikpapan Bay (Lien Imbrechts, 2011).

IV. Discussion

Population of Balikpapan has level increase 1,8% per year from 2001 to 2012. Most of population lives in Balikpapan Selatan district, about 34,39 percent of total population of Balikpapan City. The population density is centralized in the downtown, which is in the area of Balikpapan Tengah district. Balikpapan Tengah district which comprise 11,07 Km2 occupied by 98.552 people, in the other words it has 8.902,62 persons per square kilometers in population density. Those district (Balikpapan Selatan and Balikpapan Tengah) are located in ten downstream area of Balikpapan City.

The ordinary problems of Balikpapan City are (1) flood on the rain season, and (2) the difficulties of fresh water on the dry season. By identifying the upstream area of Balikpapan City, Sungai Wain Basin and Sungai Manggar Basin, it will hoped solving the problem.

Actually, in Sungai Manggar Basin, type of tropical rain forest is dominated by sparse forest trees and another land use, i.e. agricultural field. Some location of agricultural field developed by the local people. The agricultural field is prohibited to developed in Sungai Manggar Basin, in case Sungai Manggar Basin is an conservation zone. This area has some function: (1) as water catchment area, (2) tropical rain forest, and other function of conservation area.

Sungai Wain Basin and Sungai Manggar Basin are located in the area, where the inclination area between 15% to 40% slope, that is critical zone. Those river basin are also located in the upstream of Balikpapan City. Some natural disasters might be hapenned, flood and land slide on the rain season, the difficulties of fresh water on the dry season, and other natural disaster.

Therefore to protect upstream as water catchment area in case Sungai Wain Basin and Sungai Manggar Basin by describing tropical rain forest, is one of the environmental wisdom to protect Balikpapan Urban Housing in the downstream, minimizing of natural disasters and also accomodate fresh water, drainage, and sewage water system for Balikpapan City.

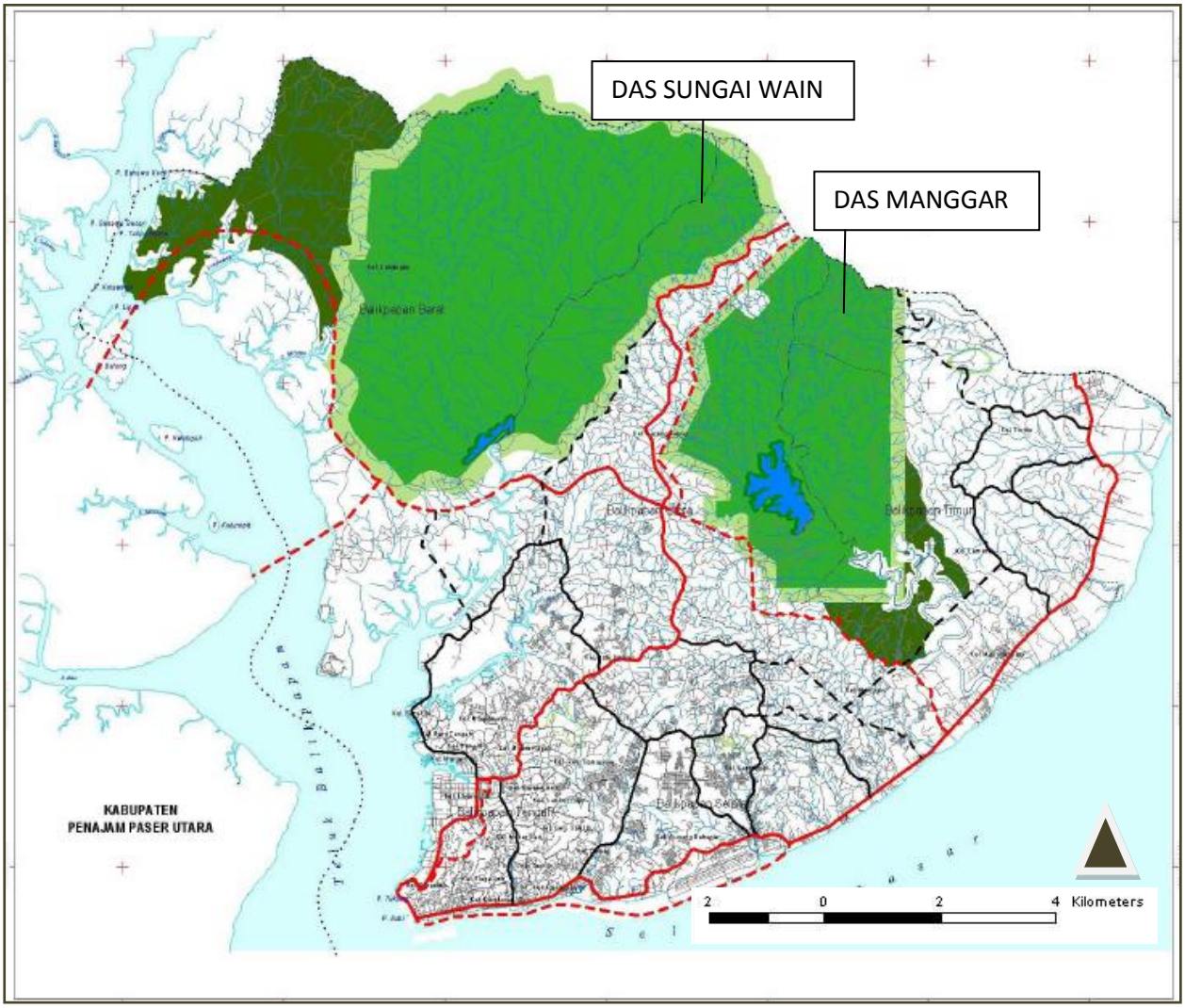


Fig 2. Map of Tropical Rain Forest Area of Balikpapan City

Source: RTRW Balikpapan, 2012-2032

V. Conclussions

1. Plants can regulate the losses of storm water by runoff. Urban Forest as catchment area of storm water may decreases the water runoff. Urban Forest is one of some ways to conserve groundwater in the urban area.
2. To solve the problem of urban water, ecologic landscaping is suitable to be implemented in upstream area of Balikpapan City. Urban forest is one of the solutions for conserving the urban water. In that case, urban forest could be substitute the infiltration of storm water in the urban area and automatically as storm detention.
3. Sungai Wain Basin and Sungai Manggar Basin are located in the area are critical zone. Those river basin are also located in the upstream of Balikpapan City. Some natural disasters might be hapenned, flood and land slide on the rain season, the difficulties of fresh water on the dry season, and other natural disaster.
4. To protect upstream as water catchment area in case Sungai Wain Basin and Sungai Manggar Basin is an environmental wisdom for protecting Balikpapan Urban Housing in the downstream.

VI. References

..... , 2012, **Balikpapan in Figures**, Government Balikpapan City.

..... , 2012, **RTRW Balikpapan**, Bappeda Kota Balikpapan, Balikpapan.

Crowther, R.L., 1992, ***Ecologic Architecture***, Butterworth Architecture, Boston.

Fredriksson, G. & de Kam, M., 1999, **Strategic plan for the conservation of the Sungai Wain protection forest, East Kalimantan**, The International Ministry of Forestry and Estate Crops & Tropenbos Kalimantan Project, Wanariset Samboja.

Kats, G., 2001, ***Building Connecticut Leadership in Green Buildings and Clean Energy***: A Report to Connecticut Innovations, http://www.cap-e.com

Lien Imbrechts, 2011, **Protection Forest governance in East-Kalimantan,** Katholieke Universiteit Leuven

Moughtin C., 1996, ***Urban Design: Green Dimensions***, Butterworth Architecture, Boston

Santosa, M., 2001, ***The Urgency of Urban Forest and Infiltration Tank of Storm Water in The Urban Area***, Second International Seminar of Sustainable Environmental Architecture (SENVAR), Semarang.

Santosa, M., 2001, ***Eco Architecture As One Of Design Research In Indonesia***, A Paper Presented to the ACAE Conference, National University of Singapore, September, 7, 2001.

Steele J., 1997, ***Sustainable Architecture***, McGraw Hill, New York, San Francisco, Washington D.C.

Turner T, 1998, ***Landscape Planning and Environmental Impact Design***, 2nd Edition, T.J. International Ltd, Padstow.

Zero Waste Concepts on *Pantai Baru Pandansimo* Master Plan by Applying Portable - Reuse Material for Subsurface Flow Constructed Wetland

Arif Kusumawanto[1], Zulaikha Budi Astuti[3], Agung Eka Syaputra[3]

[1]Associate Professor at Department of Architecture and Planning, Faculty of Engineering, University of Gadjah Mada.

[2]Researcher at Department of Architecture and Planning, Faculty of Engineering, University of Gadjah Mada.

[3]Master Student at Master of System Engineering, University of Gadjah Mada

Abstract

Zero Waste is one of urban design concepts to minimize the environment impacts. Through reuse, reduce, and recycle activities architects and environmentalists have opportunity to create green design to be applied in a community.

Pantai Baru Pandansimo in Bantul has been declared to be a zero waste area. One of the activities is the processing of grey-water to be safety water to be dumped to the environment. It is important for *Pantai Baru* to have comfort and clean area since nowadays it becomes a new tourism destination in Bantul Regency.

This research has found that an applicative technology of ''Portable Subsurface Flow Constructed Wetland'' can reduce the polluted materials of grey-water. The construction material used is from reused fish boxes from the fishery activities. The average dimensions of the boxes are 50 x 40 x 22 cm^3, 75 x 42 x 22 cm^3, 120 x 40 x 22 cm^3 and it needs two wetlands to treat the grey-water. The unit consists of three layers of materials: sands, gravels and soils with water plantation to absorb the pollutants. This green constructed wetland will enhance the green and zero waste concepts which will be applied in the *Pantai Baru Pandansimo*. The wetland can be created as garden wetlands with several plantations to create more green in this coastal.

Keywords: green urban design, zero waste master plan, grey-water, portable, Subsurface Flow Constructed Wetland

1. Introduction

Master plan is a guideline for an area in order to have a better built environment. It is an evolving and a long term planning documents. It establishes the framework and key elements of a site reflecting a clear vision created and adopted in an open process. An effective master plan helps to promote highly effective land use and high land use intensity.

Pantai Baru Pandansimo in Bantul is 24 Ha of new tourism area with beautiful landscape of *Casuarina* plantation, sea food culinary, and renewable energy complex. Nowadays it faces solid waste and grey-water problems from public toilets and culinary activities' kitchens.

Zero waste concepts on *Pantai Baru Pandansimo* Master Plan have specific objectives to propose an integrating waste management master plan. Zero waste which is defined as reduce, reuse and recycle process is an approach to promote green urban design.

* Arif Kusumawanto, Associate Professor of Department of Architecture and Planning, Faculty of Engineering, University of Gadjah Mada

Jl. Grafika no 2 Sleman 55281

Tel: 08112503738

e-mail: arifk@ugm.ac.id

2. Zero Waste Concepts and Green Urban Design

Creating urban space is one of the works of architects. Architects have to involve in designing, developing, and inhabiting lived spaces which has been dreamed and thought to be different. Not only creating beautiful landscape but also providing design which have available some special sources to generate alternative visions what might be possible solver (Harvey, 2000 in Guy and Moore, 2005).

Kawase (2007) formulated the green urban design theory in a simple mathematical model. It is formulated as T= W-D, T is Throughput which theoretically should be reached at maximum results. T is built by subtraction between Welfare (W) and Environmental Damage (D). Welfare consists of safety, relief, health, comfort, and sense. Environmental Damage consists of the analysis of Life Cycle CO_2, Life Cycle Cost, and Life Cycle Energy (see Figure 1). In green urban design theory, the design should meet the needs of people welfare without sacrifice the environment. For instance designing buildings in a tropical country should concern the temperature, wind, humidity, and small animals' hazard. To solve this design challenge, architects have a lot of opportunities to apply green urban theory.

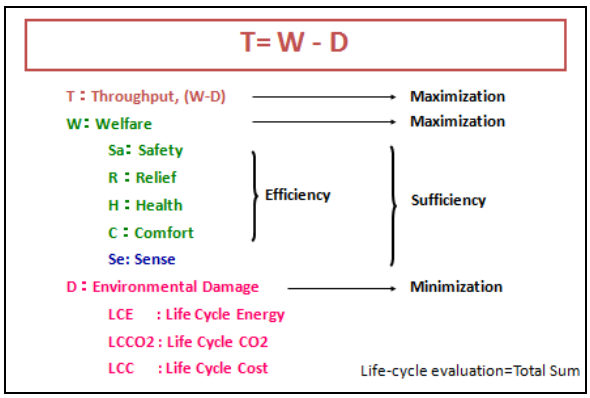


Fig. 1. The theory of T= W - D

(Source: Kawase, 2007)

Zero waste concepts systematically force people to think how to conserve all resources (reuse), to eliminate all discharges to the environment (reduce), and to design wastes as a new resources (recycling). San Francisco nowadays has become closer to the Zero Waste City. The City Hall has struggled to involve all of the citizens to separate the waste and recycle all of the wastes.

Pantai Baru Pandansimo has been declared as Zero Waste Area in July 2013 by the Head of Bantul Regency and the Dean of Engineering Faculty of Gadjah Mada University. It has been three years research collaboration to conserve *Pantai Baru* as Sustainable Tourism area without waste problems. A master plan has been proposed to help community manage their waste easier. The circulation system and street networks are designed to be well-connected to support waste mobility (see Figure 2). Physical elements intervention, such as: land use, waste management, green open space, signage and car-free zone have been elaborated to form green area (Kusumawanto et.al., 2014).

Fig. 2. Master plan of *Pandansimo Baru* Beach

Source: Sabono (2013)

3. Grey-water

Grey-water is the wastewater produced from sinks, baths, or clothes-washing. It does not include toilet water. Grey-water may contain nitrate, phosphate, Soaps, salt, bacteria, bleach, foam, food particles, organic matter, suspended solids, perfumes and dye.

In the human daily activity, there are ±20% of water consumption and ±80% of water used. It is about 60% of water used goes to grey-water (Metcalf and Eddy, 1991).

The grey-water in *Pantai Baru* sources are from public toilets and sea food restaurants. This research is focusing on the treatment of sea food grey-water with its characteristics below on Table 1.

Table 1. Grey-water characteristics from the site

Sources	BOD (mg/L)	COD (mg/L)	TSS (mg/L)	pH
Sample from Restaurant A	222,9	120	360	6,6
Sample from Restaurant B	109,9	88	257	6,5

The number all of those parameters are high if it is comparing with the allowed water throw to the environment. On table 2 below, there is some grey-water resources standard quality that should be approached by the sea food restaurant grey-water.

Table 2. Standard minimum of several grey-water sources

Sources	BOD (mg/L)	COD (mg/L)	TSS (mg/L)	pH
Domestic grey-water*	100		100	6-9
Grey-water for agriculture**	120	200	120	6,5 – 8,5
Restaurant Grey-water*	30	50	50	6,9

Source: Indonesian Ministry of Natural Environment (2003)* and M. Platzer et.al. (2004)**

As a restaurant, the sea-food restaurant is required to have 30 mg/L of BOD before released in the environment. However, since it has much organic materials, this grey-water has potency to eutrophicate the watershed. If the water is under control, it has potency as media plantation for water-vegetables plantations.

Grey-water is a middle quality of waste water. It will not damage the watershed immediately but the additions of grey-water to surface watershed can cause

pH imbalance, increased oxygen demand, and increased turbidity.

4. Constructed Wetland

Wetland is a natural watershed which growth some specific water plantations. Naturally it is a temporary water-storm parking which balancing the water-flow in rainy season. It acts as a sponge in absorbing and slowly releasing water flow and as filter in removing materials from water flow. This behavior has been examined since 1970's in USA and Europe as an alternative of low-cost wastewater treatment to remediate abandoned-polluted factories. Wetland probably is the best example of ecological engineering because of the mix of ecology and engineering is nearly even.

Wetlands need significantly more space and more time to provide treatment. A key factor in wastewater treatment is hydraulic residence time. The minimum hydraulic residence time is greater than 5 days and in some is over 100 days (Knight, 1995 in Kangas, 2005). The efficiency of treatment wetlands is evaluated by input-output methods which quantify assimilatory capacity. It demonstrates percent removal of TSS, BOD, nutrients and pathogens which measured by water flow rated and concentrations of sewage parameters (Kangas, 2005).

Constructed wetland is artificial wetland which is built to process waste water. This wetland is under engineering controlled to get appropriate released water quality to the environment. According to the water flow direction across the plantations, wetlands are distinguished in to surface flow constructed wetlands (SF Wetlands), subsurface flow constructed wetlands (SSF Wetlands), and hybrid system that incorporate surface and subsurface flow wetlands. SF Wetlands means water level is above the ground surface, vegetation is rooted and emerges above the water surface, and water flow is primarily above ground. SSF Wetlands means water level is below ground, water flow is through a sand or gravel bed, roots penetrate to the bottom of the bed (see Figure 4) (Water Pollution Control Federation, 1990 in A Handbook of Constructed Wetlands) (see Figure 3).

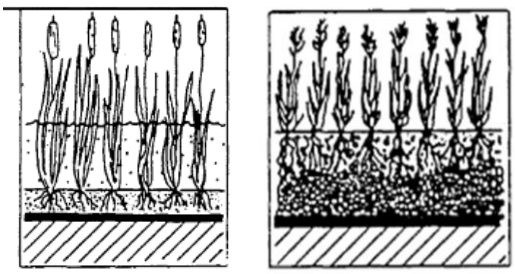


Fig. 3. Surface flow constructed wetlands (left) and subsurface flow constructed wetlands (right)
Source: Water Pollution Control Federation (1990) in United States Environmental Protection Agency (1993)

5. Existing Grey-water treatment in *Pantai Baru*

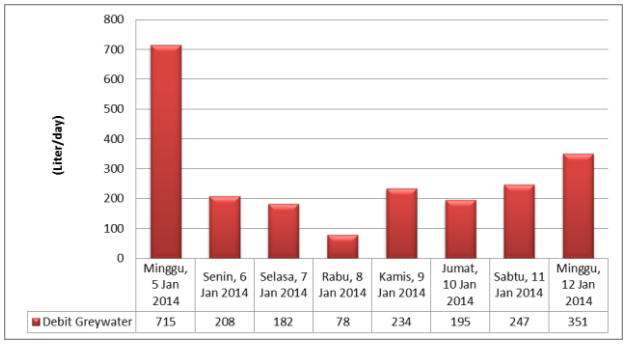
Grey-water from culinary activities has not been treated in the septic tank or waste water treatment plants. The most influence factor of this behavior is the cost to build this infrastructure. The restaurants are small entrepreneur activities with low capital. They have not much concern, willingness, and money to treat their wastewater.

The sources of grey-water from restaurants have been identified. The most polluted is from the kitchen. The characteristics can be seen on the table 1 above. The next source is from the hand-washed tube mostly water with hand soap. The last one is from fish cooling box with melting ices. This grey-water has a lot of nutrients.

Fig. 4. The wastewater from restaurants' kitchen and hand washing are directly released to the ground
Source: Saputra (2014)

Total number of the restaurants is 78 and dominantly operated in weekend and holidays. The number of the visitors is influencing the activities in the beach including the amount of grey-water. Saputra (2014) sampled the amount of grey-water of one restaurant in *Pantai Baru* for a week and he found that, the activity in *Pantai Baru* has very big range from the highest to the lowest amount of grey-water. In average, Saputra concludes that the amount of grey-water produced by the restaurants is 276,25 liter/day.

Fig. 5. A one week grey-water flow sampling



Source: Saputra (2014)

The high level of grey-water which released in the weekend and holidays might be increasing since *Pantai Baru* is a developing tourist area.

Directly releasing grey-water to the ground will

give bad impacts to the environment. Bad odor is the first impact to be felt by people around the restaurants and the contamination of groundwater and surface water will be felt as the long term impacts. For today, the nature can treat the grey-water immediately, however, if the amount of grey-water has been accumulated, those bad impacts will influence the comfort of the beach and people will leave it.

6. Proposal of SSF Wetlands in *Pantai Baru*

Constructed wetlands are introduced to be an alternative for grey-water treatment especially for the restaurants in *Pantai Baru*. The simple and cheap wetland is chosen to accommodate an economist wetland for the small entrepreneur restaurants.

The grey-water from hand-washed tube and fish box can be treated using simple wetlands. The water from hand-washed tube can be used to irrigate non-food producing houseplants and the water from fish box can be used to irrigate food producing houseplants since it has high nutrients (see Figure 6).

Fig. 6. A household water irrigation system
Source: Yocum (2005)

For the kitchens' grey-water, a wetlands system will be proposed. In this design, to accommodate the flux of the grey-water flow during a week, it is recommended to have equalization tank as a buffer. The number of BOD is 222,9 mg/L which is very high comparing to the maximum BOD for restaurant is 30 mg/L. In this case, it is concerning to treat the grey-water into two wetlands. First it is treated in a wetland with bulrushes which has 0,8 m of depth root – the depth of the root will influence the surface area needed of the wetlands. This first wetland will reduce the BOD to 120 mg/L as maximum BOD for agriculture. The second wetland will be treated with agriculture plantations such as kale. Kale can be cultivated as vegetable sources for the restaurants. This second wetland is designed to reduce BOD up to 30 mg/L as the maximum number of BOD from restaurants. In Figure 7 it can be seen the diagram.

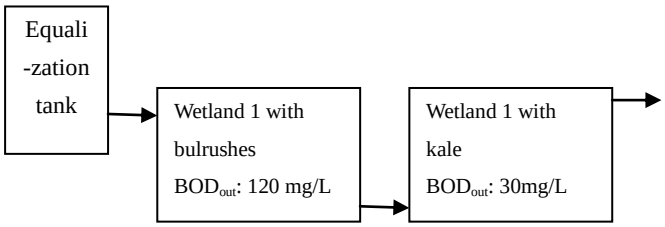


Fig. 7. Schematic for the wetlands' treatment

Based on those assumptions, a calculation for the wetlands dimension will be done according to the wetlands formula from Tchobanoglous et.al. (1991).

1. Determine the minimum monthly average ambient temperature (T (°C)) that the system will work at.

$$K_T = K_{20}\,(1{,}06)^{(T-20)}$$

K_{20} = 1,104/day (Reed et al,1994)
T_{in} wetlands = 25 ^{0}C
K_T = 1,104*(1,06)$^{(25-20)}$ = 1,48/day

2. Calculate the retention time (t (day)), the time the water should remain in the system in order to reach desired BOD level with the equation

$$t = \frac{-\ln(C/C_0)}{K_r}$$

$$t_{w1} = \frac{-\ln(120/222{,}9)}{1{,}48} \qquad t_{w2} = \frac{-\ln(30/120)}{1{,}48}$$

$$t_{w1} = 0{,}42 \qquad t_{w2} = 0{,}94$$

3. Determine the necessary field area for the subsurface flow bed (m^2)

$$A_{s=} \frac{(Q_{ave})\,(t)}{(e)\,(d_w)}$$

$$A_{sw1=} \frac{(276{,}25)\,(0{,}42)}{(0{,}35)\,(0{,}5)} \qquad A_{sw2=} \frac{(276{,}25)\,(0{,}94)}{(0{,}35)\,(0{,}5)}$$

$$A_{sw1=} 0{,}66\ m^2 \qquad A_{sw2=} 1{,}5\ m^2$$

4. The dimension of wetland 1: 1 x 0,7 x 0,5 m^3
   The dimension of wetland 2: 1,5 x 1 x 0,5 m^3

The rectangular shape is chosen since it will give better performance in treating the grey-water (see Fig. 8). A research from Kenya explains that 2 x 1x 0,86 m^3 wetland with retention time of 2 days can reduce BOD of grey-water for about 99,7% (Raude et.al.(2009) in Suswati, et.al. (2013))

Fig. 8. Wetland no. 1 with bulrushes from plastic container has been demonstrated in front of the community
Source: Saputra (2014)

In accordance to zero waste concepts, the material to build this portable SFF wetland can use waste materials. The equalization tank comes from former water tank with volume for about 200 – 300 L. The wetland construction comes from former plastic containers or fish boxes which usually become wastes after several times are used. The average dimension of the fish boxes are: 50 x 40 x 22 cm^3, 75 x 42 x 22 cm^3, 120 x 40 x 22 cm^3 (Styrofoam thickness: 3 cm)

By reusing those materials, the design for the wetland should be checked to fulfill the efficiency of the wetlands. The design proposed is:

- V equalization tank: 300 L
- Q design: 75 L/day= 3,125 L/jam.
- d_w: 20 cm
- material use: medium gravel (e: 0,4)
- layers (bottom to top): sand (5 cm), gravel (10 cm), soil (5 cm)
- dimension use for W1: 75 x 42 x 22 cm^3
- dimension use for W2: 120 x 40 x 22 cm^3

Checking for the retention time:

$$t = \frac{(e)\,(L)\,(W)\,(d_w)}{Q_{design}}$$

$$t_{w1} = \frac{(0{,}4)\,(0{,}75)\,(0{,}42)\,(0{,}2)}{0{,}075}$$

$t_{w1} = 0{,}34\ day$ approaching 0,42 as t_{w1} calculation

$$t_{w2} = \frac{(0{,}4)\,(1{,}2)\,(0{,}42)\,(0{,}2)}{0{,}075}$$

$$t_{w2} = 0{,}52\ day$$

The retention time of wetland 2 is less than 0, 94 as the retention time calculation. It is due to the dimension of the materials available in the sites. To solve this problem, the effluent from wetland 2 can be used to irrigate plantation on the ground as the next treatment. Here is the illustration for the SFF wetland to treat grey-water from restaurants' kitchens.

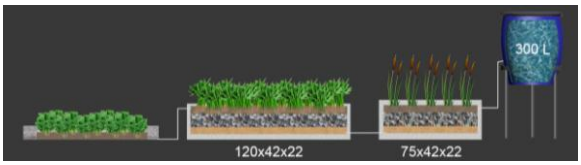


Fig. 9. Wetland no. 1 with bulrushes
Wetland no. 2 with kale

7. Visualization of SSF Wetlands in *Pantai Baru*

In figure 10 below is the existing situation of restaurants in *Pantai Baru*. It consists of semi-permanent buildings as the main infrastructure and it has portable area to put and keep the fishes and as the place where the customers can choose the fishes.

Fig. 10. The existing condition of the restaurants

By applying SSF Wetlands, it will bring new image of *Pantai Baru*. Here is the visualization of portable SSF wetland for one restaurant.

Fig. 11. Perspective of the wetlands in the restaurants

On the restaurants' sites, it is proposed three types of grey-water treatment. First, it is to treat the hand-washed water. This grey-water is mostly consists

of water and soap. The problem is the water will go to the ground directly and create uneaten environment. It is proposed to have sink from reused tank and fill it with gravels, before the water will flow to the ground.

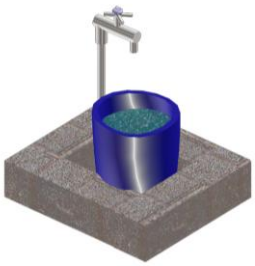


Fig. 12. The hand washing sink

The second one is the wetland to treat water from fish boxes. It's a homogenous grey-water as fish-washed water which has high nutrients. It is very good for irrigating food plants. It is proposed to provide drum as the equalization tank, which is connected to the wetland systems.

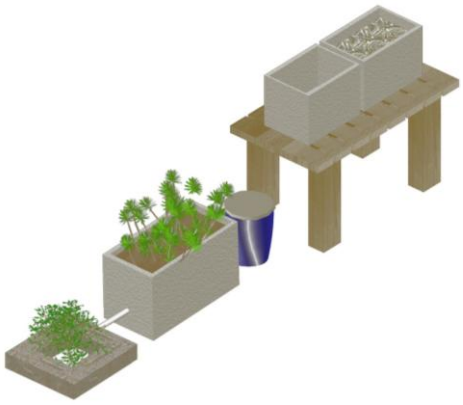


Fig. 13. The wetland to treat grey-water from the melt ices inside the fish boxes (high nutrition's grey-water)

The third one is to treat grey-water from restaurants' kitchen. The perspective can be seen on the Figure 14 below.

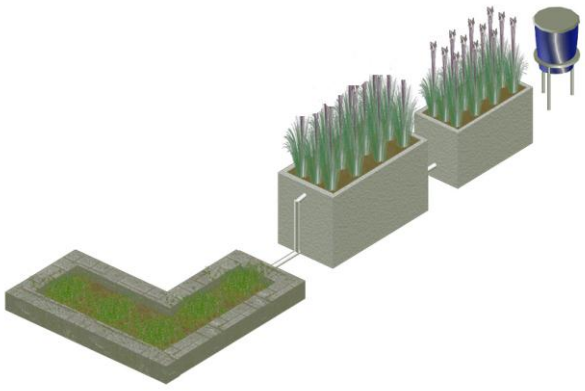


Fig. 14. The wetland to treat grey-water from kitchens. First wetland uses bulrushes and second wetland uses food-plantations

Conclusions

Zero waste is possible to be applied in a green urban master plan for rural tourist area in a developing country. This concept suggests the community to maximize the usefulness of the sources surrounds area. It allows the area to have a closed loops waste management and furthermore new green urban image and new resources.

In order to fix the problems of grey-water especially from restaurants' sites, there are some advantages that community can fulfill it. First, the tourist are will be free from bad odor and uneaten environment, second, they can reuse the fish boxes as SSF Constructed wetlands, and third they will have new natural resources from the food plants cultivation.

The proposal of three layers of sands, gravel, and soils in the fish boxes, combining with the plantations can treat the grey-water in a better way. By identifying the sources properly, the best treatment can be decided.

Acknowledgements

The authors acknowledge Indonesian Ministry of Education for the research fund in the scheme of Comprehensive Research 2013. Acknowledgement is addressed to Faculty of Engineering of Gadjah Mada University, Department of Architecture and Planning Faculty of Engineering of Gadjah Mada University, Bantul Regency for the research collaboration, and the villagers of *Pantai Baru Pandansimo*. The authors would like to thank to Rifka Annisa Ulfah, student of Department Architecture and Planning of UGM for the picture's materials.

References

1) KAWASE, Hiroshi (2007), *Architecture of Habitat System for Sustainable Development. International Symposium*, The 21st century COE Program, December 2007, p.1-2.
2) Guy, Simon and Moore, Steven A (2005), Sustainable Architectures, Cultures and Natures in Europe and North America, Spon Press, New York.
3) Indonesian Ministry of Natural Environment (2003), *Ministry Declaration no. 112/2003, Standard and Characteristic for Domestic Waste water.*
4) Kangas, Patrick, C. (2005), *Ecological Engineering Principles and Practice*, CRC Press, Washington D.C.
5) Kusumawanto, A., and Millati, R. (2013), *Penerapan Konsep Zero Waste pada Pengembangan Kawasan Pantai Baru Pandansimo*, Research Report, University of Gadjah Mada, Yogyakarta.
6) Metcalf dan Eddy. (1991). *Wastewater Engineering: Treatment, Disposal, and Reuse*, Mc Graw Hill Book Co. Singapore.
7) Platzer, M., Caceres, V., Fong, N. (2004). *The Reuse of Treated Wastewater for Agricultural Purposes in Nicaragua*, Central America. Water Science and Technology.
8) Sabono, Ferdy (2013) Perancangan Konsep Zero Waste pada Master Plan Panta Baru Pandansimo. Yogyakarta: Unpublished
9) Thesis of Magister of Patronage Design Are of Gadjah Mada University
10) Saputra, Agung Eka (2014), *Pengelolaan Greywater Wilayah Pantai Baru Pandansimo Kabupaten Bantul Untuk Menciptakan*

Kawasan Zero Waste, Thesis, Gadjah Mada University, Yogyakarta.
11) Suswati, Anna Catharina S.P. and Wibisono, G. (2013), *Pengolahan Limbah Domestik dengan Teknologi Constructed Wetlands*, Indonesian Green Technology Journal, vol. 2 no. 2, p. 70-77.
12) Tchobanoglous, G. dan Burton, F. L., 1991. Wastewater Engineering Treatment, Disposal, reuse. Series Water Resource and environmental engineering 6th ed. McGraw Hill Book Co., Singapore.
13) United States Environmental Protection Agency (1993), Subsurface Flow Constructed Wetlands For WasteWater Treatment A Technology Assessment, Office of Water.
14) Yocum, D. (2005), *Design Manual: Greywater Biofiltration Constructed Wetland System*, Bren School of Environmental Science and Management, University of California, Santa Barbara.

Environment and Green Context

Fourth Session Parallel Notes
Moderator: Agus Hariyadi

K4 Room 2nd Floor
10.45 – 11.45

Presenter	:	**Erma Fitria Rini**
Title	:	**The Availability of Green Open Space to Absorb CO2 Emissions in East Surabaya**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

- Air pollution in Surabaya is the greatest and urgent issue to be solved.
- There are 3 district which the air pollution were the highest in Surabaya, there are Gubeng, Tambangsari, and Rukut.
- From content analysis we also find out factors of the air pollution issue is depends on the availibility of green open space in East Surabaya.
- These factors is different between factors in formal housing with factors in kampong.

- East Surabaya is still need green open space to absorb the CO_2 emissions from housing in some district.
- The needs is about 38.60 ha of green open space with tree vegetation type.
- In formal housing, we found that the developers of housing is also affecting the availability of green open space.
- Therefore, we have to pay attention to the coordination between government agencies and developers and the concept offered by developers.

- But in kampong, some factors such as limited land, housing density, changes in land use function, and limited funds affect the availability of green open spaces.
- For both of kampong and formal housing, factors from institutional, policy, and social aspects are affecting.
- Those factors can be used as a consideration for the government in providing green open space in East Surabaya.

Presenter	:	**M Santosa**
Title	:	**The Urgent of Catchment Area in The Upstream for The Urban Housing in The Downstream**
Presentation Duration	:	**10 minutes**

PRESENTATION CONTENTS

- Changing city in Balikpapan are very fast.
- In the urban context, the population increase of the urban area influences the number of the building, which automatically effect to the building coverage in the urban area.
- The changing of the agricultural area to the housing area moves faster and faster, which means that the water conservation in the urban area is decreasing.

- The number of people in Balikpapan in 2011 is 557.579 people.
- Most of population lives in Balikpapan Selatan District.

- The population density is centralized in the downtown, which is in the area of Balikpapan Tengah district.
- Population of Balikpapan has level increase about 1,8%.
- Those density of citizen makes a new problem "how do the urban area get the freshwater for the public demand?", and "how do they protect the urban area from flood as an urban disaster?"

- Then the researchers makes some research to solve the problem.
- To solve the problem of urban water, ecologic landscaping is suitable to be implemented in upstream area of Balikpapan City.
- Urban forest is one of the solutions for conserving the urban water.
- In that case, urban forest could be substitute the infiltration of storm water in the urban area and automatically as storm detention.

- Sungai Wain Basin and Sungai Manggar Basin are located in the area are critical zone.
- Those river basin are also located in the upstream of Balikpapan City.
- Some natural disasters might be hapenned, flood and land slide on the rain season, the difficulties of fresh water on the dry season, and other natural disaster.

To protect upstream as water catchment area in case Sungai Wain Basin and Sungai Manggar Basin is an environmental wisdom for protecting Balikpapan Urban Housing in the downstream.

Presenter	**:**	**Arif Kusumawanto, Zulaikha Budi Astuti**
Title	**:**	**Zero Waste Concepts on *Pantai Baru Pandansimo* Master Plan by Applying Portable - Reuse Material for Subsurface Flow Constructed Wetland**
Presentation Duration	**:**	**9 minutes**

PRESENTATION CONTENTS

- Zero waste and green urrban design consist of 3 ideas; reduce, reuse, and recycle.
- Nowadays those ideas turn up as a new approach on urban designer.
- 3R General Guidelines are collecting activity of transport and garbage disposal and implementing the minimization efforts by reducing, reusing and recycling waste generated (household waste and the region area).
- Researcher took Pantai Baru Green Mater Plan as a study case on this research.

- Pantai baru located in Bantul, with 24 hectares wide.
- Pantai Baru have 78 restaurants dominantly operated in weekend and holidays.
- The number of the visitors is influencing the activities in the beach including the amount of grey-water.
- The amount of grey-water produced by the restaurants is 276,25 liter/day(average).

- Researcher try to reduce the grey water.
- Recycle the box, to processes green water.
- By treating the grey-water from restaurants' sites, the tourist area will be free from bad odor and uneaten environment, the villagers can reuse the fish boxes as SSF.
- Constructed wetlands, and the tourist area will have new natural resources from the food plants cultivation.
- The proposal of three layers of sands, gravel, and soils in the fish boxes, combining with the plantations can treat the grey-water in a better way.
- By identifying the sources properly, the best treatment can be decided.

Unpresented Paper

Segregation in Formal Housing and the Surrounding Environment (Case Study: Perumahan Batununggal, Bandung)
Nova Asriana, Novan Prayoga, Riza Aulia, Niken Mahayu

Transport Disadvantage in Urban Areas: Case Study of Low Income People in Yogyakarta Urbanised Area
Yori Herwangi, Pradono, Ibnu Syabri, Iwan Kustiwan

Packaging Architecture As A Representation Of Community Social Status A CaseStudy of KampungKemasan in Gresik, East Java Province
Hafidz Al Mubarok ,Tyas Santri

Gardens in Healthcare Facilities
Fuziah Ibrahim, Wan Mariah Wan Harun, Wan Nor Wahidah Syumaiyah Wan Kamaruddin

Segregation in Formal Housing and the Surrounding Environment (Case Study: Perumahan Batununggal, Bandung)

Nova Asriana[1], Novan Prayoga[1], Riza Aulia[1], Niken Mahayu[1]

[1] Architecture Program, Institut Teknologi Bandung

Abstract

The development of Bandung city in various sectors led to population explosion which then causes housing demand as residence. Therefore, housing developers more frequent build residential housing in vacant land potentially for housing. Housing are built by developers certainly well planned and well organized referred to formal housing. Formal housing is always in groups, exclusive, and contrast with the surrounding environment. These points provoke segregation between formal housing with the surrounding residential area. Segregation in formal housing could be caused by several factors, such as differentiation social-economic status, culture, life style, and ethnic. The existence of a high boundary fences in a number of upper middle formal residence which close to informal residences indicate presence of segregation. The aims of this paper is to see segregation which occurs in formal housing and the surrounding environment as a impact of the existence dweller of formal housing and surrounded by low income housing. Batununggal residence in Bandung was selected as case study. This residence is a type of formal housing which is allocated for upper middle class.

Keyword: *segregation, formal housing*

I. Introduction

Bandung is one of a major city and densely populated in Indonesia. It offers a variety of opportunities (formal and informal) economy and causes people form various regions outside Bandung come to get these oppurtunities. This causes high housing demand as residence. However, housing demand is not only as commodity for migrant citizens, but also for local citizens. As fact of high housing demand, the developers more frequent build residential housing in vacant land potentially for housing.

Housing which is well planned and organized by developer called formal housing. Formal housing is regular pattern residence which is built based on straightly orders and designs. While informal housing is a totally accumulation which is built by individual without any straightly orders or designs (Kuswatorjo, 2005).

Formal housing is always in groups, exclusive, and contrast with the surrounding environment. Moreover, the developer always makes boundaries between formal housing and the surrounding environment. The existence of a high boundary fences or only one access which is merely passed by certain group totally presence of segregation between dweller formal housing and the surrounding environment.

The purpose of this paper is to see kind of segregation, which occurs in formal housing and surrounded by low income housing who have been living in this area. In this paper, Batununggal residence in Bandung was selected as case study. This residence is type formal housing which allocation for upper middle class.

This location firstly was productive land *(persawahan)* which own by local citizens. This paper also identify social development in Batununggal residence, in context of separation or spatial fragmentation and social segregation. The issues; (1) how segregation occured and social relationship between dweller formal housing community and the surrounding environment (low income housing), (2) how the perception dweller formal housing community to the surrounding environment (low income housing) and opposite.

Hopefully, to developers in creating residence should more attention, in order formal housing does not emerge fragmentation of city space.

Nova Asriana
---Postgraduate student, Department of Architecture, Institut Teknologi Bandung.
E-mail: *nova_asriana_ms@yahoo.com*

II. Methods

Writers use some methods for getting data in this paper, such as (a) studying theories about segregation, (b) observing case study, and (c) interviewing dwellers who live in Batununggal residence and also from the neighbor's of Batununggal residence.

III. Segregation

Segregation is separation concept of spatial structures which formed by the forced entry into social space, so that interaction between groups is limited (Wong, 1991, in Suparti, 1998). According to Wong, we could conclude that segregation consist of two concepts, namely separated and no interaction, or limited interaction.

According to Olsson Hort, segregation as a concept also includes a certain level of social between groups. Segregation defines borders between groups, placing, physical separation and interaction (from Legeby, 2010).

Physical separation could be defined as control allocated and guaranteed. It could be characterized by the existence line of trees, fences, signs and landmarks (Lynch, 1981). In addition, physical separation as spatial former could be tagged with the wall, perimeter wall and movement border. Constructed road as an access within or between groups, sometimes indicate physical separation too (Newman, 1981).

(Hakim 1991 and Natalissa 2009, in Tin Budi Utami, 2014) explain about several factors that influent visual impression on a physical boundary, which is height, density or massiveness and contour level. This height consists of low, middle or high level. This density shows density level which consists of dense, transparent density, and transpararency. While contour level show low, flat and high level.

(Winarso 2000 and Leish 2002, in Tin Budi Utami, 2014) based on their research in Jabotabek residence state that the development new area or newly present formal housing clearly shows the existence social and spatial segregation.

Based on points of Olsson Hort, space reflects the differences that is caused by some reasons in segregation. The reflective differrences could occur in school, housing, residence, social - public facilities and etc. So, spatial segregation commonly could be defined as spatial separation based on characteristic status or social inhabitant community.

Interaction of social inhabitant community is influented by limited characteristic which this character also influent interacting opportunity. The distances could influent interacting opportunity and it also can appear spatial separation. It is based on Suparti Salim's writing; *"geographically, residence from various social groups may be closed to and shared the border, but interacting opportunity become limited or nothing, because it is influenced by closed territory border. In opposite, the distances separate territory social groups, but whether territory border is open, then still have interacting opportunity".*

There are some kinds of segregation that always happened, like social – economic segregation, ethnic segregation and racial segregation. Social – economic segregation, usually is kind of segregation that caused by the difference social status and economic level between people or groups. Sometimes, it happens between upper middle level groups or lower middle level groups. Ethnic segregation, usually is kind of segregation that caused by the difference of ethnic, religion, or culture. Sometimes, people or groups have the same of ethnic, religion or culture feel comfort to stay in the same area. These points appear segregation because they make group theirself. While, racial segregation is caused by racial difference, like groups or separating between racial white and racial black in America.

In chosen of variable to indicate segregation in formal housing, writers conclude from theories that relate about segregation;

Table 1. Theoritical summary

Expert	Opinion	Variable
Olsson Hort	Space reflects the differences between certain social groups and the surrounding environment	(a) space (b) social status, (c) border
	As hierarchy social level in their population	between groups, (d)
	Border between groups, placed groups in hierarchy power that influent collaboration, interaction and physical separation	physical separation
Kevin Lynch	Physical separation is characterized line of trees, fences, signs and landmarks	(a) line of trees, (b) fences (c) signs (d) landmarks
Newman	Physical separation as spatial former could be characterized by wall, perimeter wall, movement border and constructed road access	(a) wall (b) border (c) road
Wiliam Schwab	Three segregation (a) social economic status, (b) ethnic segregation (c) racial segregation	(a) social - economic status (b) ethnic, religion, culture, (c) racial

Sumber : Analisys, 2014

Based on **table 1** above, could conclude some indicators as variable in this paper.

IV. Segregation in Formal Housing

Segregation of formal housing could be caused by some factors, like the difference social economic status, culture, life style, and ethnic. These factors finally cause spatial borders that separate between groups. The existence of high fences in some residence which close to low income housing in presenting segregation, even-though it is for security basically.

Widhyharto (2009) states formal housing is usually recognized by physical unique elements, like perimeter wall, massive fences, wall, or natural fences (transparency, BRC or wire). Other elements like security spot, portal, or gated entrance and also sign like *"do not entry"* or *"guest please report".*

Physical border of formal housing is a part of borderness, boundaries or side in area which is like plane, or real side or imaginer, massive /unheavy in residential area include infra-stuctures for upper middle social level that constructed by developers.

According to Schwab (1992), segregation influents relation of interaction between people or groups. It consequently has positive side and negative side. Segregation become positive, whether groups is voluntarily. Every people has same social status, language, culture and religion will feel comfort to live together in the same background. This equality will contribute feel ownship in residence. While, segregation become negative, whether groups seems discrepancy between higher social status or lower social status or the existence gather groups based on culture or religion or anything that can cause conflict.

The social discrepant phenomenon between rich people and poor people could be also influented by buying power of citizens in formal housing and elite. This is as effort to make identity theirself. When people need identity theirself, they will find equal groups as image of their identity. In example, choosing location or prestige the residence, especially formal housing where all facilities and technologies available here than the surrounding environment, just only "kampung".

The difference contrastly could appear an implicit conflict; make gaps or rich groups and poor groups will result criminal and less interaction between dwellers and the surrounding environment.

V. Case Study: Batununggal Residence, Bandung

Batununggal residence is type of formal housing that located in south of Bandung City. This residence has 195 hectar and until 2014, surely this area will not get extension anymore. Batununggal residence has main access from Jl. Soekarno-Hatta where economic district, government and education district. Buah batu (Purbalenyi) toll road is city gate of Bandung that passed around five minutes from this location. As one of elite residence in Bandung, the developer, PT Batununggal Indah more concern facilities in residence and to make dweller feel comfort, private and exclusive.

Picture 1. Masterplan map Batununggal residence, Bandung (Source : PT. Batununggal Indah)

Based on observation, Batununggal residence itself; (a) has main gate entrance , (b) has only one access in-out, portal and security post, (c) has perimeter wall and high wall higher than human's height, and line of trees, yellow bamboo, (d) the residence border on some groups of low income housing, (e) the residence does not have other access (dead road) to other housing, (f) welfare level, job level and education level in Batununggal residence are upper middle class, (g) various dwellers; native (pribumi), non native (non-pribumi), and migrant citizens (pendatang).

While, the surrounding environment Batununggal residence; (a) dimensions and quality of the street smaller than Batununggal residence, (b) every people who visit the dweller of Batununggal residence should passed by main gate entrance, (c) periphery border like high wall make close all activities between Batununggal residence and their neighbours, (d) high jobless level, low welfare level and low educational level, (e) the dwellers are native who had this productive land before become residence.

Dimension and quality of street in Batununggal residence

One of cluster is characterized by line of yellow bamboo trees, gate, and security post

Dimension and quality of the surrounding environment

Periphery wall border between dwellers Batununggal residence and the surrounding environment

Modern market in Batununggal residence

High fences in Batununggal residence itself and some dwellers heighten the fences

Football yard

SD – SMP - SMA St. Aloyyisius

Mosque

Church

Picture 2. Existing condition of Batununggal residence
(Source : PT. Batununggal Indah & writers)

6. Analisys

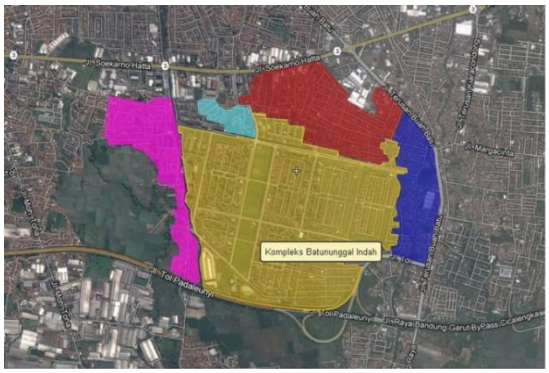
Writers analyse segregation in Batununggal residence based on variable that was concluded from table 1. Theoritical summary. These indicator are used to analyse the issues; (a) how segregation occured and social relationship between dweller formal housing community and the surrounding environment (low income housing), (b) how the perception dweller formal housing community to the surrounding environment (low income housing) and opposite.

a. Types of segregation that occured and social relationship between dweller formal housing and dweller low income housing

In Batununggal residence could be identified the dynamic of segregation form indicators above (see table 1); (a) spatial segregation, (b) physical segregation, (c) social economic status segregation, (d) ethnic, racial, culture segregation.

Tabel 2 Types of segregation in Batununggal residence

Types of Segregation
a. Spatial Segregation Batununggal residence border on some others housing, this border shape space and separate. It looks different with the surrounding environment



b. Physical Segregation

- The height periphery wall higher than human's height and some dwellers in Batununggal residence heighten the fences as security excuses.

- Line of trees

Line of yellow bamboo trees in the boundaries as physical border between Batununggal residence and the surrounding environment.

- Signs

A cluster which its access signed by portal and security post (see line yellow in picture above)

- Landmarks -

- Street

The access is characterized by dead road form (no connection) between Batununggal residence and the surrounding environment

c. Social economic status segregation

Characterized by job level, welfare level and education level between dweller batununggal residence and the surrounding environment

d. Ethnic-culture-racial segregation

Various dweller; native (pribumi), non-native (non-pribumi) and migrant citizens (pendatang).

Source : Analisa 2014

b. The perception dweller formal housing community to the surrounding environment (low income housing) and opposite.

To analyse the perception, writers interviewing form dweller Batununggal residence and their neighbor (dweller from low income housing). Based on this, Ibu Wati (real dweller who have been living in batununggal around 1980s and now stay absolutely near Batununggal's fence) states;

"... Originally, I was a farmer in productive land (persawahan) here, living here was so peaceful, our result of farming for side dishes, the river still had fishes. In case our neighbor illness and lack of food, together we helped each other. But since 1990s, the residential development occured in Batununggal area. We were displaced and compensated cheap. Our land occupation of farming began to decrease, the river became polluted. The dwellers of Batununggal residence was less interaction, visible presence of social inequality and the surrounding environment. Sometimes the dwellers Batununggal residence heightened the fences their home as security excuses...".

That is totally different according to Pak Wahyu (dweller and developer Batununggal residence) states;

"I've lived here since 1990s which is the beginning of housing development. Now, this residence only focus on housing development in Batununggal residence itself. In the context of segregation, we permit other resident come and joy the available facilities here. The workers (house keeping, servant, driver, security guard, vendors) come

from the surrounding environment. Modern market and football yard is used as merging dweller batunuggal residence and the surrounding environment…".

From these interviewer, we can conclude that the life of local citizens at the time more sociable and fellowship. May be, for migrant citizens or local citizens may not expect the presence anything about segregation. However without any realizing it, developers emerge the existence segregation itself. Finally, segregation was seen clearly between dweller formal housing and dweller low income housing. It is totally different in developer's view, they regard that they do not make segregation, but they help local citizens in economical order and provide football yard-public facilities as spatial interaction.

Glasze and Meyer (2000) explain that emerging of formal housing which has physical separation identify as global phenomenon in future settlement, besides that, formal housing also emerge fragmentary city and some peoples worry about formal housing can cause social segregation in its further development.

VII. Conclusion

Segregation is a reflection of the differences and hierarchy status between groups and other groups. It occurs in due to spatial structures which formed by the forced entry into social space, so that interaction between groups is limited. Segregation has two concepts, consist of separated and no interaction, or limited interaction.

Segregation have already happened in our daily life. However, when segregation is clarified, it will become implicit conflict. It can be said that, if in a limited area of the various aspects, then there will be no interaction. And vice versa, if an area was unbordered and blended each other, then there will be a little interaction.

Batununggal residence shows some segregations that occurs; (a) spatial segregation, (b) physical segregation, (c) social economic status segregation, (d) ethnic-racial and culture segregation. Geographically, Batununggal residence lives side by side with the surrounding environment, but segregation is strongly cleared, so the impact is less interaction.

Based on the perception from two sides, it definitely dwellers formal housing and dweller low income housing may not expect the presence anything about segregation. However without any realizing, developers emerge the existence segregation itself. Although, they have assumed that they have helped local citizens in economical order and have provided football yard-public facilities as spatial interaction. Finally, segregation can be strongly clear between dweller formal housing and the surrounding environment. Therefore, the developer should consider in any development in urban renewal with the surrounding environment area, in order to merge and blend each others. The emergence formal housing indicates the phenomenon of segregation, especially physical segregation and fragmentary city as cause social segregation. Like statement from journal Barliana (2008), *"people modify the spaces they live ini, in turn are modified by then. Society creates space, space creates society".*

References

1) A. Salim, Suparti. (1998). *Segregasi dan Keadilan Ruang, kasus studi: Lingkungan Perumahan Dualistik di Bandung dan Makassar.* Institut Teknologi Bandung.
2) Barliana, S. (2008). *Kontribusi Lingkungan Binaan dan Perilaku Spasial terhadap Modal Sosial Komunitas Penghuni dan Implikasinya bagi Pendidikan IPS.* Mimbar Pendidikan, 32(2).
3) Budi, Tin Utami. (2014). *Makna Fisik pada Real Estate bagi Masyarakat sekitar di Tangerang Selatan.* Institut Teknologi Bandung.
4) Kuswartojo, T (2005). *Perumahan dan Permukiman di Indonesia.* Bandung; Institut Teknologi Bandung.
5) Legeby, A. (2010). *Urban Segregation and Urban Form : From Residential Segregation to Segregation in Public Space.* Kath Royal Institute of Technology, Architecture and The Build Environment. Sweden: Trita-Ark Publisher.
6) Lynch, K (1981). *A Theory of Good City Form.* Massachusetts Institute of Technology.
7) Newman. (1981). *Physical and Symbolic Means.* Dalam K. Lynch, *A Theory of Good City Form* (hal.213). Massachusetts Institute of Technology.
8) Schwab, W. A. (1992). *The Sociology of Cities.* New Jersey: Prentice Hall, Inc.
9) Glasze G. dan Meyer G. (2000). *Workshop Gated Communities-Global Expansions of a New Kind of Settlement.* DAVO-Nachrichten No 11.
10) Widhyharto, Derajad S. (2009). *Komunitas Berpagar: Antara Inovasi Sosial dan Ketegangan Sosial (StudiKasus Komunitas Berpagar di Provinsi D.I. Yogyakarta, Indonesia.*

Transport Disadvantage in Urban Areas: Case Study of Low Income People in Yogyakarta Urbanised Area

Yori Herwangi[*1], Pradono[2], Ibnu Syabri[3], Iwan Kustiwan[4]

[1] Doctoral candidate of Urban and Regional Planning, School of Architecture, Planning, and Policy Development, Institut Teknologi Bandung and a lecturer of Department of Architecture and Planning, Universitas Gadjah Mada
[2,3,4] Associate Professors, School of Architecture, Planning, and Policy Development, Institut Teknologi Bandung

Abstract

Recent research has recognised transportation as one of the aspect that has a significant effect on social inclusion that could relate to sustainable development. This prompted the emergence of the concept of transport disadvantage. One of the groups potentially experiencing transport disadvantage is the low income people. Limited choice due to limited resources can lead to difficulty in accessing various opportunities, especially if they also live in a location that is also categorized as a transport disadvantaged area. Yogyakarta Urbanised Area (KPY or *Kawasan Perkotaan Yogyakarta*) as the fast growing area, is more likely to have problems related to transport disadvantage. The concentration of low income people, with uneven distribution of facilities and transportation services could lead to the high ownership of private vehicles, especially motorcycles that is more affordable than a car. Therefore, the purposes of this paper are: 1) To identify the distribution of low-income people as one of the transport disadvantaged groups resides in KPY; 2) To identify areas in KPY that can be categorized as transport disadvantaged area; 3) To identify the magnitude and distribution of transport disadvantaged groups who live in the transport disadvantaged areas as input for transport policy. To achieve these objectives, the method used in this study is descriptive statistical analysis and spatial mapping with the help of GIS software. Conclusion of this study is that low income people are widely spread in the suburb which is also transport disadvantaged areas.

Keywords: transport disadvantage, low income people, urbanised area

1. Introduction

There is a growing interest in the concept of sustainable transportation in term of the social aspect. Recent research has recognized transportation as one of the aspect that has a significant effect on social inclusion that could relate to sustainable development. The absence of reliable transport can cause a person to experience social exclusion because of the loss of the opportunity as a chance to get an education, health care, employment, and social relationships. These groups are said to be experiencing transport-related social exclusion or transport/mobility disadvantage (Lucas, 2012). Transport disadvantage usually experienced by people who do not have many options in choosing a place to stay and people who are socially disadvantaged because of the disability, age, ethnicity, and other socio-economic conditions.

One of the groups potentially experiencing transport disadvantage is low income people. Limited choice due to limited resources can lead to difficulty in accessing various opportunities, especially if they also live in a location that is also categorized as a transport disadvantaged area.

Yogyakarta Urbanized Area (KPY or Kawasan Perkotaan Yogyakarta) which comprise of 23 districts in the City of Yogyakarta, Sleman, and Bantul; as the fast growing area is more likely to have problems related to transport disadvantage. The concentration of low income people, with uneven distribution of facilities and transportation services could lead to the high ownership of private vehicles, especially motorcycles that is more affordable than a car.

Therefore, this paper aims to identify the magnitude and distribution of low income people as one of the transport disadvantaged groups who live in the transport disadvantaged areas as input for transport policy. It is organized into 4 sections. First, this paper presents a brief explanation about transport disadvantaged and low income people based on the literature. Second, the paper explain the method used in this study. Third, the paper show the distribution of

low-income people as one of the transport disadvantaged groups resides in KPY, and areas in KPY that can be categorized as transport disadvantaged area. Finally, the paper will discuss the distribution and magnitude of low income people who live in the transport disadvantaged areas as input for transport policy.

2. Transport disadvantage and Low income people

Low-income people do not have many options in choosing residential location due to limited resources. Meanwhile they also have limited options in term of the employment opportunity. This often causes them into hardship because of transportation mismatch between residential location and workplace (Clifton, 2003; SEU, 2001). They also experience difficulties in accessing shopping facilities, health facilities, social facilities and educational facilities (Lucas, 2004; SEU, 2001; Ureta, 2008; Currie, 2009).

The transportation difficulties result in lower total trips per day and high transportation cost on the low-income population. In Bogota, Colombia, the total travel frequency in the poorest parts of the city only reached 1.5 trips per day, while the portion of transport cost to total income could reach up to 20% (Bocarejo and Oviedo, 2012). In Indonesia, the population in the urban slums of Jakarta, Yogyakarta and Solo spend 10% of their income on transport (Renny, 2009). With the low level of public transport services, poor people in the cities are also forced to have a motorcycle, without thinking of safety and pollution resulting from the vehicle (Renny, 2009).

Several studies have also revealed that to overcome the high cost of transportation, low-income families are forced to reduce spending for other needs, whether it is discretionary such as recreation, and cigarettes, and non-discretionary such as food and education (Agrawal et al., 2011; Nasution, 2006).

3. Methods

To identify the transport disadvantages and non-transport disadvantaged area in KPY, the public transport routes data is used. Non-transport disadvantaged area is defined as the area within 400 meter from the regular public bus route and 400 meter radius from TransJogja bus stop.

There are some standards to explain low income people. In this study, low income people is defined as pre-prosperous family (*keluarga sejahtera*), prosperous 1 family (*keluarga sejahtera 1*), and prosperous 2 family (*keluarga sejahtera 2*) based on BKKBN (*Badan Koordinasi Keluarga Berencana Nasional* or National Agency for Family Planning) standard. These three groups are families who have been able to fulfil their basic needs including social and psychological aspect (BKKBN, 2005), but has not been able to do personal development and to use the modes of transport in accordance with local conditions (BKKBN, 1994)[1]. Both data are then overlayed with the help of ArcGIS software to obtain the most vulnerable area to the occurence of transport disadvantage, which is the area with high concentration of low-income residents that is not served by public transport.

4. Yogyakarta Urbanised Area (Kawasan Perkotaan Yogyakarta)

Yogyakarta Urbanised Area (*Kawasan Perkotaan Yogyakarta* or KPY) consist of the City of Yogyakarta and several villages and districts in Sleman and Bantul, which borders the city of Yogyakarta and has been characterized by urbanity. KPY divided into the core urban area, namely the city of Yogyakarta and the surrounding urban area, which covers most of Sleman and Bantul. The total area is 186.87 km^2, which covers an area of:

a. 14 (fourteen) district in Yogyakarta
b. 6 (six) district in Sleman include:
   1. District of Gamping covering Banyuraden, Ambarketawang, Trihanggo, Nogotirto;
   2. District of Godean, covering Sidoarum and Sidomoyo;
   3. District of Mlati, covering Sinduadi and Sendangadi;
   4. District of Ngaglik, covering Minomartani and Sinduharjo
   5. District of Depok, including Caturtunggal, Condongcatur, Maguwoharjo;
   6. District of Ngemplak, including Wedomartani
c. 3 (three) district in Bantul include:
   1. District of Banguntapan, covering Jagalan, Banguntapan, Singosaren, Baturetno, Wirokerten, Tamanan, Potorono;
   2. District of Sewon, incluinge Panggungharjo and Bangunharjo;
   3. District of Kasihan, covering Ngestiharjo, Tamantirto, Tirtonirmolo.

5. Transport 'rich' and transport 'poor' area in KPY

In this study, ttransport disadvantaged area is the area with poor public transport service. To asses public transport service, the criteria are (PTEG, 2010):

1. Availability: number of public transport routes that pass through the area
2. Accessibility: distance from residential location to bus stop or to the road with public transport services.
3. Acceptability: feeling safe and comfortable when using public transport
4. Affordability: public transport cost

In this study, there are only two criteria which are availability and accessibility used to assess transport

disadvantaged and non-transport disadvantaged area. Acceptability and affordability are assumed as personal based judgments that are not suitable to compare public transport services between areas as applied in this study.

Based on these criteria, it appears that most of the area in the City of Yogyakarta is served by more than three public transport routes. The further the area from the city centre, the lesser public transport routes in this area. The dark area (Figure 1) shows area in KPY that is served by public transport which is considered as non transport disadvantaged area in this study.

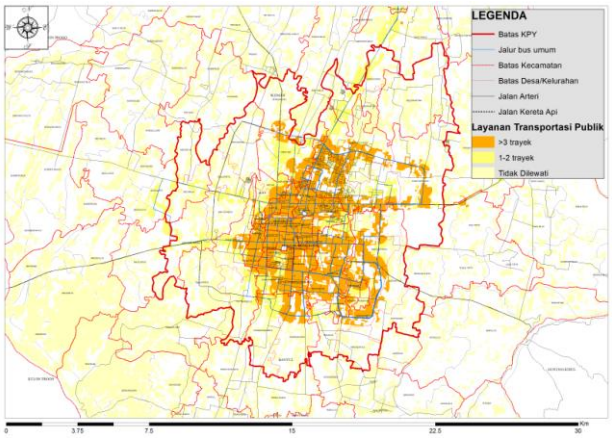


Fig 1. Public transport service area in KPY

4. Distribution of low income people in Yogyakarta Urbanized Area

The total number of low-income families in KPY is 110,184 families, or about 407,690 people. The high proportion of low income family is scattered in Sleman, Bantul and Yogyakarta. In Figure 2, it can be seen that the proportion of low income family is mainly concentrated in the western part of KPY, as well as the central part of which is part of the city of Yogyakarta. The darker area on the map shows the area with low income family more than 50% of the total population in the area.

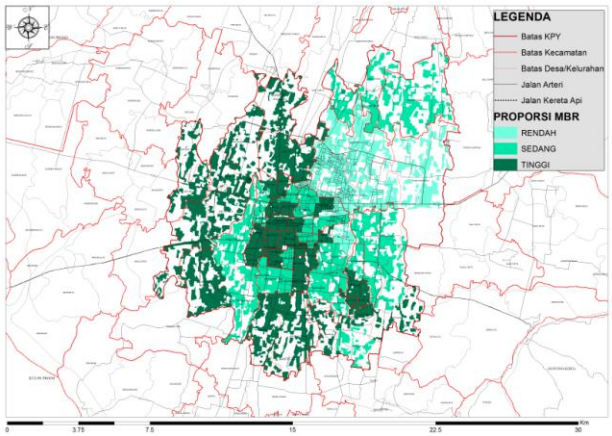


Fig 2. Proportion of Low Income Family in KPY

In Sleman and Bantul, low-income family in some sub-districts could reach more than 4,000 families. As for the city of Yogyakarta, the number of low income family is high enough in the district of Pringgokusuman and Kricak, with more than 1,400 families. The number of low income families in Sleman and Bantul is more than in the city of Yogyakarta is partly because the population in Bantul and Sleman is bigger than the population in the City of Yogyakarta.

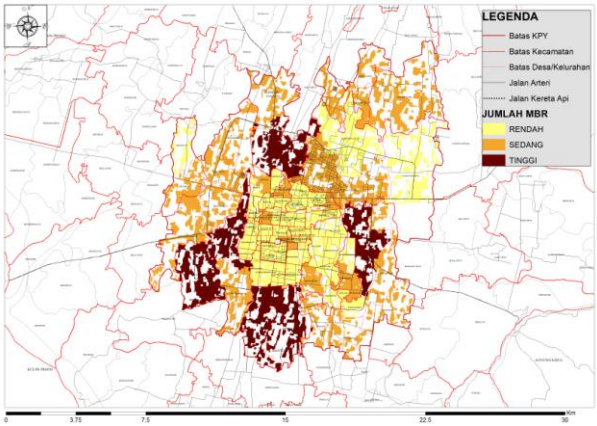


Fig 3. Distribution of Low Income Family in KPY

5. Low income people living in the disadvantaged area

According to Hurni (2006), transport disadvantage experienced severely by transport disadvantaged groups (ie. low income people) living in transport disadvantaged area (ie. areas with poor transport services). By overlaying public transport service map (Figure 1) and distribution of low income family (Figure 3), there is 32.160 low-income households in 13 sub-districts that are vulnerable to transport disadvantage conditions based on Hurni's definition (Table 1). These area needs to be prioritized in term of public transport policy for low income people

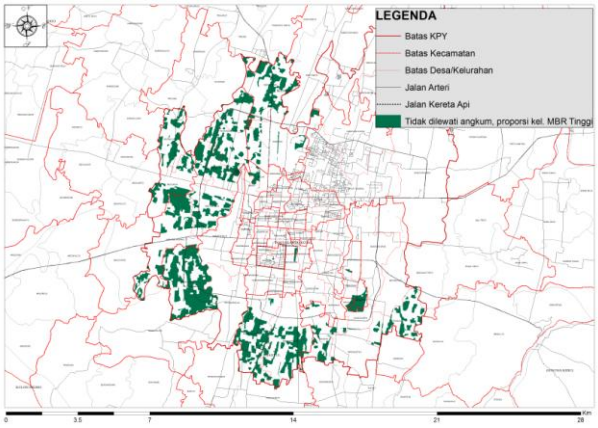


Fig 4. Transport Disadvantage Vurnerable Area

Table 1. Number of Low Income Family in Transport Disadvantage Vulnerable Area

Sub-districts	Number of Low Income Family
Sendangadi	2372
Trihanggo	1865
Nogotirto	1964
Banyuraden	1730
Sidomoyo	1194
Sidoarum	2025
Ambarketawang	2234
Tamantirto	4454
Panggungharjo	3951
Bangunharjo	4996
Tamanan	1844
Potorono	1932
Purbayan	1599
TOTAL	**32160**

6. Conclusion and Discussion

This research is aim to identify the magnitude and distribution of low income people as one of the transport disadvantaged groups who live in the transport disadvantaged areas as input for transport policy. By using public transport service data and distribution of low income family in YUA, it can be concluded that some area in the outer ring of KPY is need a special attention. These area is identified as vulnerable to transport disadvantage condition because of the availability and accessibility of public transport service in the area.

In terms of transport policy, improved public transportation service area must be done in this area by considering characteristics of the movement and the affordability of low-income residents. For it as an input for inclusive transportation planning, further research to look at the characteristics of the movement of low income family and affordability they need to be done to complete this research.

Notes:

[1] The selection of low income criteria by BKKBN standard is based on following considerations:

1. The data of prosperous family is the most complete data available for the entire area of YUA and have the same standards for all parts of Indonesia so that it is comparable between regions.

2. Equalization of low income people with prosperous 2 family and below (pre-prosperous, prosperous 1, prosperous 2) based on the assumption that the standard of low-income families are $2 per capita per day or below (ADB standards for developing countries, 2010). With an average family size of 3.7 in Jogja, it is equal to approximately 2 million per family per month. With that amount, the family is expected to meet the basic needs including social and psychological needs which is the criteria for prosperous 2 family in BKKBN's standard.

References

1) Agrawal, Asha, Evelyn A. Blumenberg, Sarah Abel, Gregory Pierce, and Charles N. Darrah. 2011. Getting Around when You're Just Getting By: The Travel Bahavior and Transportation Expenditure of Low-Income Adults. In MTI Report 10-02. San Jose: Mineta Transportation Institute, College of Business, San Jose State
2) Badan Koordinasi Keluarga Berencana Nasional, 1994, Indikator dan Kriteria Keluarga Sejahtera
3) Badan Koordinasi Keluarga Berencana Nasional, 2005, Indikator Keluarga Sejahtera
4) Bocarejo, Juan Pablo, and Danoel Ricardo Oviedo. 2012. Transport Accessibility and Social Inequities: a Tool for Identification of Mobility Needs and Evaluation of Transport Investment. Journal of Transport Geography.
5) Clifton, Kelly J. 2003. Examining Travel Choices of Low-Income Populations: Issues, Methods, and New Approaches. In 10th International Conference on Travel Behaviour Research. Lucerne.
6) Currie, Graham, and Alex Delbosc. 2009. Car Ownership and Low Income on the Urban Fringe - Benefit or Hindrance? In 32nd Australasian Transport Research Forum (ATRF). Auckland.
7) Hurni, Anne. 2006. Transport and social exclusion in Western Sydney: Western Sydney Community Forum, University of Western Sydney.
8) Lucas, Karen. 2004. Transport and social exclusion. In Running on Empty: Transport, social exclusion and environmental justice, edited by K. Lucas. Bristol: The Policy Press.
9) Nasution, Dewi Hartika. 2006. Adaptasi Masyarakat Miskin terhadap Inflasi Akibat Kenaikan Harga BBM. Jurnal Pemberdayaan Komunitas 5 (3):271-286.
10) Renny, Maria. 2009. Case studies on transport challenges for the poor a study of slum settlements in Indonesia In Expert Group Meeting, Access to transport for the urban poor in Asia Yogyakarta: UN Habitat & GENUS.
11) Social Exclusion Unit. 2001. Preventing Social Exclusion: Cabinet Office.
12) Ureta, Sebastian. 2008. To Move or Not to Move? Social Exclusion, Accessibility and Daily Mobility among the Low-income Population in Santiago, Chile. Mobilities 3 (2):269-289.

Packaging Architecture As A Representation Of Community Social Status A Case Study of Kampung Kemasan in Gresik, East Java Province

Hafidz Al Mubarok [1],Tyas Santri [1]

[1] Student of the Master Program, Departemen of Urban Design &Architecture
School of Architecture, Planning and Policy Development
Institute of Technology Bandung

Abstract

The cultural identity of our community has many ways and factors to grow up. Kampung Kemasan become one interesting case to look at, in which stores, symbolizing historical wealth in the form of mixed and diverse architectural style, are still maintained until now. The existence of mixed architectural style represents much social values translated into the life of the indigenous people at the time. For example, although colonial-style buildings in Indonesia tend to be owned by rich merchants or the upper classes, such trend does not seem to apply in Kampung Kemasan. The use of monumental Doric columns, which suggests justice, does not appear in government buildings only, but also in the residential homes of ordinary people. This review was written to investigate the history and phenomenon of a region, in which the society represents its social status through the architectural packaging of the residential homes. The method used in this study was exploratory qualitative, with the scope of study of KampungKemasan, Gresik supported with relevant literature and field survey. One significant finding observed in the history of KampungKemasan is that its heyday as one of the largest swallow nest producers has had enormous influence on the existence of imitation of grand homes scattered in many places. Due to its littoral location as well as improvement of the economy at the time, the social and cultural influence brought by the Chinese, European and Arabian settlers was easily absorbed. Apparently, the society saw themselves as a group of wealthy people with higher socio-economic conditions. This was why most of them made it as a benchmark and model in some aspects of their life, especially in term of architectural occupancy. One interesting finding of this case is that although the local people were not as economically advantaged as they settlers, they created homes similar to those of the settlers. They overcame their situation through packaging design strategies, which were applied in various ways according to the abilities and creativity of the homeowners. Here, social values are highly visible as a critical component underlying the existence of grand homes in KampungKemasan. Packaging design phenomenon that was originally developed to show social status unwittingly has become a brand of cultural identity.

Keywords : *packaging, representation, social communities, cultural*

I. Introduction

It is inevitable that humans live in a society and require recognition of their existence, one of which is social recognition in their neighborhood. One way to get social recognition is through appreciation on the formation of their residential architecture. Nowadays, in choosing or building houses, people often choose the design based on their need and purpose, in addition to the social and financial limitations that become a factor in appreciating their house. Differences in one's social class may lead to differences in the representation toward their house. Generally, those who are in the middle to upper social classes tend to choose homes with magnificent design both interior and exterior, while those in the lower and middle social classes tend to design homes with a simple design but could meet their needs.

Problems that arise due to differences in social and financial level in appreciating the residential architecture is (1) to find how social class affects the characteristics of residential architecture and (2) to investigate how the society with different social and financial levels appreciates the design of their residential architecture as to create packaging (image) to the region; and the case study in this review was done toward the area of Kampung Kemasan, Gresik.

The purpose of this study was to determine the cohesivity status of the occupants and the local people

Hafidz Al Mubarok
---Student of the Master Program in Urban Design, School of Architecture and Planning and Policy Development, ITB.
Jl. Tamansari 64 Bandung 40116, Jawa Barat, Indonesia.
Tel: +62222504962, Fax : +62222530705
E-mail: mr.als88@yahoo.com

in appreciating the design of their residential buildings in order to form the image of the region. Limitation of this study is on the architecture identification of some residential buildings in Kampung Kemasan whose development is visually influenced by the differences in the social and financial status.

II. Methodology

The method used in this study was based on the result of observation on the correlation between residential architecture and the level of financial and social status of the owner and its impact toward the residential design and the built environment of Kampung Kemasan. The approach chosen was exploratory-qualitative through historical documentary and descriptive investigations by conducting a survey. The survey was conducted through field observations and interviews with some of the resource associated with the study. This survey was supported by reviews on related literature.

III. Discussion

3.1 Architecture in Gresik as a Seaport

Record about Gresik as a seaport was found in a note of Chinese military expedition trip which explains that during the 12th and 13th century, Gresik and Tuban developed as a seaport that served the trading activities Majapahit Kingdom. Gresik (or also called as Ssu-st'un / Hsints'un / Ko-erh-shi, which literally means a new settlement), located east of Tuban, at that time was inhabited by about a thousand families headed by a person from Guangdong. Foreign ships came to trade, and the majority of the population lived in prosperity in this area.

Like most old towns in Indonesia, the local people of Gresik live in groups in areas having ethnic ties. There are three elite ethnic groups spread across Gresik, namely Arabian, who mostly live in the south of the city square (KampungGapuro and Pulopancikan), Chinese, who live in the east of the city square (KampungPecinan), and European, who live in the west of the city square.

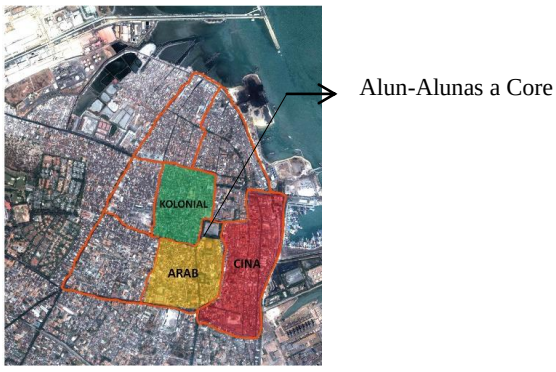


Figure 1. The distribution of settlement based on ethnicity
Sources: Googleearth and the writer's analysis, 2013

The diversity of foreign residents who came and settled in Gresik then facilitated the entry of new cultures and civilization to the indigenous people and it resulted in acculturation of the new cultures and the local culture of Gresik, including in the field of architecture.

The acculturation of the local architecture and the Arabic and Chinese architecture was influenced by trading activities and religion, yet European architecture, unlike the first case, entered through colonialism that occurred during the 18th and 19th centuries. The works of architecture coming to Indonesia in the 19th century altogether with the coming of Western culture was described by Jean Casson as "a period of irresponsibility charming and genial self-sufficiency". The people at that time were very fond of the glory of economic ratios and imperialism of the middle-layer group called the bourgeoisie. Thus, this made the European or colonial architecture dominated the development of architecture in Gresik.

3.2 Architecture Phenomenon in Kampung Kemasan in Forming Region Display

Kampung Kemasan is one of the villages in the urban area of Pakelingan, Gresik that has quite a lot of evidence of the vernacular architecture, a form of acculturation of the coastal communities in East Java. Located one km from the city square and surrounded by residential foreign ethnic groups, the livelihood of the people living in KampungKemasan generally is swiflet breeders and on tannery industry, which reached its heyday in the 18th century up to the 19th century. According to some sources, the name "Kemasan" has various meanings in Indonesian, which ranges from “the golden age (emas in Bahasa means gold, ke-emasan means golden); “Kemasan” which means goldensmith; or “Kemasan” that literally means as a brand / packaging in Indonesian.

The existence of magnificent buildings owned by the native people of Gresik, which was considered unusual for local people at that time since it was normally owned by noblemen, showed that the local people had quite good financial ability and economy level at the time.

The trade relationship developed between the indigenous people with the settlers, and the increased financial capacity of the merchants at least led to the establishment of social relationships between the two groups of people which then influenced the change in lifestyle of the local people. One of the lifestyles shown as shaping their character and social identity was the adoption of housing typology of the settlers, that were Europe and China, that represented a symbol of civilization, social strata, and success.

The existence of the house of a successful gold trader from China, known as BakLiong, was considered as the underlying point toward the emergence of residential buildings adopting Chinese architectural style in Kampung Kemasan (Gresik 1896-1916, Oemar Zainudin, Ruas, 2002). Although the condition

of the present buildings cannot be clearly identified, the use of slender columns and wooden ornaments on the front part of the building becomes the proof of the existence of residential buildings in the surrounding area applying and adopting similar typology or formation.

Figure 2. Residential houses adopting Chinese architectural styles of BakLiongas a representation of groups with certain social status
Sources : Personal documents, 2013

Figure 3. The application of Chinese architectural styles to the residential buildings of the local people in Kampung Kemasan
Sources : Personal documents, 2012

The construction of magnificent homes in the area was originally done by Chinese artisans and colonial civil engineers who also served as architects due to their ability in building similar houses for their com-patriots (H.Bruijn, Bijdragen tot de kennis der bouw-kunde in Nederlandsch-India, Van Harenn Norman, Batavia;1851). Their ability as well as interference from the house owners who had been affected by the three cultures resulted in unique residential mixes that were strong enough to represent the characters and the social identity of the owner. One of the houses was Gajah Mungkur, a house owned by famous tannery businessman, H.OemarSechan.

Houses adopting the new architectural styles of China, Europe, and Arabic were successful in raising social strata of the owners that they got a visit from the Queen of the Netherlands and Pakubuwono X of - Surakarta, who both were regarded as the highest symbol of power and social status of the colonial and Javanese society at that era. Here, the role of architecture as ethnic identification tool became a political tool to show which ethnic groups were in power in this country (Liem, The History of Semarang, op. cit. (footnote 7) 150).

Figure 4. European, Chinese and Arabic architectural styles at Gajah Mungkur housing complex
Sources : Personal documents, 2013

Figure 5. The existence of other residential buildings with mixed architectural style in Kampung Kemasan
Sources : Personal documents, 2013

The existence of these luxurious residential buildings turned out to give a wide impact on the surrounding regions in adopting the new social values translated through the architectural styles. The community with such diversity in the levels of financial capability then thought that residential buildings with such architectural mixescould produce such charisma and social status to the owners, so that the existence of such residential buildings were not only adopted by the upper classes, but also by other classes of society throughout the region of Pakelingan. The spirit of plagiarizing, imitating, or adopting all architectural elements without such good and organized patterns, just based on one's pleasure, made the task of the architectsto be narrowed into merely a decorator to establish similar typology of all the residential buildings. "Resource was made to the catalogue of the past to all the brick-a brack of history, and finally, eclecticisms inevitably became the key of the taste" (WastuCitra, page 192, Gramedia, Jakarta, 1998). This is where the idea to create a visible identity was manifested by the entire community in the physical form of a building so as to form an image and the image of the region exists even up to the present time.

Figure 6. Homes of the nouveau riche in Gresik with a style similar to the roof of GajahMungkurhouse in Kemasan, symbolizing how the bourgeoisie wanted to certify themselves as a new aristocracy.
Sources : Personal documents, 2013

Figure 7. The use of Doric columns on the first and second floorwas also applied by other residential houses at a radius of 2 KM from Kampung Kemasan
Sources : Personal documents, 2013

3.3 The Display of the Residential Buildings as Social Identity

Modernization, needs, and socio-economic interaction require the presence of a new architecture that is able to fulfill the diverse demands of the residents. It is the time when "a building designed by an amateur without any training in design" (Brunskill [ed], 2000: 27-28), thus causing the appearance of vernacular building varieties that were extremely diverse in the region.

One example of the display of the building owned by the society with medium social skills at that time was the buildings owned by the descendants of Oemar Sechan located not far from Gajah Mungkur. The combination of European and Chinese architecture was applied differently between exterior and interior of the buildings. The appearance of the buildings resembling the European style was implemented through the installation of Doric columns that lined symmetrically on the terrace of the buildings, while the Chinese style was applied to the door ornament and residential interior.

The majority of residential buildings in Pakelingan region were two-story building. In terms of display, these buildings seemed to indicate that the second floor functioned as part in which the owners stayed. It could be seen from the placement of windows and patio on the second floor which was generally used as a circulation area in a residential building. But in fact, many of the second floors of the houses did not function as part in which the owners stayed. The second floor of the houses was mostly used for breeding the swiflet that became an important part of the economy at that time.

Figure 8. The application of Doric columns at the front hallsof the buildings
Sources : Personal documents, 2013

Figure 9. The application of Chinese style at the door ornaments, windows, and colors
Sources : Personal documents, 2013

Figure 10. The application of the second floors as swiftlet breeding area
Sources : Personal documents, 2013

The existence of swiflet breeding on the second floor of the building was designed as closely as possible with the existing residential function underneath, and was considered as a strategy for the owners to make the house more monumental visibly which indirectly was related to the depiction of the social status. The application of artificial architecture on the parts of the building such as windows and door ornaments also become special characteristics owned by buildings in Pakelingan. One example was the faux window on the second floor of the building, as well as other wood ornaments which were made as closely as possible to the original.

Figure 11. Grille and faux windows on the second floor of the building as well as aesthetic ornament as a tool of social status

Sources : Personal documents, 2013

Figure 12. Shops owned by Chinese traders by using the second floor of the building and the original window as part of the residential houses

Sources : Personal documents, 2013

Installation of windows, columns, or porch that was not working properly on the second floor has become an interesting topic for debate, and has not been unresolved. Some sources, such as the descendants of OemarSechan, that is OemarZainuddin explained that the existence of imitation architecture found on the second floor or the first floor of the building was used as a strategy to fool burglars who stole the swiflet nests at that time. However, this argument is very weak when compared to the argument stating that the existence of imitation architecture was as part of a residential aesthetic to represent the social strata of the ownerof the building.

People's eclecticisms against colonial and Chinese architecture turned to be not in accordance with the climate and other social values that had long become the part of the community of Gresik. The terrace became the part of the building where the local element retained. In terms of climate, the roof of the building with the colonial style was thought to be unable to resist the rain water into the residential patio section. This was caused by several factors such as the height of building, the lack of eaves, and, in short, the distance between the porches with the main rooms of the building. In terms of social influence, the immigrants from Arabian regions brought Islamic values to the indigenous people through the formation of more-closed houses to protect women living in the house. It made Gresik people, who normally had a house with an open terrace where everyone could easily look into the house, to install woven bamboo blinds or curtains to block the view of people to look directly at female occupants of the house. Thus, the existence of double blinds functioned not only to block rain water but also to protect the Muslim women.

This is where social values of society struggled. "A less extreme acculturation" will provide an opportunity for "local genius" to accommodate elements of culture from the outside and then integrate into their ethnic culture (Ayat Rohaedi-1986: pp.29-31)

Figure 13.The blinds or curtains at the front part of the house as a response to climate and religious values held by the society (Sources : Personal documents, 2013)

IV. Conclusion

"...In each period of transition, religion, and social changes area behind the changes in architectural forms, as well as new inventions and the development of new techniques" (Sigfried Gideon 1971:4). The social values evolving through residential buildings architecture become a reflection of the customs and lifestyle of a community (Ravi S. Singh, 2006). The community builds houses without basing their choice on local wisdom, but rather on the idea that a house is

Table 1 .Several architectural elements that are used by people as a representation of social status.

No	Application	Note
1.	Windows	Wide apertureand grille in buildingswasusedby the colonialelites as circulation room. Itwasadoptedby the nativehousesusing the secondfloor of thehouse as a swifletbreedingareathrough the apllication of fauxwindows and grille, to servebothfunctions of aesthetic and social recognition.
2.	Columns	The use of Greekcolumnwith doricstyle on the frontporch of the building (voorGalerij) waswidelyappliedon the Dutchcolonialgovernmentbuildings in Gresik. Indigenouspeopleadoptedit as a symbol to position themselves as a new aristocracy.
		The thincolumnsin BakLiong (the gold trader) wereapplied to the nativehousesbecause the housewasconsidered as a representation of arichand successfullmerchant in KampungKemasan.
3.	Housing Corridor of Kemasan	The houses of rich native who started to apply the mix style of European and Chinese architecture was imitated by the community around the village as representation of noble residential style. Among them wereGajah Mungkur house and other houses applying the mix style of European and Chinese architecture owned by Omar Zaenudin and his descendants.
4.	Blinds	Residential buildings of Arabian settlers which weremore-closed in the forms were adopted by the local people in terms of Islamic values of the use of blinds and curtains to protect the outsiders to directly look at women living in the house and to protect the house from rain water.

(Sources: Writer's analysis, 2014)

the symbol of their social status. The residential architecture of the noblemen serves as social parameters, and then it is appreciated differently by the people who act as the architect in their own house through various ways in accordance with their wishes. Thus, it is not surprising that the development of the existing residential buildings is "anonymous, indigenous, native, naive, primitive, rude, spontaneous popular, local or folk-based" (Papanek, 1995). Here the adoption of the architectural parts is described as a packaging representing the desire of the people for recognition and as the symbol of social existence of larger social environment; thus, unrecognizably, the packaging design phenomenon that was originally developed to show social status has unwittingly added a brand of cultural identity**.**

V. Suggestion

Needing the data collection and further research on the existence of indigenous people and settler buildings that have a role and inspire the imitation architecture formation in the region.

For interested parties, this study can be used as a preliminary studies. And further studies are expected to be related in order to cultivate the region image by repacking the potential existing.

References

1) Omar Zainudin (2010), *Kota Gresik1896-1916*: *Sejarah Sosial Budaya dan Ekonomi*, Ruas, Gresik
2) Mangunwijaya, YB (1998), *Wastu Citra*, Gramedia Pustaka Utama, Jakarta
3) De Vletter, Martien (2009) *Masa Lalu Dalam Masa Kini : Arsitektur Indonesia*, Jakarta
4) Mentayani Ira (2012), Lanting Journal of Architecture Vol 1 No.2, August 2012, Page 68-82

Gardens in Healthcare Facilities

Fuziah Ibrahim [1], Wan Mariah Wan Harun[2], Wan Nor Wahidah Syumaiyah Wan Kamaruddin[2]

[1] Associate Professor, Interior Design Programme, School of Housing, Building and Planning Universiti Sains Malaysia
[2]Lecturer, Interior Design Programme, School of Housing, Building and Planning Universiti Sains Malaysia

Abstract

Garden is a therapeutic space. Greens, the sound of running water and fresh outdoor environment are elements of therapeutic in nature. Utilising healing or therapeutic garden is an added value to healthcare premises. The awareness of positive impacts of therapeutic garden to the users especially on patient's healing process has been acknowledge in healthcare built environment space. This paper explores the garden provided by the healthcare facilities and assesses the uses' perception on the facilities and environment of the garden. It is an attempt to understand the importance of therapeutic from the users' point of view and its suitability in accordance to their need. Observations on the garden healthcares and interviews with the users of the garden that consist of staffs, patient' relatives and patients are the primary methods in conducting the study. The findings reveal that the primary points of concern by the users regarding the garden are pedestrian walkways and resting area. While being in garden the users of the healthcare also experience the feeling of tranquillity, positive changes in mood and a sense of privacy from the stressful interior healthcare environment. The elements of garden especially accessibility and location in relation to the premises have also influenced the usage of the garden by the users. This paper assists in foreseeing the therapeutic space in healthcare facilities for the next generation.

.

Keywords: *healing garden, healthcare facility, environment of garden*

I. Introduction

Space is a major element in any design. Through space people move, see forms and shape, hear sounds and feel the breezes, the warmth of the sun and the smell of fragrances of flowers in bloom. Space is form from the perception of the relationship between the elements that make up the space (Ching &Binggeli (2005). A space would dictate how we feel and behave. It could change the mood by changing the elements that make up the space. Certain elements in space could even contribute to the feeling of healing.

Cooper-Marcus(2007) describe green nature, sunlight and fresh air as important components of healing. Garden in general features natural visual setting that reflects life such as plants, trees and flowers. Elements that arouse the senses such as sounds of water, fragrance of flowers, gentle breeze and the feel of sunlight are (Epstein,2006) features in the health garden enhances the visual features. English et al. (2008) believe that therapeutic landscape is site which is associated with healing and treatment. They describe the therapeutic landscapes as the space that physical, built environment, social conditions and human perceptions combine to produce an atmosphere which are conducive to healing. These sites evoke "emotional geographies" which play a role in shaping and maintaining the therapeutic landscape. Emotional geographies are the emotional meanings of places. These emotional geographies consist of a place or space which has all the necessary elements in nature. In a wider perspective it could be place that are peaceful, relaxing and far from the hassle and bustle of the busy life. It is a place that link human to nature i.e. a place that evokes positive feeling when the sound of birds, running streams, the soft fresh breeze and beautiful landscapes. Such space or garden needs to be managed and maintained. In reality the earth is the natural healing garden from the beginning of time.

Literature reviews suggest the rationale for the study of garden as an element in healing; exposure to natural settings reduces stress and enhances healing (Ananth, (2008), Hartig(2006), there are also suggestions that healing environment may influence patients and family perceptions of their healthcare provider.

The value of nature as healing elements disappear from healthcare environment from 1950s to 1990s Ulrich (1991) and Horsburgh (1995). They claimed

Fuziah Ibrahim
---Associate Professor
School of Housing, Building and Planning Universiti Sains Malaysia, 11800, Penang, Malaysia
Tel: 604-6532834 Fax: 604-6576523
e-mail: fuziah@usm.my

that most healthcare facilities resembled office buildings layout and natural ventilation is replaced by air-conditioning, outdoor's natural environments are replaced by parking lots. Design of the interiors resembled corporate office for efficiency and found stressful to the patrons of the facilities.

There are attempt by local healthcare facilities to incorporate healing garden in their premises. However most are done as an add-on. The garden is not incurporated in the early design stage. Some do not provide and garden at all. Beginning in the 2000s the new healthcare facilities in Malaysia started incorporating gardens in their premises such as Sultanah Bahiyah Hospital and Sultan Abdul Halim Hospital. The old healthcare facilities such as Sungai Bakap and Bukit Mertajam Hospitals which were established in 1890s, just added on a healing garden in their premises. The effectiveness of such garden is directly related to the response of the patrons to the garden. The patrons are people who have direct link with the healthcare premises such as patients, patients' visitors, or members of the staff.

The elements of therapeutic or healing for the research are based on Ulrich's theory of Supportive garden from Ulrich, Marcus and Barnes (1999), which are: to provide opportunity for movement and exercise; to provide opportunities to make choices and to seek privacy; to encourage positive distractions with nature,; visibility; accessibility; familiarity; quietness; comfort; unambiguously positive art.

Studying the patrons and their perspective of the reasons why they use the garden and the elements of the gardens of the healthcare premises would put into light some correlations between them.

II. Methodology

Healthcare facilities are chosen to explore the garden and the usefulness of the garden provided by the facilities. The chosen hospitals are located in the norther part in peninsula Malaysia. They represent the new established ones and the older ones.They are Seberang Jaya Hospital, Kepala Batas Hospital, Sultanah Bahiyah Hospital, Sultan Abdul Halim Hospital, Bukit Mertajam Hospital and Sungai Bakap Hospital. The oldest hospitals are Sungai Bakap and Bukit Mertajam Hospital which started operating in 1890. Sultanah Bahiyah and Sultan Abdul Halim Hospital are among the new ones which started their operation in 2007. Kepala Batas Hospital started operating in 2003, whereas Seberang Jaya Hospital in 1995.

The observations and open-ended interviews are chosen to discover and explore the use of the gardens in the healthcare facilities. The researcher observed and noted the elements of the garden according to the supportive gardens elements by Ulrish Et al (1999). The patrons who visited the gardens are approached by the researcher for open-ended interviews. The data are content-analyzed.

III. The Findings and Discussion

The first phase of the research is identifying who are the patrons of the gardens in the healthcare facilities. The next phase is finding the reasons behind their reasons and establishing correlation to the elements of healing garden adopted from Ulrish's theory in Cooper-Marcus (2007). And Ulrish et.al. (1999).

3.1 The elements of therapeutic gardens

Although all the gardens are from one ministry of health, each of them is unique. As mention earlier, the healthcare facilities are established at different time. Sultanah Bahiyah and Sultan Abdul Halim Hospital were established in 2007. Both the hospitals have therapeutic gardens incorporated when they were first established. Kepala Batas and Seberang Jaya Hospital were established in 2003 and 1995 respectively. The healing gardens in both Seberang Jaya and Kepala Batas were also part of the plan. Both the garden were first built when the hospitals were established.. Bukit Mertajam hospital was established in 1890 with only 52 beds. Over the years it has gone to a lot of expansion and refurbishing that currently it houses 242 beds. Sungai Bakap Hospital was established in 1891 and currently houses 105 beds. The healing gardens for both Sungai Bakap and Bukit Mertajam Mertajam Hospital were not part of the plan but added on in the 2000s.

10 elements of healing or therapeutic garden adopted from Ulrish's theory are; provide opportunity for movement and exercise; provide opportunity to make choices either to seek privacy or experience a sense of control; to encourage people to gather together to experience a sense of support; to encourage positive distraction with nature; visibility; accessibility; familiarity; quietness; comfort; and unambiguously positive art.; These 10 elements are observed in all the six hospitals. The summary is made in **Table 1**.

a. The first Checklist; provide opportunity for movement and exercise

In the first checklist, to provide opportunity for movement and exercise is further divided into five sub-categories. They are setting that facilitate physical outdoor activity, setting that allows children to play and run, setting for contemplative walking, setting for users to walk and jog, and setting with landscape for post surgery exercise.

In the first sub-category, setting that facilitates physical outdoor activity such as mini gym and playground, only 3 hospitals provide such facility. The other 3 do not provide such facility although two of the hospitals belong to the latest established hospitals.

In the setting that allows children for running and playing, three hospitals fulfilled the setting. The other three in which one is from the new established hospital does not have space for children to run and play.

Table 1. The Checklist for the elements of healing garden from Ulrich's Theory of Supportive Garden Design adopted from Ulrich et. Al. (1999)

Table 1. The Checklist for the elements of healing garden from Ulrich's Theory of Supportive Garden Design adopted from Ulrich et. Al. (1999)				SJH Seberang Jaya	KBH Kepala Batas	SAHH Sultan Abdul Halim	SBH Sultanah Bahiya	SgBH Sungai Bakap	BMH Bukit Mertajam
1	Provide opportunity for movement and exercise	Setting facilitate physical outdoor activity		/ **Mini gym**	X	X	/ playgound	/ **Mini gym**	X
		Setting allow children for running and playing		/	X Limited space	/	/	/	X Limited space
		Setting for contemplative walking		/	/	/	/	/	/
		Setting for users to walk and jogging		/	X Not suitable for jogging	X Not suitable for jogging	/	X Not suitable for jogging	X Not suitable for jogging
		Setting with landscape for post-surgery exercise		X	X	X	X	X	X
2	Provide opportunity to make choices either to seek privacy or experience a sense of control	Regaining freedom and reducing stress.	place to be able to stay alone or with others,	/	/	/	/	/	/
		User can explore the entire access and must be able to make decision which pathway they prefer	Place to sit under the shade or the sun	/	/	/	/	/	/
		Design must offer different choices	Place with broad or narrow view	/	/	/	/	/	/
			Fix or moveable seating	Fix seating	Fix seating	Fix seating	Fix seating	Fix seating	Fix seating
			Different length of walking routes	/	/	Too short a distance	/	Too short a distance	Too short a distance

3	To encourage people to gather together and experience social support	Locate near patients room, waiting area or main entrance	Provide moveable seating	X Fix seating	X Fix seating	X Fix seating	X Fix seating	X Fix seating	X Fix seating
			Provide subspace for small group	/	/	X	/	/	/
			Area with table and chairs for family or staff having meal together	/ wakaf	/ wakaf	/	/	/	/
4	To encourage positive distraction with nature	Plenty of different types of plants, with variety of colours, texture and shape,		/	/	/	/	/	/
		Trees to attract wild life (birds chirping)		/	/	/	/	/	/
		View to the sky		/	/	/	/	/	/
		Elements to reflect sound of moving water		/	/	X	X	X	/
5	Visibility	Near entrance or visible from the main foyer, accessibility without the help of a signage		/	X	/	/	/	/
6	Accessibility	Accessibility by all age, Pathway must be able for two wheelchairs pass horizontally		/	X Pathway made from stones and stepping stone	/	/	X Certain width of the pathway is less than 1000mm	X Certain width of the pathway is less than 1000mm and hilly
		The pavement joints should be narrow enough as not to harm or catch a cane, or wheelchairs or IV poles		/	X	/	/	X	X
7	Familiarity	People seek familiar surrounding especially when they are stress		/	/	/	/	/	/
8	Quietness	Located away from The noise of traffic, or machinery rooms		X Near main road	/	X Near to cafeteria	X	/	/
		Feel the wind		/	/	X	/	X	X
		Hear the sound of water fountains		/	/	X	X	X	/
		Sound of birds chirping		/	/	/	/	/	/
9	Comfort	Physiological		/	/	X Not enough seating	/	X Arrangement of plant and seating not suitable	/
		Psychological		/	/	X Less plant, no wind and hot	/	X No wind and hot	/
10	Unambiguously positive art	No complex sculpture		/	/	/	/	/	/

The setting for contemplative walking, four hospitals fulfilled the category. The two oldest established hospitals do not fulfilled the checklist.

Four hospitals were identified that their therapeutic gardens are not suitable for jogging, as the size is too small for such activity. All the hospitals do not provide setting for post-surgery exercise.

b. The second Checklist: provide opportunity to make choices either to seek privacy or experience a sense of control

In providing opportunity to make choices either to seek privacy or experience a sense of control, Ulrich's explain further that such setting must provide the user to explore the entire garden and able to make which pathway they prefer. The design must allow user to make different choices of seating. The checklist is further sub-categorised into 5; place to be able to stay alone or with others, place to sit under the sun or shade, place with broad or narrow view, fix or moveable seating and garden that provide different length of walking routes. It seems all the hospitals provide all the categories in the second checklist.

c. The third checklist: to encourage people to gather together and experience social support.

Ulrish emphasised that in order for people to gather together and experience social support, the garden need to be located near patients' room, waiting area or the main entrance. The garden must also provide moveable seating, provide subspace for small groups and area with tables and chairs for family or staff to have meal together. All the hospitals do provide moveable seating and all hospitals seem to have space for family and staff to stay together. Two of the hospitals do have a subspace for small groups.

d. The fourth checklist; To encourage positive distraction with nature.

In this category, the positive distraction include different types of plants with variety of colours, texture and shape, trees which attract wildlife such as birds, view to the sky and the elements to reflect the sound and moving water. All the therapeutic gardens in the hospitals fulfilled all the sub categories except the sound and moving water. Three of the gardens do not have water element in their garden. They included the two new established hospitals and one old one.

e. The fifth checklist: Visibility

The visibility of the garden is important for the patrons to realise there is a garden provided for them. It is considered visible if the location of the garden is near the entrance, or visible from the main foyer without the help of a signage. All gardens fulfilled this category.

f. The sixth checklist: Accessibility

Accessibility is crucial as it is the first point for the patrons in deciding whether to venture into the garden. It must be accessed by all age. The pathway must be accessed by two wheelchairs horizontally. The result shows that 3 out of 6 hospitals, their gardens are not being able to access by wheelchair users. Some pathway are made from stones and stepping stones. Certain pathways are less than 1000mm wide and some parts are hilly. The pavements which are finished with stones have joints which are not narrow enough that would cause harm to cane, wheelchairs and IV poles.

g. The seventh checklist; Familiarity

When people are in stressful condition, they will try to seek familiar surroundings to ease their stress. All the gardens seem to have the familiarity that the patrons are looking for.

h. The eighth checklist: Quietness

Quietness refers to location that is away from the noise of traffic or machinery rooms. Four of the gardens fulfilled the category, except for two, one hospital located the therapeutic garden near to the main road and the other next to the cafeteria. Both are latest established hospitals. Quietness also refers to the patrons are able to feel the breeze, to hear the sound of birds chirping and the sound of water fountains or running water. All gardens have birds chirping. However three gardens do not have the sound or running water or water fountains. It includes the newly established and old hospitals.

i. The ninth checklist; Comfort

Comfort must fulfilled both physiological and psychological. Among the six therapeutic gardens, two do not fulfil physiological and psychological category. In term of physiological category, it is observed that there are a lot of patrons who visit the gardens but not enough seating is provided. Some arrangement of seating and plants are not suitable.

j. The tenth checklist; unambiguously positive art

All the gardens do not have any complex sculpture that would distract the patrons' state of mind.

k. The highlights from the checklist of the elements of therapeutic gardens:

- When a garden is design, the designer might focus too much on a visual effect, as Stigsdotter & Grahn (2002) claim that a garden should not just on visual aspect, but a patron may first enter as an observer, then into a visitor, experiencing the four dimensions of the garden (three-dimensional space and time) will all one's senses. The garden

must activate all senses, sight, hearing, smell and taste as well as temperature sense, muscular sense, the sense of touch.

- All the gardens do not have setting with landscape for post-surgery exercise. The post surgery exercise is usually carried out indoor under full supervision from the staff. It is also done in a special room with special equipment and facilities.
- Not all gardens have space for jogging and for children to run and play.
- All the gardens only have fix seating. The seating do not allow the flexibility that the patrons need in encouraging them to gather and have some social interaction with their relatives or friends. The seating and plants arrangement does not consider sociopetal or sociofugal arrangement (Lawson,2003). Sociopetal is to encourage social interaction whereas sociofugal is for those who seek isolation. Similar gardens do not fulfil the psychological category because there is no breeze or wind, making the stay in the garden too hot and humid.

Fig.1 Fix Seating

- Accessibility to the garden is crucial in determining the decision by the patrons to the garden especially patients or patrons with wheelchairs and those that carry IV drips with them. The width of the pathway must be at least 1000mm wide to allow two wheelchairs to pass at the same time. Three newest established hospitals design their access pathway that follow the requirement of Ulrish's theory of supportive garden design.

Fig. 2 Inaccessible to Wheelchair users

- The comfort and quietness are important elements. The location which is away from the noise of traffics or children playground will be more preferable for the required quietness. The cool breeze which passes through the garden will counter the hot and humid space in the garden. It brings physiological as well as psychological wellbeing to the patrons.

In discussing the results of the elements of the therapeutic gardens, it is nevertheless important to relate to the patrons who frequent the gardens and the reasons behind their actions.

3.2 The patrons of the gardens:

The patrons of the therapeutic gardens could be categorized into groups. They consist of immediate family members of the patients, other visitors (relatives and friends), the patients themselves and the staff of respective healthcare facilities.

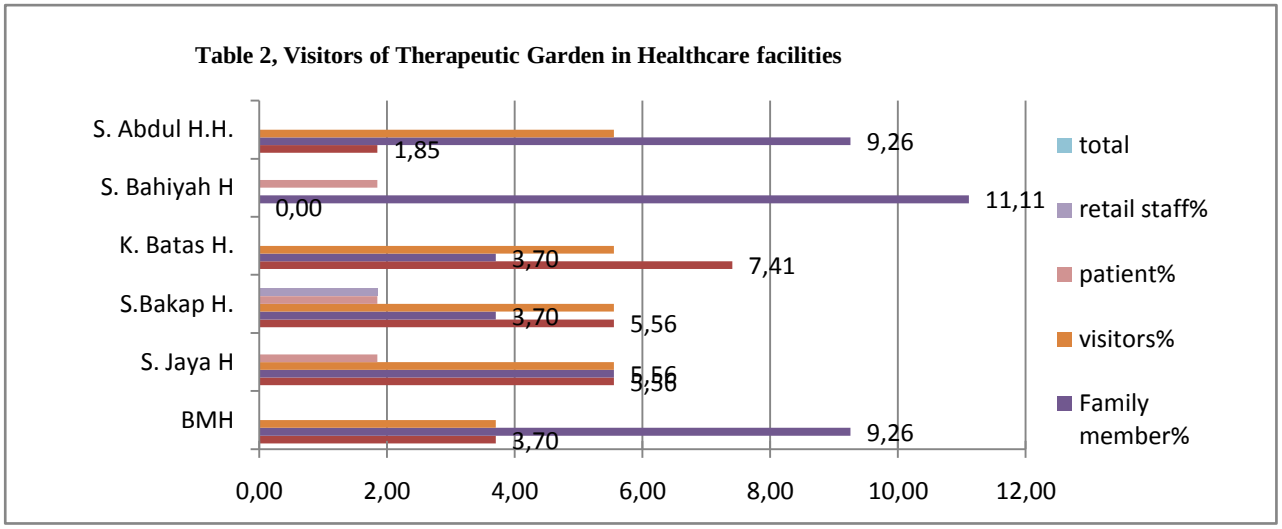
Table 2 shows the percentage distribution of the patrons by the respective healthcare facilities. In three hospitals, the majority of the patrons are the family members of the patients. However in one hospital, the members of the staff make up the majority. In one of the hospital, the family members, visitors and staff make up almost equal percentage of patrons to the hospital garden. It is significant to note that in three hospitals patients make up the least number who visit the gardens. The other three hospitals do not record any patients at all. In one of the hospitals, only family members and patients are the patrons to the garden.

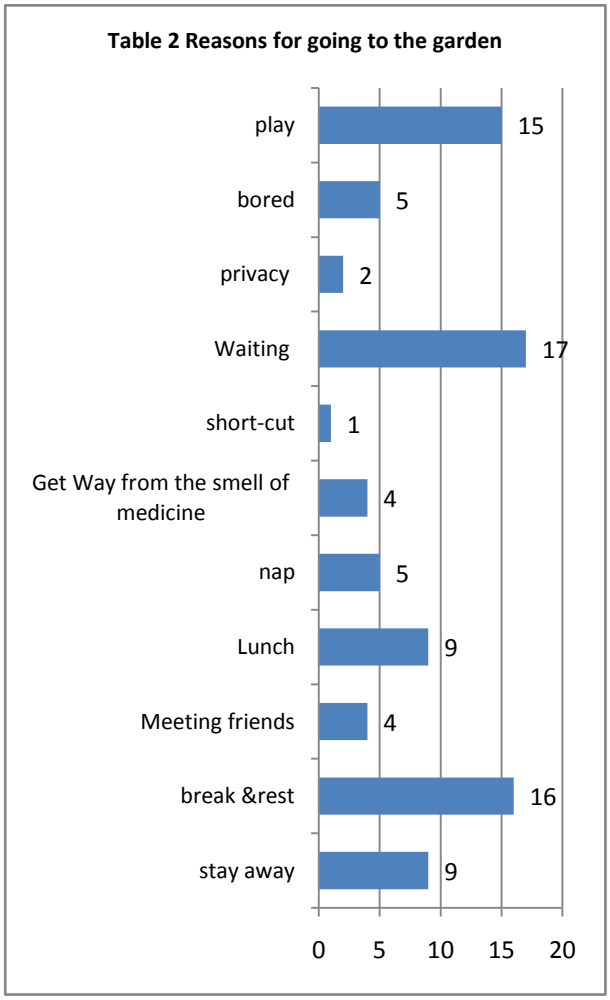
Table 3 shows that there are 11(eleven) main reasons. Waiting is the main reason, follows by 'stay-away'. The stay-away is summarized from a group of adjectives with similar meanings. (They are: stay away; get away; escape; to ease & keep myself calm; release tension; escape from crowded area.)

3.3 The reasons for going to the garden:

In analyzing the reasons for going to the garden, patrons have come out with plenty or adjectives in describing their reasons. The adjectives are: break, lunch, meet and talk, nap, wait, play, bored, rest, privacy, to ease and keep calm, outside, stay away, crowded, the smell of medicine, get away, short-cut, release tension, escape, worry, hang out. Some of the adjectives are group together or summarized with similar meanings. The result which is a combination from all the healthcare facilities is shown in **Table 3**.

Waiting, taking a break, and resting are the main reasons for the patrons to use the garden. A lot of the patrons go to the garden are the relatives to the in house patients. They need to wait for the visiting time. Some of them wait for outpatient treatments. Those who use the garden as a place to play are children. They come to the healthcare facilities with their parents who are visiting the relatives. They would be easily become restless in the wards, while waiting for their parent, they spend their time playing in the garden. There are patrons who use the garden to have their lunch and some to stay away from the wards. The staff of the healthcare facilities and the relatives of the patients and the patients themselves make up for this category. The green scenery of plants provides a relief from their stressing ward or work environment.





Those that come for a nap are the staff who find the gazebo a good place to rest and nap after a long day. A short nap will refresh them to be able to start work. Some relatives of the in-house patients do take a nap needed after a long night or day caring for their love ones in the wards.

Bored are the patrons who have to wait for too long in the out-patients departments. They use the garden to get away from the boredom of waiting.

Fig. 3. Examples of Gazebo

Bored are the patrons who have to wait for too long in the out-patients departments. They use the garden to get away from the boredom of waiting.

Patients as well as staff appreciate the privacy that the garden provides. The secluded area of the garden is the needed space to get away from the busy ward area. They are able to interact with family members without staff interference. The staff appreciate the garden as a space that is very contrasting from their busy work interiors. They are able to get away from the smell of medicine. Some even use the area as short cut to other departments in the premises.

Table 2, show that overall, the majority of the patrons who visit the garden mostly come from the groups who want a break & rest, those who are waiting, those who want play, those who want to stay away and have lunch.

Granhn's model of patrons' participation in Stigsdotter & Grahn (2002) is divided into four kinds of participations, which are participation directed inwards involvement, emotional participation, active participation and outgoing involvement. His model of participation depend on their mental power. Those involved with directed inwards involvement level where mental power is very weak. The physical activity undertaken is private, such as walking, picking or collecting fruits or woods and will not like disturbances. The highest mental power are those on the outgoing involvement.

If the reasons of visits from **Table 2** and Granh's model are match together, then the following Figure would illustrate the match. Figure 4 shows that most of

the reasons of people visiting the gardens fall under the second tier of the pyramid. They consist of patients 'family members, other visitors and even member of the staff.

The least number of patrons to the gardens are the patients themselves. Most patients need assistance if they are to venture into the gardens. They have to be accompanied by family members or the staff. This could be link to the accessibility to the gardens. The accessibility is crucial in encouraging in-house patients to the garden. Figure 2 shows some of the problem in the accessibility.

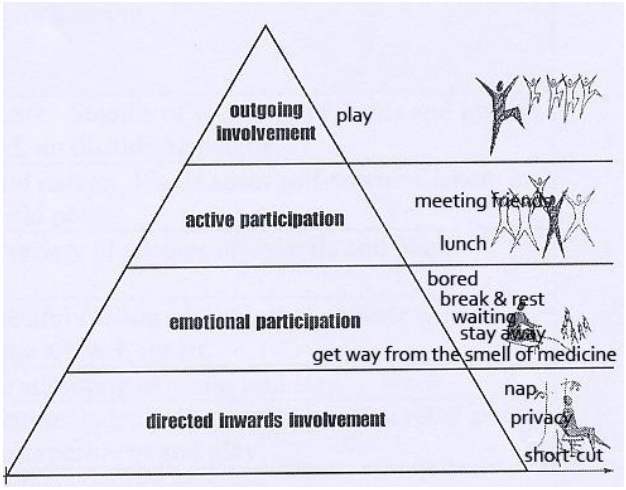


Fig. 4 Granhn's model of patrons' participation in Stigsdotter & Grahn (2002)

Stigsdotter (2004) suggested that having access or view to a garden improve comfort, pleasure and well being and Kuo (2001) claims it will lower mental fatigue, in contrast to watching the concrete block brings sensory stress Nakamura and Fujii (1992).

IV. Conclusion

The research reveals that most elements of a therapeutic garden of all the healthcare facilities concern are met. However accessibility is one of the important elements neglected by the health facilities concern. It is in direct relation to the number of visitors to the garden. Improving the accessibility will encourage more patrons especially the in-house patients to enjoy the tranquillity of the garden.

As accessibility to the garden is important, the research could be further carried out by focusing on the use of the gardens by in-patients of the healthcare facilities as they will have different physical ability or independence. Furthermore there are different groups of in-patients who consist of children as well as adults who would benefit from the garden.

References

1) Ananth, S.(2008), *Building Healing Spaces*, Explore, November/December, Vol 4. No.6, pp.363
2) English,J., Wilson,K., Keller-Olaman,S. (2008), *Health, healing and recovery*: Therapeutic landscapes and the everyday lives of breast cancer survivors, *Social Science & Medicine*, Vol. 67, pp.68-78
3) Burls,A.P., (2008), *Seeking Nature: A Contemporary Therapeutic Environment*, Therapeutic Communities, Vol.29, No.3, Autumn.
4) Burls,A.& Caan,A.W., (2005), *Editorial: human health and nature conservation*, British Medical Journal, Vol. 331, pp. 1221-1222.
5) Cooper-Marcus, C.(2007) Interdisciplinary Design and research e-Journal. Volume 1, Issue 1, Design and Health.
6) Epstein,M. (2006) *Hospital gardens help patients heal*, Healthcare Design & Construction, Special Section, www.djc.com/news/co/1118402.html
7) Hartig,T. and Marcus,C. Clare, (2006). Healing gardens-places for nature in health care, *Lancet*. Vol. 368. Pp.536-537
8) Horsburgh (1995), Healing by design, New England Journal of Medicine, Volume 33, Issue 11, pp 735-740.
9) Kuo, F.E., (2001), Coping with poverty: ompacts of environment and attention in inner city. Environment and Behavior, Vo. 33, pp. 5-34.
10) Nakamura, R., and Fujii, E., (1992). A Comparative Study of the characteristics of the electroencephalogram when observing a hedge and a concrete block fence. Journal of the Japanese Institute of Landscape Architects Volume 55,pp 139-144.
11) Rodiek,S.D. and Fried,J.T. (2005), Access to the outdoors: using photographic comparison to assess preferences of assisted living residents, Landscape and Urban Planning, Vol. 75, pp 184-199.
12) Stigsdotter, U.A & Grahn, P. (2002), What Makes a Garden a Healing Garden?, Journal of therapeutic Horticulture. American Horticultural Therapy Association.
13) Stigsdotter (2004),U.A., A Garden at your workplace may reduce stress, Design & Health, 147-157.
14) Ulrich, R.S. (1991) Effects health facility interior design on wellness: Theory and recent scientific research. Journal of Health care design, Vol. 3; pp 97-109. Reprinted in Marberry, S.O. (1995) Innovations in Healthcare Design, New York, Van Nostrand Reindhold.pp 880104.
15) Ulrich, R.S. (1999) Chapter 2. "Effects of Gardens on Heakth Outcomes: Theory and research" in Coorper-Marcus,.C and Barnes, M. Healing Garden:Therapeutic Benefits and Design recommendation. John Wiley & Sons.

ICIAP 2014

Best regards,
2nd ICIAP Organizing Committee
Department of Architecture and Planning
Faculty of Engineering
Universitas Gadjah Mada

9 786023 090211