PROCEEDING

DECODING IDEAS AND THINKING IN ARCHITECTURE

ARDC 2017
9th International Conference on Architecture Research and Design

NOVEMBER 9, 2017

DEPARTMENT OF ARCHITECTURE
FACULTY OF ARCHITECTURE DESIGN AND PLANNING
INSTITUT TEKNOLOGI SEPULUH NOPEMBER

PROCEEDINGS

9th INTERNATIONAL CONFERENCE ON ARCHITECTURE RESEARCH AND DESIGN

AR+DC 2017

Decoding Ideas and Thinking in Architecture

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Foreword

First of all, I would like to thanks to Department of Architecture and colleagues in making this international conference on architecture research and design happen. It is quite hard to manage and interpret the very interesting theme regarding how the architect think and how the idea is processed, not only they allow for subjective interpretation but also to be able in decoding intangible steps.

The 9th International Conference on Architecture Research and Design (AR+DC) is an annually conference held by Department of Architecture and in the frame of 57th Dies Natalis ITS.

In this conference we invite all of academics, researchers, and students to exchange their knowledge of theories, design methods and researches, which the idea could be based on their own experiences and related to architecture design or on interpretation from other people's experiences. Professionals are also invited to share and to discuss their design process and knowledge.

Today we have 17 papers (9 AR+DC's papers and 8 CIB's papers) from academic and researchers and I would like to thank to all participants in joining this annually conference and looking forward to meeting in the next event.

Finally, I would like to thanks to the keynote speakers Dr. Gregory K Missingham from the University of Melbourne and Mr. Ary Indra from Aboday-Architects for sharing their knowledge and experiences as well as Institution such as Indonesian Architect Institution for East Java (IAI Jatim), Association of Indonesia Higher Education (APTARI) and all sponsors which supported this conference

Best regards,

DR. Ing. Ir. Bambang Soemardiono

Organizing Commitee of the 9th AR+DC 2017

Introduction

DECODING IDEAS AND THINKING IN ARCHITECTURE

Design thinking has a paradoxical characteristic: designers agree it is the core and the most important part of a creative process, yet to explain how it works is the most difficult one. As a process, it follows a logical sequence of actions or events, requires a logical objectivity, as it also allows for subjective interpretation. To create the best decision and solution, designers should have a consciousness in their process. They cannot rely only on their intuition, but they must be able to try revealing and decoding their intangible steps.

Decoding means transforming, analyzing and interpreting a message of language, either visual or semiotic ones. So, to decode means to convert a coded message into intelligible language as well as to analyze and interpret a communication or image. The concept of decoding therefore focused on analyzing the design process and its methodologies with the objective to reach a better understanding of its structure and content as well as to improve efficiency in design practice.

In this conference, academics, researchers, and students are invited to exchange their knowledge. This will be a medium where current theories, design methods and researches on this field are discussed. It can be based on their own experiences in academic activities related to architecture design or on other people's experiences which they analyzed and interpreted. Professionals are also invited to share and discuss their design process and knowledge specifically on how they are dealing with interrelation between their objectivity and subjectivity thoughts.

Topics

Architectural theory
Keywords: pragmatism, semiotic language, hybrid language, Theoretical approaches & discourses, etc

Architecture research
Keywords: vernacular architecture, traditional architecture, architecture & urbanism, local architecture, eco-architecture, housing and human settlement design, etc

Architecture method
Keywords: transformation, contemporary idioms, digital design, narrative, diagrammatic approach, contextual approach, community based design, programmatic approach, evidence-based, etc

Architecture design

Keywords: contemporary vernacular design, creative design thinking, decode, manifesto, interpretation, reconstruction, etc

Architecture education
Keywords: exploration, utopian design model studio, concept-test model studio, digital design model studio, survey analysis design model studio, etc

Architecture practice
Keywords: pragmatism, trial & error, phenomenology, case-based, etc

Aim and Scope

Academics, researchers, and students are invited to exchange their knowledge in this conference. This will be a medium where current theories, design methods and researches on this field are discussed. On AR+DC 2017, professionals are also invited to share and discuss their design and knowledge specifically on dealing with place based design for contemporary needs.

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Program Schedule

Thursday, November 9, 2017

Day 1 Subject for Parallel Sessions: Architecture Research

1.	08.00 – 08.30	Registration	
2.	08.30 – 08.40	Reported speech	by Organizing Committee
3.	08.40 – 08.50	Speech and Opening of Conference	by Rector ITS
4.	08.50 – 09.00	Coffee Break:	
5.	09.00 – 10.30	Session 1: Keynote Speech	
6.	Moderator: Defry Agatha Ardianta		
	Speakers:		
	09.00 – 09.50	Ary Indrajanto	Aboday Design
	09.50 – 10.40	Gregory Missingham	University of Melbourne
	10.40 – 11.45	Discussion (Question and Answer)	
7.	11.45 – 12.00	Group photo session	
8.	12.00 – 13.00	Lunch and Prayer Break	
9.	13.00 – 14.30	Parralel Session I	Emerald Room (4 and 6)
10.	14.30 – 16.00	Parralel Session II	Emerald Room (4 and 6)
11	16.00 – 16.30	Closing Ceremony	By Head of Department
12.	16.30 – 17.00	Coffee break	

PARALLEL SESSION I: EMERALD ROOM IV (13.00 – 14.30)

ARDC: Architecture Research
Moderator: Endy Yudho Prasetyo

Time	Paper ID	Author(s)	Paper Title
13.00-14.30	**Parallel and Discussion**		
13.00 - 13.15	PP-ARDC17-14	Dewi Septanti, Happy Ratna Santosa, Jouke M. Post, Emilia van Egmond	MULTIFUNCTIONAL SPACE DESIGN FOR LOW INCOME HOUSES IN COASTAL SETTLEMENTS

Time	Paper ID	Author(s)	Paper Title
13.15 - 13.30	PP-ARDC17-018	Emmelia Tricia Herliana, Himasari Hanan, Hanson Endra Kusuma	EXPLORING SENSE OF PLACE FOR THE SUSTAINABILITY OF HERITAGE DISTRICT IN YOGYAKARTA
13.30 - 13.45	PP-ARDC17-029	Fuad Langguta	STREETS SPACE UTILIZATION BY USER IN THE D.I. PANJAITAN AND K.H. ALI MAKSUM STREETS AS ONE OF THE AXES OF PHILOSOPHY IN THE YOGYAKARTA CITY
13.45 - 14.00	PP-ARDC17-030	Marchelia Sari, Dwita Rahmi	CHANGE AND CONTINUITY OF THE TRADITIONAL JAVANESE LIFE STYLE OF ABDI DALEM HOUSES (Focused on abdi dalem houses near the Imogiri Royal Mataram Islam Graveyard Complex)
14.00 - 14.15	PP – ARDC17-020	Bambang Soemardiono*, Murni Rachmawati, Defry A, Rahma S, Muhammad Syafiq, Arie Ranuari, Arina Marta S. P	INNOVATIVE SUSTAINABLE STREETSCAPE DESIGN ALONG KEMBANG JEPUN CORRIDOR SURABAYA

PARALLEL SESSION I: EMERALD ROOM VI (13.00 – 14.30)

CIB W110: Informal Settlements and Affordable Housing
Moderator: Arina Hayati

Time	Paper ID	Author(s)	Paper Title
13.00 - 14.30	**Parallel and Discussion**		
13.00 - 13.15	PP-CIB17-003	Annisa Nur Ramadhani,	BEHAVIOUR SETTING AND SPATIAL USAGE ANALYSIS

Time	Paper ID	Author(s)	Paper Title
		Muhammad Faqih, Arina Hayati	ON SOMBO LOW COST FLAT'S CORRIDOR
13.15 - 13.30	PP-CIB17-005	Idawarni Asmal, Nurmaida Amri	HOUSING CHARACTER IN THE BORDER BEACH AREA OF THE CAMBAYYA
13.30 - 13.45	PP-CIB17-006	Nurul Nadjmi, Fadhillah Khairani Asrul	THE ADDITIONAL FUNCTIONS OF PORCH AND VAULT IN PANTAI BAHARI FISHING VILLAGE
13.45 - 14.00	PP-CIB17-008	Winny Astuti	HOUSING TENURE SECURITY IN RTLH PROGRAM OF SURAKARTA, INDONESIA- HOW CAN IT CONTRIBUTE TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS OF POST-2015 AGENDA?

PARALLEL SESSION II: EMERALD ROOM IV (14.30 – 16.00)

ARDC: Architecture Theory, Methods, Design and Practice
Moderator: Rabbani Kharismawan

Time	Paper ID	Author(s)	Paper Title
14.00 – 16.00	**Parallel and Discussion**		
14.30 – 14.45	PP-ARDC17-005	Rahmania Alaydrus	HOLMES St. FORENSIC LAB & EDUCATION CENTER (Idea of Interiority through the Trail Observation)
14.45 – 15.00	PP-ARDC17-015	Wawan Ardiyan S, Ainiyah Intan Permatasari	NATIVE CHARACTERISTIC OF INDIGENOUS INDONESIAN CULTURE AS

Time	Paper ID	Author(s)	Paper Title
			REFERENCE IN RE-DESIGNING TOURISM AREA
15.00 – 15.15	PP-ARDC17-035	Sri Amiranti, Erwin Sudarma	SENSORY AESTHETICS: BRIDGING THE HUMAN'S PHYSIOLOGICAL NEEDS AND THEIR PSYCHOLOGICAL NEEDS IN ARCHITECTURAL DESIGN

PARALLEL SESSION II: EMERALD ROOM VI (14.30 – 16.00)

CIB W110: Informal Settlements and Affordable Housing
Moderator: Kirami Bararatin

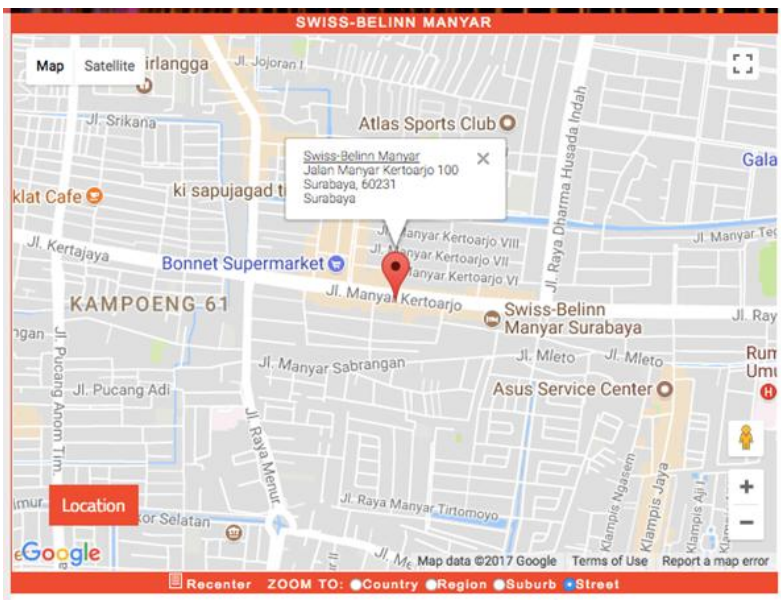
Time	Paper ID	Author(s)	Paper Title
14.00 – 16.00	**Parallel and Discussion**		
14.30 – 14.45	PP-CIB17-001	Aris Alimuddin, Shirly Wunas, Mimi Arifin, Ria Wikantari	THE CONCEPT OF COSMOLOGICAL-BASED TRADITIONAL HOUSE TOWANI TOLOTANG COMMUNITY IN SIDRAP REGENCY SOUTH SULAWESI
14.45 – 15.00	PP-CIB17-002	Purwanita Setijanti, Tanti S. R. N, Angger Sukma M, Asri. D, Muhammad A. Y	KAMPUNG DEVELOPMENT TOWARD SMART CITY
15.00 – 15.15	PP-CIB17-004	Ramos P Pasaribu, Uras Siahaan, Rumiati Rosaline Tobing	COMMODITIES SPACE FOR SOCIAL INTERACTION SPACE IN THE KAMPUNG AROUND CAMPUSES AT JAKARTA CASE STUDIES : PUBLIC OPEN SPACE AT KAMPUNG IN

Time	Paper ID	Author(s)	Paper Title
			AROUND NINE UNIVERSITY WITH CONCENTRATION AT KAMPUNG IN TARUMANAGARA AND BINA NUSANTARA UNIVERSITY
15.15 – 15.30	PP-CIB17-007	Mimin Aminah Yusuf, Dewi Septanti, Rika Kisnarini, Wahyu Setyawan, Adinda Sih PRU	THE IMPROVEMENT OF ECOLOGICAL ASPECT ON POST-URBAN RENEWAL IN PEKUNDEN FLATS, SEMARANG

Venue

Swiss-Belinn Manyar Surabaya

Address: Jl. Manyar Kertoarjo No.100, Manyar Sabrangan, Mulyorejo, Kota SBY, Jawa Timur 60231



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2017

9th International Conference on
Architecture Research and Design

DECODING IDEAS AND THINKING IN ARCHITECTURE

9th International Conference on Architecture
Research and Design (AR+DC)
November 9, 2017

CROW'S QUIZZICAL EYE: DESIGNING YOUR DESIGNING

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Abstract

A kind of personal manifesto on design thinking, this paper considers four interlaced ingredients:

- that designers are *Future Curious* and pro-active (following Clemens Steenbergen), using thinking focused differently from science and the humanities on different fields, with different methods and values (following Nigel Cross);
- that the fields and focuses of designers' thinking are constructed within Frames (of reference), arguing with and through Philip Plowright, Sir Henry Wotton, art history and Asian landscape and aesthetic traditions, noting, also, work of Carolin Stapenhorst, Klaus Krippendorf and Christian Norberg-Schulz;
- that, within continuously negotiated Frames (and their nested layers), following Kate Tregloan, the impulse a personal design epiphany provides is a product of its significance and the progress it engenders and that designers can prepare themselves to have design epiphanies both about an ongoing design and about their own designing practices,
- particularly through deliberative reflective thinking, at three levels: making design conjectures, choosing design approaches and methods and, ultimately, designing their own designing.

In this paper, I am concerned with the nature of both design and designing and how what might be called 'mature' designers take charge of their own acts of designing, becoming Masters.

Keywords:*Design Thinking, Designers' Frames of Reference, Design Epiphany, Reflective Thinking*

1. Introduction

My underlying belief is that if you know how you design, you can choose what to strengthen, what to boost, or even what to treat in an absolutely standard but adequate way because you find it uninteresting. And, to do that, you need to be aware of your own frames of reference, of your own design approaches and where you as a designer naturally find useful concepts. This is part of mastering your own designing. As a designer, mastery of yourself entails being able to control your designing.And, to do that requires …

a Taking charge of your own education
b Managing your investments in learning
c Actively learning from others' experience
d Making cases for your proposals, and
e Reflective and Deliberative Thinking.

In this paper, I am concerned with the nature of both design and designing and how what might be called 'mature' designers take charge of their own acts of designing, becoming Masters.

The Ingredients of this discussion include …

Future Curious
Frames
Epiphany, and
Reflective Thinking.

Future Curious has to do with how designers differ from, say, scientists in being far more concerned with the future than with the past. A motto derived from words of Clemens Steenbergen and Wouter Rout and observations by Nigel Cross are discussed: the Frame within which designers work is orientated toward the man-made rather than the natural or human behavioural realms, designers' methods are modelling, pattern-forming and synthesis and their values entail a concern for appropriateness.

Frames are the over-arching structures of thought under which we engage with creative work or, more broadly, with any thinking. Frames frame our thoughts, one could say. Not in detail, but in terms of limits, bones, key themes, approaches and methods, judgements of success and so on. Philip Plowright's account of three Frames dominant in architectural design since the Renaissance is canvassed and found to omit reference to current concerns for affect and people's experiences of space (or the 'phenomenological'). Art history's account of successive Frames oscillating between Apollonian and Dionysian poles is noted, together with Sir Henry Wotton's version of the Vitruvian triumvirate (and a more recent version of that). These three Western systems of Frames (synchronic, diachronic and holistic, respectively) manage to avoid granting Locality, siting, particular primary significance in determining architectural design. That is not true of some Eastern Frames. Nature as model and measure is characteristic of Chinese, Korean and Japanese garden design traditions, for example. And, there is the additional Frame associated with Chinese aesthetics, more generally, that requires an artist to place their work within the synchronic and diachronic dimensions of cultural tradition simultaneously.

Frames are nested structures, involving decisions at a number of super-imposed levels and scales. This is true, also, of a Frame where the determinants of a design outcome are the task, the site and the designer in layered contexts. Kate Tregloan's account of Design Epiphany was developed within the model of designing that sees designing as a negotiation between two realms, that of a Framed task and that of a proposal, both of which are incrementally modified in an evolving process until a satisfactory pairing is achieved. Tregloan's account sees the impulse provided toward a successful proposal as a function and measure of a Design Epiphany. Further, she identifies a number of kinds of Design Epiphany and a set of attributes of designers prepared to have Epiphanies. Key attributes include reflective thinking, with designers knowing themselves and their preferred approaches and methods as designers.

Reflective thinking is at the core of meta-cognitive levels associated with Meta-designing. Donald Schön's model of reflective thinking as a designer is unfolded from its focus on present activity both in its implicit analytic dimension (regarding immediate past activities) and in its proactive and evaluative, future-orientated dimension (its design thinking dimension) over the three levels of task-orientated, reflective and reflexive thinking. Future-orientated design thinking is described across the three associated levels: making Design Conjectures, Choosing Design Approaches and Methods and Designing Your Designing. Finally, the activities entailed in Designing Your Designing at the level of nested Frames, Design Approaches and Methods and Design Conjectures are set out in brief.

I will start out by discussing the ingredients in the order listed, above, but, like braids, each recurs and appears both earlier (if inexplicitly) and later.

2. Future Curious

2.1 Curiosity versus Knowledge

When in 2007, my then colleague, Kate Tregloan, and I sat down to design a new first year design subject as part of the Bachelor of Environments, one of the University of Melbourne's New Generation undergraduate degrees, including five Majors from our own Faculty (Architecture, Building and Planning), three from Engineering, two from Science and three from Land and Environment (Tregloan and Missingham, 2010), we adopted as a motto, the following …

Designers are driven
not
by their Knowledge
but
by their Curiosity.

Figure 1. Motto for *Designing Environments*
Modified from Steenbergen and Router (2003: 16).

Tregloan then noted a series of important differences between Knowledge and Curiosity implicit in the motto …

KNOWLEDGE	**CURIOSITY**
Is to do with ***what is***	Is to do with ***what if?***
Is already defined	Is about what is ***not yet understood***
By ***others***	Driven by ***the self***
Provides ***safety***	Entails **risk**
And is rooted in the ***Past***.	And is ***Future-orientated***.

Figure 2. Knowledge versus Curiosity

Now retired, former long-time professor of design at the Open University, Nigel Cross (2007), in admittedly shorthand, rhetorical form, argued that the three cultures of Science, the Humanities and Design differed in a number of substantive and telling ways, but particularly in terms of the phenomena they study, the appropriate methods of inquiry and the values held by each.

According to Cross, the Sciences study the natural world, the Humanities essentially study people and Design studies the artificial. In this, Cross was following the Nobel-winning economist, Herbert Simon (1969), who famously argued that design was a 'science of the artificial'.

Here, each culture is studying a field of phenomena at the same time as it is focused on particular parts of it. Even if we can gloss the 'artificial' as the *man-made* or *that-which-is-the-result-of-human-endeavour*, it's quite easy to disagree with this characterisation because Design is not passive observation. As Tregloan noted, design is future-orientated. In short, scientists study what is, the humanities study what people do and think but, if you want to change the world, then become a Designer!

Next, Cross argued that, in the Sciences, controlledexperiment, classification and analysis are its appropriate modes of inquiry, where analogy, metaphor and evaluation are the appropriate methods in the Humanities and modelling, pattern-formation and synthesis in Design. Finally, Cross said that the values of Science are objectivity, rationality, neutrality and a concern for 'truth', those of the Humanities subjectivity, imagination, commitment and a concern for 'justice' and those of Design practicality, ingenuity, empathy and a concern for 'appropriateness'. This, of course, raises the question of what might be meant by 'appropriateness'. The answer will be largely determined by the Frame.

3. Framing Designing

> interactively, we *name* the things to which we will attend and we *frame* the context in which we will attend to them.
>
> (Schön, 1983: 40)

The idea of a 'frame of reference' is important in numerous intellectual fields: sociology, artificial intelligence, anthropology, philosophy and the history and philosophy of science, at least, often using other terms and not covering exactly the same referents. The traditional way in which the history of art is taught as a succession of stylistic periods is itself founded on the idea of periodic successions of governing ideas or frames of reference. Here, for simplicity, I'll use the term 'Frame'. And, following Cross, we have …

FIELD / FOCUS + METHODS + VALUES >> FRAME.

Figure 3. Elements of a Frame.

Within our context, I begin with two quotes …

> I think that the richer the associational resonance, the richer the possible interpretations and the richer their inter-layerings the better the work of architecture. Further, I think that the richer the possible experience, the richer the possible uses and the more the modes of appropriation invited the better the work. That work is best that simultaneously achieves these ends with the greatest economy of means – that is, it exhibits maximum richness, maximum subtlety and maximum mnemonic resonance with the minimum of architectonic means.
>
> Missingham (1987: 84).

> A consequential project both connects to generationally shared set of social, political, and cultural desires, which exceeds authorship, and at the same time develops within the practice as a sustained set of material, organizational and formal interests that connect across time, at disparate scales, programs and sites, and with a particular authorial stamp.
>
> Reiser and Umemoto (2017, from publicity for a lecture at the University of Melbourne)

In the first quote, writing about Jane Davies' student design thesis project, my first sentence focuses on building form, even iconography. The second sentence concerns people's experience and their adoption of a built facility and the third concerns resource parsimony. In short, I am appealing to something like the Vitruvian triumvirate (if not in the usual order): delight, commodity and firmness. The second quote, thirty years later, couches a similar trio (together with noting 'sites') within three social dimensions: of shared community values, of organisational values and of artistic signature. Both sets of remarks expose the authors' Frames of Reference for thinking about architectural design. All statements of what makes good architecture do this.

3.1 Designers' Frames of Reference

Philip Plowright (2014) claimed that the history of architectural design has been dominated by three Frames:

1 Patterns
2 Resolution of Forces, and
3 Concepts.

Architects whose designs are Framed as***Patterns***are fundamentally interested in shape, both of buildings as a whole and as two-dimensional diagrams in plan, as types, or as surfaces. Historically, we can think of Palladio with his interest in proportion and the harmony of the spheres, of Le Corbusier and his Modulor and of Dom Hans van der Laan and the elegant, perception-based proportion system he used in designing a number of Dominican monasteries and nunneries (Van Der Laan, 1983, Voet et al, 2016). More recently, we can think of Frank Gehry or Zaha Hadid. Plowright's own examples include Durand, Raphael Moneo and Aldo Rossi (Plowright, 2014: 39-40).

Architects whose designs can best be understood as Framed as***Resolution of Forces*** include the designers of the building I work in, the Melbourne School of Design: John Wardle and Nader Tehrani (Clark, 2016). But, the most influential relatively recent body of work in this vein is that of Christopher Alexander and the Center for Environmental Structure at the University of California, Berkeley, on patterns and pattern language (Alexander et al, 1977). Plowright's own examples include Viollet-le-Duc, Frank Lloyd Wright, Foreign Office Architects, BIG and MVRVD (Plowright, 2014: 40-44).

Architects whose designs are Framed as ***Concepts*** are now too numerous to cite but, though commonly thought of as a formalist (Patterns), Peter Eisenman has the longest recent history of driving his designs by Concept. (Eisenman, 2004, Eisenman Architects, 2002) Rem Koolhaas and Bernard Tschumi are also prominent, particularly with students. (Office of Metropolitan Architecture, R. Koolhaas and B. Mau, 1998; Tschumi, 1994, Migayrou, 2014) Plowright provides no examples (2014: 44-47). A dominant, cognate Frame in Melbourne architecture is that of ***Architecture as a Cultural Practice***, with Peter Corrigan as its late champion (Haman 2012).

Supposing we grant Plowright's view that there are dominant Frames in architectural design, then the contemporary reaction to computer-supported design thinking in architecture (as with parametrics) is a fourth Frame which we could refer to as ***Affect***. It is usually referred to as *Phenomenology* or *Psychogeography*, concerned with people's experience of the built environment, particularly with interior experience and emotional effects (Norberg-Schulz, 1971, 1980, 2000, and Coverley, 2010). Robert McCarter (2016) argues both that the very reason we have architecture is to support interior experience and that most human experience is of interiority. For the Frame ***Affect***, everybody's contemporary champion architect is Peter Zumthor, but we could equally fondly think of the Baroque architects Bernini, Guarini, Fischer von Erlach and Zimmerman or the Ottoman Sinan.

3.2 Carolin Stapenhorst on Concepts

In Carolin Stapenhorst's recent book (2016), she identifies three primary senses of the term 'Concept' as it is used in architectural discourse and provides each with a Chapter:

CONCEPT as Repository of Rules, Strategies and Criteria
CONCEPT as Generator and Communicator
CONCEPT as Explorer of Non-architectural Knowledge.

There are two other senses of "concept" in Stapenhorst's book to which she doesn't draw the same attention:

> CONCEPT as Result of and Guideline for an Ideational Process, and
> CONCEPTual use of Architectural References (= precedents).

The first sense is that often taught as the 'Governing Idea', which is then to be used in the second and fourth senses, ideally.

3.3 Krippendorf's Semantic Turn

In his 2006 book, *The Semantic Turn*, Klaus Krippendorf argues, essentially, that designers are working in a ***semantic ecology***, that the act of designing is an interpretative one, that designs themselves both are constructed as meaningful entities, as complexes of affordances inviting interpretation and use and, when manifest in the wider world (outside the office, factory or school) are subject to interpretation in terms of their status, function, merit and aesthetics. Designs are laden with meaning and enter an ecology of meaning and values in the very nature of being human artefacts, and they are not evaluated, in practice, through people's ordinary engagement with them primarily on technological grounds but on essentially semantic and emotional ones. I put it like this (Missingham and Selenitsch, 2002: 10 of 18):

> most artefacts are only partial manifestations of the designed entities that are inextricably associated with particular sets of ideas

Krippendorf raises Plowright's Frame of ***Concepts*** to being ***the*** Frame. In this so-called Age of Information, I don't think that we should be surprised by these developments.

3.4 Frames of Reference in Western Architectural Thinking

Plowright's is a ***synchronic*** account of Frames of Reference in architectural design, concerned primarily with identifying and cataloguing key examples of Patterns. Art historians will be more familiar with a ***diachronic*** account, concerned with changes over time, often built around the idea of reactionary periods successively transcending each other, oscillating between Apollonian and Dionysian poles (Nietzsche, 1872): the Renaissance, the Baroque, Neo-Classicism, Romanticism, Modernism and Post-Modernism, for example. (We could consider this an oscillation between Plowright's ***Patterns*** Frame and an ***Affect*** Frame.)

Neither account attempts to embrace more fully the complexity of everyday architectural design in the way that Henry Wotton's three-part version of ideas from Vitruvius does: Firmness, Commodity and Delight – or, in contemporary terms: Technology, Amenity and Poetry (the version used in my undergraduate elective subject *Design Workshop* because many students took 'Commodity" to be a matter of Economics theory). This influential trio is simplistic but useful and may be referred to as a ***holistic*** account not because of its achievement but because of its intent.

The synchronic account focuses architects' attention on the building, the diachronic account focuses architects' attention on the building and the holistic account focuses architects' attention on the building. All three accounts tend to omit focusing on crucial aspects of Locality (cultural- and socio-political and economic context, topography, climate, ecology or what first Australians refer to as 'respect …' or 'concern for country').

But, these are Western views. Other Frames have dominated and do elsewhere.

3.5 Nature as the Model and Measure

We can start examining other cultures' designing Frames through considering four cultures' attitudes to stone, for example: Korea, Sri Lanka, Japan, and China.

I start with Korea, because it appears to have the most direct relationship between stone and design. A characteristic way in which certain kinds of Korean garden are established is to place a pavilion on a large or interesting natural outcrop of living rock without in any way modifying the rock. What is of importance is the view out across the landscape from the pavilion. Here, nature (man-modified and otherwise) is to be admired and not disturbed (Korean Institute of Traditional Landscape Architecture, 2007: 255-300).

In Sri Lanka's ancient palace complexes, natural granite boulders, often very large, appear to be exploited in a curious way. Generally, the building complexes are relentlessly rectilinear and apparently constructed without regard for the boulders that are naturally strewn around much of the north of the island. But, this must be an illusion. Seemingly, the boulders simply disrupt the building texture wherever they occur. But, the result is, in every case I encountered, a dialogue between the natural and the man-made. Each realm is stronger and more interesting for the forced juxtaposition. And, this sensitivity continues, for Sri Lanka's most celebrated architect, Geoffrey Bawa, understood this device and often employed it (Robson, 2002: 31, 93-94, 204-205, 209) Here, nature and the man-made mutually contribute to a richer whole.

One ancient and still used term for landscape gardening in Japan is *seki*. It means 'placing stones'. In the Japanese garden, the designer finds his individual stones in the mountains, on an island or in riverbeds and uses each stone in the garden more or less as it was found in a new association with new fellows. Here, nature is represented in modified form and individual stones are respected for their nature. However, in the collective, it is a representational use of the stones, symbolic and an aid to meditation and there is very little that is actually natural about the garden. It is very closely designed. (Slawson 1987, Keane 2002)

The private Chinese garden tradition is similarly representational, symbolic, an aid to meditation (contemplation and reverie) and even less actually natural. The natural world is held to be the supreme model, but the garden is a compressed, enhanced, distilled representation. The stones that make up artificial mountains are usually carefully crafted but it is the specimen stones (usually limestone), looking like frozen champagne explosions or baroque versions of Henry Moore sculptures that visually set this tradition apart. These stones are to exhibit *qi* with their writhing forms and they usually balance on their point, at a tense equilibrium, poised as if they could topple at any moment. (Rambach and Rambach, 1987)

What is common to these traditions is the dialogue with ***Nature*** as a continuing aesthetic and spiritual tradition, as *THE* Frame, providing both models and measures of success.

3.6 Norberg-Schulz and The Meaning of Western Architecture

Now, it's simply not true to say that there are no important western thinkers in architecture that have argued that ***Locality*** (as is otherwise missing from *Design Workshop*'s modified version of Wotton's version of Vitruvius) ought to be considered a key determinant of architectural design. One of the reasons I particularly enjoy the opening chapters of Norberg-Schulz's (1974) *Meaning in Western Architecture* is the way in which he stresses that the differences between Egyptian, Greek and Roman architecture were based in very different ideas about the nature and function of buildings and cities and, in turn, that these different ideas were rooted

in differences of geography and topography (or place) and local materials. *Bannister Fletcher'sA History of Architecture*(Musgrove, 1987) is a much older architectural history text now no longer fashionable that took location as the key determinant of architectural style.

In my own country, it could be argued that the dominant Australian architectural Frame, despite eighty-plus per cent of us living in cities and what has happened architecturally in Melbourne, is that of the ***Pavilion-in-the-Landscape***, championed by Gabriel Poole, Glen Murcutt, Peter Stutchbury and Troppo Architects, for example. (Goad and Bingham-Hall, 2001)

3.7 Then-Now, There-Here / Gujin [古今], Bici [彼此]

As with its gardens, traditional Chinese aesthetics requires an artist to place their work of art ideally in the Chinese philosophico-aesthetic cultural tradition simultaneously in both synchronic contextual and diachronic senses. The expressions used are ‘then and now’, ‘here and there’ (Wu, 2012). This is a very rich, culturally affirming Frame. It is almost what we expect of our contemporary PhD students: that they contextualise their work within a historical stream of disciplinary concern and demonstrate, also, that they are across current thinking on the matters they are studying (Missingham, 2016). (I think that both the Korean and Japanese traditions might expect something like this, also, but have seen no direct evidence of it.)

This is a Frame that is entirely consistent with a Semantic Ecological one.

4. Epiphany

Now, effectively, I do have my own Frame that I’ve been showing students for years that also includes Locality, the Task and the Designer with a Context, defining the field of possibilities (**Figure 4**) …

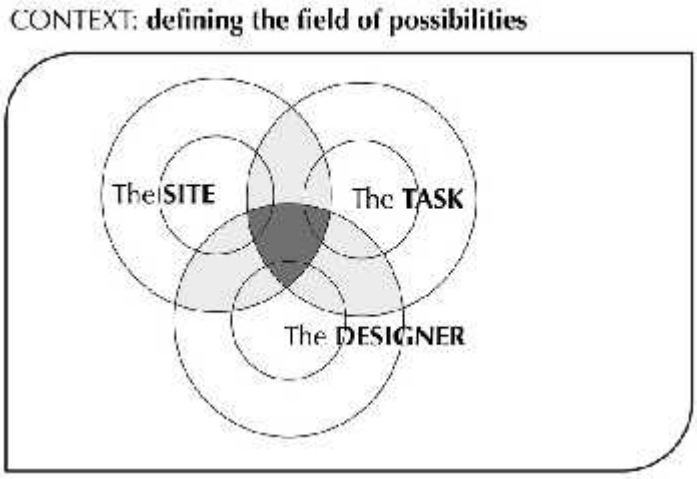

Figure 4. Key Determinants of Design Outcomes.

Importantly, Frames are nested structures. For example, a Frame focused on People (those who determine the Task, above), might note at least three scales of concern:

The SCALE OF **THE COMMUNITY**
Primarily expressed in ***symbolic*** ways: reifying + giving presence;
The SCALE OF **THE GROUP** / FAMILY or ORGANISATION

Primarily expressed in ***behavioural*** ways: function; and

The SCALE OF **THE INDIVIDUAL**

Primarily expressed in ***psychological*** ways: perception + affect.

It should be easy to see that each of the other Key Determinants is equally and often associatively nested.

We can think of the site as the footprint of the building(s) designed, only, or as that immediate area plus circulation around it, perhaps with terraces and gardens. We could think of the site as the whole plot of land on which a building will sit, boundary to boundary. We could think of the site as the parcel of land in its immediate urban, suburban or rural environs or in terms of the valley in which it sits or the forest surrounding it or the hillside on which the building might be located.

Finally, as a designer, each of us is an individual. But, in the world of practice, we usually work in teams, as a company or professional practice, and we are members of our profession and of the wider intellectual discipline of architecture with its history and traditions. We are all of these kinds of designer simultaneously, even when working 'alone' on a single project.

Now, given such a Frame, how does a designer get good ideas and how can they prepare themselves to have good ideas?

4.1 Tregloan on Design Epiphany

In her account of Design Epiphany, Kate Tregloan (2014) developed a version of the model of designing that sees a task and a proposal for its resolution as an evolving pair: Framed task and proposal. (For a related discussion but couched in very much older terminology, see: Dorst and Cross, 2001.) Initially, the task is ill-defined, possibly because the Frame that encompasses it is relatively inexplicit. Accordingly, appropriate proposals for completing or satisfying the task are similarly ill-defined, probably even more so. In this model of designing, over time the designer gradually and incrementally refines the definition of the Frames and hence the task and modifies proposals accordingly until a sufficiently appropriate pairing is arrived at. A Design Epiphany, that famous "aha" experience, may occur in the process of that designing.

Tregloan describes Design Epiphany, so:

a Epiphany is an experience of personal insight in response to a particular situation
b It is concerned with creative outcomes (novel, valuable and suggestively fecund – my definition of 'creative' rather than Tregloan's related version, from Missingham, 2010)
c Epiphany is both an emotional and intellectual (affective and cognitive) experience
d Design Epiphany is a cognitive outcome (rather than a process) that may offer insight to either or both design outcomes or processes
e Fruitful intersection of developing task and resolution proposals is key outcome and test of a Design Epiphany, and …
f The value to a design project of a Design Epiphany is related to change in momentum toward a successful proposal.

That is, the impulse from the Design Epiphany is the momentum it provides toward a successful proposal. Or, in Tregloan's shorthand version …

Design Epiphany Impulse = Significance X Progress.

Figure 5. Design Epiphany Impulse

This account of Design Epiphany allows both for 'slow burning' Epiphanies and for the more recognisable, 'instant' Design Epiphanies that are usually noted and reported – as in the commonplace comparison between, for example, Beethoven's working out of the theme for the 5th Symphony over 40-odd years as compared with Mozart's reputed practices.

Tregloan identifies a number of types of Design Epiphany, including those that may be most familiar to you:

Design **project** epiphany (with which we are most familiar, where the insight propels the progress of the proposal), and

Design **practice** epiphany (in which the designer's insight relates to how their own designing might better take place or better be conducted: more efficiently, more effectively or more expressively – Professor Emeritus Graham Brawn's three "Es" of better designing in words not actually used by Tregloan but implied).

And, finally, for Tregloan, a Designer prepared for Epiphany is …

a **Active**: working on many levels with many simultaneous agendas
b **Opportunistic**: ready to take advantage of ambiguity
c **Confident**: clear about ambitions and abilities
d **Informed**: having relevant information together with knowledge of procedures
e **Adventurous**: flexible about means to achieve desired outcomes
f **Skillful**: practiced in many forms of representation and able to build on them
g **Balanced**: can integrate abstract with practical views of designs and possible designs
h **Reflective** (when designing): able to use perception and judgement, diverging or converging, with productive engagement
i **Reflective** (on the design and designing): aware of the impact of personal perspectives and preferences.

(With all these references to Tregloan's work, I have sometimes quoted verbatim but have usually modified the original wording to shorten it, but always trust that I haven't altered Tregloan's meaning too radically. Please, consult the excellent original.)

5. Reflective Thinking

Now, it's this last pair of characteristics of a designer prepared for epiphany that I'd like to pay a little more attention to, this reflective thinking as designers.

Consider the following comments:

> For the most part, …, students hold unrealistically high expectations for their performance. Once they become aware of their perceived shortcomings, they believe they should be able to produce complete and perfect designs. They see shortcomings as failure, and when they reproduce their shortcomings, they experience a blow to their self-esteem. They do not as yet have the idea of a learning process in which imperfect actions are continually modified through reflection-in-action. Hence, their growing awareness of complexity and dilemma leads them to discouragement or even despair.

> …
> It was a relief for them to become aware of their unrealistic expectations for their own performance. It helped them to be able to lower their own expectations and to see incompleteness, corrected in the doing, as a necessary concomitant of effective practice.
> (slightly modified from Schön, 1987: 291 and 292)

Further, the empirical educational, pedagogical evidence is that being able to think meta-cognitively about your own thinking allows you to improve your thinking in general regardless of the field within which it is applied. It encourages a life skill that transfers to success in other academic subjects and to all your endeavours as professionals and citizens.

And, student TEW's comments:

> … in design studios it should be part of your assessment to write a piece reflecting & evaluating your work / end result (a post completion essay) comparing your hopes & dreams for the project against actual outcomes. I think it would be a great tool for students to try to learn from their mistakes & also for tutors to get a better understanding of their students and their work.

Let's begin with what Donald Schön (1983) calls ***knowing-in-action*.**This is the kind of thinking required, for example, while riding a bike, typing, working with a computer program or to play a musical instrument when you are skilled in doing so. What he calls ***reflection-in-action***is where you are making design decisions in the here-and-now, in the act of designing (what Schön refers to as "having a dialogue with" the drawing or with the design as it unfolds). Both these kinds of thinking are thinking ***in the present***. What he calls ***reflecting on reflection-in-action*** can occur in the present, also, but is quite likely to be a little retrospective. Let's agree to call these kinds of levels of thinking, **Thinking-in-Action**. Catching such Thinking in Action is difficult – particularly as stopping doing it to take note of it means that you have shifted to a retrospective, analytic mode of thinking.

Protocol studies of designing taking place attempt to catch this kind of thinking, studies that try to capture design thinking as it happens. Peter G Rowe (1987) is referring to interview-sourced protocols of three students working through their proposals. Schön (1983) is referring to discussions, recorded in detail, between a design tutor and a student working through issues she is having with her developing proposal.

For designers, then, there are at least three levels of thinking: thinking about the project, the task (= Task thinking), reflection-in-action or thinking *as you are designing* about how to tackle the project (= Refle***ctive*** thinking) and thinking about that design thinking, itself(= Refle***xive*** thinking). But, in the heat of the action, in the absorption of designing, we don't usually stop to examine our actions like this. These kinds of thinking are usually all retrospective thinking, thinking that is about what has already happened, thinking about matters ***in the past***. This is why I can call it **Analytic Thinking**. Catching such thinking might be difficult but not impossible as the work itself, documented in notes, sketches, drawings, models and reports (especially those that include arguments for the proposals), provides much of the evidence.

Now, neither Analytic Thinking nor Thinking-in-Action are quite what designing actually and necessarily frequently and crucially entails – thinking that is both proactive and involves evaluation of outcomes. This kind of thinking has been called deliberative thinking. That is, neither past-orientated Analytic Thinking nor present-orientated Thinking-in-Action quite capture thinking in designing.

So, as you will have guessed, I think we should recognize that there is ***Future-orientated*** thinking and that it can be quite carefully conducted and controlled by you, as designers. It is ***prospective***, about what is possible – in terms of the task, in terms of design approaches and in terms of one's own thinking (those same three levels, again: Task, Reflective and Reflexive thinking). But, I think it is much better described as **Proactive and Evaluative Thinking**. At the level of Thinking about the Task, Proactive and Evaluative Thinking entails making proposals that test out options and explore the territory of possibilities on the assumption that the particular shortcomings revealed will tell you very much more about that territory and how to make better, more focused proposals next time. Proactive and Evaluative Thinking is concerned very much not with immediate success but with personal learning – at each of the three levels, and with continual improvement of proposals.

At the level of thinking about the task itself, various design tactics or motifs or, better, ***design conjectures***can be employed Proactively and Evaluatively. Here, I have in mind the kind of procedure claimed as characteristic of science in Popper (1972). Faced with a growing design scheme, often a designer trials a series of alternative continuations, testing various constraints, the client's actual wishes or, simply, formal options.

At the level of Reflective Thinking, Proactive and Evaluative Thinking can employ any number of useful *heuristic strategies*and that is why it is so very powerful. Here, the designer is choosing ***Design Approaches and Design Methods***. Design Approaches have to do with what you are trying to achieve under a Frame. Design Methods have to with how to get where you want to get.

At the level of Reflexive Thinking, of thinking about one's own design thinking, Proactive and Evaluative Thinking entails ***Designing your Designing***.

So, to summarize, these are the kinds of thinking that I think are involved in designing (see **Figure 6**, below). Nine kinds of thinking. I recognize that this seems to complicate matters but I think it should make your actual designing practice more comprehensible and easier to report on.

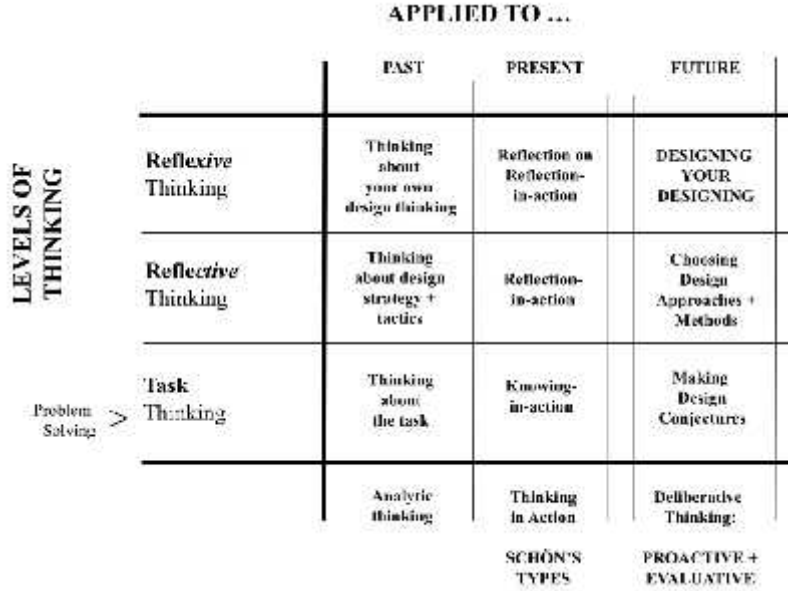

Figure 6. Thinking in Designing

5.1 Designing Your Designing

Now, what is entailed in Designing Your Designing?

The first level of thinking is the highest level of thinking, the level of Designing, generally. At the level of ***DESIGNING YOUR DESIGNING***, design thinking involvesChoosing / Developing / Recognizing your own FRAME(s),remembering that Frames are nested structures, covering matters at a number of scales.

Mind you, I am well aware that some designers engage with different Frames at different scales of consideration in their designing, probably unaware that they are doing so. Further, there are Frames appropriate to particular and different scales of designing.

At the level of ***THE DESIGN***, itself,a designerwho is Designing Their Designing isprimarily choosing ***Design Approaches and Methods*** (Heuristics) that follow from and/or support the Frame (and, so, are not working against their own grain).

At the level of ***THE IMMEDIATE TASK***a designer who is Designing Their Designing is primarily making ***Design Conjectures***and evaluating the results.

But, the detail of each of these levels, how to do it, has to wait for another opportunity for me to discuss it.

5.2 Last Note

Readers may have noticed that, in this essay, the only place where I refer to problem solving in respect to designing is in **Figure6**, in the very bottom left, as a subset of Task Thinking. Talk of ‘problems’ and ‘solutions’ belongs in medicine and engineering. However, it would be unfair to blame the terminology entirely on the popularity of Gyorgy Polya’s (1957) book or the adoption of its jargon by various engineers writing on design methods. Given my views on designers being *Future Curious*, and that designerly thinking occurs at at least three scales, I find the characterization of designing as being essentially problem-solving as misleading, backward-looking and an impoverished understanding of what designing really entails. Designing has always been and is very much more than mere high school mathematics exercises.

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References

Alexander, C.; S. Ishikawa, M. Silverstein with M. Jacobsen, I. Fiksdahl-King and S. Angel (1977), *A Pattern Language: Towns • Buildings • Construction*, Oxford University Press, New York.

Clark, J. [ed] (2016), *This Building Likes Me: John Wardle Architects*, Thames & Hudson Australia, Port Melbourne, VIC.

Coverley, M. (2010), *Psychogeography*, Pocket Essentials, Harpenden, Herts..

Cross, N. (2007), *Designerly Ways of Knowing*, Birkhäuser, Basel.

Dorst, K. and N. Cross (2001), Creativity in the design process: co-evolution of problem-solution, *Design Studies* 22, 425-437, Elsevier, Milton Keynes, UK.

Eisenman, P. D. (2004), *Eisenman inside out: selected writings 1963-1988*, Yale University Press, New Haven, Conn.

Eisenman Architects (2002), *Blurred Zones: Investigations of the Interstitial: Eisenman Architects 1988-1998*, The Monacelli Press, New York.

Goad, P. and P. Bingham-Hall (2001), *New Directions in Australian Architecture*, Pesaro Publishing, Balmain, NSW.

Hamann, C. (2012), *Cities of Hope Re-Membered/Re-Hearsed: Australian Architecture and Australian Stage Design by Edmond and Corrigan 1962-2012*, Thames & Hudson Australia, Port Melbourne.

Keane, M. P. (2002), *The Art of Setting Stones*, Stone Bridge Press, Berkeley, CA.

The Korean Institute of Traditional Landscape Architecture, (2007), *Korean Traditional Landscape Architecture*, Hollym, Elizabeth, NJ & Seoul.

Krippendorff, K. (2006), *The Semantic Turn: A New Foundation for Design*, CRC/Taylor & Francis, Boca Raton, Florida.

McCarter, R. (2016), *The Space Within: Interior Experience as the Origin of Architecture*, Reaktion Books, London.

Migayrou, F. [ed] (2014), *Bernard Tschumi: Architecture: concept & notation*, Centre Pompidou, Paris.

Missingham, G. (1987), 'Order Defined and Chaos Risked': Jane Davies' National Archives project, *Transition*, (22/23), 84-89, Department of Architecture, RMIT University, Melbourne, VIC.

Missingham, G. (2003), Figuring Ariachne's Gardens: Reflecting on Research-led Teaching in Design, Paper for: *Design + Research: Project Based Research in Architecture, Proceedings of the Second International Conference of AASA*, 17 pp, 28-30 September 2003, Melbourne. [http://www.arbld.unimelb.edu.au/events/conferences/aasa/papers.]

Missingham, G. (2010), Greg Missingham, in: Williams, A.; M. J. Ostwald and H. H. Askland, [eds], *Creativity, Design and Education: Theories, Positions and Challenges*, Australian Learning & Teaching Council, Sydney, 103-106.

Missingham, G. (2016), Design Education All Over the Place: On the plethora of dimensions of Design Education and the peculiar place of PhDs by project, Paper for: *Art and Design Education in the Global 24/7*, 23-25 September 2015, Adelaide. [http://acuads.com.au/conference/2015-conference/].

Missingham, G. and A. Selenitsch (2002), Transplants, Transferences and Translations: Exchanges of strategies and design ideas, gardens and cross-cultural considerations, Paper for: *ADDITIONS to architectural history: XIXth annual conference of the Society of Architectural Historians, Australia and New Zealand*, 18 pp, 4-7 October 2002, Queensland University of Technology, Brisbane.

Musgrove, J. [ed] (1987), *Sir Bannister Fletcher's*A History of Architecture, 19th edn, Butterworths, London.

Nietzsche, F. (1872), *The Birth of Tragedy: out of the spirit of music*, Penguin, Harmondsworth, 1993.

Norberg-Schulz, C. (1971), *Existence, Space & Architecture*, Praeger, New York.

Norberg-Schulz, C. (1974), *Meaning in Western Architecture*, rprt Studio Vista, London, 1975.

Norberg-Schulz, C. (1980), *Genius Loci: Towards a Phenomenology of Architecture*, Academy Editions, London.

Norberg-Schulz, C. (2000), *Architecture: Presence, Language, Place*, Skira, Milan.

Office of Metropolitan Architecture, R. Koolhaas and B. Mau (1998), *Small, Medium, Large, Extra Large*, 2nd edn, The Monacelli Press, New York.

Plowright, P. D. (2014), *Revealing Architectural Design: Methods, Frameworks and Tools*, Routledge, Abingdon, Oxon.

Polya, G. (1957), *How to Solve It: A New Aspect of Mathematical Method*, 2nd edn, rprt: Penguin Books, Harmondsworth, 1990.

Popper, K. (1972), *Conjectures and Refutations: the growth of scientific knowledge*, 5th edn, Routledge & Kegan Paul, London.

Preziosi, D. (1979), *Architecture, Language and Meaning: The Origins of the Built World and its Semiotic Organisation*, Mouton, The Hague.

Rambach, P. and S. Rambach (1987), *Gardens of Longevity in China and Japan: The Art of the Stone Raisers*, Skira / Rizzoli, New York.

Robson, D. (2002), *Geoffrey Bawa: the complete works*, Thames and Hudson, London.

Rowe, P. G. (1987), *Design Thinking*, The MIT Press, Cambridge MA.

Schön, D. A. (1983), *The Reflective Practitioner: How Professionals Think in Action*, Harper Colophon/Basic Books, New York.

Schön, D. A. (1987), *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions*, Jossey-Bass, San Francisco.

Simon, H. A. (1969), *The Sciences of the Artificial*, The MIT Press, Cambridge, MA.

Slawson, D. A. (1987), *Secret Teachings in the Art of Japanese Gardens: Design Principles, Aesthetic Values*, Kodansha International, Tokyo.

Stapenhorst, C. (2016), *Concept: A Dialogic Instrument in Architectural Design*, Jovis Verlag, Berlin.

Steenbergen, C. & W. Roh (2003), *Architecture and Landscape: The Design Experiment of the Great European Gardens and Landscapes*, Rev & exp edn, Birkhäuser, Basel.

Tregloan, K. (2014), *Design Epiphany and the Opportunities of Wickedness: constructions of insight, perspective and design*, unpublished PhD dissertation, The University of Melbourne, Parkville, VIC.

Tregloan, K. and G. Missingham (2010), Designing 'Designing Environments', Paper for: *ConnectED 2010 International Conference on Design Education*, Paper 50, 28 June-1 July 2010, Faculty of the Built Environment, UNSW, Sydney, CD-RoM ISBN 978-0-646-54506-6.

Tschumi, B. (1994), *Architecture and Disjunction*, The MIT Press, Cambridge, MA.

Ulmer, G. L. (1994), *Heuretics: The Logic of Invention*, John Hopkins University Press, Baltimore.

Van Der Laan, Dom H. (1983), *Architectonic Space: Fifteen Lessons in the Disposition of the Human Habitat*, E J Brill, Leiden, The Netherlands.

Voet, C. with R. de Carpentier and R. van der Laan (2016), *Tomelilla: Dom Hans van der Laan: architectural theory in practice*, Van der Laan Stichting/Architectura & Natura, Amsterdam.

Wotton, H. (1624), *The Elements of Architecture*, facsimile edn, The University of Virginia Press, Charlottesville, 1968.

Wu X. (2012), History, *Neo*-Confucian Identity, and Landscape at the Yuelu Academy, in: S Bann, [ed], (2012), *Interlacing Words and Things: Bridging the Nature Culture Opposition in Gardens and Landscapes*, Dumbarton Oaks / Harvard University, Washington, DC, 65-80.

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FRAMING MEMORY

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Abstract

Today is the ocular centrism era of architecture. As a product of growing society, they are fragile to changes and irrelevant interference. It is now a bodily enjoyment, deviates from the very idea of architecture as a spiritual experience. Intellectuality is paramount of important, shifting away from its emotional aspect.

As an architect, we are a definite author. When architecture has been reduced to merely visual spectacle or signages, we need to return back and start speaking with our own language. With their innate capacity to remember place, time, material and other atmospheric situation, architect therefore need to rework their framework of working method. Design as architects common language and memory as its vocabulary need to be further developed, as part of our structured mind.

Keywords:*memory, framework, conscious mind, pre-conscious mind*

A month ago I was driving along the street of Rejawinangun area in Yogyakarta. We were looking for an address, when suddenly my eyes stumble upon a modest faded pink building on the roadside. Intrigued by what we see, we got down and walk towards the structure and suddenly, without any warning we were already within building vicinity. There was tall boundary wall with brick pattern, alongside a series of open spaces. Walls, no roofs, with different shapes and heights. Javanese ornamentation and form in contemporary style highlight certain parts of its highest wall. We tried to find our own position, rubbing the curve of what used to be a door jam, peering into some hidden parts, all of those with a hint of scene that seems come from the past.

There was no need to hurry, no urge to move on. We were simply, present. A 17th century ruin, Umbul WarungBoto[1] has just been renovated months back; we later found out. It just stood there, in the midst of our journey. We were immediately aware of the quality and beauty of that place, which stood in sharp contrast to the randomness of many infrastructure buildings we had seen scattered around the area. We then spent the next minutes to discuss. Was it architecture? Or sculpture? Was it a piece of water infrastructure? It was rather impossible to put it in a specific genre, nor defining its actual size, as some of it has been disappear. But we felt that what was built there related in a specific way to our body. It is an enjoyable space of emptiness, producing a state of heightened attention to the 'now', and sharpened our appreciation to this man made structure of imagination.

[1] Umbul WarungBoto was erected in 1785 oleh Hamengkubuwono II as a weekend getaway for Yogyakarta royal family. The small compound consisted of small bungalow, plunge pool as well as special area for ritual ceremony. Built in the area of Rejawinangun, this composition of pink thick walls is adorned with Javanese ornamentation and form. It was abandoned around the period of early 20th century before being renovated in 2015 and open to public in 2016.

Those lyrical impressions of my mind towards what I saw, do not happen any day. I can count with all my finger how many architectural objects can stop me, make me think and feel. Not only those which can be seen by my eyes. Architecture should offer inspiration, enjoyment and comfort. Maybe this is a new awareness, of how spaces can be enjoyed both physically and emotionally. We want to be present in a space, to interact, to be in the same wave length of merging into its materiality. People began to realize that in appreciating architecture, we are not just a pair of eyes wandering and inspecting; we have bodies, senses, emotions, expectations and memories.[2]

Umbul WarungBoto with its non-universal language captures imagination of passers-by. Unlike other buildings around that seems to be uniform, containing almost similar message: of putting themselves on 'sale'. Those billboards architecture are happening around us, in any other cities in Indonesia. What is seen today will soon fade, when new message needs new form of 'architecture' to advertise it. Endless flood of information make most of the now architecture premature in nature. New product of today will soon be replaced tomorrow. Architectures time span is getting shorter.

We seem to forget that architecture is a language that conveys feeling and message. There is content within container of form. Development, however makes architecture vulnerable; intervention and changes are inevitable. What used to give human a coherent body and soul experience; architecture becomes a profession of 'building producer'. The language stays, while feeling and messages evaporate. The gap between architecture as craft (which emphasizes the emotion) and architecture as work (which intellectually equipped)[3] are widen. As a result most architectures are visual attractions that lose the depth of speculation, provocation or poetry[4]. Client and capital make 'instant product' such a necessity. Architecture is a product of form, the way building look and not how it perform to human. Impression over content.

The idea of restoring architecture as a product of craft, is indeed still relevant. Not just a series of technical display, which merely pass through diagram of function and needs[5]. Human should be given the lead role in the process of its creation, as a soul bearer. Because the beauty of architecture precisely lies not only in visual, but above all impression, sensation, interaction and interpretation of space that will make us finally feel the sense of presence. Technology could come later. As often we remember the comfort of a hotel room without knowing the light system that compose the atmosphere. Comfort is absolute, regardless of form or technology it is employed. This is what architecture should be.

We all posses a dense layering of knowledge gleaned from experience; and architecture has been part of our physical and imaginative explorations of our spatial boundaries since our birth[6]. Although our awareness is not always active, particularly when the space around us are predefined and beyond our control, we regularly choose and transform the places we inhabit. The ability to remember and cultivate imaginations about space, material, color as well as memories of atmospheric situation, is specific to each person. Memory is the greatest weapon of man to conquer problems of his life. And the memory of space, is the greatest ingredients to create, manipulate and duplicate our next space or architecture. Our mind is like a library of collections, with books or CD's selected base on our personal preference. Frequently used memories will be store in our

[2]Philip Ursprung, "Present: The Light Touch of Architecture", Sensing Space (London, Royal Academy of Arts, 2014), page. 47

[3]The difference between craft and workwas described clearly by Gunawan Tjahjono in 'Rajin'. Read, Gunawan Tjahjono, "Rajin", 2014

[4]Juhani Pallasmaa, The Eyes of The Skin, Architecture and The Senses, (West Sussex, Wiley, 2005), page. 30

[5]Maria Fedorchenko, 'Generating Form', The Architectural Review, (London, The Architectural Review, April 2017) page 7

[6]Kate Goodwin, 'Curator Preface', Sensing Space (London, Royal Academy of Arts, 2014), page. 36

conscious mind, because of their actual relevance towards our present situation. While those memories that are rarely used, will be compressed in the nature of our pre-conscious mind. Ready to be recalled at any time.

Freud developed a topographical model of the mind, whereby he described the features of the mind's structure and function. Freud used the analogy of an iceberg to describe the three levels of the mind.

> **Conscious (top iceberg)**
> On the surface is consciousness, which consists of those thoughts that are the focus of our attention now. Actual things that are related to technology, economy and what is being done.
>
> **Pre-conscious (mid iceberg)**
> It consists of all which can be retrieved from memory. It is a bridge between conscious and unconscious. Experiences left by attention, memories of space, or pleasant state of mind at one particular time will be stored within this pre-conscious area.
>
> **Unconscious (bottom iceberg)**
> Here lie the processes that are the real cause of most behavior. Like an iceberg, the most important part of the mind is the part you cannot see.The unconscious mind acts as a repository, a 'cauldron' of primitive wishes and impulse kept at bay and mediated by the preconscious area[7]

Architects remember and understand space in a structured way. Conversely a person who can understand space this way, may choose to become architect. The ability to manage memories of space are supposedly special, compare to others who are not. And architect with that flair and later, acquired ability, should be able to produce a new space that thick of content and spirit; as an amalgamation of their experiences and advance expectation. Unfortunately, technological and economical frames are slowly repressing this capability. The same framework of thinking, resulting on the same product. If this condition is worrisome, it's time for architect to reworked the way they think, the way they produce design. Exploring deeper into memory to produce a 'personal' space, could be the new way.

How architect involves their conscious mind, delve into their pre-conscious and cultivate subconscious area as their new playground to reach out available memories and ideas become interesting of discussion, in pursuit of better architecture. Those option of frameworks engagement will each be resulting in different product. Design process is not just a gamble of coincidence and intuition, which sloppily end up on acrobatics and juggling geometry. If the later become common practice, good architecture will only be judged by their refine detail of construction. And that is not architecture are all about. Any choice of these desired framework makes design process a conscious choice for different architect; as oppose to common believe that a good design can be produced when the artist is in a state of 'trance'.

> His work is known to explore simple geometry dominates by horizontal lines. He said in an interview that for some reason building in horizontal orientation works better to him rather than vertical once that more often sending an aloof impression. His strength however does not lay on the form and shape of his many creation, but rather on how the irrelevance

[7] Kendra Cherry, The Conscious and Unconscious Mind, The structure of The Mind according to Freud,www.verywell.com/the-conscious-and-unconscious-mind-2795946, November 6th, 2017, 19.40.

between external geometric - and internal circulation create tension in some of his best works.

I asked him if there is any space, form, material or color he experienced at his early age that leave deep impression, and further influence the way he thinks about architecture now. Then came the story of his uncle's house that he visited often, during his teenage day. The house taught him well about composing curiosity, or so he said. Creating long journey of experience from its main door, long corridor and dim turn usher visitor to its main living room next to an open garden; those experience of procession excite him. There is absolutely no word of shape or form, his memory solely refer to it as an enticing walk into space. And this is when I observed, that his work consistently recalling this specific pre-conscious memory. Procession of entrance, how people approaching his architecture become his distinctive signature. Hierarchies and sequences are important. It occur to me that this also reflect to his taste of music, which he prefer when listening to movie soundtrack album rather than single. Order of curiosity, if anything, is important to him.[8]

It obvious to me the above architect has been employing and processing his pre-conscious memories into his architecture work. The experience of his childhood in his uncle's house, become his main stock of resource right now. This is anything but instant discovery. His accumulation of work knowledge has liberate him to explore deeper, finding meaning after his 15 years in his profession. Having done with all conscious mind matter of technology and (perhaps) economy; he start cultivating his other ground of pre conscious mind layer. Involving many stages of trial and error, this trivial process reward him with his now well known distinctive signature. And it keeps progressing, as architecture is never a staid knowledge. Will he further delve into another layers of consciousness memory in pursuit to his next level of architecture, I certainly think there is no sign of stoping from him.

Architect needs to keep their relevance in any period of time, by nurturing an endless willingness to explore new possibilities. Never stop thinking in expectation that the next one will be their new imprint. Maturity playing an important aspect. Age, as oppose to common believe, will bring certain mannerism of curiosity.

In his early work, this architect admits his childhood memories of houses with utilitarian material captivate him. Those very material that dominates the house he lived in during migration period following his parents' movements, explain his tendency to work with layer of impermanent materials. This is evident in the design of his house that is composed of chain link, glass and steel; breaking architecture establishment of his era, and put him in the radar of world architecture.

In the next move, his exploration brought back a personal memory from his past as an immigrant son; when her mother and aunt had to keep a live fish every night in some places at the back of her house, for family consumption. The double curves of fish form fascinated him. So did its delicate skeleton, light and graceful in itself and the way it suggest movement. The fish scale appealed to him as a reminder that such sensuous creature can be made up of many small parts that come together, rather like his earlier utilitarian architecture. And soon the fish is everywhere, from restaurant in Japan to folly in Los Angeles. Without having to

[8] Interview with Andra Matin in October 16th 2017

> literally transform the shape of a fish (although this is often done in some of the lamps he creates), much of his work has spatial dynamics and forms based on his observations on memories of fish bodies and gesture. He brings abstraction of nature in his work. Human times moves quickly, architecture would normally slowing it down, allowing human to become more in tune with nature. With his fish, once again he uses 'nature' to make people in tune with nature.[9]

In the above story architect experiences a progressive thinking process. The memory of his consciousness (semi-permanent industrial material) colored his earlier work; before exploration of fish from his deeper mind becomes his new interest. Maturity and acquired experience of construction industry realm lead him to the exploration of his pre-conscious mind, to dig up memories that are all along considered unattractive. Here lays the difference between this profession and artist: in architecture imagination is our trade, not fantasy. While imagination is a certain composition of memory and empirical experience, fantasies dwell solely with memory and its intangible external factor[10].

What kind of memory does architect choose to give a consistent gesture to their work? It is all depending to their intuitive judgment. Some architects have been faithful to a particular choice in their lifetime; some enjoy the adventure of digging memories from different layers of consciousness. We all know, humans will make choices on something that makes him 'comfortable', 'enjoyable' and inspired; when faced with diverse choices. This determines how far exploration of mind can be conducted. What is stored in the unconscious mind may surface, into memories stored in pre-conscious mind, ready to be used anytime. This tendency may occur in a empirical knowledge framework, not just instinctively.

> As far as I can remember, my memories and dreams of space are always dominated by large, circular forms that keep my body safe and an inner feeling of unexplainable comfort. I can remember its rugged but safe layer of 'blanket'. I remember rubbing its towel like surface. Without ever knowing exactly of what objects gave me that memorable protection, some of my work intuitively exploit many interconnected, circular and curled space. They become a consistent abstraction of what I feel in that 'cozy dream', and act as an attractive source which I have continued to include in my work.
>
> Is that 'comfortable' memory related to my past of physical or psychological events? Some information reveal that my birth was colored by prolaps corda umbilical[11] event that made me have to be push back to my mothers womb before I can be borne normally. Is this the first spatial experience recorded in my unconscious mind? Which I am now succeeding to surface it into my pre-conscious mind and developing it into my architecture signature?

Design arguably is architects most profound language, with memory as it source of vocabulary. They are rendered together in the manifestation of space and form. While form has been exposed by many way and enjoy its status as representative of the word 'architecture', space and its quality has never been explored with deeper meaning in our built world.

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[9] Paul Goldberger, 'Building Art: The Life and Work of Frank Gehry", (New York, Alfred A.Knopf, 2015) page.210

[10] Anthony C. Antoniades, "Poetics of Architecture: Theory of Design", (New Jersey, Willey, 1992).

[11] Condition where unborn baby have their umbilical cord around their neck and body . Readhttp://mira332.blogspot.co.id/2013/03/askep-prolaps-corda-umbilical.html, November 5th, 2017, 19.50.

To provide architecture with a sense of substance we shall move on from emphasizing only on form which now seem rather obsolete, as people are becoming aware once more that the relationship between ourselves and buildings can no longer be merely visual. To do that, we must exploit other human sense in appreciating architecture by expanding architects design framework; rather than depending solely within conscious memory of everyday. Other layers of consciousness that waiting to be discovered definitely open an endless potential to revive the very sensation of inhabiting built space. The move to display and framing our memory for the better of architecture.

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MULTIFUNCTIONAL SPACE DESIGN FOR LOW INCOME HOUSES IN COASTAL SETTLEMENTS

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Abstract

A house is not just shelter but also a place to accommodate all the households' activities, both domestic and business. Home Based Enterprises (HBEs) have been supported many low-income household in developing countries to increase household income. In coastal settlements, these activities are conducted in improper house condition without standards. Moreover, this condition has worsened because of the lack of infrastructure and services (Dahuri, 2001). This study investigated a set of issues about the space designs of low income housing to sustain the economic aspect of people in coastal settlements. This study focused on the households' requirements for functionality and adaptability specially to support business activities of residents at home. This study was designed as some explorative, descriptive, ex-poste, cross-sectional and synchronic evaluation study. Due to gain the goals, this study uses the Activity Theory approach. The result also brought to light that activity determines the function of space, but spaces can be used for multiple functions, especially for low-income houses. It will increase the functionality of space. Several activities were also conducted in one room; therefore, the concept of open space or multifunctional rooms can be applied in houses for low-income. The conclusion showed that the space in low income households was no longer used as a place to facilitate the domestic activities, but it has been used as a place to generate income. Therefore, the multifunctional space that can be used as place for domestic and HBEs activities is highly recommended.

Keywords:*multifunctional space design, low income houses; coastal settlements*

1. Introduction

The previous studies which conducted by Septanti, D (2015), Kisnarini, R (2015) has been found the requirements for low income basic daily activities was including domestic and business activities. This study will be continued the previous studies which expect to strengthen and broaden the knowledge and understanding of the affordability of coastal communities to access a simple formal house with multifunctional design space and how people adapt to the design.

To improve the quality of human life in coastal cities, local governments in Indonesia have decided to resettle or rebuild the coastal settlements. While many cases show that resettlement or rebuilding in some communities fails to meet the space requirements that required to carry out household activities. This is due to the building system being applied using unsustainable materials and ignoring the coastal geographic context that does not meet the requirements desired by a household.

This study examines a series of issues on multifunctional design of house space for low-income households in coastal areas. This study also focuses on the needs of households for residence that aims to improve the

adaptability of space fulfilment, especially to support the business activities of the household. Although several studies on coastal housing issues have been conducted extensively, investigations on the affordability of housing and the adaptability of communities are still very limited, especially in terms of requirements requested by a family related to the changing needs of the family over time (Marfa ' I, MA, 2008).
To address the housing problem for low-income communities in coastal areas, it is necessary to explore broader insights and understanding sustainability concept in terms of affordability of the community to meet their housing needs. This study focused on housing and formal settlements in coastal areas in Surabaya and surrounding areas.

Considering the lack of specific data and the clearer context of coastal settlements for low-income communities, the important aspect that has been researched is the function and adaptability of space design and user needs for housing units in a sustainability perspective. So, for the continuation of the research need to be seen further whether is the design of the proposed space meets and in accordance with the capabilities and affordability of low-income communities. Secondly, there is no research yet on how affordability is perceived by the people who own the household business. On the basis that mention above, this research is focused on the affordability of coastal communities to access simple formal settlements with multifunctional spatial design and how people adapt to the design of the house.

Research Scope

This research was conducted in the coastal settlement of Surabaya and surrounding areas. Such settlements are government-built settlements or low-income developers focusing on the affordability of the community in providing housing and adaptation to existing designs to meet spatial needs.

This study was conducted to determine the extent of low-income communities in coastal settlements can meet and reach the needs of housing in accordance with space requirements that have been found in previous studies, as well as how their ability to adapt.

Picture 1. The case study area (houses provided by governments/ developers)

2. Litarature Review

2.1 The Requirement of Multifunctional Space on Formal Simple Houses in Indonesia

Some researcher said about the requirement of multifunctional space, such as:

1.Open enough and can freely support the mobility of residents,

2.Determine some alternative functions that can be combined with or without partition space,

3.Differentiate the function with different furniture or color.

As for how to create a multifunctional space is to reduce the extent of certain spaces (if it is within the ideal and comfortable limits), or combine several rooms that had been separated into one multifunctional space. For example, combine dining room with living room, or living room with family room, and so on.

2.2 Coastal Communities Affordability to have a Simple House

2.2.1. One Million Housing Development Policy

The Government of Indonesia introduced Simple Healthy House (Indonesia: *Rumah Sehat Sederhana* - RSH) program that proposes better quality housing for low-income households. This RSH is a house built with simple materials and construction methods that meet the requirements aspects of health, safety and comfort. The development of this house also considers the local and physical potentials (such as building materials, geographic, climatic, social and cultural as well as the potential of local architecture and community way of life).

Specification of Simple Healthy House includes the minimum requirements and amount of space. Space needs per person is calculated based on basic human activities in the house. Activities under consideration include the activities of a person in the house, such as sleeping, eating, working, sitting, bathing, toilet, and cooking. Under the Constitution of Indonesian Government No. 1/2011 on Housing and Settlements, the minimum size of housing is 36 square meters. While the Regulation from Ministry of Public Work No.54 / PRT / 1991 state that the minimum requirement of space per person is 9 square meters, or minimum standards with 7.2 square meters per person. The average height for the ceiling is 2.80 meters.

There are several types of houses on the market that are enough for a small family on the minimum required space. Type of house that is enough for a small family consisting of 3 people is 21 square meters (House Type 21). House type 36 (36 square meters) is suitable for family with more than 3 people. Type 21 usually consists of 1 bedroom, 1 living room, 1 bathroom and kitchen. The larger type (type 36 or more) has two bedrooms, living room and bathroom.

Table 1. The minimum requirement of Building and Land Area for Simple Healthy House

Standard per person (m3)	Square (sqm)for 3 persons				Square (sqm)for 4 persons			
	Housing units	**Site Minimal**	**Effective**	**Ideal**	**Housing units**	**Site Minimal**	**Effective**	**Ideal**
7.2 sqm (min)	21.6	60	72-90	200	28.8	60	72-90	200
9 sqm (Indonesia)	27	60	72-90	200	36	60	72-90	200
12 sqm (International)	36	60	-	-	48	60	-	-

Source: Indonesian Standard for Simple Healthy House (RSH)

Based on Indonesian National Standard (SNI), RSH enables citizens to be in good health and feasible to carry out their daily activities. The minimum requirements of space that need to be considered in several criteria are as follows:

- Area needs per person
- Area needs per household (HH)

• The need for building area per head of household (KK)
• Requirements per unit of building

Simple Healthy House (RSH) is a habitable and affordable housing for low and middle-income people. The ideal land area should meet the needs of simple healthy building for both groups before and after development. In a broader line, the calculation of residential buildings and plots of the ideal land area should meet the requirements of health, safety and comfort in buildings such as the minimum space requirements according to the calculation of the minimum standard size which is 9 square meters, or a minimum threshold standard with the amount of 7.2 meters square per person. As a basic conception, these two calculations are still used considering the final form of a post-development home. With the following objectives calculated above, the initial building area obtained (RIT) is 12 square meters. The Healthy Simple House area's guideline is 21 square meters with considerations that can be developed for 36 square meters. Even under certain conditions it is possible to meet the international space standards.

"One Million Housing Program for Indonesian Households"is different from other home ownership programs. The government seeks to facilitate the process of home ownership for low income people. For example, by giving opportunities to all levels of society to own a house by installment payments for 18 months. The 18-month installment shows the credibility of the home finance applicant so there is no need for any salary slips and job descriptions. Non-permanent employees can apply for home ownership financing. For example, contract employees, outsourcing, until the meatballs seller even have the right and equal opportunity to have a home.

3. Method

This study uses both primary and secondary data collection method by using questionnaires and observations, interviews, and document analysis such as existing standards and designs. Primary data required include the data of household characteristics and their household activities, as well as data collected through interviews and surveys. Secondary data consists of data in existing sources such as those in literature, government reports, and housing drawings. The existing literature is reviewed first to provide background information on the context, nature and scope of this study. Literature is also used to find the basis for the theoretical and analytical approaches that have been applied in this study. Based on this methods, theoretical framework and research instruments have been developed. The literature comes from relevant publications of journals, articles, books, and government documents. Following Preiser (1993)interviews are used for better understanding and documenting ('what' and 'why' dimensions) of household needs for space and for architectural information collecting. Household interviews involving issues (i) household activities and where it happens; (ii) why the location is selected for the activity; (iii) how the household deal with the spatial issues. Answers are used to determine which factors affect the needs of user space based on their characteristics.
Interviews with the experts were held to validate decisions made during the study as well as for providing information on the provision of formal housing in Surabaya.

Observations are used to cross-check what people are saying they do or not, to check facts and to interview households. The observations in the houses done by walkthrough observation (for inventory of space, furniture, and equipment) and to discover how people use space as well as to identify signs using multiple rooms. Observations also inspect physical indications, with systematically collecting physical evidence of user changes made to their homes. Observations were captured through sketches and photographs.

4. Research Result

4.1 Space and the Kind of Activities

Following by this research, it is generally seen that some activities can be done in a space. Sign (V) is the main activity carried out in that space and the sign (*) is the side activities which can also be done in that space. Here is a table that shows the relationship between space with some activities that are usually done in the space.

Tabel 1. The Relationship among space and the kind of activities which conducted on the formal houses.

NO.	KIND OF ACTIVITIES	*SPACE IN THE FORMAL HOUSES*														
		USABLE AREA (UA)									CA	INSIDE PLOT (IP)*			*OUTSIDE PLOT (OP)**	
		GR*	FR	BR	K	Bath+ WC	Wash	ST	SH*	WP	T	FY	SY	BY	CD	*CH*
A. DOMESTIC ACTIVITIES																
1.	Entertaining guest	*	V							*	*					
2.	Dining (4 people)		V	*	*						*					
3.	Sleeping	*	*	V												
4.	Cooking/preparing food		*		V					*	*		*			
5.	Taking a bath					V										
6.	Toileting					V										
7.	Washing clothes					V	*					*	*	*		
8.	Ironing		V	*												
9.	Storing equipment		V													
10.	Learning / reading		V	*												
11.	Drying										*	*	*	V		
12.	Storing clothes		*	V												
13.	washing dishes				V	*						*	*	*		
14.	Taking children/elderly		V	*							*					
15.	Praying		*	V					*						*	
16.	Watching TV															
17.	Playing	*	V	*											*	
18.	Relaxing		V	*							*	*	*	*		
B. HBEs ACTIVITIES			V	*							*					
1.	Storing raw material		*		*			*		V						
2.	Accepting customer		*							V	*					
3.	Business activities		*	*						V	*	*	*			
4.	Storing product		*		*			*		V						
5.	***Storing equipments***		*		*			*		*V*	*					

GR = Guest Room; FR = Family Room; BR = Bedroom, K= Kitchen; B+WC = Bathroom + WC; Wash= Washing Place; ST = Storage; SH = *Shalat*/ praying room WP = Working Place; T = Terrace; FY = Font Yard; SY = Side Yard; BY = Back Yard; CD = Communal space used for domestic Activities; CH = Communal space used for HBE Activities

From the results shown in the table above, by not showing the time of activities conducted, it can be concluded that some space turned out to have a different function or in other words some activities carried out

in the same space. A space can accommodate several activities at once. And certain activities can be done anywhere not limited to the type of space available. These activities can occur at the same time or at different times, both domestic and business activities.

4.2 The Development Study of the Formal Simple Houses

The limited space and desired space requirements cause users try to fulfill their activities in other ways, namely: adaptation, repositioning and new development, expand space or add space. However, with the limited area of the plot owned and some applicable rules or regulations, the addition and extension of the space is limited. Here is a study of how the adaptation can be done with maximally, but this study does not involve other components that may will affect the comfort, lighting and so on.

From the study, the house type 21 and 36 sqm (1 and 2 bedroom) built by the government or developers can be developed by the following:

	Type 21 sqm	**Type 36 sqm**
Plot size	72.00	84.00
Border line	3.00	3.00
House size (+terrace)	21.00	36.00
Space available for :		
- Horizontal transformation	34	39
- Vertical transformation	34 + 54 = 88 sqm	39 + 69 = 108 sqm

= space ble for horizontal transformation

= original space and front yard

Figure 1 The available space and the possibility for adaptation for houses type 21 and 36 sqm

The original design of the 36 sqm house (2 BR type) shows that the space on their site is large enough to accommodate the change by adding space in the horizontal direction. The space capacity to accommodate the adaptation of space depends on the size and position of the site, and the demarcation line. The illustrations shown in the figure below illustrate the space that can be used to adapt.

The space available to accommodate the horizontal transformation is 39 square meters of side and rear side pages. While the vertical transformation is wide availability up to 108 square meters, assuming the original

house still exists. While on type 21, although the availability of more limited space, but still can add space horizontally area of 34 sqm

The extended space analysis that can be done on this simple formal housing has not considered the openings and air circulation that should be provided in a home for convenience reasons. From the available space available, it can be concluded that the required space can still be provided, even though the size of the original house is very far below the needs of the community. The concept of home grown is an appropriate concept for the middle to lower society.

4.3 The Available, Requirement and Adapted Spaces in the Formal Houses

The total space provided by the original house (built by the government or the developer) is only available 36.00 sqm whereas from the study results obtained activity needs of an area of 69.75 sqm, although the extent of this activity needs does not mean the area required for the whole house. Some activities can be done in the same space so that by taking the average space added based on the user's adaptation to the activity and the availability of space it is obtained outside the optimum of about 51.91 sqm or equivalent to 52 sqm for each simple house that can accommodate all the required activities either it is a domestic activity and business activities. Here is a table that shows the space available activity and space needs after adaptation to it.

Table 2. The available space in existing formal houses and the requirement space needed.

No. Act	Room Need	SPACE IN THE FORMAL HOUSES		
		The average of available space (sqm)	**The average of requirement space (sqm)**	**The average of adapted space (sqm)**
A	**Usable Area (UA)**			
	Family room - guest room - dining room	 6.00 4.50	26.16	14.98
	Bedroom	18.00	17.12	21.10
	Kitchen	2.25	7.39	6.92
	Bath + WC	2.25	6.08	2.44
	Working place	-	13.00	6.47
B	**Circulation Area (CA)**			
	Terrace	3.50	-	3.00
C	**Inside Plot (IP)**	-		24.00
D	**Outside Plot (OP)**	-	0	0
TOTAL UA + CA		**36.00**	**69.75**	**51.91**

Source: Analysis and syntesis

From the study of spatial development on the above formal housing (point 4.2) which shows that with the plot area of 84 sqm it can be adapted in the form of additional space up to a maximum of 108 sqm, while the results show that the space requirement is only around 52 sqm, it is concluded that the area of the plot provided is sufficient.

5. Result and Discussion

5.1 Relationship between the Occupant Activity and the Multifunction Room

Activities can change from one to another without changing the layout of furniture in the room. Meanwhile, space functions can be converted even with no significant changes. Thus, in the available house, space is simply a container that can be used in accordance with the intended activity. Space becomes just an object of

design not as a subject. Although initially the design is intended for certain activities or functions, but for houses with limited space, the space can function as a desired function.

A space design is classified as functional space if the space capable to accommodate the activities performed there in accordance with the intended function. Functional space in the housing where the user is not considered in the development and building process can cause the converted space according to the needs of the user.

5.2 Multifunction Room in Simple House

The study found that space in formal housing is used for a variety of activities that are not limited to their initial function. The existence of a domestic business forces family members to organize space so that it can be used for domestic and business activities. In formal housing, where space should be able to accommodate all activities, it was found that the boundary between the use of space for domestic activities and HBE (Home Based Enterprises) activities was unclear.

The space in the formal settlement was originally constructed considering its main function. The function of the space is determined before the house is built. Nevertheless, the study found that most houses adjust the function of space according to changes in family needs. This adjustment is influenced by household characteristics (socio-cultural background). As mentioned above, space has been used as a means of accumulation and transmission of social knowledge. Requirements that the user needs being the basis for determining the function of space. Functions and activities performed in space can be determined from previous experience (user / family experience). In addition, it was found that some households created an initially undetermined space to accommodate their unforeseen activities.

The findings of this study indicate that although the initial space function in the formal housing has been determined, it may change and/ or increase its function, for example: 1) a space can be a bedroom, a workplace or even a living room; 2) space is just a container of activity in which any activity can happen even as never. In other words, multifunctional space is indispensable, especially for low-income houses. Limited space and financial ability are two things that households need to address this issue.

Space that can be used for various activities will increase the value of spatial functions. This is in line with Kendall (2010) who has proposed the concept of open space that accommodates many activities. It is also seen in this study, which found that some activities can be done in one room. Thus, the concept of open space with multifunctional space can be applied in low-income houses. Although this concept does not apply to the entire space, the family room can at least be used as the space that mostly used, and that is able to accommodate all kinds of functions and activities that benefit for low-income families.

5.3 The concept of "Simple Home Grown Independent" on Formal Housing

In this study, it was found that a family would adapt to its home in the following cases, such as an increased of the number of family members, an increase of income level (which also changes over time) and the length of stay. These variables lead to an increasing number of activities and impact on the increasing demand for space. This study shows that 55% of households make some adjustments due to the changes in their activities, such as household business in the house.

This finding is accordance with the statements made by Tipple (2000) and Manalang (2003). They argue that the change of professions can contributes to the transformation process. Changing professions include those caused by the scale-up of HBE activities, which impact on possible changes to the home. However, Manalang (2003) argues that changes in household characteristics (including household size, activities, income etc) are the main factors why households increase their residential units. These two views are like the arguments proposed by Minami (2007) that state about the changes to the layout of housing are due to adaptation efforts based on user needs. Therefore, it can be concluded that the adaptation of homes is done by households to adapt their changing needs.

For a formal housing design with a very narrow original design (type 21 - type 36 meters square), the concept of home grown is highly recommended. With this concept, it is hoped that the community can expand their buildings according to their ability and needs that change from time to time.

6. Conclusion and Suggestion

6.1 Conclusion

From the provisional results of research that has been done, it can be obtained some conclusions as follows:

1.Multifunctional space is needed by low income families.

2.Multifunctional space can accommodate various activities both domestic or business or both at once.

3.The concept of home grown is strongly recommended for simple house procurement, so that people can adjust to the increase in income and needs over time.

4.The community has the ability (effort) to repay the house, if there is the opportunity.

6.2 Suggestion

Some suggestions that can be delivered are:

1.Simple houses as part of the "Million Houses Program" procurement should not be built only outside the city, thus keeping people away from their livelihoods. It is needing to be considered for more humane locations that can be reached by the community.

2."Million Houses Program" may be considered for integration with Kampung Improvement Programs (KIP). It can be a soft loan for residents whose mechanism is regulated later and can be analyzed in a further study. This program can be proposed as a house improvement program that is specifically programmed by the government. So at least the government does not need to provide land because the land is already available. And the cost can be customized to each condition needs.

Aknowledgenment

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References

Constitution of Indonesian Government No. 1/2011 on Housing and Settlements

Dahuri, R., 2001. The Comprehensive Management For The Source Of Coastal Area. Pradnya Paramita Jkt.

Egmond Emilia Van, 2012. Innovation, Technology And Knowledge Transfer For Sustainable Construction: In A Book Edited By Akintola Akintoye, Jack S Goulding, And Girna Zawdie: Construction Innovation And Process Improvement. Publ. Blackwell Publ. Ltd Part 5, Page 95-123.

Kellett, P., Tipple, A.G., 2000. The Home As Workplace: A Study Of Income-Generating Activities Within The Domestic Setting. Environ. Urban. 12, 203–214.

Kisnarini, R., Van Egmond, E., Mohammadi, M., 2012. Importance Of Functionality In Realizing Sustainability Of Low Cost Apartments In Surabaya, Indonesia. Archit. Urban Plan. 6, 31–36.

Kisnarini, R; 2015 Functionality and Adaptability of Low Cost Apartment Space Design. A Case of Surabaya, Indonesia; PhD Thesis; Architecture and Urban Development Engineering (AUDE) Fakulteit de Boukunde; Technische University of Eindhoven The Netherlands.

Marfa'i, M.A, Et. A., 2008. The Impact Of Tidal Flooding On A Coastal Community

In Semarang. Environ. J. 28 1 237–248 Springer Sci. Bus. Media Llc.

Manalang, Munemoto, Yoshida, Espina, 2003. A Study On Residents Self-Built Improvements As A Predictor Of Their Intensions On Residential Mobility. Mrb Dwell. Units Metro Manila Jaabe November 2003 / 122.

Minami, K., 2007. A Post–Occupancy Evaluation Of Layout Changes Made To Keep Adaptable Housing. J. Asian Archit. Build. Eng. 6, 245–250.

Septanti,D; 2015 Functionality and Adaptability of Coastal Low Income Houses in Java Indonesia; PhD Thesis; Architecture and Urban Development Engineering (AUDE) Fakulteit de Boukunde; Technische University of Eindhoven The Netherlands.

Indonesian Ministry of Public Work Regulation No.54 / PRT / 1991

UNCHS, 2011. Cities And Climate Change: Global Report On Human Settlements 2011. Earthscan.

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EXPLORING SENSE OF PLACE FOR THE SUSTAINABILITY OF HERITAGE DISTRICT IN YOGYAKARTA

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Abstract

Yogyakarta is well-known as a historical city and the centre of Javanese culture that attracts many tourists to come. In recent year, Yogyakarta has been very popular to domestic and international tourists in that many heritage places in the city have been developed to distinctive tourist destinations, yet no reasonable criteria has been developed to guide its development. This study assumed that places with distinctive identity or character or uniqueness are the most interested object of attraction for tourists. Therefore, the study will explore the sense of place as the important success factor in sustaining a heritage place as tourist attraction and identify aspects of a place that might contribute to its sustainability. Two heritage districts: Kotagede and Kotabaru are selected for evaluating aspects of place that are significantly contributing to the historical and cultural image of the city of Yogyakarta. The study identify and analyze the existing condition of physical attributes, performed activities and conception of the place. Indicators being used are developed from the current research undertaken by geographer and environmental psychologist. The study resulted to the conclusion that an interconnection of many aspects rather than identity of the place is the critical factor for the sustainability of a heritage place.

Keywords:*sense of place, heritage place, Kotagede, Kotabaru.*

1. Introduction

Nowadays, rapid development in urban area challenges local authenticity for distinctive and valued places to sustain cultural, social, and economic network. Consequently, heritage conservation has became an imperative effort in placemaking. However, the concept of heritage conservation is complex and varied between generation, professionals, and across time and space. Although there are varying diversity in opinion, there is a common belief that urban development has disrupted the emotional attachment to place, particularly to the heritage places. Urban development should consider not only on restoring authenticity, but it should also maintain a sense of place that reflects a belief embedded within the place as the whole.

The existence of Yogyakarta is closely related to the history of the Islamic Mataram Kingdom. Wardani, Soedarsono, Haryono, and Suryo (2013) explained that Yogyakarta is the last royal city which become the most important center of cultural heritage on the island of Java. Prince Mangkubumi, who had a title Sultan Hamengku Buwana I, built Yogyakarta Palace in 1756. Yogyakarta Palace is the continuation of the Islamic Mataram dynasty.Islamic Mataram Kingdom was founded by Panembahan Senopati in 1586. In the beginning, the center of Islamic Mataram Kingdom had moved several times, from Kota Gede (1586-1613),

to Kerta (1613-1645), Plered (1645-1677), and to Kartasura (1682). It had experienced the turnover of the ruling monarch ten times. In the period of Paku Buwana III, as a result of Giyanti agreement, Islamic Mataram Kingdom was divided into two different kingdoms: Yogyakarta and Surakarta.

As a center of Javanese Kingdom, Yogyakarta becomes a centre of Javanese culture. For several decades, it attracts many people to come, whether people from other regions in Indonesia or form other countries, fascinated by the uniqueness of Javanese culture. Supported by physical heritage architecture and related activities which reminiscent past memories, heritage places might develop into distinctive tourist destinations.This study is derived from the assumption that places with distinctive character are the most interested object of attraction for tourism. The aim of this study is exploring the sense of place as the important factor in sustaining a heritage place as tourist attraction and identify aspects of a place that might contribute to its sustainability.

2. Method

This study is a comparative study of two heritage districts: Kotagede and Kotabaru. Both of them have historical and cultural image of the city of Yogyakarta. However, they have significantly different time era in history and different response in terms of conserving cultural and historical values. Kotagede was the former capital of the old Islamic Mataram Kingdom, whereas Kotabaru was the residential area of Dutch officials. Kotagede still reflects the components of the Mataram Kingdom and mostly supports the living of local settlements. The living of Islamic culture community, which is a non-physical cultural asset, is still preserved. Meanwhile, Kotabaru located at the center of the modern urban life. Besides residential areas, it accomodates offices, public facilities, and commercial bussiness activities, such as governmental offices, banking offices, shopping malls, stores, cafes, hospitals, railway stations, educational facilities, sports facilities, and religious facilities. The physical cultural assets in the forms of building complexes and single-detached building from Dutch Colonial era are the main assets ini Kotabaru. Changes in building functions to accomodate modern living styles often give impacts on building appearance. Kotabaru has an adaptive response to the recent urban lifestyles.
Indicators of comparison developed from the previous research undertaken by geographers and environmental psychologists.In the early 1970s, humanistics geographers such as Tuan (1974), Buttimer (1976), and Relph (1976) developed definitions of place. They probed place as an integral part of human experience. Tuan (1974) mentioned the term of topophilia as the affective bond between people and place or setting in experiencing place. Such ties may varied in intensity, subtlety, and mode of expression. Responses to the environment may be aesthetic, tactile, or emotional. Buttimer (1976) described that phenomenological descriptions has remained vague to the functional dynamism of spatial systems, just as geographical descriptions of space have desolated many facet of human experience. She suggested dialogue between two disciplines in three major research areas: the sense of place, social space, and time-space rhythms.

Relph (1976) used a phenomenology of place as a research method to interpretive human experience. Relph recalled unquestioned and taken-for-granted nature of place and its significance as an obvious dimension that can not be ignored in human life and experience. He emphasizes that in studying the relationship of space to a more experientially-based understanding of place, space must be explored in terms of how people experience it. He describes persistence identity of place in terms of three components: the place's physical setting; its activities, situations, and events; and the individual and group meanings created through people's experiences and intentions concerning to that place. Furthermore, he defines the concept of insideness as the core lived structure of place as it has meaning in human life. It includes the degree of attachment, involvement, and concern that the people has for a particular place. Then, places are more thoroughly understood as we can identify particular place experience in terms of the intensity of meaning and intention that a people and place hold for each other.

Farrinelli (2003), an Italian geographer, in Agnew (2011) explains two perspectives in understanding place. Place as a part of terrestrial surface is a distinctive entity. It cannot be subtituted with any other without everything changing. Whereas place as a location (space), its part can be subtituted for another without anything being changed. An environmental psychologist, Canter (1977) explored the idea of place. He indicates that a place is a result of relationships between actions, conceptions, and physical attributes. A place can be identified by understanding the behaviour which is associated with or anticipated in a given locus, the physical parameters of that setting, and the description or conceptions which people hold of that behaviour in that physical environment. The notion that those three elements are embodied in particular place is supported by Uzzell, Pol, and Badenes (2002), Shamsuddin and Ujang (2008), Shamsuddin et al. (2011), and Vali and Nasekhiyan (2014). Montgomery (1998) added that people will combine physical forms, activities, and images in experiencing urban places to construct sense of place.

Relph (1976) in Shamai (1991) emphasizes that the essence of place can be revealed through experiencing place. Creating a sense of place is not just merely from condition of the location, but there is also need for a long and deep experience of a place. Involvement in the place through ritual, myths, and symbols can be helpful in strengthening the attachment to place.Shamai (1991) mentioned that symbols of local culture reflect and enhance sense of place. Shamai (1991) qoutes Datel and Dingemans (1984) who defined sense of place as the complex bundle of meanings, symbols, and qualities that a person or group associates with a particular locality or region, consciously and unconsciously.Experiencing places is felt through all of the human senses, such as sight, hearing, taste, smell, and touch. Therefore, the place experience is a total sensorial experience. A place is not only the object, but also part of the whole that can be felt through the actual experience of meaningful events. The study identifies and analyzes the existing condition of physical attributes, performed activities and conception of the place as indicators of place.

3. Case Study: Kotagede and Kotabaru

According to Yogyakarta Municipality in cooperation with Regional Development and Poverty Reduction Program (2005), there are five cultural areas in Yogyakarta which have physical cultural heritage: Kotabaru, Kotagede, Kraton, Malioboro, and Puro Pakualaman (Figure 1). In this study, Kotagede and Kotabaru are selected for evaluating aspects of place that are significantly contributing to the historical and cultural image of the city of Yogyakarta.

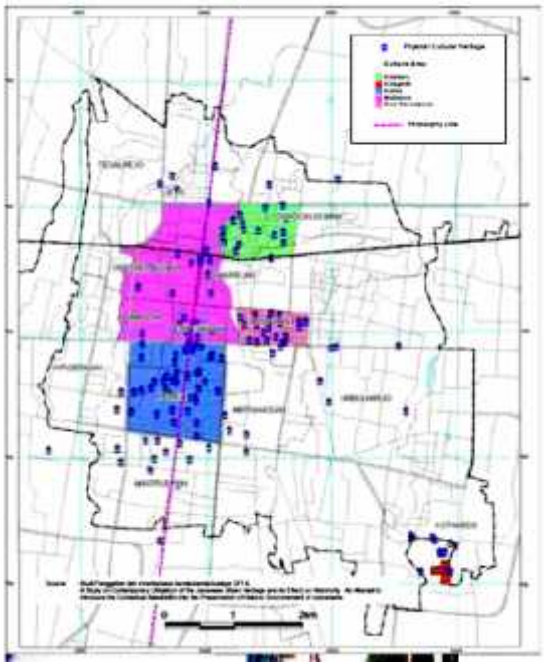

Figure 1. Cultural Heritage Area in Yogyakarta
Source: Yogyakarta Municipality and RDPRP, 2005

3.1 Location and historical background of Kotagede and Kotabaru

Figure 2. The location of Kotagede District, Yogyakarta
Source: https://www.google.co.id/maps/place/Kotagede, accessed on 29September 2017

Kotagede District is located around 10 kilometres at southeastern of city center of Yogyakarta (Figure 2). It is now recognized as the center of silversmiths. As a former capital of the ancient Islamic Mataram Kingdom, Kotagede District has significant heritage sources. Jogja Heritage Society (2007) states that Kotagede has been built by Ki Ageng Pemanahan in sixteenth century and had a role as a center of Old Islamic Mataram

Kingdom. Altough Kotagede does not have a function as a capital of a kingdom anymore, but it still revives historical sites which remains as collective memories for local residents. The sites in Kotagede still reflect components of capital of the Mataram Kingdom, i.e. the Palace (Kedhaton), Alun-alun, Mosque, and Market, which is known as "catur gatra tunggal". There is no physical evidence of the Palace and Alun-alun (public open space), but the surrond settlements reflect the traces of history. Both of them have became settlements (Kampung Dalemand Kampung Alun-alun). Figure 3 shows the location of Kampung Dalem (T2), Kampung Alun-alun (T3), Pasar Kota Gede (T1), and Masjid Mataram (T4). These heritage sites also connect present living activities with the past. After the Independence of the Republic of Indonesia, the whole territory of Kotagede is in the province of Daerah Istimewa Yogyakarta (DIY). Today, Kotagede district is under two different administrative regions, Bantul Regency and Yogyakarta City.

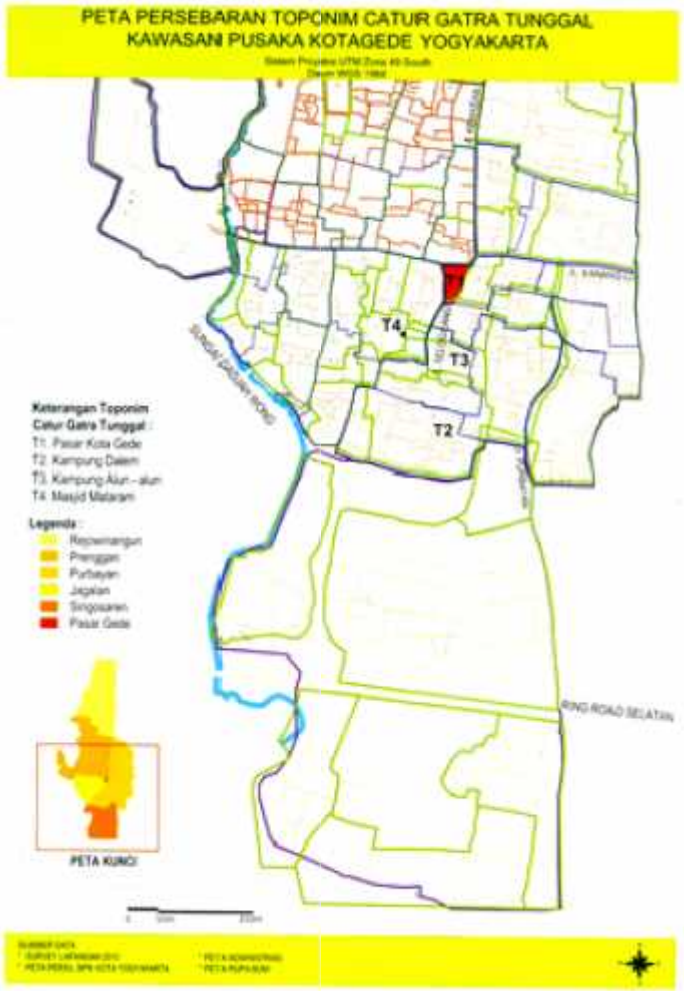

Figure 3. The location of Catur Gatra Tunggal Heritage Sites in Kotagede, Yogyakarta
Source: Wibowo, Nuri, and Hartadi, 2011

Figure 4. The location of Kotabaru sub-district, Yogyakarta
Source: https://www.google.co.id/maps/place/Kotabaru, accessed on 29 September 2017

Figure 5. Radial concentric pattern of street in Kotabaru sub-district, Yogyakarta
Source: https://www.google.co.id/maps/place/Kotabaru, accessed on 29 September 2017

Kotabaru was the residential area of Dutch officials. In colonial era, this region was specifically inhabited by the Dutch. Today, sub-district of Kotabaru is located in Gondokusuman District at northeast side of city center of Yogyakarta (Figure 4). Kotabaru region has potential assets to be developed as tourism destination, including the image of tropical Indisch architecture, boulevard with shady vegetation, public open spaces which have a function as sports stadium, and public buildings such as railway station, hospitals, schools, offices, bakery, cafés, restaurants, stores and shopping center. Figure 5 shows the radial concentric of the street patterns which make the access from one place to another places easier.

3.2 Identification of three elements of sense of place in Kotagede and Kotabaru

3.2.1. Kotagede

According to Jogja Heritage Society (2001), historical and cultural values of Kotagede Heritage District are reflected in the architecture of its houses and the social life of its people.

3.2.1.1. Physical attributes

Figure 3 explains the location of heritage sites related to the components of capital of the old Islamic Mataram Kingdom. There is a traditional market, Pasar Gede, which was built by Panembahan Senopati. At the south of Pasar Gede, there is a gate and long fort to protect the heritage site. Passing through the second gate, there is a two-metres high wall with passages on both sites leads to the entrance of The Great Mosque complex. At the center of the complex, there is a Great Mosque (Figure 6) surrounded by the houses of the court servants.

Dinas Kebudayaan Provinsi Daerah Istimewa Yogyakarta (2009) mentions that the architecture of this mosque adopts Hindu and Buddhist elements. The Great Mosque is also called Masjid Mataram, located at west side of Kampung Alun-alun. This mosque is a sacred place for the Islamic Mataram Kingdom. Its location is integrated with the tomb of the founder of the Old Islamic Mataram Kingdom which is called Pasareyan Agung Kotagede. The area has significant religious and spiritual values. The mosque is a symbol of Islamic influence in hinterland area of Java which was dominated by Hinduism and native beliefs. The Great Mosque as a royal mosque is signified by “mustaka” which is the characteristic of “masjid keprabon”. Hinduism character is reflected in the gate and the fences surrounds (Figure 7). The elements of water which surrounded the mosque is the continuation of Hinduism.

Figure 6. The Great Mosque,
Kotagede, Yogyakarta
Source: Survey, 2017

Figure 7. Gate into The Royal Cemetery,
Kotagede, Yogyakarta
Source: Survey, 2017

Figure 8. Kampung Alun-alun,Kotagede, Yogyakarta
Source: Dinas Kebudayaan Provinsi DIY, 2009

There are toponyms of Alun-alun and Dalem. Kampung Alun-alun initially was Alun-alun (public open space) of The Mataram Palace, but today it is a settlement (Figure 8). It has been argued that the changes were occurred a long time ago before the lost of the old of Islamic Mataram Kingdom. Kampung Alun-alun is located at the eastern side of The Great Mosque, at the southern side of Pasar Kotagede, and at the northern side of Kampung Dalem. Based on the location, it has been interpreted that Kampung Alun-alun is the former Alun-alun of the old Islamic Mataram Kingdom.

The traditional houses, which were built hundreds years ago, constructed with timber and have the unique carved timber brackets called *"bahu dhanyang"*(Figure 9).Another significant characteristic is Kalang House. The people of Kalang comes from Bali and have the skills as builders, particularly using wooden materials. The uniqueness of the architecture of Kalang House is it combines Javanese traditional architecture and Indisch architecture, sometimes also uses the Arabian styles. Figure10 and 11 show Kalang House in

Kotagede. Villages (kampung) in Kotagede have narrow alleys between houses and their inhabitants still live in Javanese traditions.

Figure 9. Bahu dhanyang, which supports the overhang, has an aesthetic function.
Source: Yogyakarta Municipality and RDPRP (2005:40)

Figure 10. Kalang House in Kotagede,Yogyakarta
Source: Survey, 2017

Figure 11. Kalang House in Kotagede,Yogyakarta
Source: Survey, 2017

3.2.1.2. Performed activities

Figure 12.*Ambengan Ageng Kotagede*
Source: http://kotagedelib.com/kirab-seni-budaya-nawu-sendang-kotagede/,
accessed on September 29th, 2017

Figure 13. Symbolism of *nawu sendang*
Source: http://www.catatannobi.com/2013/04/menyaksikan-prosesi-nawu-sendang-seliran.html
accessed on September 29th, 2017

In Kotagede, people still preserve and do rituals and traditons. Among several traditions, there are *"Ambengan Ageng Kotagede"* and *"Nawu Sendang Selirang"* which involve the whole community in Kotagede. "Ambengan Ageng Kotagede" (Picture 12) is a procession which has the aim to alms the crops and traditional foods arranged forming a cone. The alms is prepared by the people to celebrate Islamic religious holidays such as Eid al-Fitr and Eid al-Adha or the village celebration such as cleaning-up the bathing place called *nawu Sendang Selirang*. There is a procession of Ambengan Ageng from the yard of Jagalan sub-district, passes through Mondorakan Street, surrounds the market, into the yard of The Great Mosque of Mataram. In front of the prosession of Ambengan Ageng, there are miniature of houses with green wall. Inside of those miniature, there are scoops which are made from coconut shell called 'siwur'. These scoops are used for cleaning-up 'sendang' symbolically in the ritual of nawu sendang. After the ritual is done, foods and vegetables inside *Ambengan* were taken by the people there. Then, they clean-up the bathing place -called sendang selirang- and the moat -called jagang-, together with the court servants.

Ritual and procession of Nawu Sendang Selirang held anually as cultural preservation and remind the people to their culture (Picture 13). Nawu Sendang Selirang means cleaning-up two bathing places which are located at southern side of The Great Mosque. This ceremony is a symbol of self-purification.

Kotagede is also well-known as the center of silver handicraft. The ability to produce silver handicraft is descended by the ancestor to the next generation. At first, handicrafts in Kotagede were made of gold, silver, and copper, but then, silver is most preferred.

3.2.1.3. Conception of place

Kotagede District has a conception of place as cultural heritage places which attract tourism. People from other countries often visit the center of silver production. Whereas, local tourist tends to do pilgrimage to the Great Mosque (Masjid Mataram) and to the complex of the old Islamic Mataram Kingdom dynasty.

3.2.2. Kotabaru

3.2.2.1. Physical attributes

The obstacles in the conservation of Kotabaru region are demolition and the addition of new buildings which are not in accordance with the image of this region. Figures 14 and 15displaythe old buildings which still maintain the original form, while Figure 16displays the eye clinic which conserves the original appearance, but with modification. Figure 17 shows a new building which still conforms to its surronding area. On the other hand, Figures 18 and 19reveal new buildings which are not contextual to their surroundings.

Figure 14. The old buildings which still keep the original appearances and functions
Source: Survey, 2017

Figure 15. Religious buildings which still maintain their original appearances
Source: Survey, 2017

Figure 16. The old building which is modified and changed into a new function
Source: Survey, 2017

Figure 17.A new building which is contextual to its surrounding
Source: Survey, 2017

Figure 18. New buildings which are not contextual to their surroundings
Source: Survey, 2017

Figure 19. Hotel which is not contextual to its surrounding
Source: Survey, 2017

3.2.2.2. Performed activities

There is no specific activities in Kotabaru sub-distric which involve the whole community to remind the people about the relation of present life to the conception of the past. The events or activities usually took place in particulararea or buildings. They are conducted for spesific purpose, such as car free day, bazaar, festival, or exhibition.

3.2.2.3. Conception of place

Kotabaru sub-district is recognized as the region which is characterized by colonial buildings and has boulevards with shady vegetation. However, some buildings seems uncontextual because their appearances do not conform to the surrounding area.

4. Conclusion

The existence of Kotagede District as Heritage Place is strengthen by the living-culture community, heritage sites, heritage buildings, and traditions. Kotabaru sub-district has several heritage buildings, but lack of integrated activities that can revive the memories of the past or creatively create the connection of conception of place into present life activities. The interconnection of the components of sense of place is important to establish in a heritage place because it is a critical factor for the sustainability of a heritage place.

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References

Agnew, J. (2011), Space and Place dalam Agnew, J. and Livingstone, D. (Eds.). *Handbook of Geographical Knowledge*, Sage, London.

Buttimer. A. (1976), Grasping The Dynamism of Lifeworld, *Journal Annals of the Association of American Geographers*, 66(2), 277–292, http://dx.doi.org/10.1111/j.1467-8306.1976.tb01090.x

Canter, D. (1977), *The Psychology of Place*, The Architectural Press, London.

Dinas Kebudayaan Provinsi Daerah Istimewa Yogyakarta (2009), Ensiklopedi Kotagede, Dinas Kebudayaan Provinsi Daerah Istimewa Yogyakarta, Yogyakarta.

Jogja Heritage Society (2007), *Homeowner's Conservation Manual: Kotagede Heritage District, Yogyakarta, Indonesia*. UNESCO, Jakarta.

Montgomery, J. (1998), Making a city: Urbanity, Vitality and Urban Design, *Journal of Urban Design*, *3*(1), 93–116, http://doi.org/10.1080/13574809808724418

Najafi, M., and Shariff, M. (2011), The Concept of Place and Sense of Place in Architectural Studies, *International Journal of Human and Social Sciences*, *5*(8), 1054–1060, Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.294.3599andrep=rep1andtype=pdf

Relph, E. (1976): *Place and placelessness*, Pion, London.

Shamai, S. (1991), Sense of Place: An Empirical Measurement, *Geoforum*, *22*(3), 347–358, http://doi.org/10.1016/0016-7185(91)90017-K.

Shamsuddin, S., Syala, N., Latip, A., Sulaiman, A. B., Ujang, N., Alias, N. A., and Azlan, N. A. (2011), Historic Waterfront and the Sense of Place: The Case of Two UNESCO World Heritage Sites of Malaysia, *International Journal of Arts and Science*, *4*(17), 191–211.

Shamsuddin, S., and Ujang, N. (2008), Making Places: The Role of Attachment in Creating The Sense of Place for Traditional Streets in Malaysia, *Habitat International*, *32*(3), 399–409, http://doi.org/10.1016/j.habitatint.2008.01.004

Tuan, Y. F. (1974). *Space and Place: The Perspective of Experience*. Minneapolis, University of Minnesota Press, London.

Uzzell, D., Pol, E., and Badenes, D. (2002), Place Identification, Social Cohesion and Environmental Sustainability, *Environment and Behavior*, *34*, *1*, *26-53*, (1), 1–5, http://doi.org/10.1007/s13398-014-0173-7.2

Vali, A. P., and Nasekhiyan, S. (2014), The Concept and Sense of Place in Architecture From Phenomenological Approach. *Indian Journal of Fundamental and Applied Sciences*, *4*(S4), 3746–3753, Retrieved from www.cibtech.org/sp.ed/jls/2014/04/jls.htm

Wardani, L. K., Soedarsono, R. M., Haryono, T., and Suryo, D. (2013), City Heritage of Mataram Islamic Kingdom in Indonesia (Case Study of Yogyakarta Palace), *The International Journal of Social Sciences*, *9*(1), 104–118, Retrieved from http://repository.petra.ac.id/16086/\nhttp://repository.petra.ac.id/16086/1/Publikasi1_00011_921.pdf

Wibowo, E., Nuri, H., and Hartadi, A. (2011), Toponim Kotagede: Asal Muasal Nama Tempat, Rekompak, Kementerian Pekerjaan Umum Direktirat Jenderal Cipta Karya, Java Reconstruction Fund, Forum Jogle (Forum Musyawarah Bersama Sahabat Pusaka Kotagede), Yogyakarta.

Yogyakarta Municipality and RDPRP. (2005), *ATLAS Yogyakarta Municipality: Final Main Report*, Yogyakarta Municipality in cooperation with Regional Development and Poverty Reduction Program (RDPRP)Yogyakarta.

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STREETS SPACE UTILIZATION BY USER IN THE D.I. PANJAITAN AND K.H. ALI MAKSUM STREETS AS ONE OF THE AXES OF PHILOSOPHY IN THE YOGYAKARTA CITY

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Abstract

The city of Yogyakarta is one of cities in Indonesia that has a different spatial pattern with others. The spatial pattern in Yogyakarta forms an axis that extends from north to south (Mount Merapi, Pal Putih (Monument), Sultan's Palace (Kraton), Panggung Krapyak to South Sea) to form a linear line and connect some physical symbols and philosophical values which is known as an imaginary Axis. Tugu, Kraton and Panggung Krapyak, they are parts of a straight line of imaginary axis, is the Philosophical Axis of Yogyakarta city. It is said as Philosophical Axis because it is a street (including D.I. Panjaitan street and K.H. Ali Maksum street, that stretches horizontally from north to south)as the real line that connects between Tugu, Sultan's Palace and Panggung Krapyak

Problem of this research was the phenomenon of street space utilization by the street users – which consisted of forming elements – including students of Islamic boarding school, street vendors and locals that gave impact of the development that happened in the street spaces of D.I.Panjaitan, K.H. Ali Maksum and Panggung Krapyak as philosophical axis part in Yogyakarta city, because philosophical axis is one of cultural heritages that has been set by Yogyakarta Government as the core of preservation and image of Yogyakarta city.

The method used in this research was observation with the technique of data collection using the time budget and place-centered mapping behavior to produce intensity and tendency form of utilization made by the street users to the elements of street spaces in the D.I Panjaitan Street and K.H. Ali Maksum Street as part of the Philosophical Axis in Yogyakarta City.

The results of research indicated that as part of the Philosophical Axis, the spatial forming elements of D.I. Panjaitan Street and K.H. Ali Maksum Street didn't portray it enough and it caused negative impact from the street space utilization, because there was relation between forming elements and utilization activity, in which the utilization was the existence of behavior influence the physical setting, in this case, space elements into which it is contained.

Keywords:*Street Users, Street Spaces, The Philosophical Axis*

1. Introduction

1.1 Street Spaces of D.I. Panjaitan and Ali Maksum Street as A Part of Yogyakarta's Philosophical Axis

Yogyakarta City is one of cities in Indonesia with a very unique spatial pattern due to its street spaces. The uniqueness comes from an imaginary axis which stretches from North to South (Mount Merapi, *Tugu Pal Putih* (Monument of White Pal), Panggung Krapyak, Southern Sea), and those form a linear line and connect some physical symbols and philosophical values. Basically, this Imaginary Axis has more symbolical meanings than the physical ones. The Tugu, Kraton, and Panggung Krapyak which are in one straight line forma philosophical axis of Yogyakarta Kraton. They are known by the name of philosophical axis because

the line which obviously connects the *Tugu*, Kraton and Panggung Krapyak is a horizontally straight way, whilst the imaginary axis is Merapi Mount, Kraton, and South Sea.

Meanwhile, from Panggung Krapyak to north and ending up at Kraton symbolizes a process of newborn infant to adulthood and finally getting married. Whereas the symbolization of the Tugu to Kraton means human's journey to meet the *Khalik* (God) (Aprimadhany, 2013: 2-3).

Panggung Krapyak is located 2 Km from Southern Yogyakarta Kraton. In the beginning, Panggung Krapyak used to be a castle and a place for King to watch soldiers training and hunting deer (Aprimadhany, 2013: 5). Panggung Krapyak region is also called as *Kampung* (Java Islamic student village) since a *Pondok Pesantren* (Islamic boarding school) has been being around it for a long time ago, and this was proved by a study result summary (Prasetya, 2008 in Sanitha 2013: 1) which described that the presence of *PondokPesantren* with their religious life are still preserved in Panggung Krapyak region.

1.2 The Development in D.I Panjaitan and K.H. Ali Maksum Streets.

Panggung Krapyak area has been gone through so many significant changing processes, especially the streets. In the beginning, buildings in Panggung Krapyak area, even in the street corridors of D.I Panjaitan Street and K.H. Ali Maksum Street used to be functioned as houses and *Pondok Pesantren,* but as time goes by, along with the residents' and the students' needs (Islamic boarding school axis) causes the change of buildings' functions in D.I. Panjaitan Street and K.H. Ali Maksum Street and becomes the economic and tourism sectors particularly in service field such as cafes, guest houses, and shops/ art galleries, restaurants, *warung makan* (small and simple restaurants) and printing shops.

D.I. Panjaitan Street and K.H. Ali Maksum Street are passed by philosophical axis, so as cultural heritage; one of the street corridors formed a straight line from Tugu, Kratonto Panggung Krapyak (Provincial Regulation of Yogyakarta Special Region Number 6 Article 61in Sanitha, 2014: 2). The street corridors of Panggung Krapyak area are protected by regional regulations as part of Yogyakarta's cultural heritage, and these streets are expected to be able to form image of cultural area, the aim is to maintain its preservation through the limits of government official regulation in Provincial Regulation and Regional Regulation of Yogyakarta Special Region Design and Urban Land Use Planning of Yogyakarta. Panggung Krapyak area is one of the thirteen City core locations of image preservation either buildings, houses, gardens, streets or ornaments that have specific exclusivities of city region as the axis of Panggung Krapyak – Kraton – *Tugu* (D.I. Panjaitan, Trikora, Ahmad Yani, Malioboro and Mangkubumi Street) and a city road that implies philosophical image and cultural relic.

Residential development as the result of the presence of *Pondok Pesantren* is also very noticeable, especially in the Krapyak settlement which is very near to *Pondok Pesantren.* The use of settlement land has turned into supporting areafor *Pondok Pesantren* and the students who study there, like temporary lodging, dormitories, restaurants, photocopy shops, and *angkringan* (traditional Yogyakarta's food stall). Thus, there is an activity mixture in the area, especially places that are close to the *Pondok Pesantren.* The *Pondok Pesantren*got more constructions along with its increasing fame time after time. Unfortunately the space had its limits and the construction should have been conducted near to the Krapyak Settlement, this current *Pondok Pesantren* area is even separated by main streets of Panggung Krapyak. Yet the effect of this construction immensely influences the spaces of D.I. Panjaitan Street and K.H. Ali Maksum Street to which it is near.

Other effect of *Pondok Pesantren* development is the appearance of economic sector around the street spaces of D.I Panjaitan Street and K.H. Ali Maksum Street especially in *Pondok Pesantren* area to fulfill the*pesantren*students' needs, and street activities in the main street by which the Krapyak settlement residents often use, make the street space functions become more complex. The presence of more-and-more developed *Pondok Pesantren* in Krapyak Street area makes some changes in utilization of street spaces of D.I Panjaitan Street and K.H. Ali Maksum Street, either from the *Pondok Pesantren* itself or the settlement in the Panggung Krapyak area. Physically, it is clear that there are changes of buildings' appearance and functions, those buildings were once residences or houses before, but now the houses are modified to be home-business houses, and the *Pondok Pesantren* also makes the houses around the area become the students' places to stay (*mondok).* So that, the misuses of road and sidewalk as parking lot are the consequences toward trade business and developing *pesantren* as well as the utilization of sidewalks as business lots and the presence of the students who utilize the street space near to *Pondok Pesantren* for their outdoor activities.

Therefore, unexpected street space utilization occurs as the consequence of activity intensity in the street space that gets higher and higher so that there are some function changes in the street spaces, for instancebuildings which were functioned as settlements are now changed to be business places. Pedestrian sidewalks also turn into parking lots, and the presence of street vendors in the road, also unclear placement of parking lots. This case can erase the maintenance form of the historical regions like the street spaces of D.I. Panjaitan Street and K.H. Ali Maksum Street as one part of philosophical axis in Yogyakarta. This must be concerned by related parties, particularly the government to make the street spaces of D.I. Panjaitan and K.H. Ali Maksum as one of the image maintenance core in Yogyakarta city.

Problem as the focus of this research was that there was phenomenon of street space utilization by pedestrians, students of *Pondok Pesantren*, street vendors and the residents which was unexpectedly occurred so it gave bad impacts toward the development in the street spaces of D.I. Panjaitan Street and K.H. Ali Maksum Street. Krapyak Street as one of the cultural heritage region and the core of Yogyakarta City maintenance, should have been an attention for related parties especially Government to make the street spaces of D.I. Panjaitan and K.H. Ali Maksum Street as one of the core for Yogyakarta city maintenance.

In this research, there were two research questions:

1. Kind of elements that formed street spaces in D.I Panjaitan and K.H Ali Maksum Street as one part of philosophical axis
2. How the users' street space utilization was in D.I Panjaitan and K.H. Ali Maksum Street

2. Theory and Method

2.1 Theory

Shirvani (1985: 7) describes in a process of urban design, there are some basic elements that really influence inside the spaces in urban area, namely 1) Land use, a fundamental element in an urban and as the key in two planning two dimensions after making three space dimensions which are made and functioned, in this case the planning for land-use would be done (Shirvani, 1985: 9); 2) According to Shirvani, Building form and massing, building mass form can be from physical form aspects that become as the building setting like height, building setback and area; 3) Circulation and Parking, are two elements which overly take effect on the term of the structure in the urban environment (Shirvani, 1985: 23-26).

According to Sutrisno (2014: 18) pedestrian word derived from *Pedos* (Greek) means foot, thus it can be defined as the pedestrian or the walker or person who walks on feet, while way is the medium on this earth that eases the human beings to walk, so the pedestrian way in this case has meaning as movement or

displacement of person or human being from a place as starting point to another place by using way as the medium. Iswanto (2003: 15-16) interprets pedestrian as:

1. One who walks or journey on foot
2. Person walking in a street
3. One traveling on foot
4. Person going or performed on foot
5. Walking person

Shirvani (1985: 31-36) says that Pedestrian way is one of basic elements in urban area that helps so much to interact between environment and the activity around it. Amenities in the pedestrian sidewalk are essences of physical component solution in the sidewalk. Facilities in pedestrian way are needed and there must be maintenance by the users, involving the place determination for vehicles line, accessibility, information (about transportation location, location guides, and public service area) and comfort.

In doing activity study, a must thing in doing to interaction between activity in the environment are:

1. What and why the activities occur
2. Who and what do the activities
3. When the activities occur
4. Where the activities occur
5. How the activity acts are (Rapoport in Ikhsan, 2013: 18)

According to Zeisel (1987) in Maria (2011: 20), human Activity as an action form influences or be influenced by the physical setting in it. The 6 elements that must be attention in an observation of environment acts:

1. Who
2. What (act)
3. With whom (people around)
4. In what relation (relations)
5. What context (social, situation, and culture)
6. Where (physical atmosphere, spatial and relation

Activities that happen in the space street including the pedestrian sidewalk:

a. Moving activities non-pedestrian
b. Pedestrian activities

Human as a social creature who adapts with his environment by building the physical environment. Physical environment functions as response of self-defense from nature and reflection of needs and user's act so it results 12 attributes of acts that appear in the interaction between user and physical environment:

1. Comfort
2. Sociality
3. Visibility
4. Accessibility
5. Adaptability
6. Sensory stimulation
7. Control
8. Activity
9. Crowdedness
10. Privacy

11. Meaning
12. Legability

In forming area characters as the historical area is the presence of forming elements namely significant historical building, and it has the historical background or history, so it forms its own characters in the area. A character of historical area will be defended stronger, if the forming elements of the historical buildings dominate the environment context through the physical elements of the area. To defend the character of a historical area, there must be genius loci of special areas to maintain and keep from the development and making the characters in the future.

According to Regional Regulation of Jakarta No. 5 Year 1978 in Sutrisno (2014: 19-21) about regulation of business place and street vendor coaching in Jakarta area, the street vendors are those whose the businesses use road/sidewalk parts and places which are obviously for public interest and not for business places or other places that don't belong to them. The activity tendency of street vendors in urban area includes commodity, location, facility and infrastructure type in city area. Business identification is entire aspects that become parts of businesses the street vendors do, and it involves: 1) Economy; 2) Location; 3) Time; 4) Facility.

2.2 Method

This research used rationalistic approach with qualitatively processed data (Qualitative Rationalistic). The locus of this research was the street spaces of D.I. Panjaitan and K.H. Ali Maksum in Panggung Krapyak. The focus of this research was to analyze how the utilization of street spaces in D.I. Panjaitan and K.H. Ali Maksum by the street users was, as a cultural heritage area and Philosophical Axis of Yogyakarta City. The scope of this research was the street spaces of D.I Panjaitan and K.H. Ali Maksum in Panggung Krapyak of Yogyakarta with research material was how the utilization of the street spaces. Therefore, the research materials are literature studies about the research discussion, and as addition of knowledge in the field., the research instruments were prepared research components, location map of research, digital camera to take pictures of objects and occurred activities, and notebook to write down the observation, and computer to process the obtained data This research used Place-Centered Mapping and Time Budget as method and data collection technique.

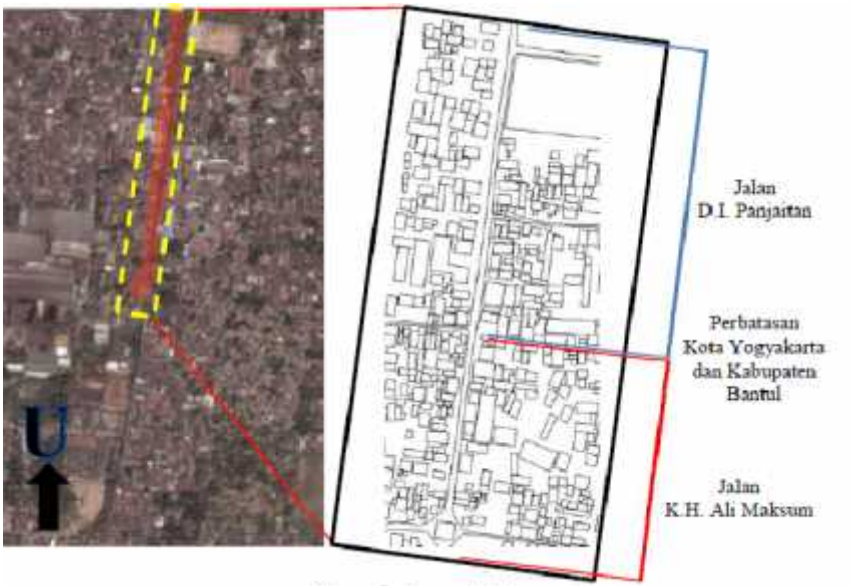

Figure 1. Research Lokus
(Source: *Google Earth* accessed on November, 1 2015)

3. Discussion

There were a number of elements that formed the street space of D.I Panjaitan and K.H. Ali Maksum Street. These elements were:

1. Street

Based on Regional Regulation of Yogyakarta Special Region Number 2 Year 2010 article 30 mentions that D.I Panjaitan Street is involved in one of secondary collector streets in Yogyakarta City in which the secondary collector street is street network that connects secondary region in Yogyakarta.

Ali Maksum Street is type of local street based on Regulation of Bantul Regency Number 04 Year 2011 about Regional Spatial Pattern Plan 2010-2030, article 19 and 21 section 1 regarding to the local street that connects first secondary area to housing area, second secondary area to housing area, third secondary area, and so on to housing area.

D.I Panjaitan street is one part of street in Yogyakarta region with the measurement about 6-7 meters extending from north–south to the border of Yogyakarta City and Bantul Regency. Meanwhile, the K.H. Ali Maksum Street is a part of street in Bantul Regency with the measurement about 5 to 6 meters extending from the border of Yogyakarta Street and Bantul Regency to southern Panggung Krapyak. Although administratively both streets have two difference, but they are a unity in formingPhilosophical Axis of Yogyakarta City because theyare the link between South *Alun-Alun*, *Kraton* and Panggung Krapyak, and as one of forming elements of Yogyakarta's image among *Tugu- Kraton-* Kraypyak Stage. D.I Panjaitan and K.H. Ali Maksum Street are important elements in the Panggung Krapyak environment because both are the accesses to link between Kraton and Panggung Krapyak which have historical value in Yogyakarta's history until now.

2. Sidewalk

In D.I. Panjaitan Street, there are sidewalks that can help the pedestrians in doing their activities. Physically, there are 3 types of sidewalks in D.I. Panjaitan that have different materials. The first sidewalk with the

measurement approximately 2,5 – 3 meters with paving block material is located at the western side of street; second sidewalk was about 3 – 4 meters with plastering cement which is located in the western side of street and as the continuation of the paving-block-made sidewalk. These sidewalks were used not only by the pedestrians but also the vehicles too. The third sidewalk is located at the eastern side of street, with the road shoulder as physical feature used by pedestrians.

K.H. Ali Maksum Street, physically there are sidewalks for pedestrians. The pedestrians only walked on the available way in that street. The pedestrians tended to use the eastern and western road shoulders. The road shoulders were also used as the parking lot for vehicles as well as the pedicabs for waiting their passengers.

3. Vegetation

In the D.I. Panjaitan Street there were several types of vegetations with each function. One of vegetations in D.I. Panjaitan Street were Tanjong trees as the a type of typical vegetation in Kraton with its deep meaning of Philosophical Axis forming from Kraton to Panggung Krapyak. Besides, it also had function as shade. There were also Mango trees at the eastern side of street with function as road direction for sidewalk with the height approximately 3 – 4 meters. Pergola grass and some decorative plants were functioned as aesthetics and located in the western side of the street.

In K.H. Ali Maksum, the vegetation was not significant like D.I. Panjaitan Street. There were only two vegetation functions in that street, namely as shade and decoration. There were Asam trees as shade due to its big shape with the height approximately 6-8 meters with wide headers. Polyalthia Longifolia was also provided there as the function of shade and the height was about 6 to 7 meters, and also some flowers and pergola grass that had the function as aesthetics which were located in the border of Yogyakarta and Bantul.

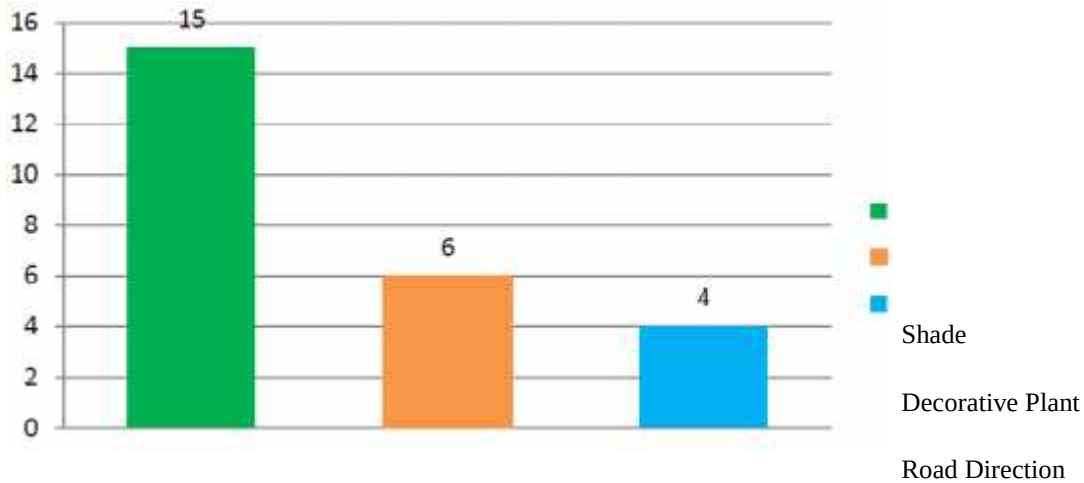

Fig. 2. Graphic of Vegetation Allocation Amount in Street of D.I. Panjaitan

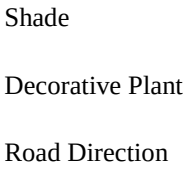

Fig. 3. Graphic of Vegetation Allocation Amount in Street of D.I. Panjaitan

Street furniture was found in some places, either in D.I. Panjaitan Street or in K.H. Ali Maksum Street. In D.I Panjaitan Street, there was street furniture such as street lamps, information board, traffic signs, street name board, flagpoles, city gate, and flower pots in the whole street. Some were still in good and preserved condition, namely street name board, city gate, information board, and flower pots. But some were not, for example the street lamps and traffic signs were in bad condition and unusable.

Generally, the buildings in D.I. Panjaitan and K.H. Ali Maksum streets were permanent. Most of the buildings were functioned as houses and *Pondok Pesantren.* But, as time goes on, the functions were added to be the commercial buildings to support the activities that occurred in those streets, for instance small diners, photocopy shops, small shops, minimarkets or even offices and banks.
Besides those commercial-functioned buildings, there were also the *Pondok Pesantren* building that dominatesin D.I. Panjaitan and K.H. Ali Maksum Street: student dorms, *Pondok Pesantren* office, even the business places owned by the *Pondok Pesantren*.

According to identification and observation results in field, the activity tendency that occurred in streets of D.I. Panjaitan and K.H. Ali Maksum Street were trade activities by the street vendors, pedestrian activities, and parking lot as the temporally different and changing characters, even in the weekdays and weekend. The collected data according to the determined time budgets of activities were morning, pre-afternoon, afternoon and evening. Performers were *Pondok Pesantren* students, street vendors, the locals.

The presence of *Pondok Pesantren* in the middle of settlement became a magnet for people who wanted to study in the *Pondok Pesantren.* The location was not far from city center, and the location was easy to be accessed by vehicles or even only walking. The students could socialize with the environment outside the *Pondok Pesantren*, this could ease to fulfill their needs during studying in the *Pondok Pesantren.*

Table 1. Pondok Pesantren Student Performer who Did Activities Based on Time Period

Pondok Pesantren Student Performer	**Pondok Pesantren Student Performer who did Activities Based on Time Period**							
	Morning (06.00 AM-10.00 AM)		Pre-Afternoon (10.00 AM-02.00 PM)		Afternoon (02.00 PM-06.00 PM)		Evening (06.00 PM-11.00 AM)	
	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity
Street of D.I. Panjaitan								
Individual								
Group								
Street of K.H. Ali Maksum								
Individual								
Group								

Table 2. Amount of Pondok Pesantren Students who Did Activities Based On Time Period

Pondok Pesantren Student Performer	**Amount of Pondok Pesantren Students who did Activities Based On Time Period**			
	Morning (06.00 AM-10.00 AM)	Pre-Afternoon (10.00 AM-02.00 PM)	Afternoon (02.00 PM-06.00 PM)	Evening (06.00 PM-11.00 AM)
Street of D.I. Panjaitan				
Individual	± 1 – 10 students	± 1 – 20 students	± 1 – 30 students	± 1 – 9 students
Group	± 5 – 15 students	± 10 – 25 students	± 15 – 26 students	± 4 – 15 students
Street of K.H. Ali Maksum				
Individual	± 1 – 8 students	± 1 – 15 students	± 1 – 18 students	± 1 – 7 students
Group	± 3 – 10 students	± 4 – 17 students	± 3 – 15 students	± 4 – 10 students

The street vendors in the streets of D.I Panjaitan and K.H. Ali Maksum were allocated unevenly, because some areas that became their business places were places used by street users everyday, especially by pedestrian. This made the street vendors became the magnet for the street users. Several kinds of the street vendor commodities were in the street of D.I. Panjaitan and K.H. Ali Maksum, even there were also street vendors who had gotten a permanent place to do their trading activities in the whole D.I. Panjaitan and K.H. Ali Maksum, either in pedestrian sideway or in road shoulder.

Table 3. Allocation of Street Commodity Form Activity Based on Time Period

Street Vendor Commodity Form	**Allocation of Street endr Commodity Form Activity Based on Time Period**							
	Morning (06.00 AM-10.00 AM)		Pre-Afternoon (10.00 AM-02.00 PM)		Afternoon (02.00 PM-06.00 PM)		Evening (06.00 PM-11.00 AM)	
	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity
Street of D.I. Panjaitan								
Permanent								
Non Permanent								
Street of K.H. Ali Maksum								
Permanent								
Non Permanent								

Table 4. Allocation of Street Vendor Commodity Activity Based on Time Period

Street Vendor Commodity Type	**Allocation of Street Vendor Commodity Type Based on Time Period**							
	Morning (06.00 AM-10.00 AM)		Pre-Afternoon (10.00 AM-02.00 PM)		Afternoon (02.00 PM-06.00 PM)		Evening (06.00 PM-11.00 AM)	
	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity
Street of D.I. Panjaitan								
Small Shops								
Cart								
Vehicle								
Bycicle								
Street of K.H. Ali Maksum								
Small Shops								
Cart								

Vehicle								
Bycicle								

Table 5. The Amount of Street Vendors Based on Commodity Type who Did Activities in the Streets of D.I. Panjaitan and K.H. Ali Maksum

Commodity Type	The Amount of Street Vendors Based on Commodity Type who Did Activities Based on Time Period			
	Morning (06.00 AM-10.00 AM)	Pre-Afternoon (10.00 AM-02.00 PM)	Afternoon (02.00 PM-06.00 PM)	Evening (06.00 PM-11.00 AM)
Street of D.I. Panjaitan				
Small Shop	-	4	4	-
Cart	2	6	6	3
Vehicle	1	7	8	3
Bicycle	1	3	4	-
Street of K.H. Ali Maksum				
Small Shop	-	6	6	-
Cart	1	4	5	2
Vehicle	-	5	6	3
Bicycle	-	1	1	-

Many locals utilized the presence of the *Pondok Pesantren* to help fulfilling the needs of the students during studying in the *Pondok Pesantren.* This made the locals did some function changes of their houses by adding the small commercial functions as response to the students' need fulfilling. But this made several negative impacts as the consequences of the change, because the land limits made some function changes of land as consequence, like the sidewalk for pedestrian that was changed to be parking lot, trading place, building area addition until the road shoulder made space to park vehicles.

Table 6. Citizen Activity Performer in the Street of D.I. Panjaitan and K.H. Ali Maksum

Citizen Performer	**Citizen Performer who Did the Activity Based on Time Period**							
	Morning (06.00 AM-10.00 AM)		Pre-Afternoon (10.00 AM-02.00 PM)		Afternoon (02.00 PM-06.00 PM)		Evening (06.00 PM-11.00 AM)	
	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity	Doing Activity	Not Doing Activity
Street of D.I. Panjaitan								
Individual								
Group								
Street of K.H. Ali Maksum								
Individual								
Group								

Table 7. Amount of Locals who did Activities Based On Time Period

Pondok Pesantren Student Performer	**Amount of Citizens who did Activities Based On Time Period**			
	Morning (06.00 AM-10.00 AM)	Pre-Afternoon (10.00 AM-02.00 PM)	Afternoon (02.00 PM-06.00 PM)	Evening (06.00 PM-11.00 AM)
Street of D.I. Panjaitan				
Individual	± 1 – 8 citizens	± 1 – 18 citizens	± 1 – 20 citizens	± 1 – 10 citizens
Group	± 2 – 4 citizens	± 5 – 16 citizens	± 8 – 16 citizens	± 4 – 10 citizens
Street of K.H. Ali Maksum				
Individual	± 1 – 7 citizens	± 1 – 9 citizens	± 1 – 12 citizens	± 1 – 8 citizens
Group	± 2 – 4 citizens	± 9 – 16 citizens	± 10 – 17 citizens	± 2 – 9 citizens

The observation result in the field, the types of occurred activity were various in D.I. Panjaitan Street, either the activity of static form like parking lot, sitting, gathering, and selling or dynamic form like walking. In the morning, the activity intensity that occurred was not significant enough in the street of D.I. Panjaitan, either the walking, selling, parking, sitting or gathering activity. But, in the pre-afternoon and afternoon, the activity intensity was high because the presence of the *Pondok Pesantren* students. In the evening, the activities occurred in the building like trading in front of houses, sitting in the pre-afternoon or afternoon.

Table 8. Activity Performer Based on the Type of the Activity Done in the Time of Weekdays in the Streets of D.I. Panjaitan and K.H. Ali Maksum

Type of Activity	**Activity Performer Based on the Type of the Activity**											
	Morning (06.00 AM-10.00 AM)			Pre-Afternoon (10.00 AM-02.00 PM)			Afternoon (02.00 PM-06.00 PM)			Evening (06.00 PM-11.00 AM)		
	S	P	W	S	P	W	S	P	W	S	P	W
Street of D.I. Panjaitan												
Sitting				■						■		
Selling		■	■		■	■		■	■		■	
Parking	■	■		■	■	■	■	■	■	■		■
Walking	■		■	■		■	■		■	■		■
Gathering				■	■		■		■	■		■
Drying Clothes with Solar Energy			■			■						
Street of K.H. Ali Maksum												
Sitting			■				■			■		
Selling		■			■			■			■	
Parking				■	■	■	■	■	■	■		■
Walking	■		■	■		■	■		■	■		■
Gathering				■		■	■		■			
Drying Clothes with Solar Energy												

S : Student Performer of *PondokPesantren*, P : Street Vendors, W : Citizen Peformer

In observation of activity location, there were two kinds of locations where the activity occurred, namely pedestrian ways (sidewalks) and vehicle ways, where these locations had different activity intensity. In D.I. Panjaitan Street, the existence of particular way for pedestrians, not making the pedestrians used sidewalks comfortably because the sidewalks were also used for parking and selling activities. As well as the vehicle ways which were used by pedestrians and street vendors as the lack-of-space consequence for pedestrians in the sidewalks.

For K.H. Ali Maksum Street, there was no particular way for pedestrian, the activity location tended to occur in the vehicle ways, where the road shoulders was used as pedestrian, parking, and selling. While the road was used as the vehicle traffic way.

Streets as forming elements in the cultural heritage area should have been determined the dimensions and material type. Pedestrian ways as one of the elements needed to be determined, so it would be better if the sidewalks for disabilities and street furniture like street lamps, information board and plant pots were made. Vegetation functions as street element namely trees, bushes and soil covers were functioned as street directions, view covers, physical borders and aesthetics and they had certain philosophical values. The height of buildings in the cultural heritage areas should have been determined to maintain the areas' characters. The

visibility should have been also be determined in order to avoid it getting hindered in the whole left and right main street 45 degrees or with the measurement of the limits of building height 2:1.

There was no consistency toward street dimension, where the street dimension was getting smaller and smaller in the Panggung Krapyak. There were no ways also for the disables in sidewalks in D.I. Panjaitan Street which became the criteria of policy regarding to the philosophical axis.

Building consistency in D.I Panjaitan and K.H. Ali Maksum was one criteria form that looked considerable in D.I Panjaitan and K.H. Ali Maksum Street as a part of the philosophical axis. The heights of the buildings were mostly dominated by one or two-stories buildings and it had the impact on the scale of the building, not more than 45 degrees (Provincial Regulation of Special Region of Yogyakarta Number 2012 on Cultural Heritage Preservation and Cultural Heritage Article 6 Section 2 Point B). This was an effort to maintain the cultural heritage area providing character and image forming of the area. On the other hand, the land use was organized by government as a criterion of philosophical axis that was found in existing building functions.

In the analysis result of utilization intensity by performers and the tendency of its utilization,there were several findings found in the streets of D.I. Panjaitan and K.H. Ali Maksum Street.The atmosphere in D.I. Panjaitan was crowded compared to K.H. Ali Maksum. This case was caused by factors of forming elements like dominant building functions in the street of D.I. Panjaitan, namely commercial building and *Pondok Pesantren* functions and those influenced to the occurred activities. Trade and parking activities in pedestrian sidewalk made the pedestrians were uncomfortable in doing the activities which was caused by those unexpected activities in the sidewalks.

In D.I. Panjaitan and K.H. Ali Maksum, from the mapping result, it was found that the presence of the *pesantren* students dominated the streets of D.I Panjaitan and K.H. Ali Maksum streets. But, in some utilization activities, the activities which were not proper for the students were utilized by the street vendors to do the activities, such as trading, relaxing while waiting for the buyers. This space utilization would create the discomfort for the other street users.

Comfort could have been felt by the street vendors when they did their activities at night in the D.I. Panjaitan and K.H. Ali Maksum, because the existence of space street forming elements supported the activities very much, like the vegetation in the sides of the streets as the shades from sunlight, especially at the pedestrian ways in the afternoon so that the tendency of the street vendors was easier to get the buyers in that area. The locals and *Pesantren* students also felt the comfort who parked their vehicles in the pedestrian ways after giving the easiness in accessing their destinations. But the discomfort was felt by the pedestrian when they walked in the sidewalkswhich were created for them, because there were many improper activities in the sidewalks like trading and parking lot.

Sociality could be found in the streets of D.I. Panjaitan and K.H. Ali Maksum, where the interactions occurred strongly between the Pesantren students and the street vendors or the localswhile doing activities in the afternoon and evening.

Accessibility was felt by the pedestrians because the existence of the pedestrians ways in the western side of D.I Panjaitan Street with the measurement about 2.5 meters. But there was no sidewalk in the K.H. Ali Maksum Street.

Adaptability could be seen in the activities of the street vendors by giving the response to environment which functioned as commercial buildings, but not very supporting or fulfilling the students's needs.

Activity, intensity of activities occurred eitherdone by street vendors (PKL) or local residents and students of Pondok Pesantrenalmost all the time, on weekdays or weekends. The highest intensity of activities occurred during pre-afternoon or afternoon.

Crowdedness was felt during the pre-afternoon and afternoon when the activities had a significant increase, activities were performed by street vendors and local people such as selling, gathering, lounging, walking and parking vehicles

Privacy issue was felt by the pedestrians and street vendors, and the parking lot in the pedestrian sidewalks bothered the pedestrians. This case was related to the comfort and crowdedness level.

Meaning issue was referred to the existence of Panggung Krapyak as the important cultural history site for Yogyakarta and giving the philosophical meaning that made the areas around it became the preservation areas and cores of Yogyakarta image.

Legability of D.I. Panjaitan and K.H. Ali Maksum Street was portrayed by the policy organized by government either region spatial management or economy-social thus the area became so important and required to be maintained for being the character and gave the characters to the other areas.

4. Conclusion

Based on the field observation and the summary of the analysis and discussion about the street space utilization by the street users in the D.I. Panjaitan and K.H. Ali Maksum, the conclusion was: as a part of philosophical axis, the forming elements of street spaces in D.I. Panjaitan and K.H. Ali Maksum as the research locus, were still lack of the depiction concretely as a part of philosophical axis of Yogyakarta. Some of the forming elements of street spaces were 1) Street dimensions were not consistent; 2) Not conducive pedestrian sidewalks, 3) The utilization of street furniture; 4) Unorganized vegetation, 5) Not maximal building-organizing.

The development of the streets of D.I. Panjaitan and K.H. Ali Maksum was very influenced by the activity in it. Like the presence of the vehicle parking lot in pedestrian sidewalk and also the street vendors in the road shoulder were some of the response forms of activities that appeared from that development. This made the utilization of street space was not proper with the functions.

The Urban Planning of Yogyakarta was stated that the street spaces in D.I Panjaitan and K.H Ali Maksum as one of city image preservation cores as a way to imply the philosophical image and historical relic that was not in line with the development that happened in the streets of D.I Panjaitan and K.H Ali Maksum because the utilization activities of the street spaces and the environment quality were not supporting enough. Therefore, there must have been a follow-up from the stakeholders, roles and public in the Panggung Krapyak to make street of D.I. Panjaitan and K.H. Ali Maksum as one of city image preservation cores that hint the philosophical image and historical relic.

Reference

Aprimadhany, Nathasja Tiffany. 2013. *Kajian Karakter Visual Untuk Memperkuat Penggal Jalan Alun-Alun Selatan – Panggung Krapyak Sebagai Bagian Dari Sumbu Imajiner Yogyakarta*. Tesis. Universitas Gadjah Mada : Yogyakarta.

Hartanto, Tri. 2011. *Tipologi Pemanfaatan Ruang Jalan Studi Kasus City Walk Jalan Slamet Riyadi Surakarta*. *Tesis Arsitektur*. Yogyakarta : Universitas Gadjah Mada.

Jacobs, Allan B. 1993. The Great Streets. New York : MIT Press.

Maria, Kiki. 2007. *Pola Pemanfaatan Ruang Jalan Oleh Pengguna Jalan Di Kawasan Komersial Studi Kasus : Kawasan Komersial Blok M, Jakarta Selatan*. Tesis MDKB. Yogyakarta : Universitas Gadjah Mada.

Iswanto, Danoe. 2003. *Mengkaji Fungsi Keamanan Dan Kenyamanan Bagi Pejalan Kaki Di Jalur Pedestrian (Trotoar) Jalan Ngeresep Timur V Semarang (Akses Utama Kampus UNDIP Semarang).* Tesis. Semarang : Universitas Diponegoro.

Rapoport, Amos. 1977. Human Aspect Of Urban Form : Towards a Man Environment Approach to Urban Form and Design. New York : Pergamon Press.

Sanitha, Onie Dian. 2014. *Studi Tata Bangunan Pada Koridor Jalan D.I. Panjaitan Dan Jalan Ali Maksum Sebagai Inti Pelestarian Citra Yogyakarta*. Tesis. Yogyakarta : Universitas Atma Jaya.

Shirvani, Hamid. 1985. The Urban Design Process. New York : Van Nostland Reinhold Company.

Untermann, Richard K. 1984. Accommodating The Pedestrian. New York : Van Nostrand Reinhold Company.

Regulations

Regional Regulation of Yogyakarta Special Region Number 6 Year 2012 About Cultural Heritage and Cultural Relic Preservation

Regional Regulation of Yogyakarta Special Region Number 2 Year 2010 article 30 About D.I Panjaitan Street Is Involved in One of Secondary Collector Streets in Yogyakarta City in Which the Secondary Collector Street Is Street Network that Connects Secondary Region in Yogyakarta.

Regulation of Bantul Regency Number 04 Year 2011 About Regional Spatial Pattern Plan 2010-2030, Article 19 And 21 Section 1 About the Local Street that Connects First Secondary Area to Housing Area, Second Secondary Area to Housing Area, Third Secondary Area, and So On to Housing Area.

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CHANGE AND CONTINUITY OF THE TRADITIONAL JAVANESE LIFE STYLE OF ABDI DALEM HOUSES (Focused on abdi dalem houses near the Imogiri Royal Mataram Islam Graveyard)

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Abstract

This study aims to understand how the traditional Javanese life styles in Abdi dalem houses have continued, or transformed to adapt to modernization through the study of Abdi dalem Houses located at three hamlets near the Imogiri Royal Mataram Islam Graveyard Complex,Yogyakarta. Abdi dalem were not only the pioneer of the hamlet settlements, but also had considered as the priyayi who spread the Javanese culture to the village community. Focused on eighteen Abdi dalem houses in Pajimatan,Giriloyo,and Banyusumurup, the measurements of the houses, interviews with the residents, and direct observations of residents' daily activities are applied for the methodology of this study.
The findings of this study are; First, most of the residents have inherited the houses from the previous generations. They tend to maintain the four sokoguru as main traditional structure and houses traditional orientation; Second, Abdi dalem is still devout to be kawula for Kraton, so they are still avoiding any architectural elements which are resemblance to the royal graveyard architecture. Third, there are spatial function changes: the uses of sacred room changed to more profane function because of the space needs reason. The function of pendopo from social activities changed to the house extension. Fourth, the spatial addition of the house in pawon and dalem adressed to fulfill the modern lifestyle.
This study concludes that Abdi dalem houses have maintained its traditional value in the aspect of the main structure, space, and kawula lan gusti obedience-life views. Pendopo and dalem has lost its initial function and meaning. Dalem and pawon are modified to adapt the modern life style.

Keywords:*abdi dalem , Imogiri, traditional, architecture*

1. Introduction

1.1 Background

Mulder (2011) stated that Yogyakarta, the center of Javanese culture, has become a place for modern and traditional culture mixture. Depari (2013) writes that nowadays Yogyakarta is facing dilemmatic situation between the architectural heritage preservation and modern urban development tendency. As is known, Yogyakarta is the successor of the Mataram Islam Kingdom that established in the 16th century. Yogyakarta has a long history of the Mataram Islam Kingdom's glorious period. Therefore, historic sites and monuments of Mataram Islam Kingdom had existed before Ngayogyakarta Hadiningrat Sultanate came to existence. Governor Decree No.186 of 2011 has declared six historical sites as valuable heritage areas. Imogiri is one of the important historical area because it was the chosen place for Mataram Islam Kingdom great monument. There are three royal graveyard complexes in Imogiri which are oftenly mentioned for their

high historical value, i.e the royal graveyard complex in Giriloyo, Pajimatan, and Banyusumurup. Currently, these three areas have been included as the planning area of Imogiri social and culture conservation masterplan (RURTK 2014-2034) by DPUP ESDM DIY.

The Mataram Islam royal graveyard complex grew the ancient settlement for living quarters of abdi dalem juru kunci, royal servants who are responsible for taking care the royal grave yard and the rituals. The abdi dalem are known for their loyality to the king. According Sulistyowati (2014: 160), people in the Imogiri region in wetan kali (east of the Opak River) considered themselves to have a higher class than kulon kali. Wetan Kali territorial is an area close to the Mataram Islam Royal Graveyard Complex. This term based on Sulistyowati (2014) refers to a predominantly dominated society by the abdi dalem who reflect themselves as priyayi who always interact with the king or the royal family. Abdi dalem who have been inhabited the settlement near the royal grave yard complex had spread the Kraton high culture to local people, especially batik painting skill. Abdi dalem were oftenly considered more knowledgeable about Kraton rituals than common villagers. Nowadays, people who lives near the royal grave yard complex are still involved of the traditional rituals along with abdi dalem .

Besides the importance of historical aspect of abdi dalem living culture continuity, Yogyakarta has been known as vulnerable province to earthquake disaster. Yogyakarta area is part of an earthquake line stretching from the island Sumatra, Java, Bali to Nusa Tenggara. In 2006, Yogyakarta experienced tectonic earthquake where the epicentre was approximately 37 km south of the city. The traditional houses in Imogiri has been collapsed, including abdi dalem houses near the Mataram Islam Royal Graveyard Complex.

1.2 The Statement of Problem

As mentioned above, the settlements surrounding the Mataram Islam Royal Graveyard Complex were emerged by the presence of abdi dalem houses. Abdi dalem who used to be pioneer of the settlements have brought the tradition values in nonphysical and physical aspect. The architectural form and the concept of the houses are the manifestation of abdi dalem relationship to Kraton and Javanese traditional architecture principle. For the architecture preservation behalf, it is necessary to know whether the Javanese traditions values carried by the abdi dalem are still reflected or not in the physical form of their houses.

1.3 The Question of the Research

1. What are the continuity and change of the Javanese lifestyle in abdi dalem houses near Imogiri Royal Mataram Islam Graveyard Complex?

2. What are the continuity and change of the architectural elements of abdi dalem houses near Imogiri Royal Mataram Islam Graveyard Complex?

2. Research Theory and Methods

2.1 Imogiri Mataram Islam Royal Graveyard Complex as Mataram Islam City Component

Woodward (1999) writes that the Mataram Islam Royal Graveyard Complex has become the sacred place of the kingdom. The Mataram Islam Royal Graveyard Complex existence was followed by the growth of the surrounding ancient settlements. Chawari (2008:64), in conjunction with Munawwir in Masyhudi (2014);Adrisrijanti (1997), the Royal Grave yard complex establishment begun at 1632 with the help of abdi dalem as the construction workers. Gradually, the abdi dalem improved their temporary shelters to be permanent houses according to Masyhudi's thesis (2014).

The historical aspect of Mataram Islam Kingdom in Yogyakarta is undeniably important for preservation and conservation consideration. Mataram Islam Kingdom reached its golden age during the reign of the third king, Sultan Agung Hanyakrokusumo (1613-1645). Imogiri Royal Grave yard Complex was built because of the command from Sultan Agung in 17th century before the division of the Mataram Islam Kingdom. After the Treaty of Giyanti in 1755 which divided the sovereignty of the Islamic Mataram Kingdom to Surakarta Sunanate and Yogyakarta Sultanate, the graveyard complex is still owned by two kingdoms until now.

2.2 Abdi dalem as Kawula lan Gusti

Javanese society according to Woodward (1999) is divided into two social groups, namely 1) wong cilik or agrarian society, and 2) priyayi, the social class of abdi dalem and the government officials. In addition, Geertz (1983) in his book, Religion of Java, divides the Javanese community based on their beliefs, namely kejawen, abangan, and santri. Burger (1957) classifies Surakarta and Yogyakarta communities into three classes. The first is sentana dalem or relative of the ruling king to be a group of nobles and kings. Second, the abdi dalem , and the third is the kawula dalem, those who receive the command.

Figure 1. Javanese society
Source: Zahnd in Depari, 2013;Woodward, 1999

Javanese hierarchical social class places the abdi dalem as both 'gusti' and 'kawula'. Even in the smaller scope, abdi dalem hierarchical position also applies that patron-client concept. Gusti is tasked to protect the Kawula because they are considered to have higher class while the Kawula is a servant who is assigned to serve Gusti. A privilege given by Kraton to abdi dalem differentiated their social class from common villagers. The apanage land is the land given to abdi dalem in return for his services to take care of the royal graveyard complex. However, during the time of Sri Sultan HB VII, the land was abolished along with the abolition of apanage system. Remuneration given in the form of money or 'bebungah' which the amount is still enough to meet daily needs.

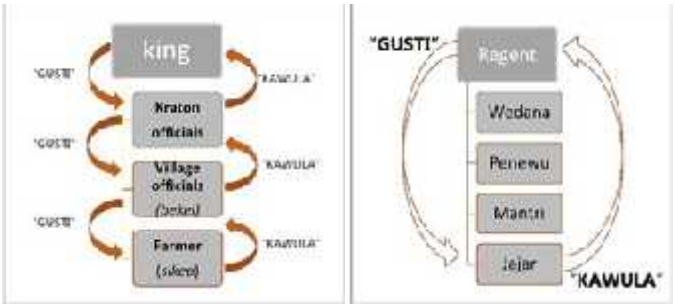


Figure 2 Javanese society and Abdi dalem rank hierarchy
Source: Winarta, 1993

The period of Dutch colonial rule that had undermined the royal power and the occupation of Japan turned out to have a different impact. At the time of the Dutch occupation, the Abdi dalem were still able to enjoy a considerable salary, but by the time the Japanese came to power, the salary received never increased while the life necessities prices rose. This is what Winarta (1993) mentioned in the socio-economic condition of the 1949 in the 1940's declining so that the number of interns decreased drastically based on the of Dalem Bupati Puralaya statistic. After 1945, the internship-enthusiasts of Abdi dalem even more degenerate. The people who are still willing to continue the profession of the previous generation of servants are based on a sense of obedience and hope of blessing from the Sultan.

2.3 Javanese Traditional Houses

Based on the development of the form, traditional Javanese house can be divided into four kind of roof forms, namely Panggang Pe, Kampung, Limasan, and Joglo. The house with the Kampung roof by Tjahjono (1989: 90) is often called 'serotong' or pipe, possibly is a derivatation the word 'kapung' or 'katepung' considering the roof of kampung is meeting two pieces of roof forming a unity. According to Ismunandar (1986: 125), the word kampung in Javanese means yard, village, village people who do not own rice field. In the past, the villagers assumed kampung shaped roof are for the needy.

Dakung (1981: 206) and Prijotomo (1984: 40) explained that traditional Javanese house owned by ordinary people at least has composition of space divided into three parts, namely 1) pendopo, 2) pringgitan as space for puppet show, and 3) omah jero, as a family room called dalem. The composition of the house is divided into three parts, namely the ngarep (front), tengah (middle), and mburi (rear). For the middle room, divided into three rooms or senthong, namely senthong kiwa, senthong tengen, and central senthong.The spatial system of traditional Javanese houses recognizes the hierarchy of sacredness of space. Central Senthong is a space for traditional beliefs, ceremonies, and worship. This room is also used to contemplate and pray for homeowners.

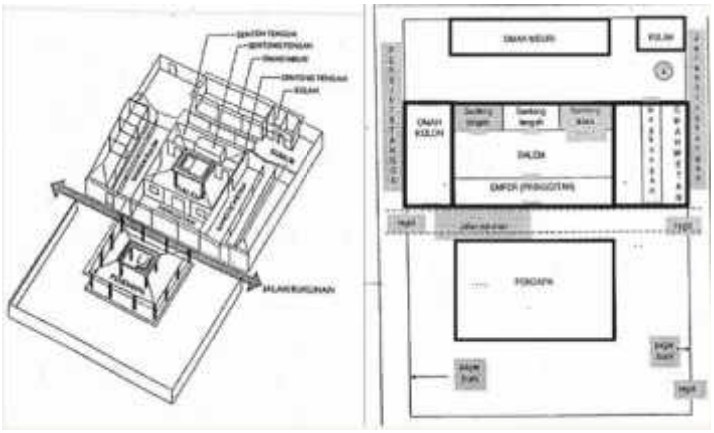


Figure 3 TraditionalJavanese HouseinKotagedeasprecedent
Source:Tjahjono, 1989;Iswati,2009

The space module in Javanese architecture is called rongrongan. The module is the basis for determining the room inside the built house. Rongrongan is a room formed by four columns and two pengeret (transverse beams). If a house has two pengeret (transverse beams), it will create a rongrongan. If it has three pengeret (transverse beams) it will have two rongrongan, and so on. The shape of a building called Limasan Trajumas is a limasan building that has six soko (columns). Thus, this building only has two spaces or rongrongan. The roof consists of four sides with one ridge or wuwungan.

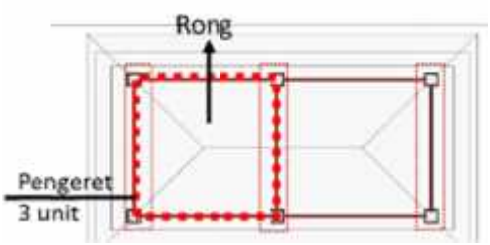


Figure 4. Rongrongan
Source : Illustrated from Dakung, 1981

2.4 Change and Continuity

According to Noel (2011: 26) who quoted Rapoport (1990), people will experience the process of cultural change. In the process of change, there is continuity or sustainability. Preston in Noel (2011: 32) states that the changes and sustainability that accompany the process occur incrementally so that people experience it unconsciously. There is a core element in culture, where core will last longer than the peripheries which will change faster. Rapoport (1990) further explains that culture will certainly affect the built environment.

2.5 Location of the Study

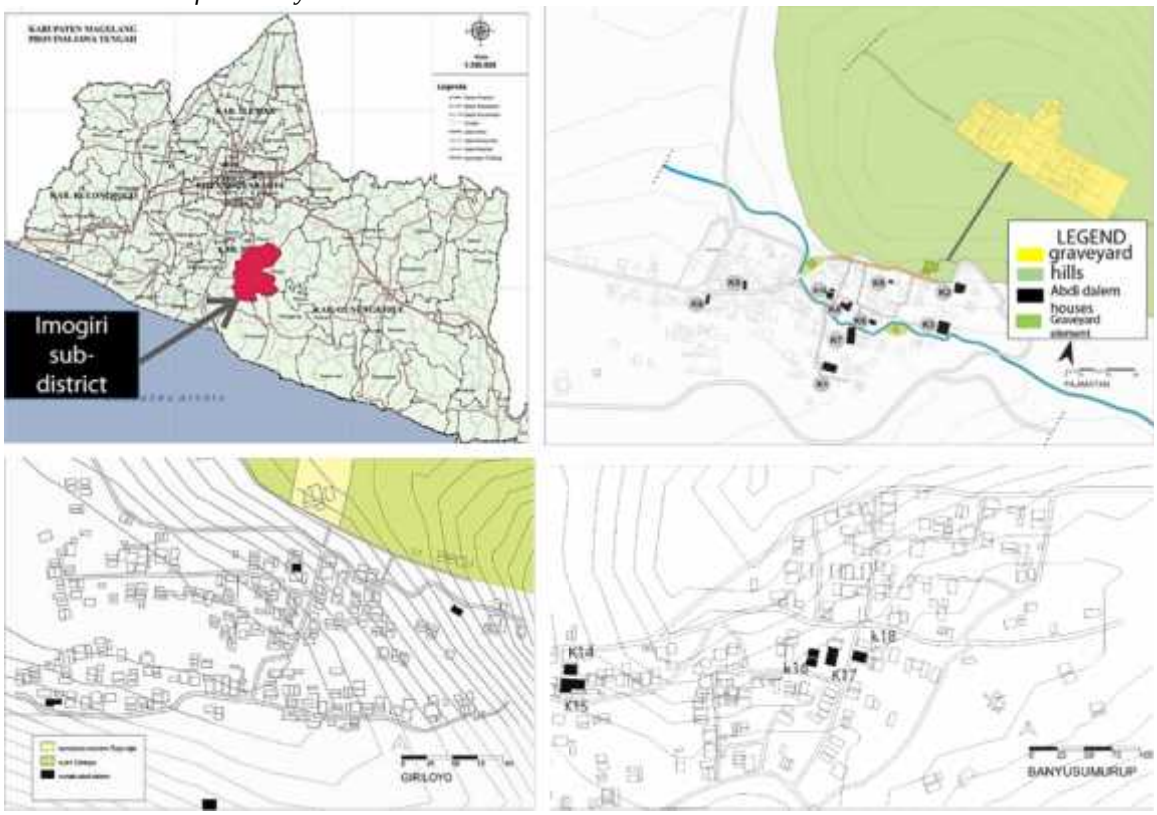


Figure 5 The Area of Study
Source : survey, 2017

Imogiri district is located in the southeastern part of Bantul regency, around 17 km from Yogyakarta. The third chosen hamlets are located surrounding the hill and graveyard complex. Abdi dalem houses are on the

hillside,. There was an unwritten rule had stated the levelling site of abdi dalem houses should not exceed the site where the royal graveyard were plotted.

2.6 Research Methods

Researchers conducted field observations to collect data, and actively involved in activities undertaken by the abdi dalem . Observations made by researchers are photography documentation and measurement. Interviews were conducted with the representative sources, i.e abdi dalem Kasunanan Surakarta and Yogyakarta, the Regent of Yogyakarta Sultanate for Imogiri which is assigned to organize Abdi dalem , indigenous villagers who have been living in the chosen hamlets for more than thirty years and be considered have knowledge about abdi dalem daily life, and the descendants of abdi dalem who work as house builder for at least two generations.

The chosen cases are based on this following considerations; abdi dalem is the descendant of the previous generation, the abdi dalem who is not a descendant but registered and have served as abdi dalem after experiencing a long apprenticeship (at least 10 years). In addition to the variety of servants in the palace, there are homes that have been inhabited 7 generations, and some are new houses which were built in the yard of inheritance.

3. Result and Discussion

3.1 Abdi dalem House Characteristic near the Imogiri Royal Mataram Islam Graveyard Complex

After major earthquake in Yogyakarta on May 27, 2006, the old traditional Javanese architectural houses in the study area suffered severe damage, even collapsed. Ironically, the respondent stated that p ost- earthquake disaster, many of damaged traditional buildings were dismantled. Its wooden columns and beams had been sold to buyers from outside Yogyakarta. It was the decision of the heirs to determine the shape of the architecture whether to preserve the traditional Javanese architecture or just ignore it.

Evidently, there are several heirs of abdi dalem houses have rebuilt their houses without heeding the principle of traditional Javanese architecture. The new abdi dalem houses which were built after the earthquake have big difference with the old houses in spatial organization, ornaments, and structures. The heirs replaced wood as the main building material with reinforced concrete, the spatial organization now tends to fulfill the aspects of functionality and modern needs than the symbolic meaning as before. The decorative elements of Javanese traditional architecture has also been abandoned.

3.2 The component of the house compound

The common abdi dalem house near the Imogiri Royal Mataram Islam Graveyard Complex consists of at least two building masses, namely dalem which is also called omah pokok, and a gandhok, a complementary building that serves as omah pawon (gegenen) or kitchen. The plotting of gandhok is generally located beside the omah pokok (west or east) or at the back of omah pokok (commonly called omah mburi).

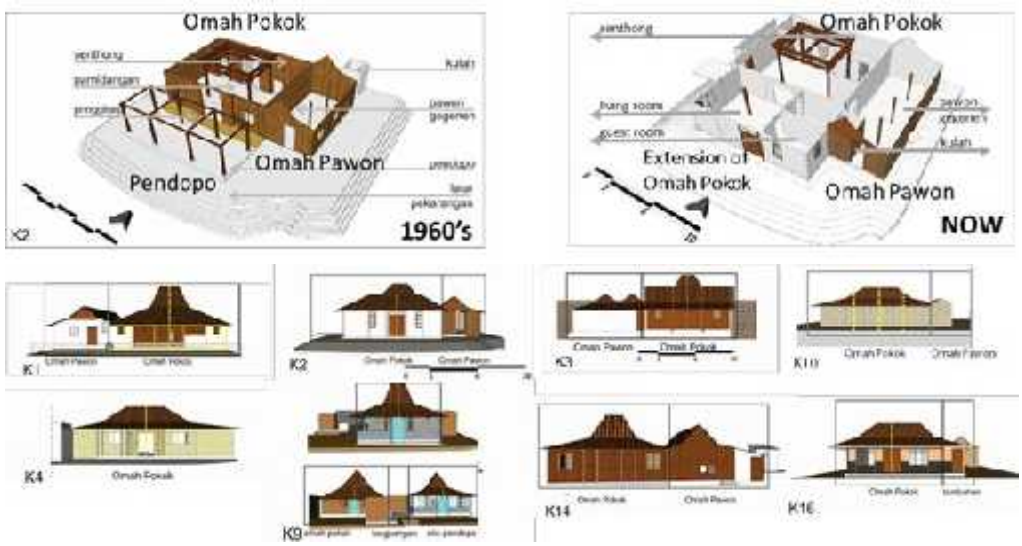


Figure 6. House compound, i.e Pendopo, Omah Pokok, and Omah Pawon
Source: Survey, 2017

Abdi dalem who has close kinship with the royals often exhibits their aristocracy by the existence of pendhopo as the component of the house. His house consists of at least three masses,ie pendhapa, omah pokok,and omah pawon. Joglo roofed pendhopo is commonly owned by the abdi dalem who has high position, especially by abdi dalem who are titled with "Kanjeng" because of his position as Kanjeng in the Sultanate of Yogyakarta, equals to 'Tumenggung' for Kasunanan Surakarta.

3.3 Change and continuity of Javanese life style in Abdi dalem House Spatial Organization

Table 1. The House Compound Component

Case	*Latar*	*Pendopo in its initial characteristic*	*Dalem/ Omah Pokok*	*Senthong*	*Omah Pawon*	*Kulah/ Padasan*	*Kandang*
K1	V	-	V	-	V	V	-
K2	V	-	V	V	V	V	-
K3	V	-	V	-	V	V	V
K4	V	-	V	-	-	V	V
K9	V	-	V	-	-	V	-
K10	V	-	V	V	V	V	V
K14	V	-	V	-	V	V	-
K16	-	-	V	-	V	V	V
K17	V	-	V	-	V	V	-

Source : survey, 2017

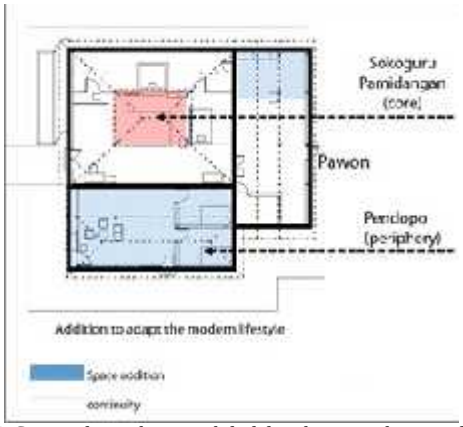


Figure 7. Core and periphery in abdi dalem house architectural element
Source : survey, 2017

Pendhopo

Pendhopo is a part of the traditional Javanese house compound which is not always found in every Abdi dalem houses near the Imogiri Mataram Islam Royal Graveyard Complex. Only the noble abdi dalem owned pendhopo as a validation of their social status, economic and aristocracy. The existence of structure and construction of Pendhopo which can still be found in four cases (K2,K3,K9,and K17).

There are two basic type of pendopo, i.e
1. an elongated pendopo (K2, K3, and K17)
2. square pendopo (case K9).

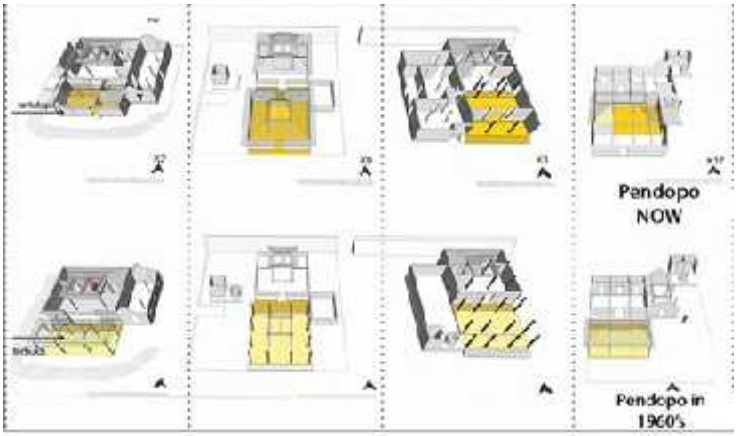


Figure 8. Pendopo Transformation

Case	Roof type	The Function Change of Pendhopo		Character	*Abdi dalem* Rank/ Kraton Kinship
K1 (Resodiharjo)	Joglo	1960's	Socialactivities, performingarts, wayang	Open	The descendant of the Royal Surakarta Sunanate
		Now	demolished	-	Living room and bedrooms
K2 (Jogo Wiyono)	Joglo	1960's	Batik workshop and social activities	Open	Kanjeng, the descendant of

Case	Roof type	The Function Change of Pendhopo		Character	*Abdi dalem* Rank/ Kraton Kinship
					Hamengkubuwono II
		Now	Living room and guest room	Closed	
K3 (Mangku Diharja)	Kampung	1960's	Batik workshop and social activities	Open	Jajar Sepuh
		Now	Living room	Closed	
K9 (Kurni)	Joglo	1960's	Social activities : performing arts,wayang	Open	The descendant of the Royal Surakarta Sunanate
		Now	Living room and bedrooms	Closed	

Source : survey, 2017

According to the heirs, in 1960's pendhapa was used as a gathering area of social activities as well as to craft the batik. Nowadays, the function of pendhapa is no longer seen as an obligatory public space as before. A pendhapa is indeed an identity of the previous generation's social status, but on the other hand, there is an increasing need for functional spaces that accomodate the domestic activities effectively , i.e bedrooms to respond the growing number of family member and more private living room.

Table 3. The Pendhopo Function Alteration and its motives

Case	Function alteration	Form transformation	motives
K1	Yard	Demolished. No reconstruction.	The front yard has been transformed to narrow alley for public pathways.
K2	Living room and guest room	The pendhapa is partitioned	batik crafter profession discontinuity
			Spatial needs reason
			Addition of functional spaces: guest room for the pilgrims
K3	Omah Pokok extension as more private living room	adding emper as public space	**Spatial needs reason**
			addition of functional spaces that efficiently support domestic activities
K9	Bed rooms and private living room	Pendhopo is partitioned with wall and movable partition	**Spatial needs reason**
			addition of functional spaces that efficiently support domestic activities
K17	Living room	Pendhopo is partitioned with wall and movable partition	**Spatial needs reason**
			addition of functional spaces that efficiently support domestic activities

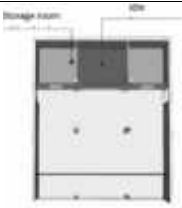
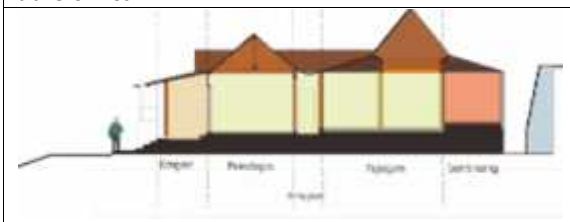
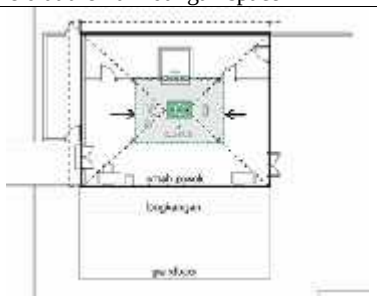
Source : survey, 2017

OmahPokok

Omah Pokok is generally divided into two parts, njogan and senthong. Omah Pokok nowadays is used in its original function for living and serves as domestic space.

Table 4.The Changes and Continuity of Omah Pokok

Changes	Aspect	Space

Changes	Aspect	Space
	Hierachy	 • The discontinuation of senthong as a sacred room. Central senthong is no longer functioned for worshipping Godess Sri. • The discontinuation of amben as place for sleeping together. Now senthong tengah has been transformed to bedroom
Continuity		floor levelling continuation despite the function of central senthong has been transformed
		 Traditional rituals held at the Pamidangan space
		 The pilgrim and *abdi dalem* still hold traditional ritual 'Kenduren' with tumpeng as offering at Pamidangan (space between sokoguru) in Omah Pokok

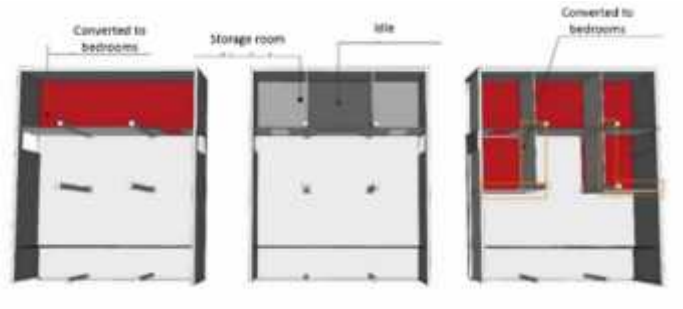
Source : survey, 2017

Senthong

There are three types of central senthong found in Abdi dalem houses;

Table 5. Senthong change and continuity

Type	Senthong Function Changes	motives	Conclusion
1	All of three senthongs have been converted to bedroom by opening the former partitions.	Spatial needs Change in perception of kejawen ritual	Senthong tengah or Central Senthong has lost its sacredness
2	Central senthong has left idle, the flanking senthong become storage room for previous generation's heirloom	Spatial needs Change in perception of kejawen ritual	
3	All senthongs have been partitioned and converted into bedrooms	Spatial needs Change in perception of kejawen ritual	

Type	Senthong Function Changes	motives	Conclusion
 Type 1 Type 2 Type 3			

Source : survey, 2017

The abdi dalem no longer practice the Kejawen rituals, the ritual of the predecessors' because they regard it as heresy (bid'ah) in pure Islam teaching, especially Muhammadiyah. Interestingly, they separated the effort to preserve traditional rituals with the rituals of Islam. This affects the space usage at home. Abdi dalem admit that they no longer practice the old rituals in the house so as not to emphasize a part of the house. Now there is no more hierarchy of space seen from the function of sacred and profane. It can be said that all the space in the house has been in profane state.

The Importance of Pamidangan and Sokoguru

To respond to the space needs development, generally, the addition of space in abdi dalem house does not change the basic module of the inherited house. The addition of space does not change the module of the dalem area or the principal omah as the core of the building.The house extension space adjusts and follows the basic module of 'rong-rongan' to place partition as a room. The addition of space usually occurs in the front, side, and back of the house.

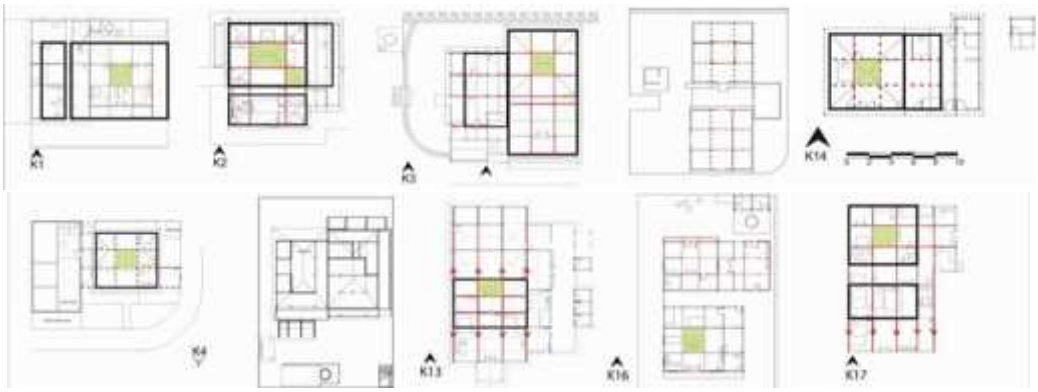


Figure 9. The Continuity of Sokoguru as main structure, and Pamidangan space
Source : survey, 2017

Omah Pawon Transformation

Omah Pawon has significant existence in abdi dalem houses. The proportion of omah pawon compared to omah pokok is quite large. Nowadays, abdi dalem tend to build more modern kitchen to omah pawon part. Despite of the addition, they preserve a distinguish part called gegenen area, the cooking area using a traditional furnace. For daily cooking purposes, the wives and families of the abdi dalem use gas stoves, but at certain times (kenduren activities), they still use the furnace. It is believed that communal cooking activities

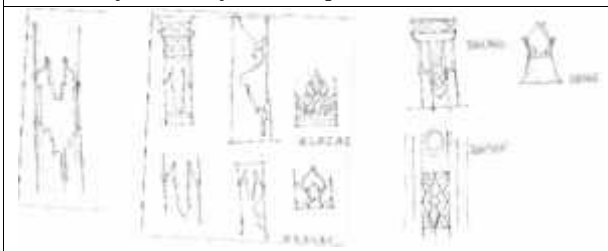
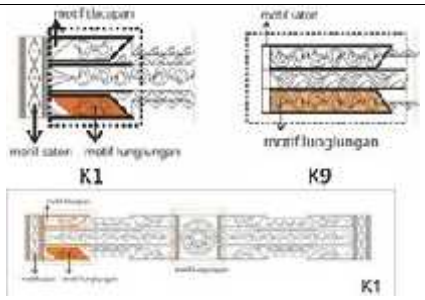
can be done more effectively when using a furnace than using gas stoves. Furnaces are usually placed in the south and east of the building. The existence of amben as a semi fixed element used as a workplace for women in an informal way. Amben is oftenly functioned as a gathering place for women.

Figure 9. modern kitchen addition and the continuity of gegenen area
Source : survey, 2017

3.4 Form and Ornaments Avoidance

Abdi dalem are still avoiding any architectural ornaments which have resemblances to Mataram Islam Royal Graveyard Complex because the position of abdi dalem is Kawula or the klien, and Kraton has higher position (patron). There is a differentiation for aesthetic taste between Kraton royals and folks.

Table 6. Form and Ornaments Avoidance

Ornaments motifs found in the cupolas of Mataram Islam Royal Graveyard Complex Columns or Saka	Abdi dalem Houses
	not implemented / being avoided because there are included
Elemen Dadapeksi	 derivating Sorotan motifs to simpler motifs

Source : survey, 2017

3.5 Structure and Construction

3.5.1 House building rituals

It can be inferred that the praxis of the house building ritual has gradually tends to be discontinued. The reason why it has been discontinued because abdi dalem are nevermore consider the rituals as an obligation for seeking God's bless. The rituals that have been preserved are foundation construction and the sokoguru erection.

Table 7. House building rituals

	1960's	1980's	NOW
Working system	V	V	-
	Gotong royong or sambatan	Gotong royongor sambatan	Sambatan dengan upah tukang
Measurement units	Human dimension : *pecak,kaki,depa,asta*	meter	meter
Traditional rituals for cleaning sites from evil power	V	V	-
Foundation construction	V	V	V
Theerectionof sokoguru	V	V	V
Theerectionof molo	V	V	-

Source : survey, 2017

3.5.2 Columns and Beams

Abdi dalem are still avoiding Limasan Trajumas shape as their house form. It is formed by only six columns and odd number of pengeret or beams. They are still strongly believe that trajumas is an exclusive form which can only be implemented for buildings owned by Kraton. Until nowadays, the architectural order of Limasan Trajumas has never been a precedent to abdi dalem houses. Abdi dalem mention that Limasan Trajumas can only form two rong-rongan (space between two pengeret beams) which is not practical for a dwelling. Building a house with an odd number of pengeret can be considered as resembling trajumas form because the number of rong-rongan formed is even. Ideally, people build houses with an even number of pengeret, for example the ideal number of pengeret are four or six so the formed rong-rongan amount are odd.

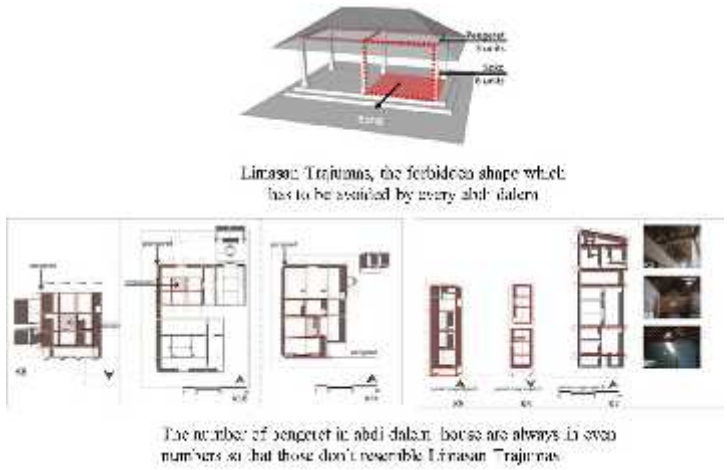


Figure 11. Avoidance of Limasan Trajumas form resemblances to Abdi dalem Houses
Source : survey, 2017

Conclusions

There are changes and continuity on Javanese lifestyle in abdi dalem houses. The changes of Javanese lifestyle are related to the domestic and traditional ritual activities discontinuity. Abdi dalem has been influenced by the modern lifestyle. The increased awaraness of purified Islamic religious teaching among abdi dalem affects the space function and meaning. Spaces which were considered sacred has now has became profane and transformed to adapt the spatial needs. Therefore, pendhopo and senthong have lost its initial function and meaning. Spatial additions of omah pokok and pawon are adressed to adapt the modern lifestyle.

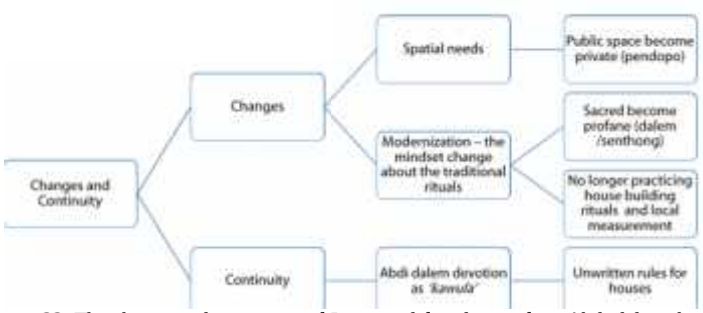


Figure 22. The change and continuity of Javanese lifestyle motifs in Abdi dalem houses
Source : analysis, 2017

However, abdi dalem is still devout to be kawula for Kraton, so they are still avoiding any architectural elements which are resemblance to the royal graveyard architecture and still obeying the unwriten rules about house ornamentation and structure. Sokoguru is always be considered be the core of the house while pendopo can be said acts as periphery, which is changed faster.

Table 8. Continuity of Javanese Lifestyle in architectural elements on Abdi dalem Houses

The Continuity of Javanese Lifestyle in *Abdi dalem* Houses		
Non-physical aspect		
	Continuity	Ritual done by the pilgrims and *abdi dalem* named 'Kenduren' which occurs at Pamidangan space
Physical Aspect		
Spatial Organization	**Orientation**	Obedience of the traditional orientation : north and south
	Continuity	Building orientation and bedroom orientation respecting the orientation of Royal Graveyard Complex
		Molo beam is still used as house orientation sign despite the house entrance has been changed
	Zoning	The plotting of *kulah-padasan* at right-front or on the left-behind the *Omah Pokok*
		The plotting the parent's sleeping room is at the privat zone in the house
Form-Ornamentation	**Avoidance**	Avoidance of limasan trajumas forn
		Avoidance of the ornaments which are resemblance to Kraton
	Derivation	Derivating Royal Graveyard Complex Cupola's Dadapeksi motifs to simpler motifs
Structure-Construction	**Preservation**	Sokoguru as main structure
	Avoidance	Compliance of unwritten rules about the number of uleng and tumpangsari beams

References

Adrisrijanti, Inajati.1997.Arkeologi Perkotaan Mataram Islam, Jendela, Yogyakarta
Chawari,Muhammad.2008. Studi Kelayakan Arkeologi di Kompleks Makam Imogiri Yogyakarta.Berkala Arkeologi, Balai Arkeologi Yogyakarta, Yogyakarta.

Dakung,Sugiyarto.1981. Arsitektur Tradisional Daerah Istimewa Yogyakarta. Departemen Pendidikan dan Kebudayaan,Yogyakarta.

Depari, Catharina Dwi Astuti.2013.Konservasi Arsitektur Kota Yogyakarta, Kanisius, Yogyakarta

Dinas Pekerjaan Umum, Perumahan, dan Energi Sumber Daya Mineral DIY.2014. Laporan Akhir Penyusunan RTR Kawasan Strategis Provinsi Pelestarian Sosial Budaya Kawasan Makam Imogiri 2015-2034

Groat & Wang.2002. Architectural Research Methods. John Wiley & Sons Inc, USA.

Habraken, N.J. 1978. General Principles of About the Way Environment Exist, Department of Architecture, MIT Massachusetts,

Iswati, Tri Yuni. 2009.Kampung Dalem, Dibalik Kemegahan Kotagede, Sebelas Maret University Press, Yogyakarta.

Masyhudi, 2014. Pelestarian dan Pemanfaatan Kawasan Cagar Budaya Makam Raja-raja Mataram Islam Imogiri. Unpublished Thesis, Universitas Gadjah Mada,Yogyakarta

Noel, Ekhaese.2011.Domestic Architecture in Benin City A Study of Continuity and Change. Unpublished dissertation. Covenant University, Ota, Ogun State, Nigeria

Prijotomo, Josef.1984, Ideas and forms of Javanese Architecture, Gadjah Mada University Pres, Yogyakarta.

Sulistyowati, 2014. Artikulasi Identitas Wong Solo di Eks Enklave Surakarta : Konstruksi Bahasa dan Pemertahanannya. Jurnal Humaniora. Volume 26 (2014).

Tjahjono, Gunawan.1989.Cosmos, center, and duality in Javanese architectural tradition: The symbolic dimensions of house shapes in Kota Gede and surroundings. Unpublished Dissertation, University of California, Berkeley.

Winarta (1993). Abdi dalem Juru Kunci Makam Imogiri Kasultanan Yogyakarta : Studi tentang Kehidupan Sosial Ekonomi. Unpublished Thesis, Universitas Gadjah Mada,Yogyakarta

Woodward, Mark.1999. Islam Jawa : Kesalehan Normatif Versus Kebatinan. Lkis, Yogyakarta

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Architecture Research and Design (AR+DC)
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INNOVATIVE SUSTAINABLE STREETSCAPE DESIGN ALONG *KEMBANG JEPUN* CORRIDOR SURABAYA

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Abstract

Kembang Jepun is an area of the old city of Surabaya known under the name of the Lower Town or "*Beneden Stad*" that developed since the 18th century which has buildings with several different periods starting in the 1870s up to the 1900s. Now *Kembang Jepun* area has been known as dense area filled with commercial buildings and less paying attention to the condition of thestreetscape. As a historic area that continues to operate actively, *Kembang Jepun* corridor has great streetscape potential to be developed to produce an attractive city situation in terms of environment, social conditions and supporting urban economic development. In fact there are problems for instance lacking in greenery and safety as well as historical atmosphere. For this purpose, the study will use a focus group discussion approach, which is a method of discussion with several stakeholders to provide innovative design ideas in the development of streetscape that has meaning in sustainable urban development, because stakeholder participation is an important key factor in the sustainable design process. The expected result of this research is to develop innovative streetscape designs in the corridor by develop the potentials and still maintaining the cultural heritage buildings.

Keywords: ***Kembang Jepun, Streetscape, Forum Group Discussion***

1. Introduction

Streetscape conditions in Surabaya experienced various changes. This can be seen in some streetscape points in central bussiness district area in downtown area. Kembang Jepun is an area of urban dense bussiness district that lacks good streetscape facilities. This can be seen in the Kembang Jepun Street segment which does not have access road for pedestrian and the entire road is used for motor vehicles. For that streetscape problem Kembang Jepun Area still need an innovative arrangement so that it can display the character of the old city around the north area of surabaya.Streetscape arrangement in the area of kembang jepun is intended to improve the circulation of good goods, vehicles and humans. Therefore, there needs to be an innovative design related in the preparation of design criteria for streetscape in Kembang Jepun area.

2. Research Theories and Methods

2.1. Innovative City

Economic and ecological sustainability can strengthen each other and benefit some parties. For example, the implementation of an integrated waste management program through a systematic implementation of stakeholders is beneficial economically and ecologically. Integrated utility and resource planning and management through systematic stakeholder collaboration can provide benefits for broader human sustainability and well coordinated and comprehensive urban development programs. Social and environmental programs demonstrated that costs are not a hindrance to ecological and economic city planning, development and management and illustration of trace success in urban development that brings together institutional and cultural space.There are 4 (four) main principles in planning an innovative city that is:

a. City based approach
b. An expanded platform for collaborative design and decision making
c. A one system approach
d. An investment framework that values sustainability and resiliency

The purpose of streetscape in the Central Business District (CBD) is to address the needs of the growing population and a desire to improve pedestrian facilities to create more walkable communities[1].
The innovative streetscape design has to address the following needs:

a) To accommodate existing driver behavior which is unique to the city due to the diverse population.
b) To design streets that create a safe environment for all users, recognizing varying levels of driver education and cultural differences.
c) To act as a tool for the transition of the CBD from a vehicle trip based society to a multi-modal society and supporting long term public transport plan.
d) To introduce fine-grained street networks that allow greater route choice for pedestrians and improve the capacity and efficiency of the streets.

The standards and guidelines in this Manual are based upon the following key design principles such as • The best transport plan is a good land use plan, Good street design starts with pedestrians, A well designed street network provides safety for all modes of transport and Street connectivity enhances capacity and allows smooth traffic flow.

2.2.Vertical garden

Vertical Garden is a descriptive term used to refer to all vegetated wall surfaces. It is also called a system to attach plants to structures of building walls or facades of vertically greened buildings either partially or completely covered with vegetation, and have a pleasant green appearance (Yu-Peng yeh, 2010)[2].

Vertical greening states some of the benefits of using vertical green elements, including:

a) Improving Air Quality: Plants require carbon dioxide to synthesize food through direct contact of sunlight in a process called photosynthesis. The product of this process is oxygen that is beneficial to humans. The more plants are grown in the urban areas, the more oxygen will be produced automatically through the recycle of carbon dioxide.
b) The Effect of Ecology: Vertical garden can serve as an alternative ecological habitat. Certain species such as Hedera helix and rose plant (Rosa) can produce colorful fruits that can be enjoyed by animals, whilevines are favored by birds and bats.
c) Increasing the Value of Urban Aesthetics: Having a vertical greening in urban space can create a positive impact in terms of availability of green space environments, where the

availability of green spaces is slowly decreasing in supply. A green wall which is designed and maintained properly can improve the appearance of a building. For example, green wall can be used to disguise less attractive areas such as old untreated bridges, multilevel parking lots, old buildings with untreated facades.

d) Rain retention and solar radiation:The Green Facade can form effective protection against heavy rain, as it prevents rainwater from reaching the surface of the building facade. Rath and Kießl in Ottelé (2011) suggest that 50% of the sun's energy will be absorbed and 30% reflected by the foliage [3].

e) Effect on Environmental Temperature :The green facade can create its own microclimate, so it can affect the microclimate in the environment around the building.

Type Of Plants Suitable For Vertical Garden

The use of appropriate vegetation types for vertical garden systems especially for exterior use is important. There are experimental applications of green facades in tropical climates (Thailand) by studying the plant species of Ivy labu (coccinia grandis), terompet biru (thunbergia grandiflora), and meksiko rambat (antigonon Leptopus). It was found that the Terompet Biru tree grows very fast and provides consistent density, making it suitable for covering green facades in tropical climates (Sunakorn, et al. 2011) [4].

The use of vines is a common choice for green facades, but research on living vegetation species on living walls is limited. Vegetation for living walls has a wider choice than a green facade. The types of vegetation commonly used include:

NO.	Name	Explanation	Picture
1	Aeschynanthus radicans	Also known as 'lipstick plant', it is a suitable plant for use in vertical garden applications both indoors and outdoors. Plants that have good growth rates in optimum lighting and moist environments and are able to adapt to dry environments with minimal lighting. This plant provides a beautiful pattern if applied to the vertical garden thanks to its red buds with green foliage.	
2	*Nephrolepis exaltata*	Also known as 'Sword Fern', the best part of this plant is the ease to maintain its health and beauty. It is suitable for humid environments and is an ideal choice for outdoor applications. This plant is good in regulating the temperature so it keeps the temperature moderate and under control	
3	Acacia cognata	Plants that can provide different attractions to the wall with a fuller impression. Often	

		used at the finishing touch and fits indoors or outdoors.	
4	Dracaena	Plants that are often used in vertical garden applications, due to the unique style of the leaves and suitable in all shapes and colors of the wall as a media of application.	
5	Stephanotis floribunda	This plant is widely known as a wedding plant thanks to a white flower bud shape and can emit an attractive scent of fragrances so it fits in vertical garden applications. This plant requires exposure to high sunlight so it can grow healthily.	
6	Epipremnum aureum	This plants known as "Australian native monstera" because it requires minimal maintenance. Often used in vertical garden applications and easily spotted from the color of the leaves which are bright yellow to pale yellow, it is a plant that is reliable enough to require minimal care and moderate exposure to sunlight.	
7	Codiaeum variegatum pictum	This common plant grown in Indonesia is also known as 'Croton'. It would grow very well if exposed to direct sunlight to get good staining and prettier color. In a vertical garden application, this plant is often used to give color accents and give a lot of color to the wall to make it look more beautiful.	

Source: Pinterest (2017)

Precedent


Fig1: Vertical Green Application on Urban Corridor
Source: Pinterest (2017)

In dense urban corridor environments, vertical garden applications are generally located on the upper floors with the aim of not interfering with human activities, giving shadows on the upper floors. Thus vertical garden applications can provide environmental and visual improvement benefits in city corridors.

Fig 2: Streetscape of urban corridor
Source: Pinterest (2017)

3. Method

This research used descriptive qualitative and explorative method with emphasized in people participation as a consideration in deciding the concept and design of the study area. Primary data for this research were collected through observation and focus group discussion (FGD). Considering the community is the subject and object of the undertaken design process, involving the community in a design process is an important thing. Community involvement consist of several stakeholders chosen based on their expertise sit together to discuss about Kembang Jepun. The engagement is conducted using Focus Group Discussion (FGD) by gathering the stakeholders in one event, and each of them can give their opinion on the issue based on their knowledge. Stakeholders as participating in the FGD are coming from various backgrounds yet similar in topic of interest. Government, expert, academia, students and also local inhabitants are included as stakeholders. In a facilitated session that last from hours to around two days, ideas are presented to the participants, after which professional facilitators will ask for people's reactions to the proposals that have been shown to them (The local agenda 21 planning guide, 1996)[5]. FGD is organized to gather information and issue from people's perception and then to disseminates the recommendation by authors. FGD as public

meetings is considered an urban planning anddesign tool by involving public in the decision-making process and it can also be used to disseminate information.

Fig 3: Urban Design Process (based on RIBA practice and Management Handbook in Moughtin, 1999)

According to the RIBA practice and management handbook, design process is divided into four phases as shown in figure 1 (Moughtin, 1999)[6]. Phase 1 is Assimilation: the accumulation of general information and information specially related to the problem, Phase 2 is General Study: the investigation of the nature of the problem: the investigation of possible solutions. Phase 3 is Development: the development of one or more solutions and Phase 4 is Communication: the communication of the chosen solution/s to the client

At the first stage, researchers collect the information regarding Kembang Jepun as an old district in Surabaya city and its phenomenon of urban landscape and streetscape. Authors then decided a suitable district as area of research. The second stage is conducted by investigating the problems and potentials in the research area, and delved into case studies and precedents to learn about existing innovative solutions. To achieve the research objective, investigation of potentials-issues is divided into three dimensions of sustainability: environmental, social and economic. The third stage is to develop a design concept from the criteria. The last stage is to hold FGD and share the concept of innovative planning in a presentation. At the final stage, advices and recommendations from various stakeholders are treated as valuable inputs for the research. The major interest of the research is to combine between authors' idea and community's perception in creating sustainable urban streetscape in Surabaya old district, specifically Kembang Jepun main road.

4. Result and Discussion

The dominance of trade and services as well as offices makes the movement of pedestrians in this region quite crowded. Especially on the main road corridors such as Jalan Kembang Jepun. Pedestrian path on this road already meets the standards. But there are some parts that have begun to damage the pavement. In addition, there are vehicles that not supposed to park on the pedestrian lane. In the business area, the condition of pedestrian way is not adequate, especially since some roads still do not have pedestrian way.

The criteria for main road of Kembang Jepun is:

a. Traffic flow and street furniture should be able to improve the performance of the road and streetscape.
b. The design should be visually appealing to improve the atmosphere and visual quality of the area.

c. The design should pay attention to landmarks and spirit of place to strengthen the identity of Kembang Jepun area.
d. The design should be able to accommodate various activities for different group of people and utilize building as background for activities
e. The design of public space should consider its local content and involve local communities

Fig 4: Before and after of jl. Kembang Jepun

Given the uneven performance of Kembang Jepun (dense in working hours but quiet afterwards), it is found several causes of this happening, namely:

a) Commercial functions that fill the rows of buildings along the corridor.
b) Buildings along the corridor form a liner line that accelerates the rate of corridor users, this is coupled with linear current flow.
c) Rows of car parks that fill the roads that worsen the atmosphere of the corridor.

Vertical garden is used for ecological use and to reduce the urban heat in Kembang Jepun Area. Vertical garden applied on the facade of the building is used to add a dynamic impression on the building by creating a curved pattern. The pattern is applied using wiremesh as the planting media of vertical garden.

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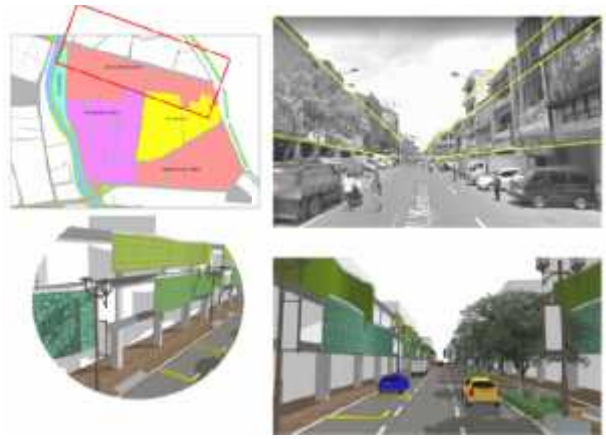

Figure 5 : Façade vertical garden at*Jl. Kembang Jepun*

The number of motorized paths will be reduced to 3 lines. On the right side of the reduced path will be used as a pedestrian way and added with some softscape and hardscape elements. In addition to

pedestrian way can also be used for street vendors at night, so installed some elements of street furniture to support economy activities at night.

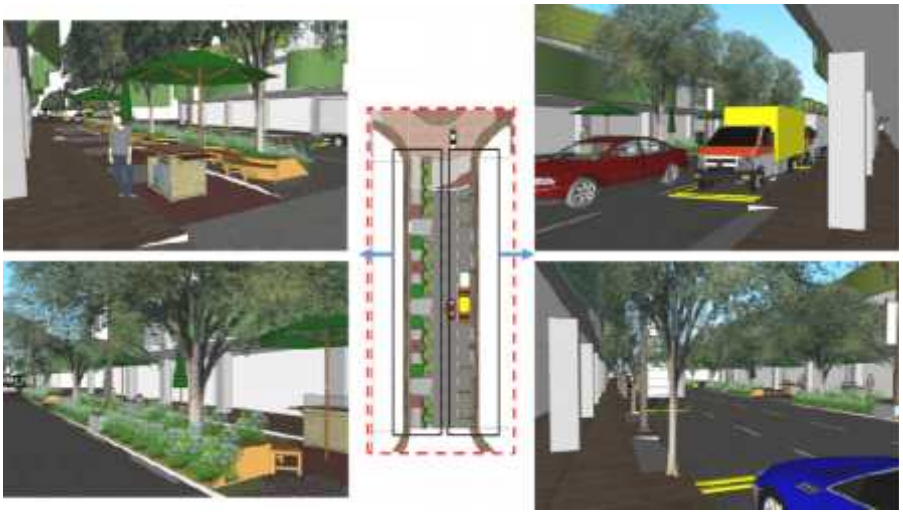

Fig 7: Streetscape for each Side

At the junction of *Jalan Kembang Jepun*, applied a concept that aims to form the active outer space achieved by redesigning the surface of the road material, thus forming a distinctive outer space. The design of the intersections is inspired by the oriental design with the aim of enhancing vernacular imagery from the study site. Road material uses surface material that has excellent absorption.

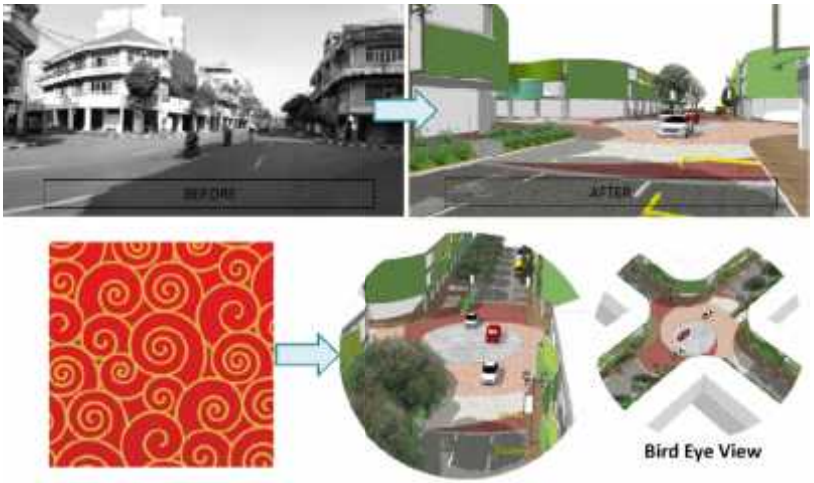

Fig 8: The Design of Intersection

The pattern at the intersection Jl. Kembang Jepun is used to reinforce the image of the *Kembang Jepun* area that is identical with the old city that reinforces the *pecinan* characteristic as a regional character.

Fig 9: The Green Façade concept of the Corridor

In the streetscape of *Jl. Kembang Jepun* there are additional lines for pedestrian located on both sides of the road. At the left side of the expansion path for pedestrian there is also an area for the green line which is also used as a barrier between motor vehicles and pedestrians. Aside from being a pedestrian lane, the extension of the path can also be used for street vendors around the kembang jepun area to attract visitors interest in the area to better utilize the pedestrian path. In addition there are also additional street furniture that is used to complete the facilities pedestrian way so that it can be used both during the day and night. Some street furniture added are:

Table 1: Street Furniture for *Kembang Jepun* streetscape

No.	Street furniture	Explanation	Picture
1	Street Lamp	The addition of street lamp is used for the lighting of the Kembang Jepun to illuminate the area for night activities. In addition, the lighting at night is also intended to provide a sense of security and comfort for visitors who visit Kembang Jepun at night.	
2	Bench	Bench is used to provide a sense of comfort for pedestrians through the pedestrian way. It is also used to serve as a mean of sightseeing around the area of *Kembang Jepun*.	

3	Street vendor	The addition of street vendors here is to create activities on the night and revive culinary tourism on the area. This is also done to eliminate the impression of dark and gloomy *Kembang Jepun* at night. Trade activity in pedestrian way area is also used to improve economic aspect of small and medium society.	
4	Soft scape	Softscapes in form of various trees, shrubs, and grass give the area a softer and more natural looking image, making Kembang Jepun more approachable and friendlier. Softscapes, green wall, and vertical gardens along the road also create a cooler microclimate and more interesting view for visitors.	

Source : Research Team and Pinterest (2017)

The picture on the side shows the above. The image shows a very clear pedestrians and green path. This is applied addition, the clearedges is also applied to can provide comfort for all aspects of the view of the Kembang Jepun road seen from division of paths between motor vehicles, to create a clear edge of the mobilization. In create an innovative streetscape quality and community in the Kembang Jepunarea.

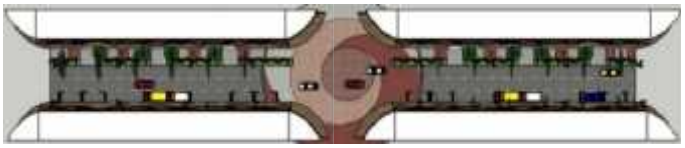

Fig 10: Picture from above

Kembang Jepun Area is one of the of business places along the road creates a important to apply an innovative streetscape arrangement applied on along the corridor of includes the addition of pedestrian way, as busiest area in North Surabaya. The existence disorder on *Kembang Jepun* road. It is arrangement on this corridor. Streetscape *Kembang Jepun* road. This arrangement well as reduction of motor vehicle lane to slow

down the vehicle path. Street furniture are also as aesthetic element that adds comfort and improves security for pedestrians. To improve the ecological quality, green path is added as a barrier between pedestrian way and motorway.

5. Conclusion

Kembang Jepun is known as a dense area filled with commercial buildings and poor condition of the streetscape. As a historic area that continues to operate actively, *Kembang Jepun* corridor can be developed to produce an attractive downtown area environmentally, socially, and economically. The criteria for main road of Kembang Jepun can be concluded as such: traffic flow and street furniture should be able to improve the performance of the road and the streetscape, the design should be visually appealing and pay attention to landmarks and spirit of place, the design should be able to accommodate various activities for different group of people and utilize building as background for activities, and the design of public space should consider its local content and involve local communities.

Innovative design of the streetscape in *Kembang Jepun* corridor is derived from various ideas and considerations through discussion between stakeholders. The design has several important points:

1. Vertical garden is used for its ecological benefit to reduce the urban heat in Kembang Jepun Area and is applied on the facade of the building to add a dynamic impression.
2. The number of motorized paths will be reduced to 3 lines to give more space for pedestrian way. The pedestrian way can also be used for street vendors at night.
3. The junction of the road is designed as an active outer space with patterns that sthrengthen its identity as an old pecinan area.
4. Green line is used as a barrier between motor vehicles and pedestrians.

References

[1] The Abu Dhabi Planning Council 2010 *Abu Dhabi Street Design Manual* https://issuu.com/cdaadmin/docs/street_design_manual_english__small__final
[2] Yu-Peng Yeh 2010*Green Wall The Creative Solution in Response to the Urban Heat Island Effect* (Taichung: National Chung-Hsing University)
[3] Rath and Kießl in Ottelé et al 2011 Vertical greening systems and the effect on air flow and temperature on the building envelope *Build. And Env.* **46** 2287-94
[4] Pasinee Sunakorn et al 2011 Thermal performance of biofacade with natural ventilation in the tropical climate *Procedia Engineering* **21** 34-41
[5] ICLEI 1996 An introduction to sustainable development planning *The Local Agenda 21 Planning Guide*
[6] Moughtin C 1999 *Urban Design: Method and Techniques* (Oxford: Architectural Press)

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HOLMES St. FORENSIC LAB & EDUCATION CENTER (Idea of Interiority through the Trail Observation)

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Abstract

Humans are the most important thing in a space experience. Two important aspects of public space are the feelings of comfort and discomfort. That comfort or discomfort kind of feeling in the public space, are obviously inseparable from the acts of crime. Through such approaches, I undertake this studies and a research for design, to identify the sequence of trails autopoietic processes, holistically, when human come up against their discomfort, and in their existential space. So, that specific and particular boundary from the trail will come up as identity. Identity of the past turns out into such an idea to be designed. When the segments are legible as segment-by-segment, the processes will be holistically identified as a whole story. When the presence of a trail becomes a boundary, therein the trail will appear as the interiority.

Keywords:*interiority, trail, living machine, criminality, identify*

1. Introduction

The public spaces of a city, such as its streets, footpaths, waterfronts, parks, plazas, town squares and laneways give form to the ebb and flow of human exchange and interaction (Carr et al. 1992). They are often where people find some of the most stimulating, exciting and worthwhile experiences of their lives (Beattie and Lehmann 1994). Human beings become an important part of public space and the overall experience in it. As well as human with their own existential space experience. The existential space itself can be interpreted differently by every single human being, based on their own environment context. Come through memory, perception, meaning, and every point of view. Each person will be different, based on their own process of thinking. Every single process of thinking could be affected by their own experience, either the good one or the bad one. The way human interpret their environment (through space and place) are all different, based on their own immediate sensory experience and affected by every single experience that appears from their own past. The relationship between people and the environment is examined by focusing on how the physical and ambient stimuli (or features) of an environment affect behaviour and emotions (Mehrabian and Russel 1974). Especially from anything that can interfere their comfort zone. Either from natural disturbances or from other human, or for anything else in the scope of “public spaces”. Human behavior, interaction and experiences in public space are believed to be the result of the “process of thinking” that are influenced by different “human being experience”. “The continuity of human life in such a space which essentially consists of interior space (interior selves) and external space (exterior world), can also be defined as the embodiment of human existential space. (Ponty, in Olkowski & Morley, 1999).

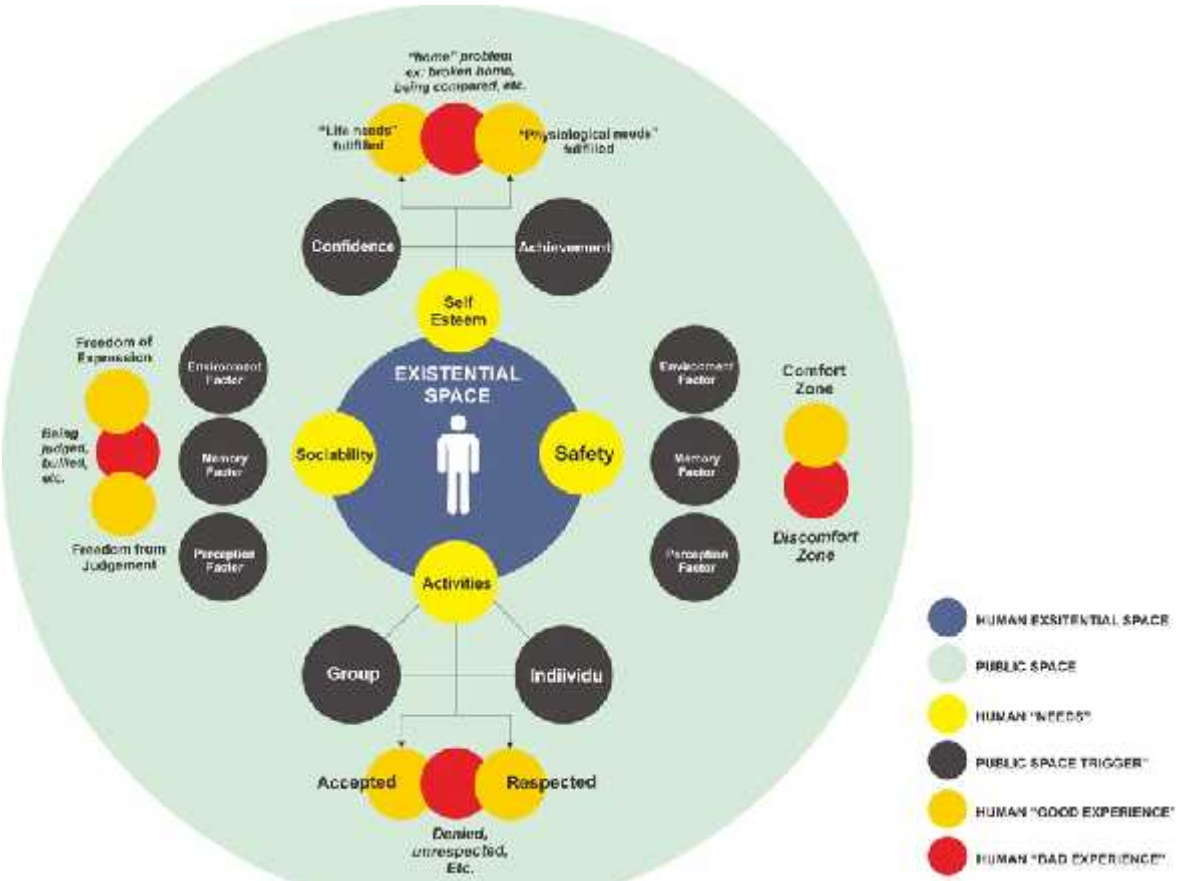

Figure 1. The Relation Between Human Being, Human Existential Space, and Public Space. Jakarta
Source: Personal Work, 2017

Every human have their own existential space with some essential needs (Fig. 1). And there will always be connection, between human existential space and public spaces. These might be physical, social, cultural, environmental, or even sensory connection. And that connection, will always influence their memory, either they remember or forget anything about their experience. “Human beings not only discern geometric patterns in nature and create abstract spaces in the mind; they also try to embody their feelings, images, and thoughts in tangible material.” (Yi-Fu Tuan, 1977). On the other hand, the public space itself is an “open space” that can be freely accessed, where each person or group can do activities together. Either at the same time, or at different times. Public spaces are inseparable from their environment.

Point of this study is all about human “safety needs” that affect human other needs such as self-esteem, sociability, etc. (Fig.1) This is about human comfort zone and discomfort zone in a public space. And even the comfort zone cannot be separated from crime. Many people tried to solve crime with forensic science. And this design of “Holmes St. Forensic Lab and Education Center” is related to the context of forensic study, using Trace Evidence Analysis approach. The study of this design is grounded in fundamental tracing concepts and techniques that are gathered from the natural environment experience and forensic science through a generative methodology of design.

Through this approach, I conduct this study and research as an idea for design, with the aim of:

1. To discover about human observation process while they are realizing something from their “past”, in this “present” space, that affected by also “present” environment. That kind of thinking process, will initiate human beings as an identifiers. The identifiers of what they see will always be a "small part" of the other "whole" story.
2. To observe and identify the other process, when humans experience discomfort in their existential space
3. To read the trails as a “space boundaries”, or the space that “look like a boundaries”. The existential space is just a small part of the whole living system. These traces allow for a retrace of motion.
4. To find out the “interiority” inside humans experience, through the trails.

So that the “certain limit” of a trail, will be the identity of the living system in human discomfort experience. The trail will be legible as a part of the holistic story. Then we can see the wholeness.

2. Research Theory and Methods

2.1 Metamorphosis of Space

Living in a space does not make human being become an object among the other objects. Many processes are actually presence unconsciously when human experienced a discomfort, in their existential spaces. The ambient environment refers to the non-visual and non-physical elements of the built environment such as sound, smell, temperature and illumination.

This suggests that people’s relationship with the environment ambience, especially when it comes to their bad experience. But mostly, they are unaware. Only the big part that appear. This is why a great sense of discomfort becomes the main reason for human being to trace their process of autopoietic system.

A living system reproduces itself. This self-reproduction they referred to as autopoietic. They defined the autopoietic system as a system that recursively reproduces its elements through its own elements. Central to the concept of autopoietic is the idea that the different elements of the system interact in such a way as to produce and re-produce the elements of the system. That is to say through its elements the system reproduces itself. (Luhmann, in Varela, 1974). That system can suddenly present some unconscious parts in anytime and anywhere, even from the very past accident.

2.2 Human as Living Machine & Environment as a Metaphor in Exfoliation Time

Human do activities and living in their environment as a whole, by the whole it means every single thing is related. There is a relationship between every component. Even “time” is one of the most important component. Human live in a quite complicated space that full of risks but also full of opportunities, it's all related on how human survive. The idea that you need to think about something in order to be conscious of it is very illusive. You become "more conscious" when you stop identifying with your thoughts, and believing what you said is reality or becomes reality. Or anything surround you, reminds you about your bad experience, make you feels like it just happen, even though it's long gone. Through this process of thinking, human get the connection with environment, especially when it comes to remind human about their bad experience in their discomfort zone, or even In their comfort zone, and this comfort zone can suddenly turn out into discomfort zone.

“Environment", however, is not one with the "self", nor is it separated from the "self". This relationship between "environment" and "self" is not the same with that of two sides of the same coin (H. R. Maturana and F. J. Varela, 1974).

As long as an autopoietic system works, the region of "self" is continuously created within the topological space wherein "environment" emerges simultaneously with the production of "self". The moment the autopoietic system produces a "self-region", "environment" penetrates into “self”. So, the self stands independently by itself without knowing its surrounding environment. This is due to the work of "by itself". The "self" cannot recognize its surrounding, and so it finds its surrounding inexplicable, while it is ceaselessly penetrated by “environment”. This relationship of the borderless penetration between an environment and "self" thus gives the “self” an impression of sheer complexity and incomprehensibility about its surrounding and also a borderless openness to its surrounding. (H. R. Maturana and F. J. Varela, 1974)

2.3 The Presence of Flashback

The autopoietic system will definitely continue, no matter what happen. God created this kind of system, to keeps the life of all beings balance. This system process is like wheels. These wheels will "go" with different speeds and stability, depending on many factors. The most obvious example to illustrate what is meant by an autopoietic living machine system is the biological cells of living things. One of the other real unconscious systems process is “the presence of flashback” through the correlation of eyes, mind, and perception response.

Three kinds of sensory response: First, an immediate physical response to stimulus; second, a response conditioned by prior knowledge of its source; and third, a response to stimulus as it has become identified in one’s memory with particular time and place. (Malnar & Vodvarka, Sensory Design, 2004).

Between human perceptual there is a processing process and the encoding process. Human mind start to do the processing process, when their bad memory comes around.

Every interaction that occurs between human beings produces thoughts and perceptions, when involving some other human beings, objects or whatever that being around will bring back the memory, then result in an agreement that will generate and develop thought further.

“Mental images are an active, vital repository of information gathered through sensual experience, through sight, sound, smell, touch, and taste. (Malnar & Vodvarka, Sensory Design, 2004).

This process of reciprocity is then characterized by the process of autopoietic that occurs in a presence of flashback process. Human can remembers each point of interaction with his environment into his memory.

2.4 Beyond the Seen

What is seen and seen is not always what the brain will accept, which processes something into a memory beyond what the human eye sees, the sense of space is unwittingly becoming a perception, a sense of security, a dream, a fear, a balance, a sense of home, movement, and others in presence.

An imagined place or state in which everything is unpleasant. A kind of feeling that present like the world got too many mind-pressures for human. A state in which everything are just “bad”. A condition when the environment suddenly reminds every little thing. Through some kind of super-quick mind evolution, there is a lot of “signage”. It’s human unconscious mind obviously know what is “actually happen” supposed to be looked like, the color, shape, etc. For example, when a girl found a stone, her conscious mind will “see” it as a stone. Yes, in either color, shape, etc. it does look like stone. And it is stone. But her unconscious mind keeps bringing up everything that “unseen”.

As we move mentally out to space, we also move either backward or forward in time. Physical movement across space can generate similar temporal illusions. (Malnar & Vodvarka, Sensory Design, 2004).

2.5 Sudden Recall

Denial is a powerful and primitive defense mechanism. Someone who is dependent frightened and him or her selves the victim of abuse can remain silent and not even see or hear the abuse in order to maintain the desperately needed relationship with the abuser. Well, people do hear it and see it and fail to act. Identify a series of processes when humans experience discomfort in their existential space. Process and read traces as space boundaries, is just a small part of the tracing the living system that I use to recollect the case evidence (in this case, is bad experience). These traces allow for a retrace of motion.

Thus, a certain threshold of a trace will be the identity of a particular movement or action. And when movement after movement is read, it is hoped that the story of an event will be fully identifiable into a holistic whole of the story.

By starting to bring back the memory, even if just a single thing, it’s unconsciously becomes the fulfillment of the main human needs. With such an approach, the architecture, minorities, and everything that relate, all becomes as if it present with human-main perceptual (past or present).

When humans feel they don't have any space to live, in this phase, all human being will begin to try and do new things to the space that he occupies, humans will be able to get out of bounds just to create more space in order to achieve their sense of dwelling, so that they will own their "new" space. This is the first interiority approaches that designer use before the extension of a separation. A different perceptual have a different properties in everybody's conscious mind, or at least different relations between eye, brain, and memory and the relationship with the object itself. But it's just the same when it turned out into human unconscious mind. So in the point of fact, it's all depends on human perception. "Image of the object" will consist of a diverse of many factors of symmetry and asymmetry of every individual. All entire set of these "signs" and will reflect the "image of the object asymmetry". At this point, if human had their bravery, they can continue to develop the trails seeking. Because at this point, their memory are slowly return.

When human can feel and project their self against space, then space will turn into a place and the place will have a meaning. The presence of memory, it’s because human can feel the space. The space becomes meaningful.

The most important force for a space that becomes 'place' is not determined by its form and its boundaries but rather is determined by how the quality of the space can be improved, and how humans interpret it. And at the end and it's all back to human. Indeed. Everything seems the idea is very simple. And most importantly, it's not objectively. But really it's just about the first perceptual that comes.

2.6 An Interconnected Part

By going through the seeking process with several methods in reading the trace of autopoietic process, interiority are present and re-presented through "separations" by using layers, to see the interconnectedness and interaction of each segment or a small part from the whole incident. Understanding this holistically and interactively will be a very helpful method in viewing and interpreting various phenomena and reality that occurs in the searching process. Human will able to remember and compile some parts of the incident. This is a start to trace the entire trail by tracing method, part by part, layer by layer, scene by scene, etc.

1. Trace

Traces that appear will be part of that space. Through this approach, the designer conducts this study and research as a final project with the aim to see and know how the process of human observation while presenting & re-experiencing the past. The existence of the tracing process, will initiate human beings as an identifiers. The identifiers of what they see are only a small part.

By using the tracing method (Fig. 2), the designer begins to figure out where is the essence of space is in the context of interiority through the trace method. Also, trying to re-create the whole story. By using this trace method, the trail here will be seen as something "different" or "new" that obviously will looks like an "alien" to every human being. But not for the one who experienced it. When doing a trace method, and find out a "boundaries", the interiority appear. Interiority is a "presence" form of the trail, in the space, with the presence of time.

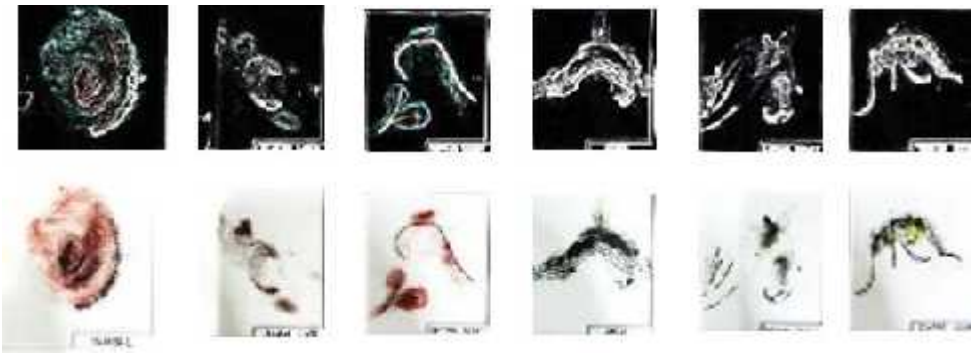

Figure 2. Sample, Breaking Down Every Single Part, From the Whole Trail. A sample made with Trace Method. Jakarta
Source: Personal Work, 2016

Fingerprints are the smallest Identity of a trace that can help find important parts of the identification process. Especially if Rori finds fingerprints in a state of intact it can be used as a sign to find out the owner of a fingerprint, left behind in the event of a particular case is very profitable and very helpful identification process. And through fingerprints, identifiers can easily identify crimes that occur.

2. Retrieval and Re-present

Some techniques of "retrieval" or "re-identification" are by means of "something" is translated and read by the sample taken through scratches of fingerprints (Fig. 3) in direct contact with the footprint and the trail area. By using the trace method and then recites it and re-unites it, I started to know that the line has 4 different qualities, first Is direction (Direction) into 3 existing models, horizontal, vertical and diagonal. Next is, movements (Movement), every single lines have motion, third is a dimension (Dimension), direction and movement in line gives multifarious definition of dimension of field length or implication. The fourth is time, time being thus proved to be no more than a retrieval concept, a "recreate" process of measuring the "long-term" and "short-term" distance between one moment and another, it is similarly shown that by denying too tightly into the past moments, it doesn't mean every-single-part of the experience are reduced or curtailed. Time can be read in a line, and human are able to trying to remember the incident by using this kind of method. Of course that is because "distance is the concept of time". Kandinsky's theory helped me in "taking" and "re-drawing" samples of trails that were present.

Figure 3. Samples made with Retrieval & Re-present Method. Jakarta
Source: Personal Work, 2016

3. Recite and Unite

After doing the analysis and see some samples that are represented and taken through Recite & Unite method (Fig.4). Some important things to note in trace sampling with Recite & Unite methods are:

a. Items that are identified as evidence, in the Recite & Unite stages will be searched, reproduced, and carried as much as possible by the Recite method, to be able to bring valuable samples as the information for the identification process.
b. Moreover, in the Unite method itself, it will pay more attention to the above, of course, to relate the connectedness, unity as a whole, as a thorough evidence to be submitted to the investigator in exposing the crime, in line with the identification process.
c. The suspect that inevitably leave a trail / trace on the scene of the case and on the victim's body, any physical contact between the two subjects or even contacted with the environment, will always change direction, and the color change of each subject, although the displacement may be very small.
d. Items that tend to be general will be important as evidence when there are unusual characteristics. This can be proved by the Recite method, by bringing the smallest part
e. The more rare and unnatural a trace on the scene, the more important it functions as a crime evidence. Such as a trace samples can be taken using both methods from Trace Method and Recite & Unite Method (Fig. 4).

Figure 4. Samples made Recite and Unite Method. Jakarta
Source: Personal Work, 2016

4. Recite and Relate

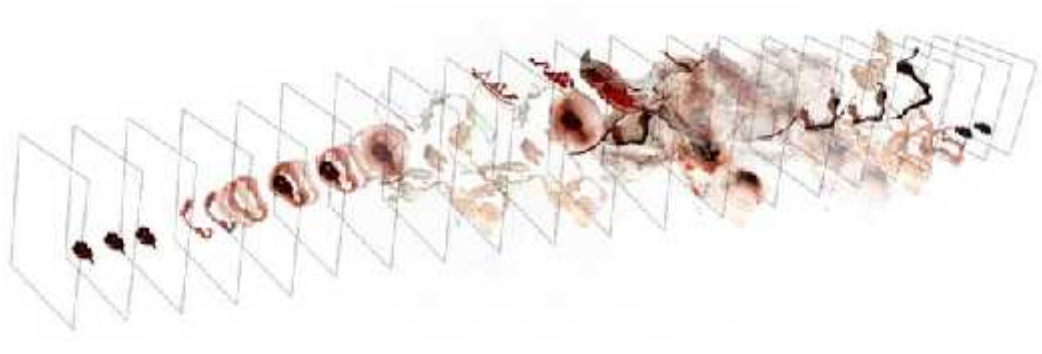

Figure 5. Samples made Recite and Relate Method Jakarta
Source: Personal Work, 2016

The final step is to identify using the Recite & Relate method (Fig. 5). A phenomenon that occurs is a trace that must be identified, in other words a phenomenon is a link between reality (related to distance & existential space) with an expected presence (related to time), in order to achieve the wholeness of the story of a phenomenon or event.

Before reaching the completion of a whole event, can solve a problem or problem then we must first perform this Recite & Relate stage. If Trace Method is the entrance, then Recite & Relate this is the

2.7 Context Approach

The environment is certainly not just being a physical limit, but also the existential space intact. To achieve the goal of seeing a certain boundaries of a trails (footprint, hence, etc.) I chose the context of pre-existing and now it is no longer a “prima donna” in their surroundings. The site I chose as the location for this research is the BDNI Centre. A long dormant building that has a lot of advantages to being an element that has no connection with any regularity arising from such a phenomenon. So, i decided to use the area of bdni centre as a place of study and research in to find out about the interiority in the breakdown of a holistic process of a trace.

Figure 6. BDNI Centre Documentation, Jakarta
Source: Personal Documentatiom, 2016

2.8 An Infusion Method

1. Re-Create Process

After going through several methods, studies, and the approach to the context, back again to the theory of autopoietic. When identifying an accident, trace is required as an ingredient to find the integrity of the story. The nature trails in the event are autopoietic. As I've mentioned above in advance that something are autopoietic means is something that actually got and have "other parts" as a unity. "Other parts" which itself has its own network and the process for the sake of achieving wholeness or the holistic process. Through the methods that I've previously mentioned above, can be seen in the existence of "interactions" which tracks only as one small part of the evidence, has and could bring changes that are sustainable, with presenting the interiority. In fact the trace reproduces fragments that produce themselves.

2. Plan of Identification with Autopoietic Approaches

In the planning process, the process of and reading traces, and observing the moment of human beings experiencing their discomfort on their existential space, BDNI centre will be used as a spaces that will be processing limits. Living system unravelling a trail. The scope that will be presented at the limit as a living machine search footprint was by dividing those limits into three spaces, which consists of the input space, processing space, and output space.

2.9 Traveling Through The Scene

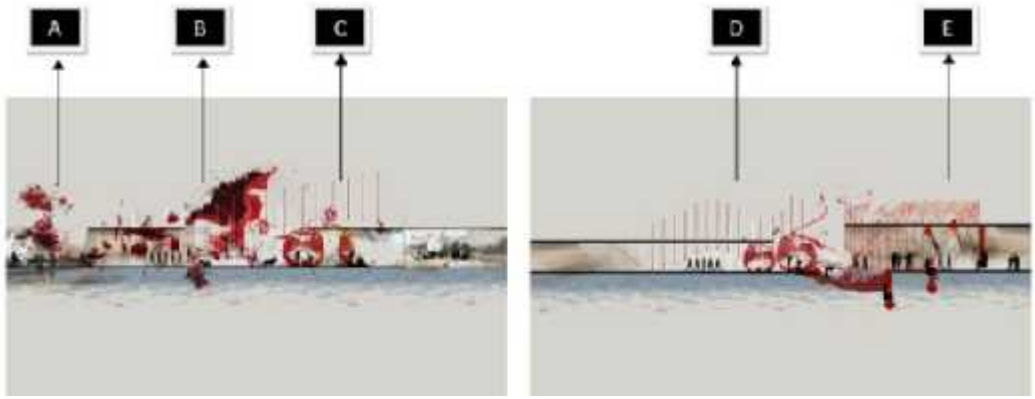

Figure 7. Breaking Down plot diagram, Input-Processing-Output, Jakarta
Source: Personal Work, 2016

Spaces and phenomenon is one unified whole. A holistic concept then the plot is divided into 3 stages space, Input-Processing-Output, this flow looked as well as treating the trail as a single entity. In the plot, this will be the main factor of a criminal case. The main factor of the existence of the plot of the input space of displacement until output is to the movement and displacement, namely the migration of the body from one position to another position, the migration phase identification of a scene to scene. As in the Diagram (Fig. 7), the piece of Planning Flow that occurs in Input-Processing-Output space, there are several stages in the program. Phase A and phase B is part of the Input space, phase C and D phase is part of the Processing space, while the phase space E is part of the Output. The identification methods are using Recite & Unite method. The last phase is the phase space E, the Output space and process, in this space, data will be displayed again thoroughly, and will do an examination and furthermore with a proof more emphasis on recognition of a witness or a suspect.

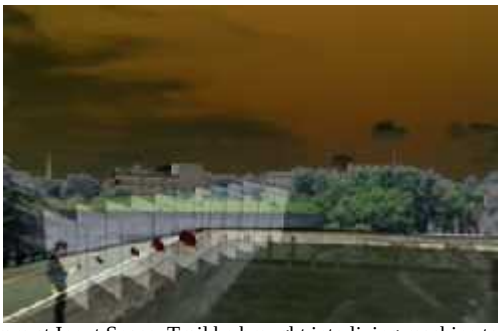

Figure 8. Input program at Input Space. Trail be brought into living machine to be identified. Jakarta
Source: Personal Work, 2016

Figure 9. Input Program at Input Space. A stage where the syntax form and content of the material from the trail as the understanding of the existential space. Jakarta
Source: Personal Work, 2016

Figure 10. Input program at Input Space

Where the trail started in blow-up and dissected and breakdown into smaller parts. Jakarta
Source: Personal Work, 2016

1. Input Space

Input space on a living system searches these traces is the source of the main sample and research, and other resources required to support the overall process of identification, which are transformed into materials or samples that already sterile and ready processed in the processing space. Samples will be taken and collected by using the method of Trace. All the inputs in the transformation process or dissection are branching new data found on the process in this input space. An activity that will occur in the input spaces are doing observations directly in the area of observation as well as perform data retrieval is needed.

Other stages include:

a. Situational Crime Prevention

Positioned at the entrance area use restrictions in the form of iron and laser to do the selection to anyone who want to come in.

b. Reliabilities Test

This is the area that shows the extent to which the data of observation can be trusted, reliable, and can be used

c. Crime Scene Analysis

Phases in the input information summarizing the basic needs in the formulation of the strategy trail search

d. Observation of the Input

The input data observations, analysis of the sustainability element, data processing, and the analysis results with the planning output analysis results to be presented in the output area

e. Depiction and the placement of the continuity of the element

The element must be connected one with the other, at any point

2. Processing Space

On the processing space, there will be stages of examination and identification. To understand the search trail completely, thoroughly, holistically. Dissecting the trace and samples obtained into a number of separate parts and put on layers of glass, where the clipped parts will be investigated with some steps with the method of Recite & Unite.

Space processing is one of the stages to reduce the complexity of the trail, which is considered as part of a small, separated into several parts and systems. This stage also allows the trace identifier and sort out its internal fragments. So the complexity of its separate parts into a detailed and organized. The complexity here will be reduced by using a system of segregation in layer-layer. On the space processing is already always involve the process of reduction, i.e. change the complexity that are not organized into organized.

Figure 11. Processing program at Processing Space. A space to process the connection. Jakarta
Source: Personal Work, 2016

Figure 12. Processing program at Processing Space Identify several phases. Jakarta
Source: Personal Work, 2016

Figure 13. Processing program at Processing Space. See the train in other point of view, to find out the secret. Jakarta
Source: Personal Work, 2016

The purpose of this processing layer flow spaces include:

- Cultivate a trail partially to find connections and continuous
- Identifying the truth through several phases and processes
- Bring and found the interiority through the search

a. Reduce The Complexity of Traces

To reduce the complexity of autopoietic trace, which is considered a small part, the separation must be done according to your needs, so that the trail of evidence of a crime on crime prepared follow-up will be more specific and each layer could be the most important information needed in proofs and searches a case or an accident. Some of the processes that will occur include:

- Dusting. This is an activity re-check the evidence at the Crime Scene
- Handouts. Activities in this handout will not be explaining some of the layer using some analysis data based on scientific technique, but will be a little describes how to detect the presence of glucose, DNA, or any of the small, left behind at the crime scene. A microscope can help the analysis process of a microbiology layer. Where there will be seen elements of microorganisms in details
- Footprints Analysis. Trace of footprints were found, put on a layer, the trail was given a color so that it will leave a clue that is unique and specific to each individual identity.

b. Graceful and Drained

After reduced the complexity, by using a system of segregation in layer by layer. On the processing space, is already includes the second reduction process, for example, change the complexity that are not organized into organized by using such Graceful and Drained way. By utilizing the water contained in the context. Some of the processes that will occur include:

- Floating
  Water pressure in the context will be distributed into the burden of any element
- Floating Cover
  Floating system will be done in a horizontal plot and lining of the pipe. This system works to prevent the loss of a particle or an important part of each segment, as well as to guard it from contamination

3. Output Space

Once the process is completed, the complexity of the traces reduction will found out the indication of crime, along with traces of planning, although only limited warning, the next output results will be displayed in a variety of forms in accordance with the needs

Figure 14. Output program at Output Space. Jakarta
Source: Personal Work, 2016

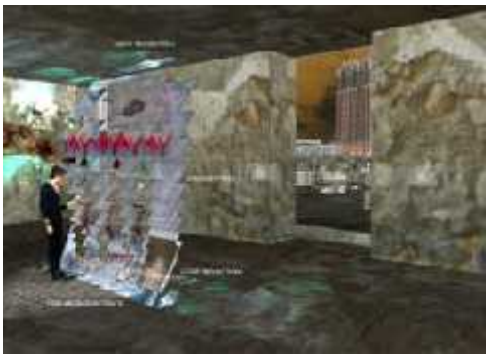

Figure 15. Output program at Output Space. Jakarta
Source: Personal Work, 2016

Figure 16. Output program at Output Space. Jakarta
Source: Personal Work, 2016

Figure 17. Output program at Output Space. Jakarta
Source: Personal Work, 2016

Conclusion

Living in an environment does not make human as an object between the other objects. Public space is an open space that can be accessed by anyone freely, many of the processes actually present when human beings experiencing their discomfort on their existential space, but unconsciously, and only the big parts that appears. Great senses of discomfort are the main reason for human to navigate the process of autopoietic.

To trace some “unknown” parts or “lack of awareness” part of an accident in the past. By the way on the trail traces process, if the traces are present in a point or in anywhere, that lost part, will be part of the spaces, anytime.

With the search process with a few methods in the reading process, traces of autopoietic interiorities present and brought back through the separation-partition by using a layer, in order to see the connectedness and the interaction of each segment or small particles that present in traces.

Methods to learn about how the traces of the circuit can be present and bring humans remember the very past time, how humans feel the space by being in a different time, and how time can present. Back again that, when the trail can be present and be a limit, then the interiority are appear. A series of stories will be identified into one whole integrity of the story.

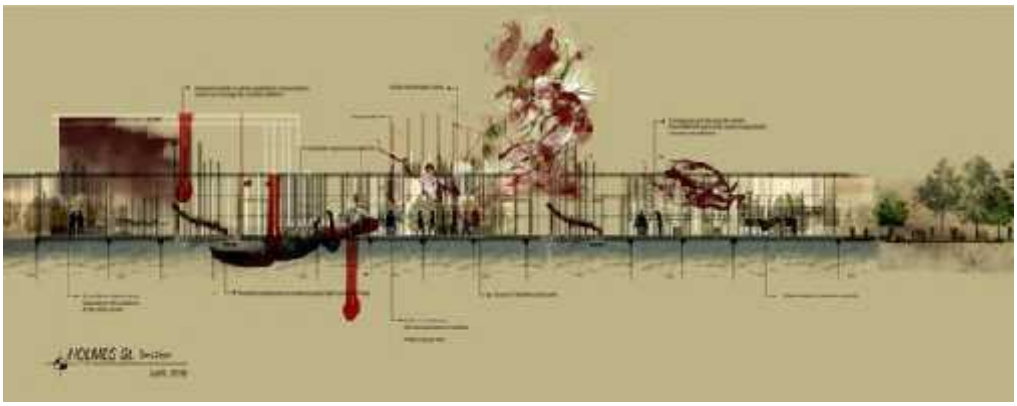

Figure 18. Space Activities, from Input to Output Process Flow (left to right) diagram. Jakarta
Source: Personal Work, 2016

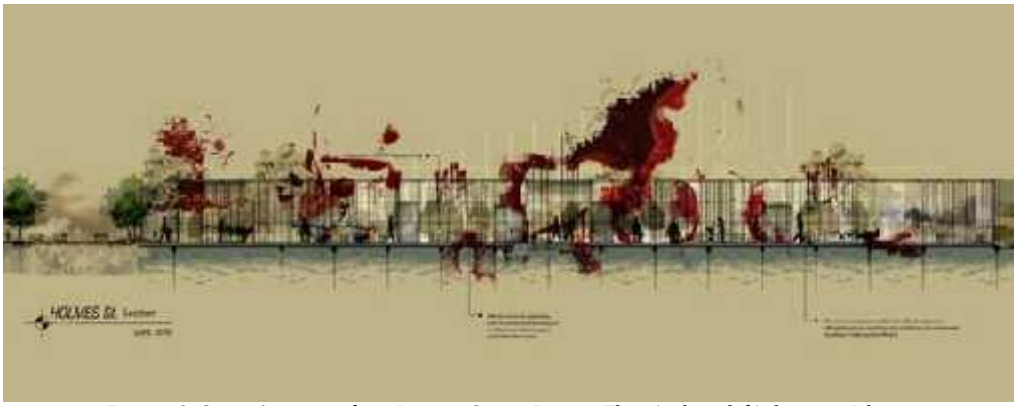

Figure 19. Space Activities, from Input to Output Process Flow (right to left) diagram. Jakarta
Source: Personal Work, 2016

The integrity of the story becomes more easy to identify the moment, if we can found the connectedness between three important aspects in the process of identifying, they are the detection of crime, detection of the human itself & detection of the context which is read by the way human feels the time as and in the space, so that a position already has a third important aspect above, so it will be easier to achieve the ultimate goal of the trail identification process holistically.

The layer system that presented here are the separator between the autopoietic systems of footprint with a system of space their existential space. The layers above serve as a medium of continuity to the process of autopoietic trace. The system determines the configuration limits, scope, or the ability of the system. Surely the limit system that is manifested in the context may be reduced or added in accordance with the needs of the placement of the samples. And each of the layers has a different system and treatment in each of the phases of its.

Figure 20. The Site Plan. Jakarta
Source: Personal Work, 2016

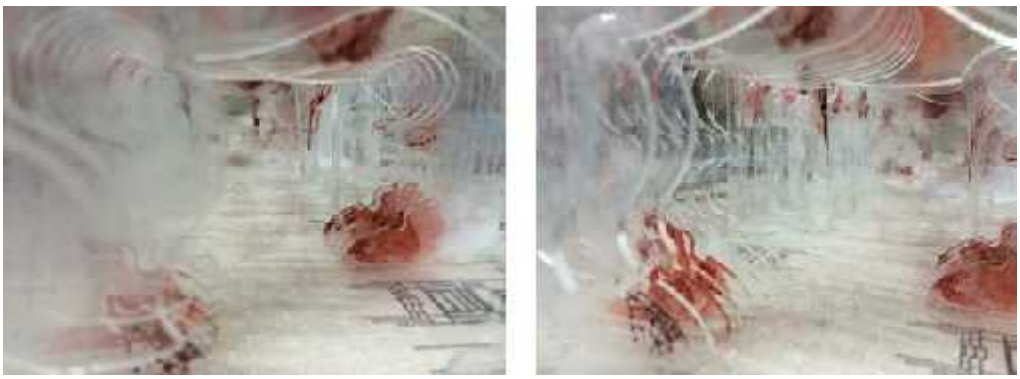

Figure 21. The Maquette. Jakarta
Source: Personal Work, 2016

References

Maturana R.H & Varela J.F (1974), Autopoiesis and Cognition, The Realization of Living Name of the publisher, Location of the publisher.

Malnar J.M & Vodvarka F. (2004), Sensory Design, University of Minnesota Press,III Third Avenue South, suite 290, Minneapolis, United States of America

Stoner J. (2012), Toward a Minor Architecture, Name of the publisher, Location of the publisher.

Baldwin, Peter C. (1999). Domesticating the Street: The Reform of Public Space, in Hartford 1850-1930. Ohio State University Press: Columbus.

Bell, Paul A; Greene, Thomas C; Fisher, Jeffrey D; and Baum, Andrew. (1996). Environmental Psychology. 4th Edition. Harcourt Brace College Publishers: Sydney.

Sommer, Robert. 1984. Social Design: Creating Buildings with People in Mind. Prentice Hall Inc: New Jersey.

Lang, Jon. (1991). Design Theory from an Environment and Behaviour Perspective. Chapter 2 in Zube, Ervin H. and Moore, Gary T. (Eds.). 1991. Advances in Environment, Behaviour and Design, Volume 3. Plenum Press: New York.

Lawrence, Roderick J. 1989. 'Structuralist Theories in Environment-Behaviour-Design Research'. Chapter 2 in Zube, Ervin H and Moore, Gary T. (Eds.). 1989. Advances in Environment, Behaviour and Design, Volume 2. Plenum Press: New York.

Munchen,S.(1997). International Encyclopedia of Systems and CyberneticsCaan,S. (2011). Rethinking Design and Interiors

Levy-Leboyer, Claude. 1982. Psychology and the Environment. Sage: London.

Zube, Ervin and Moore, Gary T. (Eds.). 1987. Advances in Environment, Behaviour and Design, Volume 1. Plenum Press: New York.

Tuan, Yi-Fu. (2005) Space and Place, The Perspective of Experience, University of Minnesota Press,III Third Avenue South, suite 290, Minneapolis, United States of America

Gavriloaia, R.,Towards a new mythology of the interior design, Pages 205-213

Olkowski,D. & Morley,J. (1999). Merleau-Ponty, Interiority and Exteriority, Psychic Life & The World

Taylor,M. & Preston,J.(1988). INTIMUS, Interior Design Theory Reader

Glanville,R. (1969). A (Cybernetic) Musing: Design and Cybernetics

(2011). Places at the Zero Point. Toward a New Interior; an Anthology of Interior Design Theory

IDEA Journal (2013). Impossible Totality and Domesticity: Designed Interiors as Monsters.

IDEA Journal (2010). Interior Ecologies.

IDEA Journal (2013). Unbecoming

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NATIVE CHARACTERISTIC OF INDIGENOUS INDONESIAN CULTURE AS REFERENCE IN RE-DESIGNING TOURISM AREA

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Abstract

Mount Bromo has been well known nationally and even internationally has stunning natural beauty and unique culture of its inhabitants. Both of these have proved able to attract many local and foreign tourists to visit, so its impact also could be felt directly on the economy improvement of local communities and also for the state's foreign exchange from the tourism sector. The uniqueness of Tengger culture can be regarded as a national treasure that has been maintained by the Government sustainably.An idea that is proposed as an effort to help its preservation is to adopt the concept of Ubud Culture Village in Bali..It is considered the most suitable to be applied because it will not only absorb tourists, but also maintain the authenticity of local culture, especially the function and architectural form of traditional buildings of the Tengger tribe that must also be preserved.

Keywords:*Culture, Preservation, Economy*

1. Introduction

According to Koentjaraningrat (Koentjaraningrat, 1974), the form of culture is divided into three elements, namely: (1) Culture in the form of ideas, thought, values, norms, and regulations. For examples: customs, rules and manners in society. (2) Culture in the form of activity of human behavior in society. For examples: the pattern of mutualcooperation life and ceremonies. (3) Culture in the form of objects of human works. For examples: palaces, mosques, temples, weapons, buildings, and fortresses.

One example of culture activity which is almost extinct is a traditional ceremony conducted by Tenggerese. They run many traditional ceremonies, such as the Kasada ceremony, the Karo ceremony, the Unan-unan ceremony, the Kapat, Kawulu and Kasanga ceremonies, Mayu Banyu and Mayu Desa ceremonies, and much more. Among those ceremonies, Kasada ceremony is the greatest ceremony. In addition to its large, Kasada ceremony is also closely related to the origin of the Tengger tribe living in the vicinity of Mount Bromo, so only the Tenggerese who carry out the Kasada ceremony.

Figure 1. Kasada Ceremony
Source: destinasi-indonesia.com

Culture done by Tengger tribe itself can be said almost extinct because of its existence which is only carried out by Tengger tribe who lives in the hinterland around Mount Bromo and Mount Semeru. Historically, Tengger tribe comes from the kingdom of *Majapahit.* At that time the Majapahit kingdom suffered a setback. In 1364 *Gajah Mada* died. However, Majapahit under the rule of *Hayam Wuruk* managed to maintain its glory until he died in 1389. Majapahit power was then ruled by *Wikramawardana*, son-in-law of *Hayam Wuruk.* Since then Majapahit suffered a setback (Al Anshori, 2010).

The event of the retreat of the *Majapahit* kingdom coincided with the widespread spreading of Islam in Java. It is estimated that Islam entered Java Island in the late fourteenth century or early fifteenth century. This can be proved by the inscription on the gravestone of Maulana Malik Ibrahim who died in 1419 AD, after the fall of the Hindu Majapahit kingdom (Turmudi, 2008).

At that time, the kingdom of *Majapahit* experienced a mismatch with the existing Islamic kingdom on the island of Java so that the kingdom of *Majapahit* people choose to flee to the island of Bali and to the hinterland around Mount Bromo and Mount Semeru. The inhabitants who live in the hinterland around Mount Bromo and Mount Semeru are what we know as the Tengger tribe.

At first in the beaches, now called Pasuruan and Probolinggo, there were Hindu Waisya people who worship Brahma. Then came the Islamic religion that entered through the sea. The arrival of Islam on the island of Java in 1426M, had pressedHindus from the coast until they finally settled in areas that are difficult to reach by migrants, namely in the Tengger area. There they formed a separate population group that is still known as the *Tiang Tengger* (Suyono, 2009).

The people of Tengger now live spreadaround the area of Mount Bromo Tengger and Semeru. There are not too many, about 100,000 of the Javanese population of approximately 100,000,000 (Sutarto, 2006). Tengger community is not only in one district, but located in four districts, namely Pasuruan, Probolinggo, Lumajang, and Malang.

The villages of Tengger community are Ngadas, Wanatara, Jetak, and Ngadisari (Sukapura, Probolinggo), Wanakersa, Ledokombo, Pandansari (Sumber, Probolinggo), Keduwung (Puspo, Pasuruan) , Ngadirejo Village, Ledok Pring (Tutur Sub-district, Pasuruan District), Ngadas Village (Poncokusumo Sub-district, Malang Regency), and Ranupani Village (Senduro Sub-district, Lumajang District) (Sutarto, 2006).

Religion espoused by the Tengger tribe is the result of Hindu Waisya or Hindu Mahayana mix with Hindu Parsi. According to R. P. Suyono, in the 16th century Brahma devotees in Tengger received the advent of fugitives from the Parsi Hindus. The Parsi Hindus are from the region around Iran. Parsi itself means Persia. In addition, the Hindu religion adopted by the Tengger tribe is a blend with traditional beliefs so that Tengger

Hindu is different from Hindu in Bali. One of the different is Tengger Hindus do not recognize traditional ceremonies such as *Ngaben*, a Balinese cremation ceremony. While the Hindu community in Bali does not do Kasada ceremony conducted Tengger tribe. In addition, the Tengger tribe is not like Hindus in general who have temples as a place of worship. The Tenggerese worship in *punden*, *danyang*, and *poten*. Poten itself is a plot of land located in the Sand Sea at the foot of Mount Bromo as the place for the Kasada ceremony. Poten consists of several buildings arranged in a composition in the yard that is divided into *TriMandala* or three parts.

1.1 Kasada Ceremony and Efforts to Preserve Tenggerese Culture

Figure 2. KasadaCeremony
Source: explore1ndonesia.blogspot.co.id

Yadnya Kasada or Kasada ceremony is a Hindu religious ceremony performed by the Tengger tribe but not done by other Hindu adherents. This ceremony is very closely related to the story of the origin of Tengger society, especially about the legend of Roro Anteng and Joko Seger. After marriage, Roro Anteng and Joko Seger were eager to have children. They finally appealed to God to have 25 children. Their wish was granted on the condition that the 25th child should be offered or sacrificed to Dewa Bromo. After being grown up, Kusuma, the 25th son of Roro Anteng and Joko Seger plunged into the crater of Bromo. Then came the voice of the child asking for their parents live harmoniusly along with her brothers and sisters. Then this ceremony became the beginning of Kasada ceremony to honor the sacrifice.

Kasada ceremony is a ritual performed once a year on the 14th and 15th full moon in the 12th month to honor Mount Brahma (Bromo) which is considered as a sacred mountain by the Tengger tribe. The ceremony takes place at Pura Luhur Poten located in the sand Sea, north side of the foot of Batok Mountain. While the sacrifice is located on the edge of Bromo Crater.

The ceremony is also commonly called as the Kurban(sacrifice) ceremony. Five days before the Kasada ceremony, there is usually a variety of spectacles such as dances, horse races in the sea of sand, a leisurely stroll, and an exhibition. Kasada ceremony is held from midnight to early morning. Begin by walking from the front of traditional shaman house to Luhur Poten Temple. According to Prof. Dr. Simanhadi Widyaprakosa, Sesajen or offerings are called ongkek consisting of thirty kinds of fruits and cakes. This Ongkek will be thrown in the crater of Mount Bromo. Ongkek ingredients are taken from a village where for a year no one died there. (Widyaprakosa, 1994)

Figure 3. Ongkek
Source: belajarsecarapraktis.blogspot.co.id

For the Tengger tribe, offerings thrown into Bromo Crater are as a form of vows (kaul) or gratitude to God for abundant livestock and agricultural products. Inside the crater there are usually many beggars or inhabitants of Tengger. They come several days before the ceremony and even deliberately set up temporary residence around Mount Bromo to get ongkek in the form of fruits, livestock, and money starting from night till noon.

Figure 4. People Activity in Bromo Crater
Source: : explore1ndonesia.blogspot.co.id

The Tengger community lives up to Titi Luri, which means following the footsteps of the ancestors or successors of the religion, beliefs and customs of their ancestors from generation to generation. Every ceremony is done without any changes, just like the ancestors did centuries ago. They believe that if there is a change in the implementation of traditional ceremonies, then disaster will come in the future. In addition, the people of Tengger are also known to be honest, obedient, and diligent work. They live a simple and peaceful life.

Tengger society condition when viewed from the economic point of view is very simple. The majority of the populations work as farmers as they realize the natural wealth owned by Bromo is so abundant. The fertile soil makes them grow crops by planting vegetables. While some of them work as civil servants, traders, laborers, and service businesses. In trade sector they open stores and restaurants. For service sector they open the lodging rental. While the transportation sector they rent jeeps and horse cars to support Bromo tourism.

From the above background, it is known that the activities of culture conducted by the Tengger tribe can be regarded as a wealth or root of national culture which continuosly by the government to be strivedly preserved. When compared with the culture of Bali, Tengger does not have a cultural village like that found in Bali. Therefore, the government has the idea to develop a cultural village located in Tengger. As a target of tourist destination, then about a few years ago, the government began to build a traditional house of Tengger. The existence of this wooden house is deliberately created as a miniature of indigenous traditional house of Tengger community. Preserving a culture with the concept of a village is the right choice. From that concept of village, it is expected that the culture of the Tengger tribe will be preserved countinuosly with the existence of interaction or socialization in the village to tourists who come.

1.2 Tourism Potential of Tengger Region

Besides having the potential of the Tenggerese culture, Bromo has a natural beauty and a wealth of abundant natural resources. The existence of Bromo Tengger Semeru National Park is a proof of its natural wealth. This park has an area of 50,276.3 hectares of which there are about 137 species of birds, 22 species of mammals, and 4 species of reptilian. This area is also the only conservation place that has a sand sea area of 5250 hectares located at an altitude of 2100 masl.

Bromo Tengger Semeru Tourism is set to be one of the top priorities of tourism destinations by the government. Bromo tour is famous to foreign countries. Bromo itself becomes unique because it is a volcano that is still active until now. In 2019, the Ministry of Tourism targets the tourism sector to become the largest foreign exchange earner. The Government believes in line with the progress of Indonesian tourism in various regions will automatically improve the economy of the Tengger region as well. However, as we have seen, with the huge potential of tourism of Bromo, it does not have a significant impact on the economy of the people. As hosts in their own land, should the surrounding community can benefit from tourism to raise the economy independently so that it is not intervened by foreign investors or communities outside Bromo Tengger Semeru.

1.3 Context of Architecture

Based on the above issues, one of methods of introducing a culture is by learning and teaching. As located in tourist area, the Tengger tribe has more value for the community and tourists. Many tourists are attracted by the beauty of Mount Bromo and the culture of the Tenggerese, and hence the community benefited by it. Indigenous people of Tengger tribe can teach the culture what they usually do daily to tourists who come, and this process would be as a form of culture preservation. The formation of interaction between the citizens of Tengger tribe with tourists is what becomes an important part in the design concept. Therefore, the design focus is aimed at the concept of a tourist village, because as we know, the village is a smallest city unit. A village concept also selected to bring people closer to the tourists so as to create a good interaction with each other.

The existence of this village certainly involves economic, social, and cultural factors of the people of Tengger. So an architectural output needed is a facility that can accommodate a similar activity to teaching and learning as a medium of cultural recognition in the form of interaction or socialization and also suits the needs and activities of the community itself. The formation of architecture can not be separated from these three factors (economic, social, and cultural) for becoming important integrated parts in order to provide direct benefits for the people of Tengger tribe in particular.

1.4 Proposed Type of Design Object

The development of tourism by involving the role of culture village is basically the application of the concept of tourism development policy of populist dimension. This community-based development is a reaction to the policy of conglomeration development that has been more pro-ownership of capital that generally does not come from members of the local community. Community-based development focuses on improving people's economy and community empowerment. Rural development thinkers and practitioners have long recognized that conglomeration development often harms local people. The community as the rightful owner of local resources often experience marginalization so that the quality of life is decreased. On that basis some other experts emphasize the importance of development from below, development as social learning, and development must start from the bottom (buttom up).

According to Korten (Suryawan and Pujaastawa, 2009), development with this reversed paradigm demands local community participation in various stages of development, so that the management of development is actually done by those living and affected most life by the development, or known as community based resource management or community management.

From the above explanation, the concept proposed is a cultural tourism village by making homestay homes. With the existence of this cultural tourism village, tourists can live side by side, learn and see firsthand the original culture of Tengger tribe. This village will become one of the Tengger people who still run their ancestral traditions so that the architecture that appears not only in the form of occupancy but also other architectures that support the culture and habits of the community. Homestay, in this case, is that one of the residents occupancy rooms rented out as tourist accommodation that can not be separated from the original architectural values Tengger. In addition, the homestay can raise the economy of citizens independently.

The development of this cultural tourism village in addition to the preservation of culture is also directed to improve the dignity and prestige, and strengthen the identity of the Tengger community, improve the welfare of Tengger society equally and sustainably. This is also in line with the development of Bromo tourism aimed at developing and utilizing all the potential of regional tourism, developing tourist attraction, and increasing community participation.

1.4.1 Theory of Community-Based Tourism

Community-based tourism is based on a community-based resource management theory. According to David Korten (Moeljarto, 1993), the main features of this theory are: (1) Initiatives and decision-making processes to meet the needs of society must be placed on the community itself. (2) The main focus is on enhancing people's ability to manage and mobilize resources to meet their needs. (3) Tolerance local variations and hence this theory is highly flexible to adapt to local conditions. (4) In carrying out the development, emphasizing on the social learning in which there is interaction between community members from the planning process until the project evaluation. (5) The process of networking between bureaucrats and non-governmental organizations, independent independent organizational units, is an integral part of this approach both to improve their ability to identify and manage resources and to maintain a balance between vertical and horizontal structures. This networking process is expectedly able to form symbiosis between development structures at the local level.

According to Korten (Suryawan and Pujaastawa, 2009) there are three basic reasons why community-based management is so important as a basic developmental approach. First, the presence of local variety that can

not be applied equally. Different regional situations require different management systems and local communities who best understand the local situation. Secondly, the existence of local resources that have traditionally been managed by the local people from generation to generation. The experience of managing local resources that have been passed down from generation to generation generally leads to an accumulation of knowledge about management. This management takeover will create a sense of community and society's antipathy towards the development project. Third, local accountability means that the management done by the local community is usually more responsible because of the various things they do to the resources will directly affect their lives. Outer management often does not contain moral closeness to the local community, so it does not feel to have a high moral responsibility. In the context of tourism, community-based development has recently become very important.

According to Kit (Dewi, 2013) there are 4 community-based tourism objectives: (1) Community-based tourism should contribute to improving and or rehabiliting nature conservation or cultural resources, including biodiversity. (2) Community-based tourism should contribute to local economic development so as to increase income and profit for the community. (3) Community-based tourism should involve the participation of local communities. (4) Community-based tourism has a responsibility to tourists to provide products that care about the natural environment, social and cultural. The above-mentioned community-based tourism theory is deemed relevant to explain the problem, which is about the form of tourism development based on the Tenggerese culture village that is managed by the community itself.

2. Design Method

2.1 Design Method

The design methods presented by Donna P. Duerk are Architectural Programming and Rationalist Approaches method: Design Researches and Precipatory Design. Method of Architectural Programming is chosen to help shape the concept of architectural design that can answer issues raised and in accordance with the purpose or achievement of the construction of this architectural object. Method Design Researches are used to help collect data on the standards or information needed in relation to building technology and materials needed in the process of designing, both from the archipelago architecture approach and the green architecture.

2.1.1 Architectural Programming

The design process method used in designing this object is the Architectural Programming method of (Duerk, 1993). "Architectural programming is the process of managing information so that the right kind of information is available at the right stage of the design process and the best possible decisions can be made in shaping the outcome of the building design". There are two main parts of concern to this method, namely the analysis of the existing state and the projection of the future state. Analysis of the existing state is a design context that covers things like land analysis, user profiles, codes, constraints, and climate. Projection of the future state is a set of criteria that must be met by a design to achieve success including mission, goals, concepts, and performance requirements.

Architectural programming is one of the methods in architectural design. Design issues are formulated at the beginning systematically with the intention of directing the design results to the desired destination. Architectural programming is needed primarily to minimize the risk of error and to streamline the design process. Architectural programming evolved as a sciencetific, systematic, and analytical approach in the realm of architectural design. One of the architectural programming models developed by Duerk is issue-based architectural programming. Duerk states, a design must start with a mission statement, namely the

reason the work needs to be done. Then sort out the issues according to specific issues, which are further downgraded into several objectives, design criteria, and design concepts.

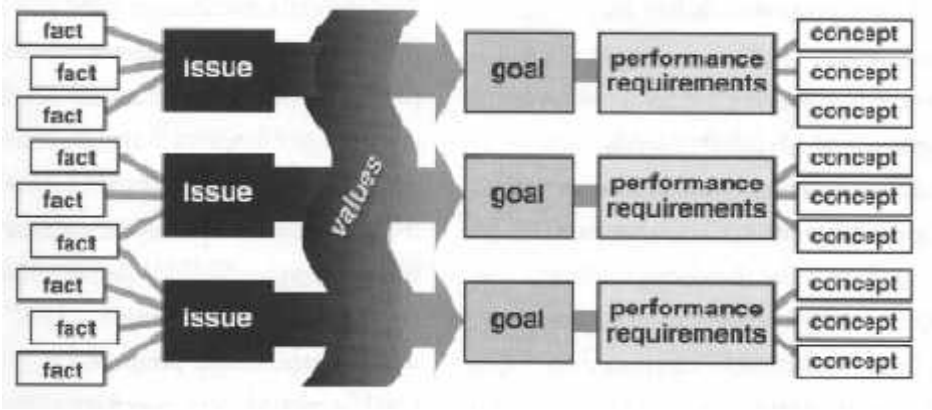

Figure 5. Schematic Design Programming
Source: arch.ttu.edu

2.1.2 Rationalist Approaches:Design Research

The next design method is taken from Basic Design Methods (Jormakka, 2008). This method is a design method by analyzing, from issues to the responses presented. It takes parameters to then be reanalyzed and evaluated to produce the best architectural design solutions.

Table 1. Architectural ProgrammingTable

Fact	Issue	Problem	Goal	Criteria	Concept
Tenggerese culture only exist in the area around Mount Bromo and Semeru	Culture Social	- Tenggerese culture is a culture that can be said to be almost extinct. - The absence of facilities as a medium of cultural preservation by means of social interaction	Forming the village as a medium in preserving Tenggerese culture to tourists with social interaction, that is teaching, seeing, and experiencing directly	- Arrangement of the village by adapting the cultural values of Pura Luhur Poten	- Implement the concept of *Tri Mandala* in the arrangement of the village, which are the Main Mandala, Madya Mandala, and Nista Mandala
The government makes Bromo Tengger Semeru as one of the priority tourism destinations	Tourim	The people of Tengger tribe have not maximized in utilizing tourism sector in economic activity	- Increasing the economy of Tenggerese people independently by establishing a homestay that supports the tourism sector - Homestay with Tengger architectural design and green architecture	- Homestay with room zonification arrangement with Luhur Poten Temple concept - Maximize natural exposure and lighting to minimize energy - Design space according to user needs - Minimize new resources in development - Concern more to the initial condition of the land	- Implement the concept of *Tri Mandala* in zoning arrangement of homestay room - Uses transparent roof for sunlight to enter - Using cross ventilation by putting a window in each room - The rooms and layout of the homestay are adapted to the Tenggerese social culture (*Sanggar*, *Patamon*, etc.) - The material used is the wood material as the main material and the existing material of the building is maintained

					(in the restored and revitalized building) - Maintaining the land contour with the concept of terracing

2.1.3 Analysis

In the process of analysis, from in-depth interviews conducted on some tourists, found the fact that: (1) The majority of tourists who attend Bromo area have a purpose to enjoy the beautiful view of Mount Bromo, that is when the sun rises. (2) Tourists do not pay much attention to local architecture because the main purpose is to enjoy its natural beauty and its cool and fresh air. The opinion of tourists is supported by the fact that the condition of residential houses or settlements there has been modified from traditional houses of indigenous Tengger tribe that became less attractive due to the same appearance with ordinary buildings. (3) Tourists want a decent homestay model house as the quality of existing homestay is not sufficient.

Therefore, conservation methods are needed to solve these problems so that existing buildings can be restored to their original form. Thus, the initial goal to raise Tenggerese culture can also be reflected in terms of architecture.

2.1.4 Building Conservation

Conservation is generally defined as preservation. However, the term is commonly used conservation architects refer to the Charter of the International Council of Monuments and Site (ICOMOS) in 1981, i.e: Charter for the Conservation of Places of Cultural Significance, Burra, Australia. This charter is better known as Burra Charter.

Conservation activities may include: (a) Preservation. (b) Restoration. (c) Replication. (d) Reconstruction. (e) Revitalization or use for new functions of a past asset. (f) Rehabilitation. These activities depend on the conditions, issues, and possibilities that can be developed in further maintenance efforts.From these explanations, the old building functions are used for new relevant activities as well as allowing to change old activities to new ones without having to eliminate them.

In the design of this village, not all buildings are conserved, but there are parts that are developed. This is based on the survey results that the main thing attract tourists to visit the area is the view of Mount Bromo. But on the other hand, to maintain the local architecture, then some buildings which are still in feasible condition will be restored. The rest will be revitalized and redesigned in accordance with the wishes of the majority of tourists. So that will appear two design concepts on this village, the concept of conservation (restoration and revitalization) and of development. Also, in this method, facts that will become the material of space order analysis of the village and house are collected. These facts then become the reference in designing the followings:

1. Composition of the Settlement Element

Identifying the value of local wisdom in the settlement can be seen from certain custom rules or provisions that govern the orientation of laying the elements of settlement. The concept of direction that developed and became a hereditary belief of Tenggerese society has a philosophical meaning and is symbolized by certain color elements. The meaning of the concept of direction is then interpreted in the ritual Pujan Mubeng (Nrundhung) ceremony which aims to request for safety for the village and clean the village from disruption and disaster. The form of applying the philosophical meaning contained in the concept of direction is based on

the customs and beliefs of Tengger tribe society is in the form of various colors of offerings (red, white, yellow, black) which has philosophical meaning symbolizing the four corners of the village.

In Ngadisari village there is a customary rule application of which becomes the basis of the concept of direction in placing the settlement elements, such as: (1) The grave consists of sacred graves and ordinary graves. The provision of laying the sacred grave is to the north of the village and away from the residential location of the inhabitants. The belief amongst Tenggerese related to the laying of the tomb is preferably outside the residential area and placed in the north. It has remained in the same place with the fixed extent of land that ought not to be increased or decreased since long time ago. (2) Temple (Pura) as a place of worshiping god is placed in a sacred place in the middle of the settlement, where there are most sanggar pamujan in the vicinity. The location of Dhang Kahyangan Kerti Jaya Buana Temple in Ngadisari Village is in the north-east of the residential area. The philosophical meaning contained in the provisions of the laying of the temple in the East is because it is facing towards the sun. As a sacred place, the temple is placed on the highest contour of the land. (3) Padhanyangan (dhanyang) is a place sacred by the people of Tengger Desa Ngadisari. The location of padhanyangan (dhanyang) is to the South of the village and is at one orientation with a sacred tomb (leading to Mount Bromo). (4) Residential building (micro) is divided into several spaces with the provisions of laying each space, e.g: (a) Sanggar pamujan (shrine) placed in front of the house must face to the East or South, should not face West and North. Sanggar is a place of offerings and storage of heritage. It also serves for a place of worship at the ceremony of death. (b) Patamon (living room) is placed on the front of the house. (c) Paturon (bedroom) should be on the right side of the door. (d) Pagenen (kitchen) and pedaringan (storage space) are placed behind the patamon and may be combined. (e) Pakiwan (bathroom) should be at the back of the house. (f) Pekayon (a place to store wood) is an additional space, placed at the back of the house. There is also a customary provision that states a married child should not build a house on the right of his parents' home. (5) The fields or fields used for agriculture are located in the South, North and East of the village. (6) Mount Bromo which is located in the south is believed to be the axis (pancer) of spiritual activity throughout the Tengger people. There is a sacred axis that leads to Mount Bromo (South) that connects between the sacred tomb and padhanyangan (dhanyang).

Tengger traditional house stands with no level, not a house on stilts, standing straight parallel to the ground. The structure is composed of boards or wooden rods. The roof is high so it looks very steep. In the yard of the house there are no tall tree plants. Tengger house width 4-8meter, 15-20meter long. Traditional houses of the Tengger tribe has only one or two windows (Suyono, 2009).

In the process of analysis, from in-depth interviews conducted on some tourists, found the fact that: (1) The majority of tourists who attend Bromo area have a purpose to enjoy the beautiful view of Mount Bromo, that is when the sun rises. (2) Tourists do not pay much attention to local architecture because the main purpose is to enjoy its natural beauty and its cool and fresh air. The opinion of tourists is supported by the fact that the condition of residential houses or settlements there has been modified from traditional houses of indigenous Tengger tribe that became less attractive due to the same appearance with ordinary buildings. (3) Tourists want a decent homestay model house as the quality.

Figure 6. Traditional House of Tengger
Source: rumahperumahan.com

In the traditional house of Tengger, materials once used were wood and bamboo. However as influenced by modern architecture, Tenggerese now use a tile or zinc for their roof instead of bamboo.

The traditional characteristic of Tenggerese house that remains is the front part of the house, with seats which is more like a divan, placed in front of the house.

2. Adaptation of Dwelling to Climate

One form of applying the value of local wisdom is the adaptation of the dwelling to the climate. The construction of traditional houses of Tengger Ngadisari village has the ability to adapt to the local climate. The climate adaptation factor has resulted in several changes and developments in the use of building materials on traditional houses of Tengger Desa Ngadisari community from time to time. The appearance of traditional houses of Tengger Desa Ngadisari can be explained based on the facade of the building and the building fixtures such as roof, wall, pole, door, and window.

Existing condition of building of traditional house of Tengger Tribe of Ngadisari Village is as follows: (1) The pyramid-shaped roof resembles a triangular vertical pit with a slope side of ± 45 °, made of zinc. (2) Wall in the form of wall or half wall. The wall is made of brick while the meaning of a half wall is a blend of walls with wooden planks. (3) The door is made of wood. (4) Window made of wooden frame and glass.

The characteristic of adaptation of Tengger Desa Ngadisari traditional house to local climate can be explained based on the function of some components found in residential building construction and surrounding environment. The change in the use of roof materials on traditional houses of the Tengger Tribe Ngadisari Village is caused by adaptation factor to the local climate. In about the 1950's the roof used materials from zinc, but later in the 1970s it was replaced by using tile. But it turns out the roofing house using tiles actually causes the temperature inside the house becomes colder. Therefore, since the 1980s the roof on the traditional house Tengger Village Ngadisari replaced again by using materials from zinc which was more appropriate if applied to cold climates such as in Ngadisari Village. From the changes in the use of materials for the roof can be identified form the value of local wisdom that is through the trial and error (trial and error), then obtained the most appropriate and adaptive results if applied. With a triangular upright roof reduces the risk of collapse during volcanic ash rain.

3. Luhur Poten Temple

Originally this temple is the residence of Ida Sang Hyang Widhi Washa. Now, this temple is used as a place of worship by Tengger Hindus. Luhur Poten Temple becomes a place to worship God Brahma. In the temple there are three areas that each of them has different functions: (1) Utama Mandala, the place of worship and prayer. (2) Madya Mandala, the place of preparation and accompaniment of the prayer ceremony. (3) Nista Mandala is the transition place between the entrance and Utama Mandala. Like other temples, Luhur Poten Temple is built towards the West with the shrine (Utama Mandala) facing towards the East following the direction of the coming of the sun.

Figure1. Luhur Poten Temple
Source: newduniatravel.blogspot.co.id

Figure 8. Luhur Poten Temple
Source: belajarsecarapraktis.co.id

4. Fenomena Aktivitas

Fenomena aktivitas menjelaskan kegiatan yang terjadi secara dominan pada suatu kasus, dalam hal ini berarti aktivitas utama yang dilakukan suku Tengger di Dusun Cemoro Lawang, Desa Ngadisari. Dengan mengetahui fenomena aktivitas yang ada, harapannya aktivitas ini akan disesuaikan terhadap isu yang diangkat sehingga bisa dianggap sebagai masalah yang harus diselesaikan dengan aktivitas yang berusaha untuk diciptakan melalui usulan objek.

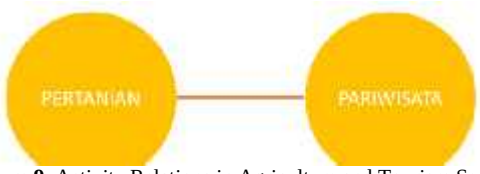

Figure 9. Activity Relations in Agriculture and Tourism Sector

The majority of the population in selected location areas works in the agricultural sector and does not utilize the existing tourism sector. Therefore, in accordance with the objectives, it is necessary to have a relationship between the agricultural sector with the tourism sector so as to improve the economy of the population with the presence of new activities.

a. Village Activity

In village activity, it is determined that the user is an external (public) actor which means individual or group actors directly related to the activities of a space, but not directly related to the ownership or management of the space. Activities that occur within the scope of the village are likely as a place of deliberation among villagers, a place to hold events or performing arts and exhibitions. Usually five days before the Kurban ceremony or Kasada ceremony, people hold various spectacle such as dances, horse races in the sea of sand, relax walk, and the exhibition. In addition, the dominant activity is farming as the majority of the inhabitants are farmers. They daily go to the fields, planting seedlings, treating, to harvesting vegetable.

b. Homestay Activity

In the activity in the homestay, determined by user as an individual or group actors directly related to the activities, ownership and management of a space. This group is also legally entitled to use the room. These internal (private) actors can be divided upon heirarchies or levels of privacy, from a low to high level of privacy. In this object, homeowners or homestays are in a high hierarchy, while guests or travelers who rent a room have a lower hierarchy. Activitiy that exist on this objects is like any residential in general. Residents can perform various activities such as praying, eating, sleeping, bathing, etc.

Homestay facility with the number of residents is determined six people, consisting of four permanent residents, namely father, mother, and two children and two tourists as temporary residents.

Especially for the business space may vary, depending on what group they belong to. In this case it is categorized into five kinds of business groups, i.e. Handicrafts group makes scarves, gloves, and hats which then sold to tourists. A souvenirs group sells daily necessities such as food, souvenirs either in the form of food or Bromo typical goods. There are also business groups that open a restaurant or shop. Last is the business group in the field of transportation, so specifically for this group, a garage is their main needs.

Figure 10 Functionality Change Diagram

The majority of the population in selected location areas works in the agricultural sector and does not utilize the existing tourism sector. Therefore, in accordance with the objectives, it is necessary to have a relationship between the agricultural sector with the tourism sector so as to improve the economy of the population with the presence of new activities.

5. Zonification

Zonification on the spatial pattern of the village is divided based on the concept of *Tri Mandala* value and conservation area. Both will be linked so as to have an order that the restored area is the *Utama Mandala*, the revitalized area is *Madya Mandala*, while the redesigned area becomes the *Nista Mandala* area. This division is based on the level of the building authenticity on the site.

Meanwhile the zonification on the homestay itself is divided into vertically and horizontally. Zone division of space vertically is meant in order that both homeowner and guest can have their own privacy. While the horizontal division zone includes the concept of *Tri Mandala*, i.e. from the front to the back of the house has the order of *Main Mandala*, *Madya Mandala*, and *Nista Mandala*. Living room, dining room, and kitchen can be used as a gathering room or can be used as a shop by the homeowner.

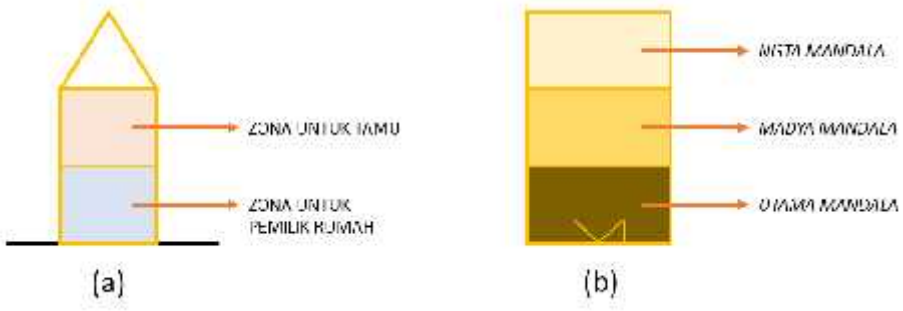

Figure 11. (a) Vertical Zonification (b) Horizontal Zonification

3. Design Concept

The concept of design in Kampung Wisata Budaya Tengger applies the same concept to the temple used by Tengger tribe to pray, that is Luhur Poten Temple. The design concept of Tengger Cultural Tourism Village, in macro, will use Tri Mandala pattern. The arrangement of the village site plan will be divided into three parts, namely the utama, madya, and nista. The grouping of this area is not intended for the classification of the houses but the grouping of the whole village layout because in the Tengger tribe does not recognize the caste system so that all are considered to have the same degree. There is no distinction of social or economic status.

Figure 12. Luhur Poten Temple
Source: shutterstock.com

Besides, in general, the village area is also divided into two groups or zonification, ie conservation areas and development areas. In the conservation area is further divided into two parts, namely the area of restoration and revitalization area. The existence of conservation area aims to maintain local architecture in Tengger region, while the area of revitalization and development is an area that is intended to answer the needs of economic improvement of society and the needs of tourists who are dominated by people who want to enjoy the view of Mount Bromo.

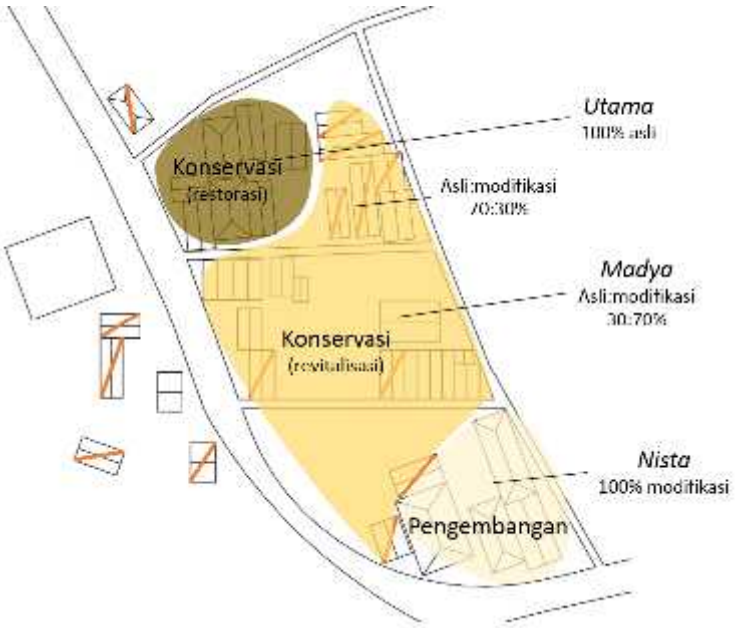

Figure 13. Macro Design Concept

The *Utama Mandala* area is a conservation-restoration area due to in that area a group of buildings can be said still worth to be maintained. So, it requires restoration or returning the building back to their initial form. This will be a group of buildings with the authenticity of the Tengger traditional house. Furthermore, *Madya Mandal*a is a conservation-revitalization area where existing buildings will maintain its function but will get

physical restoration because of the condition of the building that is less feasible. In this area, 30% original and 70% modification. This area also has open space or communal space that is located in the middle area and used as the center of social activities in the village, ie adopting the concept of laying a temple in which has to be placed in the center. Therefore, in *Madya Mandala* there is sub-classification that is *Utama ning Madya*, *Madya ning Madya*, and *Nista ning Madya*. In the *Nista Mandala* is a total-designed building area or development area and farm or field area. Communal spaces and other open spaces such as farms or fields are designed as well in order to create an interaction between residents and tourists. This productive area is designed to be used for farming without reducing its aesthetic value.

Phase 1 is in the conservation-restoration area. In this area existing buildings of Tengger society are still in decent conditions yet some parts have changed from its traditional value, so the physical form of the building is restored back to their initial physical form. The goal is to preserve local architecture and in accordance with the issues of cultural preservation on architecture of Tenggerese House. In phase 1, the building function can be a regular homestay.

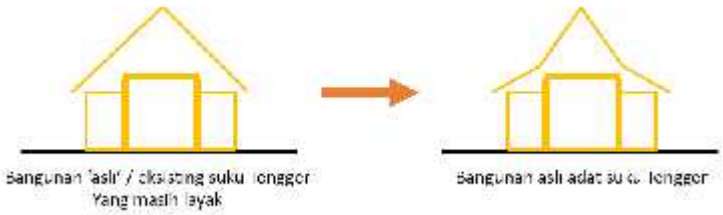

Figure 14. Conservation-restoration

Phase 2 is in the conservation-revitalization area. In this area contains Tenggerese existing buildings with the condition that is less feasible. Revitalization will be divided into two types, namely with "fixed function, changed shape" and "changed function, fixed shape". In this case, the shape of the building will be changed with a fixed function in order to be able to increase the value of the building and economic value in terms of attracting tourists. In this area is divided into two, namely with the architectural percentage betwen the original to the modification with 70:30 and of between the original to the modification with 30:70. The goal is to create a transition architectural design model and still looked to have unity in one region. In phase 2, the function of the building can be a homestay with a more decent concept and in the form of shops and restaurants.

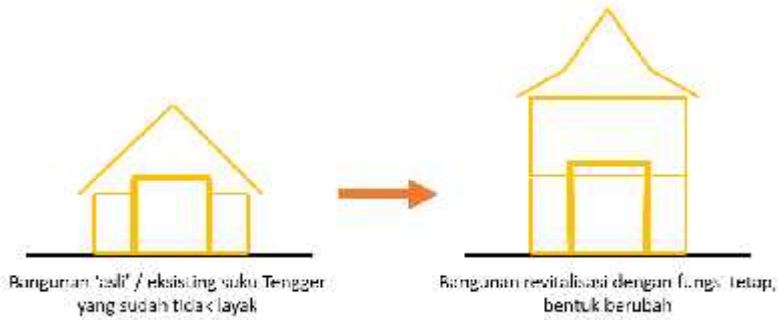

Figure 15. Conservation-revitalization

Phase 3 is in the development area. In this area, existing buildings can be fully designed so that it can create a completely new shape, but still can not be separated from the surrounding buildings. Just like phase 2, the function of the building can be a homestay with a more decent concept and in the form of shops and restaurants but can give different nuance.

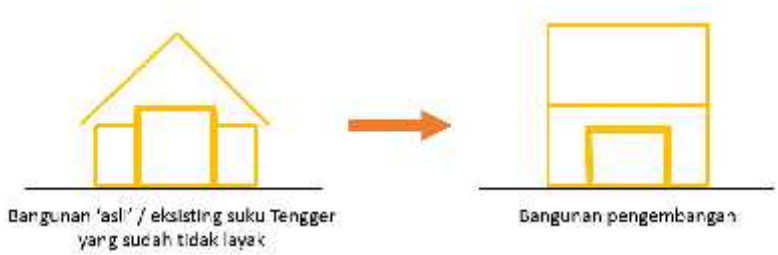

Figure 16. Development

The homestay mass arrangement has an irregular pattern. These houses are arranged in clusters and close to each other. Between one house with another house is only separated by narrow pedestrian path. The concept of this adjacent house will still be applied in the design but with a moreneat pattern. Such a mass arrangement of buildings works to deal with the extreme wind and cold weather. With the pattern of mass arrangement, the wind can not be crashed and will soon be blocked by the assembled houses.

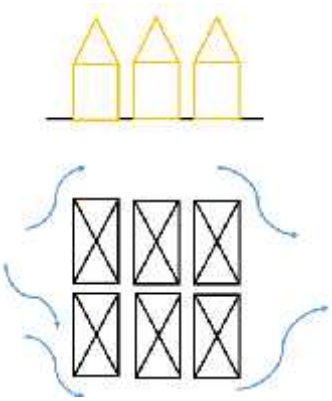

Figure 17. Windflow in the Settlement

Composition is an arrangement of activities designed and planned in accordance with technical and non-technical considerations. Composition has always something to do with the concept of floor plans or plans on the building. The space composition in this homestay follows a predetermined zonification, that is based on vertical and horizontal divisions that reflect the Tri Mandala concept.

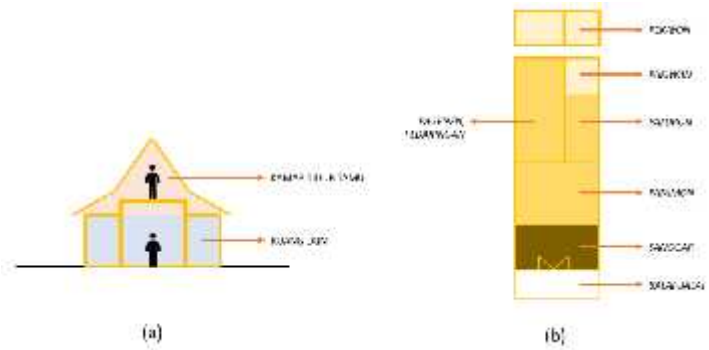

Figure 18.(a) Vertical Composition (b) Horizontal Composition

4. Conclusion

The conclusions of this discussion are:

a. Settlement Composition, composition of space in the house and environment in the Tengger tribe have similarities with the culture of Balinese Hindu society (Tri Mandala, Sanga Mandala, Tri Hita Karana)
b. On the existing conditions, where the place of praying tengger society placed on the side of the road. does not lead to Bromo mountain. In contrast to the Hindu population in Bali, Agung mountain became the center of orientation in worship.
c. Tengger community activities related to hereditary cultures, can be an interesting commodity as a tourist attraction
d. NewDesign of settlement of Tengger society, can be applied by applying Tri Hita Karana / Sangamandala order pattern, so that it can preserve the existing culture.

References

Jatim Newsroom. Menpar: Bromo-Tengger-Semeru Jadi Destinasi Prioritas Nasional. 8 Oktober 2016. http://jatimprov.go.id/read/berita-pengumuman/menpar-bromo-tengger-semeru-jadi-destinasi-prioritas-nasional

Tarigan, Frederikson. Mohe Wae Rebo. 8 Oktober 2016. http://www.coroflot.com/FrederiksonT/Mohe-Wae-Rebo

Khoiruddinuad, Ahmad. Keragaman Suku Bangsa dan Budaya. 6 November 2016. https://ahmadkhoiruddinuad.files.wordpress.com/2012/12/keragaman-suku-bangsa-dan-budaya.pdf

Savitri, Alpha. Sejarah, Agama, dan Tradisi Suku Tengger Gunung Bromo. 7 November 2016. http://wartawarga.gunadarma.ac.id/wp-content/uploads/2010/02/sejarahAgamaTradisiTenggerBromo_AlphaSavitri_OK.pdf

Anonim. Laporan Mahasiswa. 7 November 2016. http://sipadu.isi-ska.ac.id/mhsw/laporan/laporan_3398141206105758.pdf

Atmojo, Bambang Tri. Karangan Etnografi: Kebudayaan Suku Tengger. 9 November 2016. https://www.academia.edu/12099543/Karangan_Etnografi_Kebudayaan_Suku_Tengger

Putra, Kurnia Sudiar. Suku Tengger. 9 November 2016. http://kurniasudiar.wordpress.com/2013/05/06/suku-tengger/

Anonim. Upacara Adat Suku Tengger. 30 November 2016. http://explore1ndonesia.blogspot.co.id/2014/11/upacara-adat-suku-tengger.html

Wisana, Ari. Desa Adata Panglipuran Karakteristik Tempat Desa Adat Panglipuran. 5 Desember 2016. https://www.academia.edu/12018315/Desa_Adat_Panglipuran_Karakteristik_tempat_desa_adat_panglipuran

Ajus, Masem. Tata Ruang Desa Adat Panglipuran Bangli. 5 Desember 2016. http://masemislife.blogspot.co.id/2011/03/tata-ruang-desa-adat-Panglipuran-bangli.html

Bawa, Yan. Desa Adat Tradisional Bali. 5 Desember 2016. http://yanbawa9.blogspot.co.id/2013/09/desa-adat-tradisional-bali.html

Koran Arsitektur. Mengenal Arsitektur Khas Nusantara Panglipuran, Bali. 5 Desember 2016. http://archiholic99danoes.blogspot.co.id/2012/02/mengenal-arsitektur-nusantara-khas.html

Anonim. Bab I Pendahuluan. 5 Desember 2016. https://wisuda.unud.ac.id/pdf/1101605005-2-BAB%20I.pdf

Anonim. Kamus Besar Bahasa Indonesia (KBBI). 10 Desember 2016. http://kbbi.web.id

Saputra, Ririn. Keadaan Fisik Suku Tengger. 12 Desember 2016. https://chaderinsaputra.wordpress.com/2012/06/20/keadaan-fisik-suku-tengger-bromo/

Antariksa. Kearifan Lokal Masyarakat Suku Tengger dalam Pemanfaatan Ruang dan Upaya Pemeliharaan Lingkungan. 13 Desember 2016. http://antariksa.lecture.ub.ac.id/2011/03/

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SENSORY AESTHETICS : BRIDGING THE HUMAN'S PHYSIOLOGICAL NEEDS AND THEIR PSYCHOLOGICAL NEEDS IN ARCHITECTURAL DESIGN

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Abstract

Dimensions of human's needs vary in kinds, two important kinds of them concerning with architectural design are physiological needs (not only physical needs) and psychological needs either. These two kinds of needs deal closely with the human nature : varies senses i.e. visual, audio, touch, smell etc, that need some kinds of architectural design conformities with their comfortable condition and environment. SENSORY AESTHETICS is the answer for fulfilling needs of comfortable environment for the shake of physiological needs and psychological needs expressing in the performance of ambient environment in architectural design
This design approach combining architectural technology and psychological issues could be one important approach to improve the variety of design ideas
.

Keywords:*Sensory Aesthetics, Ambient Environment, Ideas In Architectural Design*

1. Background

The fulfilment of human needs in architectural design is very important in order to accommodate user's satisfaction. Human psychological satisfactions have same important level with their psychological satisfactions. Therefore, there are important things to consider psychological approach as well as physiological approach in designing architecture for thw shake of human satisfactions in their full dimensions.

Sensory aesthetics in ambient environment of each architectural spaces give chancesfor architects to brigde the fulfilment of psychological needs and satisfactions with their physiological ones as well.

2. Human's Need and Architectural Design

According to Rahman & Jhanglan, 2009, human needs can be explain below:

"This diagram shows Maslow's hierarchy of needs, represented as a pyramid with the more primitive needs at the bottom.

Maslow's hierarchy of needs is often depicted as a pyramid consisting of five levels: the four lower levels are grouped together as deficiency needs associated with physiological needs, while the top level is termed growth needs associated with psychological needs. While deficiency needs must be met, growth needs are continually shaping behaviour. The basic concept is that the higher needs in this hierarchy only come into focus once all the needs that are lower down in the pyramid are mainly or entirely satisfied. Growth forces create upward movement in the hierarchy, whereas regressive forces push prepotent needs further down the hierarchy."

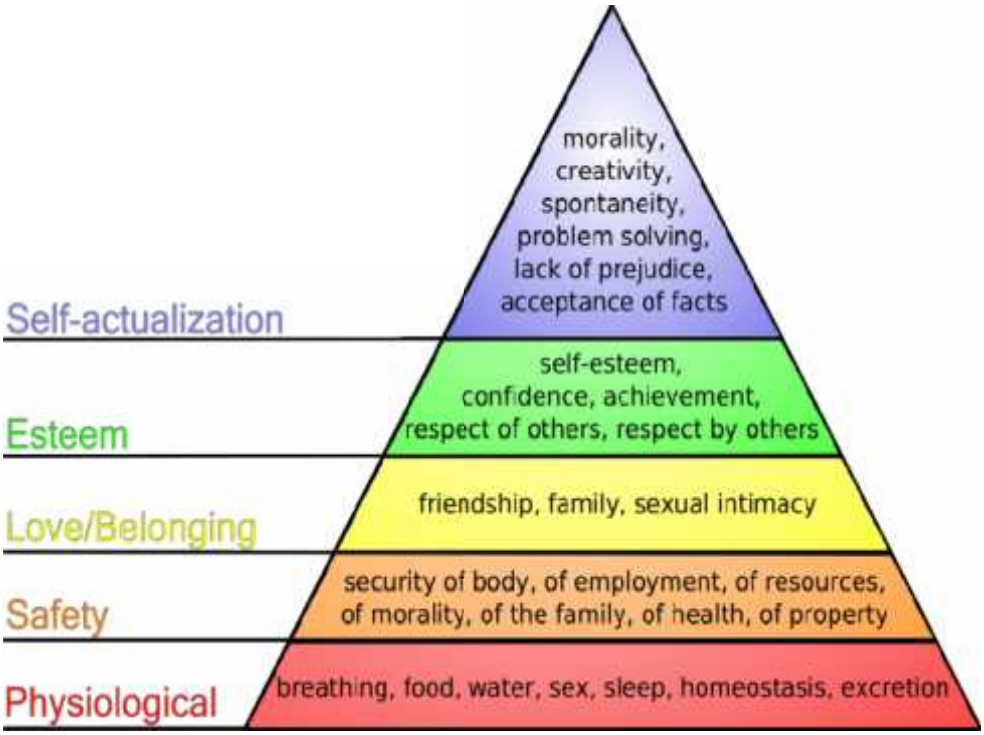


Figure 1. Maslow's Hierarkhi of Needs

In this pyramid, the higher position of the need, means higher psychological nature in it, and all of needs together form the full dimension of human needs. In order to satisfy user's needs, architects have to understand user's preferences, giving them not only physic-physiological survival but also for psychological survival as well.

User's preferences affected by their needs for performing, doing and running their lives comfortably, based on their everyday life styles.

3. Sense and Dominant of Sense

We generally learn that we have five senses, sense of seeing, sense of hearing, sense of testing, sense of touching and sense of smelling. This five senses receive sensory information from environment in various forms of images, sounds, tastes, smells, and touches to our brain, where we process it and respond accordingly (Augustin, 2009).

The major five senses that you often hear about are not necessarily the only senses that architects need to keep in mind as they design. Rebecca Maxwell, a writer who lost her sight at the age of three, describes her experience of other senses when she interacts with architecture. Some other senses that she describes are :

- sense of pressure
- sense of balance
- sense of rhythm
- sense of movement
- sense of life
- sense of warmth

(Lehman, 2010)

In classical Indian philosophy (the Brhadaranyaka Upanishad), a list of eight senses is given:
"(1) prana (breathing organ, i.e., nose; also 'breath of life'); (2) the speech organ; (3) tongue (taste); (4) eye (color); (5) ear (sounds); (6) mana (thought, mind, inner organ); (7) hands (work); and (8) skin (sense of touch)" (Elberfeld 2003: 483).

The broader kinds of senses mentioned above, especially concerning with architectural design , gives broader approahed chances and alternatives design ideas for architects. Every individual or group has its dominant sense directing every built environment preferences

4. The Ambient Environment

"The ambient environment refers to non- visual aspects, such as sound, temperature, odor, and illumination.These factors are stable daily features of environment that we may not conciously perceive. Although it often goes unnoticed, the ambient environment has aprofound impact on everything we do. Our moods, work performance, and even our physical well-being are affected by the sensory input we constantly receive from the ambient environment" (McAndrew, 1993)

The ambient environment gives us kind of emotional experiences that drive our emotional reactions. These emotional and affective quality (of ambient environment)determining the mood and memories associated with the places, buildings, spaces, (and express in our overt behaviors in those ambient environment we experience), which may even affect the individual's (or group's) health and well-being (Russel & Snodgrass in McAndrew, 1993)

Examples of the effects of ambient environment on moods and work performance, i.e.

- Noise can lead to : increase arousal, stress, narrowing attention, and constraint behavior.
- High temperature and low temperature and its associated physiological activity : tends to increase arousal, leading to improve performance at low level of arousal and deteriorate performance at high level, and increase or decrease attraction and aggression.
- Climate of such an environment can influence culture's value and personality.
    - Warm and dry winds → depression, nervousness, pain, irritation, traffic accident.
    - Barometric pressure → suicide rate and disruptive school behavior
    - Electricity in the air → human social behavior (suicides accidents, crimes, etc)
        - High level of positive ions → mood and arousal.
        - High level of negative ions → intensifies feelings, mood states, memory, aggressive behavior.
- Elevation can influence physic, physiologic, healthy.

The ambient environment is the mainfield design subject and object for architects who have expertise in architectural science and technology. Generally, and consciously the architects design ambien environment based on physical and physiological standards more often, ignoring psychological aspects of ambient environment on the other hands. As a result, the ambient environment tend to uncomfortable psychologically. Sensory aesthetics has important role to brigde the user's physiological needs and their psychological needs in ambient environment

5. Sensory Aesthetics, Bridging Human Physiological Needs and Their Psychological Needs

Sensory Aesthetics concern with the pleasureableness of sensation received from the environment and results from the colors, odors, sounds, and texture of the environment (Lang, 1992, in Muhammed, 2007)

Term "sensory aesthetic refers the sensory feelings (good or bad) evoked by the aesthetics (beautiful or ugly) of a product or interface, especially the built environment designed by architects.

Sensory aesthetics as a first order orientation response that is automatic, fast, nonconscious, and effortless to the aesthetics of the stimuli leading to an instant and implicit conclusion on its aesthetic valence (Rahman & Jhanglan, 2009).

Sensory aesthetics is an experiencing aesthetics, not only an observing or contemplating aesthetics. Sensory aesthetics in ambient environment filling psychological needs by presenting comfortable space ambience concern with multi senses stimulation needs for the users. It is not only concerns with the number of physiological standard needed for the comfortable ambient environment, but also it's psychological ambience needed to fulfil the comfort space and place. Sense of place, feeling of happiness, feeling of sadness, threatness, darkness, calm, joyful, etc, are the quality of ambience we gain from the ambient environment. Sensory aesthetics bridging human physiological needs and their psychological needs**.**

6. Sensory Aesthetics and Sensory Architecture

Thermal comfort standard could be reached in two ways, i.e. physiologically and psychologically. Quantitive standard determine the physiological comfort people can reached, on the other hand qualitative standard determine the psychological comfort people can reached.
Sense of smelling has magical, mysterious and powerful potential to fulfil psychological satisfaction. Sense of hearing has primal, dependable, and enduring potensial to fulfil psychological satisfaction. Sense of seeing has focal and influential power to fulfil psychological satisfaction. Sense of touching has subtle, sensual and undeniable power to fulfil psychological satisfaction. Sense of tasting is relating to sense of smelling deeply.
How people interpret what they sense by what their life has taught them is important. Interesting, useful, and desirable (Augustin, 2009). This fact directs us to the importance of studying behavioral subsystem of the user to be when designing their space and place. Knowing deeply cultural subsystem, social subsystem, personality subsystem, physiological subsystem, and environmental subsystem can guide us to understand how people interprete what they sense.

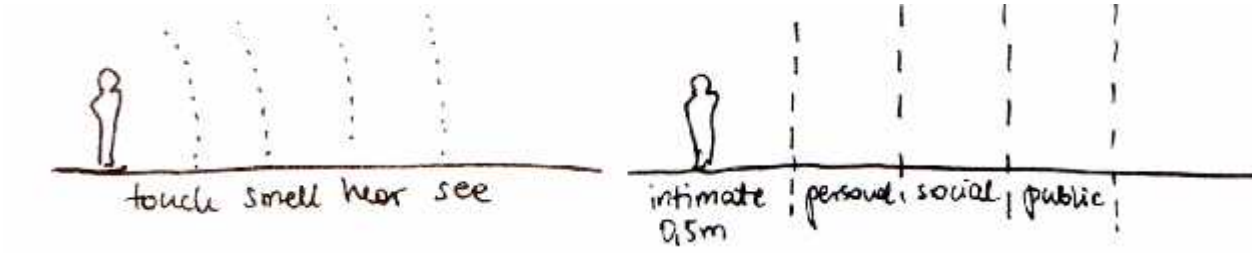


Figure 2. Telling us how every sense can accepts distance sense all at once, and we can use it for architectural design

DESIGN

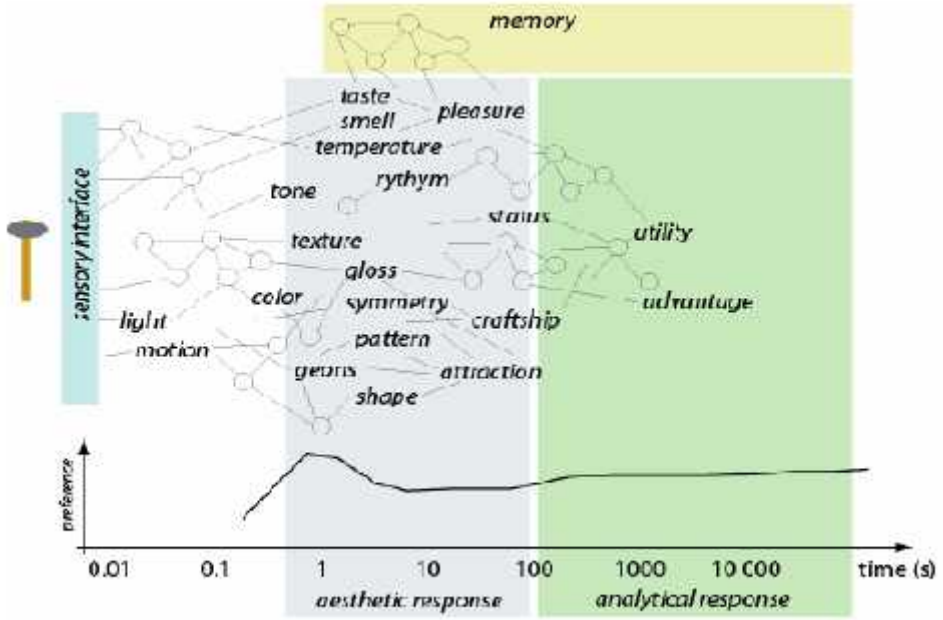
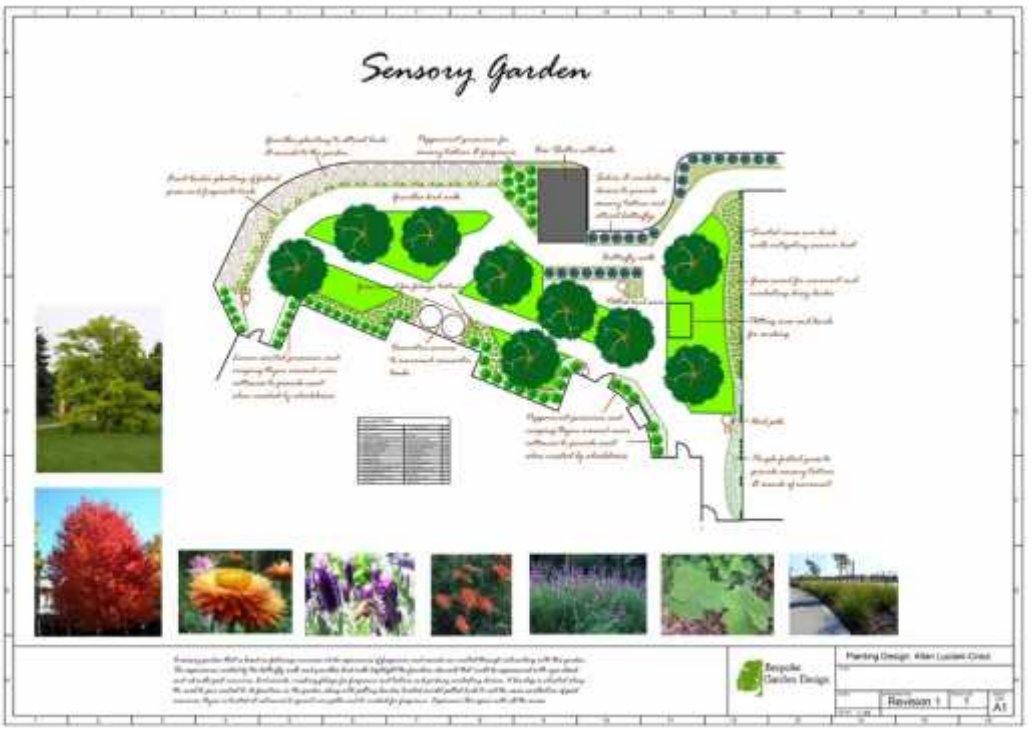


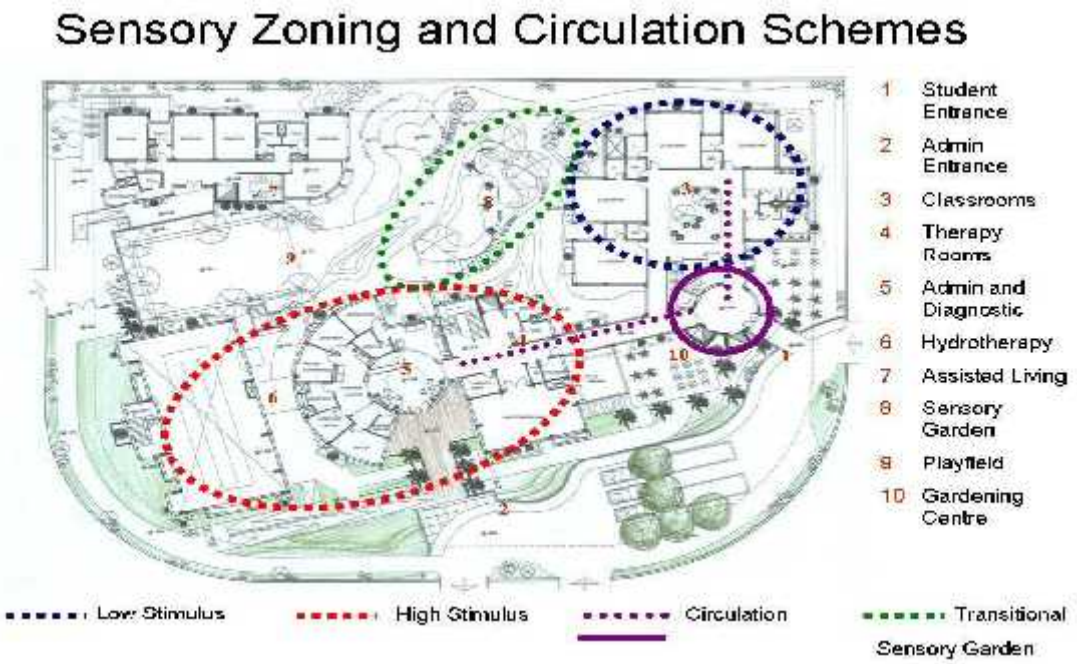
Exhibit RESPONSE. Schematic illustration of human cognitive response to an artifact.

Sense-impression	Perception	Example of Appearance
Eye contact	Visible-object	Form, shape, color
Ear contact	Sound	noisy, quiet
Nose contact	Aroma	Smell of incense, flower
Tongue contact	Taste*	Sweet, hot, delicious
Body contact	Touch	Smooth, rough
Mind contact	Mind-objects	Beautiful, Merit worthy, Sacred

Figure 3. Two figures above explain us how our senses accept, perceipt,interprete and give us cognition responses of the appearances of built environment.

7. Sensory Architecture





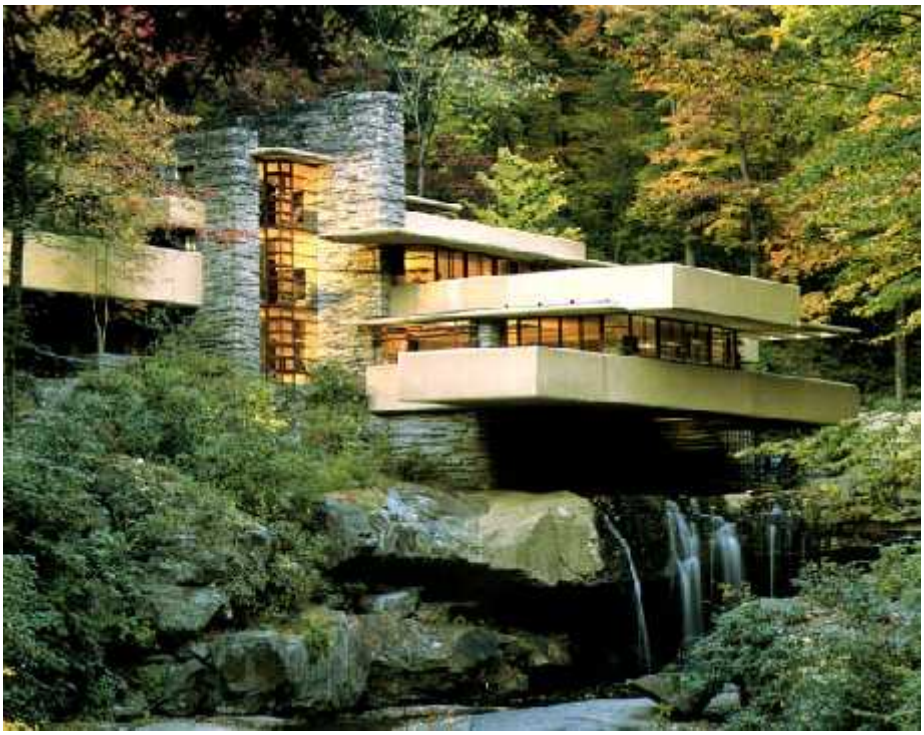


Figure 4. F.L. Wright Falling Water House, example of a multi sensory design architecture

8. Conclusion

According to the library compilation research above, we can have some conclusions concern with how sensory aesthetic has potention to bridge psychological needs and physiological needs in architectural design.

a. Sensory aesthetics concerns with the pleasureableness of sensation received from the environment and results from the colors, odors, sounds, and texture of the environment.
b. These pleasureableness of sensation can be gained from ambient environment designed with considering not only physiological needs but also psychological needs as well.
c. Sensory aesthetics in ambient environment filling psychological needs by presenting comfortable space ambience concern with multi senses stimulation needs for the users.
d. Users multi senses stimulation needs depend on how they interprete the sense that their life has taught them is important, interesting, useful, and desirable

Knowing deeply cultural subsystem, social subsystem, personality subsystem, physiological subsystem, and environmental subsystem of the user to be can guide us to understand how people interprete what they sense of our architectural design.

References

Augustin, S. (2009), *Place Advantage,* John Wiley & Sons, Inc. New Jersey
Jackson, N. (2010), *Building as Total Sensory Experiences,* Atlantic
Kopec, D. (2010), *Environmental Psychology for Design*, Fairchild Publications, Inc, New York
McAndrew, F. (1993), *Environmental Psychology*, Brook/Cole Publishing Company, California
Rahman, M. & Jhangian, I. *Sensory Aesthetics, How Social Science can Inform Design Aesthetic*

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BEHAVIOUR SETTING AND SPATIAL USAGE ANALYSIS ON SOMBO LOW COST FLAT'S CORRIDOR

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Abstract

Flats corridors design that relatively narrow is less able to accommodate the needs of social space for residents in low cost flats. This is because Indonesian people are used to live in horizontal housing, one of them is Kampung. Kampung and its alley provides various dynamic activity and social interaction for resident, and make it to be a good social space. Related to these facts, architects have the task to designing flats corridor that accommodate residents needs of social space such as user's behavior setting in Kampung street. This issue is in line with the case study in Sombo Flat's corridor which is designed based on the characteristic of Kampung street's behaviour setting concept. With that concept, flats corridors were designed wider, approximately 3–9 meters. These wide corridors give residents opportunity to do social interaction and other dynamic activities that take place in the corridors. This paper aims to evaluate the design implementation of the Sombo Flat's Corridors using analysis on behaviour setting method, which covers the pattern of the activities, setting/milleu, synormophy (the relationship between activity and the setting), and analyzing space usage patterns that occurs in the corridors. The data are collected through observation, interview, documentation and analyzed with descriptive qualitative methods. The results of observation analysis show that Sombo Flat's corridor is designed based on the characteristic of Kampung street's behaviour setting concept and accommodate the resident's pattern of activities, especially in the function of social space to create a sense of neighborhood. Yet, there is negative impact from this wide corridor design that gives residents an opportunity to adds their personal space in the corridor which supposedly as a public space (changing spatial usage).

Keywords:*Behaviour Setting, Environment Behaviour Study, Flats Corridor's Design, Spatial Usage*

1. Introduction

Space, including outdoor space is one of the results of architecture and urban design. Space is affected by geography, built environment, social, and culture wich can direct the affordance of human behaviour into a certain pattern (Lang 1978). In addition, space is also influenced by the perception, experience, spatial behavior, and the meaning perceived by the user (Stea, 1977 and Hersberger, 1969). Perception of someone to a space is also influenced by cultural factors. Culture is formed contextually and have distinctive characteristic to an individual in the context of the various regions and settings. In line with the statement that has been mentioned above, Altman (1976) has elaborate and formulate a concept of the Environment

Behavior Study (EBS), which consists of three components: environment-behavior phenomena, user group, and settings. Altman emphasized that there is a reciprocal relationship between human behavior and the environment or setting.

The relationship between human behavior and environmental setting will not be separated from the time variable. In this case there is a link between patterns of activity, environmental setting, and the relationship between them within a certain time period commonly called the Behaviour Setting (Barker, 1968). Pattern of human activity in a space can either change by the time period wether per day, per week, or per season. Behaviour setting system may vary from time to time. Most of them depends on the location and characteristics of the user. Changes in the function of the link into place can also occur, in which a space that was originally in the form of a link, because of the certain factors could turn into a place (Lang and Marshall, 2016)

The diversities of this behaviour setting can be seen on the street, where the users can perform various activities and doing behaviour pattern such as standing, talking, playing, gathering, and observe. That path connectivity including vehicle mobility and pedestrians. All these activities can form an urban life that have a significant impact on the environment and socio-cultural community (Jacob, 1993).

Street as a link in the context of housing in Indonesia adapted to the each typology of housing. This is because there was dualism housing typology in Indonesia, that is horizontal and vertical housing. In this case, Kampung is one of the horizontal housing typology and it has street or alley to link one house to another. On the other side, flats a one of the vertical housing has a corridor to link one house unit to another in the same level.

However, the phenomenon in the facts that there is an activity pattern's difference between Kampung Street and Flats Corridor that will affect behaviour setting of the user. Most of the people in Indonesia are not familiar with vertical housing culture. Flat's corridors that relatively narrow and vertical housing setting are less able to accomodate the needs of the user's social space. Different from the Kampung street that provides various activity, social interactions, and social space. Related to this facts, architects have the task to designing flats corridor that could accomodate residents needs of social space such as user's behaviour setting in Kampung street. This issue is in line with the case study in Sombo Flat's corridor which designed based on the characteristic of Kampung street's behaviour setting concept. With that concept, flats corridors were designed very wide, approximately 3–9 meters. This wide corridors give residents opportunity to do social interaction and other dynamic activities take place in the corridors. Resident who live in Sombo flats was once live in slum area in the same location, then relocated into this flats (Silas, 1996).

This paper will discuss about the behaviour setting analysis in Sombo Flats which designed based on the characteristic of Kampung Street's behaviour setting. From this analysis, it would be identified wether the corridor's design is good enough or not to accomodate social activities pattern and social space same as in the Kampung Street.

From the problem statement above, the research questions are:

1. How is the user's behaviour setting pattern in Sombo flat's corridor?
2. How is the use of space pattern in Sombo flats?
3. Is flat's corridor design can accomodate the user's behaviour setting same as in the Kampung street?

2. Research Theory and Methods

2.1. Methods

The research method that used in this paper is descriptive qualitative method. Observation and fied survey performed to analyze patterns of activity that occurs in each milleu and how they relate to each another (behavior setting). While descriptive qualitative method is to explain wether the corridor design can accomodate the user's behaviour setting same as in the Kampung street or not. While the technique of data collection were literature review, observation, photography, and interview to the residents.

2.2. Behaviour Setting

According to Roger Barker in Zeisel (1981), behaviour setting is the codetermination relation between the environment and the behavior pattern that can not be separated from one another. According to Barker, behaviour setting is human behavior in a reciprocal relationship with the environment. Behavior settings can be defined as an interaction between an activity and the setting where it occurs.
While Lang (2010) defines the behaviour setting as an attempt to create a built environment to provide the desired activity affordances that can occur in a neighborhood setting. Appropriate or not depends on the moral and cultural fabric of local communities.

Barker (1968) in Lang (2010) reveals some variables of the behavior setting, which are:

- There is activity pattern that repeated in the form of behaviour pattern
- Milleu or certain environmental setting
- Synomorphy or the relationship between patterns of activity and Milleu
- Specific time period

Meanwhile, Rapoport (2005) reveals the theory system of setting which is similar to behaviour setting that Barker stated. But Rapoport criticized the lack of one variables that have a significant influence on a behavior setting. That variable was a cultural variable. Rapoport reveals four aspects of the system of setting:

- The organization of space, time, meaning, and communication
- A system of settings
- The cultural landscape
- Consisting of fixed, semi-fixed, and non fixed elements

While in Popov (2012), Barker (1968) also mentions an additional aspect in the behavior setting aside the three main aspects mentioned above, which are:Temporal locus; Geographical locus; Social occurrence; Duration; Population; Occupancy time; Functional positions of inhabitants; Action patterns; Behavior mechanisms; Pressure;Autonomy; Welfare

Besides the aspects mentioned above Roger Baker, John Lang (2010) stated that the built environment is composed of two types of behavior setting, which are:

- Places are the sites of localized standing patterns of behavior
- Links are the channels of movement that draws them into a system that serves some purpose or set of purposes

2.3. activity in Behaviour Setting

Aspects of activity in behavior setting according to Rapoport (in Kent, 1990), that there are four aspects of the activity:

- Instrumental aspects which are the most manifest
- How activities are carried out
- How they are associated into system
- Their meaning, the most latent aspect

In analyzing the behavior setting, there are several key questions related to the relationship between the environment and the pattern of its activities (Rapoport, in Kent 1990)

- Who does what
- Where
- When
- Including or excluding whom (and why)

Meanwhile, according to Kent (1990), the system of setting could include the following aspects:

- The nature of the setting, some of the which maybe counter intuitive
- How and by Whom settings are used, depending on approriates, meaning
- Who is included or excluded
- The penetration gradients
- The rules that apply in Them
- The on-going uses, behavior and activity
- The cues provided by setting
- The nature of boundaries
- The sequence of settings
- The reason of particular sequences
- The extent of the system which, in turn, is related to home ranges, known areas, areas used or avoided
- The linkages and separation Among settings
- The nature or lingkages Among bariers

2.4. Space Usage Pattern in Specific Milleu

Rapoport (1977) named the five basic elements of space usage pattern that consists of:

- Home Range
  A space used by residents in performing the movement or activity that can consist of multiple locations and connective tissue between these locations and are influenced by the characteristics of their communities.
- Core Area
  Among the most frequently used by the public in carrying out its activities and controlled by the community itself.
- Territory
  A space that is owned by a group of people who have similar interests to that space.
- Controlled Area (jurisdiction)
  the space occupied and controlled by the people who used them for a while and not permanent.
- Personal Space

An area that is dominated and controlled by each - each individual.

While research Lauria (2014), there are some aspects of spatial use in the analysis of behavior in the context of setting neighborhoods in the cities of Surabaya, which is as follows:

- Street Usage for the economic space
- Street Usage for the social space
- Street Usage for the cultural space
- Street Usage for the spiritual space
- Street Usage for the parking area

2.5. Shared Outdoor Space in the Context of Kampung

Rolalisasi (2013) mentions that the shared outdoor space in the context of urban village in Indonesia is an alley or a small street in Kampung. Also the other areas around settlements that are used together for the communities activities and for creating a sense of neighborhood among them. Funo (1985) mentions that the open space outside the home have a significant role to life in the Kampung. Kampung street is used for various activities such as cooking, washing, playing, bathing, and community gatherings. Where to reduce the area of shared outdoor space in the village means estinguish the culture in the village.

2.6. Shared Outdoor Space in the Context of Flats

In the context of flats, Astuti (2015) reveals the ambiguity for the definition of personal space and public space in an flats. Whereas in the context of Indonesia, the flat's corridor which are supposed to be public space is used to be a personal space by users. This is because users need additional space to perform everyday activities. This conditions eventually led to conflicts among users, which in turn have an impact on sustainable housing perceived satisfaction of each user (Astuti, 2015).

3. Result and Discussion

3.1. User's Activity (Spatial Pattern Environment)

Historically, Sombo flats is the result of urban renewal and relocation of people living in slums in the same location previously. This caused activities pattern that occurs in this flats are expected to accommodate the social activities like the Kampung, but of course there are differences that will be affected by environmental setting, where flats is vertical space and Kampung are horizontal space.

Activities pattern in the flats was certainly almost equal to the user's activities in the Kampung. Where the primary activity which always done every day such as eating, bathing, washing, drying clothes, and cooking. Also the need for secondary activities such as socializing, playing, trading, and so forth. Analysis obtained in the field observations shows some key activities that are occurs in the flats corridor as follows:

Table 1. Key Activity that Occurs in Flat's Corridors

No	Activity Pattern in Sombo Flats	Men	Woman	Youths	Childrens	Outsiders
1	Bathing	✓	✓	✓	✓	
2	Cooking		✓			
3	Washing		✓			
4	Drying Clothes		✓			
5	Playing	✓	✓	✓	✓	

6	Socializing			✓	✓	
7	Trading or Other Economic Activities	✓	✓			✓
		✓	✓			
8	Certain Events			✓	✓	✓

Source: writer survey (2017)

3.2. Location Setting

Because of the similarity of cultural background pattern, activity pattern that occurs in Sombo Flats and Kampung Sombo tend to be similar. The difference is in Milleu or place setting. Where according to Rolalisasi (2013) mentions that the shared outdoor space in the context of Kampung in Indonesia is an alley or a small street. Also the other areas around settlements that are used together for the activities of communities to create sense of neighborhood. Kampung street tend to accommodate social activities such as socializing, playing, trade and mobility functions for vehicle.

While in rusunawa, Astuti (2015) reveals the ambiguity between the function of personal space and public space. Where in the context of Indonesia, the corridors of flats which are supposed to be public space is used to be a personal space by a user, because of the users need additional space to perform everyday activities.

3.3. Space Usage Patterns

The space usage patterns in Sombo flats that can be seen in figure 1.

- Personal Space (green)
  Area that is dominated and controlled by each individual. In the case of Sombo flats is house unit owned by each resident. Where the activities conducted in the personal space was sleeping and eating. While other activities carried out in public and semi-public space.
- Home Range (yellow)
  Area that is used by residents in performing the movement or activity that can consist of multiple locations and connective tissue between these locations. This area is influenced by the characteristics of their communities. In the context of Sombo flats is the corridor (yellow part) which consisting of horizontal and vertical circulation
- Core Area (light blue color)
  The area that are the most frequently used by the user in carrying activities and controlled by the community itself. In the context of Sombo Flats are light blue area that is used by people to socialize, play and do other things in addition to activity in the personal space
- Territory (dark blue)
- A space that is owned by a group of people who have similar interests to that space. This area is located at the points of shared space for the activities such as cooking, bathing, washing, and drying clothes together on the flats.
- Controlled Area/ Jurisdiction (red)
  The space that occupied and controlled by the people who used them for a while and not permanent. In the context of Sombo flats is a red area which is used as a street vendor selling in the corridor. The trader present temporary, and followed by the residents activities such as socializing, eating, and playing around the street vendors (figure 1)

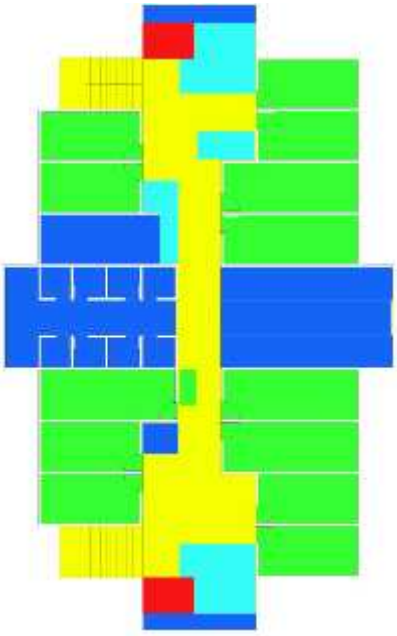

Figure 1. Space Usage Patterns on Sombo Flat
Source: survey, 2017

Furthermore, the space usage pattern will be reviewed in corridor setting. The corridor space usage pattern should be home range area of human movement as a circulation that connect one place to another. But in reality, flats corridors turns out to have a variety of additional functions. In figure 2 described space usage analysis of the corridor:

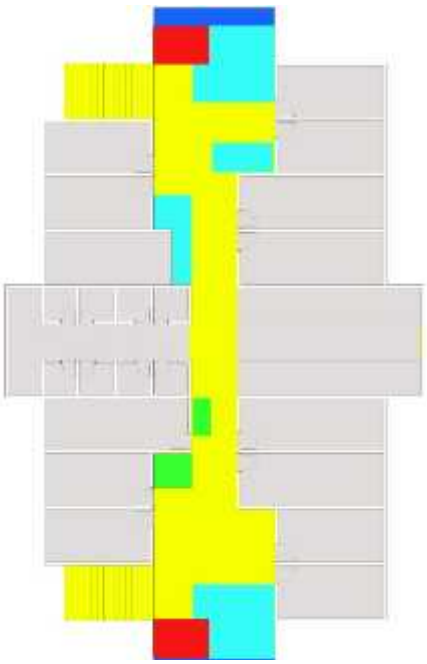

Figure 2. Space Usage Patterns in Sombo Flat's Corridors
Source: survey, 2017

- HomeRange (yellow)
- A space that is used by residents in performing the movement or activity which may consist of several locations. Home range is the area of the corridor rusunawa as a linkage between one place to another either vertically or horizontally (figure 3)

Figure 3. Corridors as a home range
Source: survey, 2017

- Personal Space (green)
- In the terms of space usage patterns in Sombo flats corridors, there are additional function of personal space in the corridor area which supposedly to be a public space. Expansion of the personal space area that taking place in corridorsuch as private owned shops is a form of private economic activity. Beside that, there are people who do sewing business in the corridor. Another expansion formis the cooking activity taking place in front of the house corridor. These are the residents response to add perceived lack of personal space (figure 4)

Figure 4. Corridors as a personal space for residents
Source: survey, 2017

- Core Area (light blue color)
- Core area is the most frequently used by the community in carrying out its activities and controlled by the community itself. In the context of Sombo flats, core area is light blue color that are used by people to socialize, playing and relaxing. It is located in the corner corridor hall that directly face to the outdoors area.In addition, there are a several benches or seating area that function as core area for social activity among residents. The benches are placed in front of each resident's house (figure 5).

Figure 5. Corridors and seating area as a core area for community
Source: survey, 2017

- Territory (dark blue)
- A space that is owned by a group of people who have similar interests to that space. This area is located at the end of the corridor where people were always used it as an area for communal drying clothes (figure 6).

Figure 6. Corridors as territory area for drying clothes
Source: survey, 2017

- Controlled Area / Jurisdiction (red)
- The space occupied and controlled by the people who used them for a while and not permanent. In the context of the Sombo flat's corridor is a red area which is used as a street vendor selling. These street vendors are temporal, and followed by the resident's activities such as socializing, eating, and playing around the street vendors. The interesting thing is that the traders are not people living in this flats, but people from outside flats who came temporaly (figure 7).

Figure 7. Corridors as a controlled area for temporary street vendors
Source: survey, 2017

Beside that, the interersting thing is when the nights, the hall is also used to sleep by the residents. This is due to the over capacity of housing units that should be occupied just by 4-6 people,but in the reality it is used by up to 10 people.

3.4. Relations with the Behaviour Setting Time Occurred on Corridor RusunawaSombo

In behavior settings, time period of the activity occured is one of the most influencing aspects (Roger Barker 1968). In relation to the Sombo flats corridor, there are differences in activity patterns that occur in a setting from time to time.

Figure 8shows the results from observation of activity pattern changes that occur in the Sombo flat corridor. These changes were observed in the morning, afternoon, and evening. Some of the major activities such as cooking, child care, socialize, play, and even nap in the corridor can be seen in the figure.

9 AM
Cooking activity take place in corridors in the morning

1 PM
In the afternoon, corridors become a link and circulation for residents

4 PM
In the evening, corridors become a social space for community

Figure 8
Source: survey, 2012

9 AM
The bench in the morning

1 PM
The bench in the afternoon used by the residents for socializing and buying street vendors that passed by

4 PM
The bench in the evening used by the residents for relaxing and socializing

Figure 9
Source: survey, 2012

Figure 10
Source: survey, 2012

4. Conclusion

Sombo's flats corridor design based on the character of the kampung's behaviour setting is quite successful in its implementation as the embodiment of social space. Theflat's corridor can serve several activity such as being an economic space where people engage in economic activities such as selling a grocery store, sewing, even street vendors who went temporary into the flat's corridor. In terms of its function as a social space, the activity of residents can be accommodated well, ranging from socialization and interaction among residents, the activities of children playing, childcare, until buying food or snacks from street vendors. While the spatial usage of the flat's corridor can be categorized into five types, which are corridors as home range for movement activities or lingkage into one place to another; corridors as a personal space for cooking, selling, and even sewing activity of residents who doing that private activity in the corridors;corridors as core area for seating and socializing among the residents; corridors as territory area for drying clothes; and corridors as a controlled area for temporary street vendor and several resident's sleeping in the night.

But, there are also indicates several negative impact from this wide flat's corridors design (3m-9m) which is it gives residents an opportunity to adds their personal space in the corridor which supposedly being a public space (changing spatial usage). And also, because of the wide corriddor the efective floor area for private house unit will be very small (66%, with a bathroom and kitchen are shared). Because of this, many people use the corridor as an extra room for his personal space, even though the function of the corridor is a public space and shared ownership. These are the ambiguity of private-public space that is happening in the corridor of Sombo's Flats. However, with good communication, agreement, and a high level sense of neighborhood among residents, this is not a big problem for the social cohesionamong residents in Sombo flats.

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References

J.S. Bridle, “Probabilistic Interpretation of Feedforward Classification Network Outputs, with Relationships to Statistical Pattern Recognition,” *Neurocomputing—Algorithms, Architectures and Applications*, F. Fogelman-Soulie and J. Herault, eds., NATO ASI Series F68, Berlin: Springer-Verlag, pp. 227-236, 1989. (Book style with paper title and editor)

W.-K. Chen, *Linear Networks and Systems.* Belmont, Calif.: Wadsworth, pp. 123-135, 1993. (Book style)

H. Poor, “A Hypertext History of Multiuser Dimensions,” *MUD History*, http://www.ccs.neu.edu/home/pb/mud-history.html. 1986. (URL link *include year)

K. Elissa, “An Overview of Decision Theory,"unpublished. (Unplublished manuscript)

R. Nicole, "The Last Word on Decision Theory," *J. Computer Vision*, submitted for publication. (Pending publication)

C. J. Kaufman, Rocky Mountain Research Laboratories, Boulder, Colo., personal communication, 1992. (Personal communication)

D.S. Coming and O.G. Staadt, "Velocity-Aligned Discrete Oriented Polytopes for Dynamic Collision Detection," *IEEE Trans. Visualization and Computer Graphics*, vol. 14, no. 1, pp. 1-12, Jan/Feb 2008, doi:10.1109/TVCG.2007.70405. (IEEE Transactions)

S.P. Bingulac, “On the Compatibility of Adaptive Controllers,” *Proc. Fourth Ann. Allerton Conf. Circuits and Systems Theory*, pp. 8-16, 1994. (Conference proceedings)

H. Goto, Y. Hasegawa, and M. Tanaka, “Efficient Scheduling Focusing on the Duality of MPL Representation,” *Proc. IEEE Symp.* Computational *Intelligence in Scheduling(SCIS ’07)*, pp. 57-64, Apr. 2007, doi:10.1109/SCIS.2007.367670. (Conference proceedings)

J. Williams, “Narrow-Band Analyzer,” PhD dissertation, Dept. of Electrical Eng., Harvard Univ., Cambridge, Mass., 1993. (Thesis or dissertation)

E.E. Reber, R.L. Michell, and C.J. Carter, “Oxygen Absorption in the Earth’s Atmosphere,” Technical Report TR-0200 (420-46)-3, Aerospace Corp., Los Angeles, Calif., Nov. 1988. (Technical report with report number)

L. Hubert and P. Arabie, “Comparing Partitions,”*J. Classification*, vol. 2, no. 4, pp. 193-218, Apr. 1985. (Journal or magazine citation)

R.J. Vidmar, “On the Use of Atmospheric Plasmas as Electromagnetic Reflectors,” *IEEE Trans. Plasma Science*, vol. 21, no. 3, pp. 876-880, available at http://www.halcyon.com/pub/journals/21ps03-vidmar, Aug. 1992. (URL for Transaction, journal, or magzine)

J.M.P. Martinez, R.B. Llavori, M.J.A. Cabo, and T.B. Pedersen, "Integrating Data Warehouses with Web Data: A Survey," *IEEE Trans.* Knowledge *and Data Eng.*, preprint, 21 Dec. 2007, doi:10.1109/TKDE.2007.190746.(PrePrint)

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HOUSING CHARACTER IN THE BORDER BEACH AREA OF CAMBAYYA

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Abstract

Cambayya is one of the areas in the Makassar city that has slum dwellings located on the water. The houses appears sporadically due to various community problems, such as the high price of land in the Makassar city and difficult to reach by the lower classes and the desire to live near the workplace. As a result, people are looking for low-cost dwellings, although not for rationing, poor sanitation conditions, and lacking facilities and infrastructure. The purpose of this research is to know the physical and non physical character of the residence located in the area starting directly adjacent to the water body up to the Barukang road. The method used is the mix use method. In the housing study is divided into 3 zones, The first zone is in the dwelling above the water body, the 2nd zone in the dwelling above the coastal border and, the 3rd zone is in the dormitory adjacent to the main road of the area. The data is collected through the results of field observations in depth on the physical condition of the dwelling and the community. Medium data are measured through closed questionnaires submitted randomly to communities in each zone. The result obtained is the occupancy in each zone is different because of the influence of occupation, land ownership, and location of establishment.

Keywords:*Housing, character, border beach, cambayya*

1. Background

Kelurahan Cambayya (Kelurahan is the lowest administrative area directly under the sub-district located at the lowest level, it is as well as of village level and is headed by a lurah, the kelurahan is also a joint area of several RW (Rukun Warga). The administrative area chosen as the survey area is RW 4. This election is based on housing conditions that appear to have a different character from the general housing in urban areas. housing in RW 4 is partly built on the coastal border area to the shallow seas.The density of population and buildings is high, it can be known from the calculation of population density reaching 437 soul / ha and building as many as 92 units / ha.

RW 4 is a buffer zone (coastal border area) that should not be inhabited. But in fact, many homes are built in that place, even some have taken the territory of water bodies. This will have a negative impact on the aquatic environment and the view from and to the sea. The houses appear sporadically triggered by lack of land and high prices of urban land as well as low purchasing power of the community, especially for those working in

the informal sector.As a result, for the people of this class will find a cheap and close residence from the workplace even though the surrounding environment is less supportive as decent and healthy dwelling.

2. Purpose

The purpose of this research is to know the physical and nonphysical residential character in Kelurahan cambayya RW 4, Makassar city. Specific objectives to see the relationship between these two factors in relation to residential space arrangement

3. Method

In this research using mix use method, physical data is taken through recording and deep observation. Physical data includes housing conditions, which include houses and materials, road and sanitation networks, and building distances. While non-physical data include the type of work, land ownership status, the number of household heads in the house, and the width of the house. Non-physical data is numerical and is taken randomly on every family. Data collection is divided into 3 zones, and each zone averages 20 families.

In this research using mix use method, physical data is taken through recording and deep observation of the building and condition of the surrounding environment. While non-physical data include demographic data covering work, land tenure status, number of family members, and house area. Non-physical data is taken numerically and randomly to households in each zone. Data collection was divided into 3 zones, and each zone was taken on average 20 families. Determination of respondents using random sampling method.
The interview process was performed with non-participation observation (Sugiyono, 2006), where the data of the research were analyzed and presented using descriptive statistical analysis technique.

4. Existing Condition

The research location is in the north part of Makassar city, precisely in Kelurahan CambayyaRW 4. Figures 1 and 2 show the research location and the zone division.

Figure 1. Location of Cambayya sub district

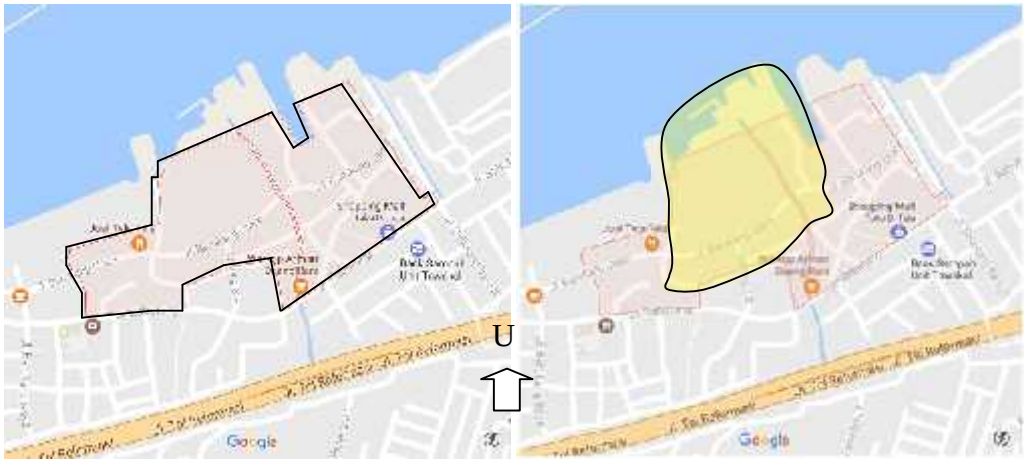


Figure 1. Location of RW 4. Kelurahan Cambayya

The left figure is the boundary of the research area that is the north part bordering the strait of Makassar, the east with PT IKI (ship industry company Indonesia), the south with Barukang street, and the west with Ujung tanah subdistrict. The right figure is the selected location RW 4 (the representation of the government in the kelurahan that consists of approximate 4 RW)

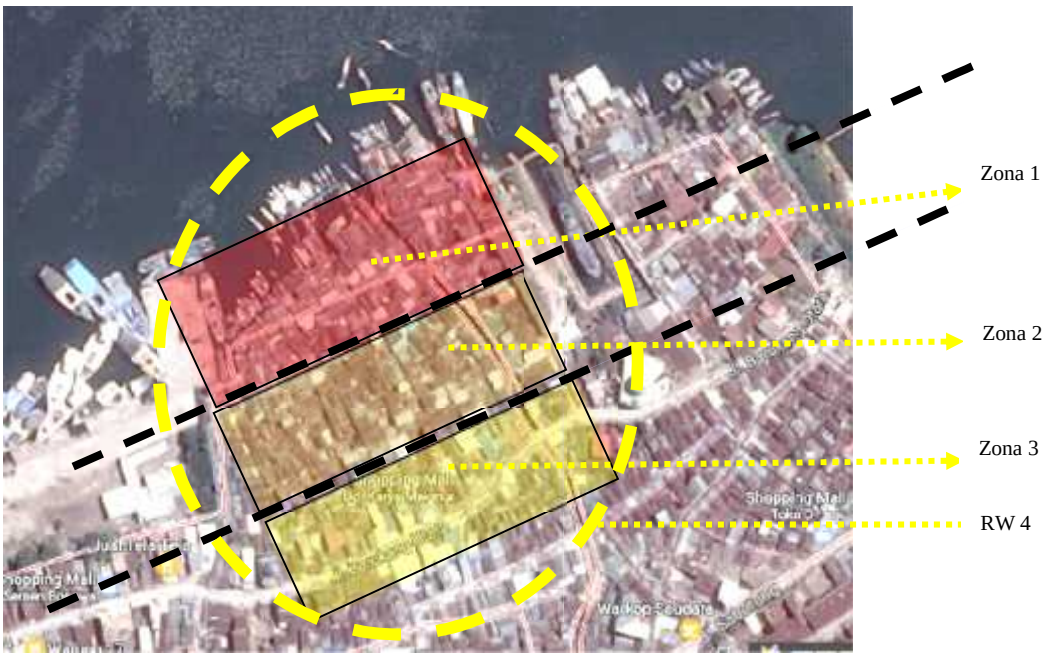


Figure 2. Zone division of research area

Each zone is sampled as many as 20 people each one representing the head of the family. In each zone there are approximately 120 houses. In one house can be inhabited by more than one family.

4.1. Zona 1

a. Houses

The zone 1, homes are generally built on water, some built on reclaimed land. Housing has an elongated pattern following the beach shape, solid, irregular, and dirty (*kolong* (space under the house) filled with garbage). Housing and environment conditions in zone 1 can be seen in Figure 3.

Figure 3 (Continuance**).**Physical Building Condition in Zone 1

The building shape is the raised-floor structure. The house terrace adjacent to the Makassar Strait also functions as a dock, boat mooring, and drying fish or other marine products. Generally, the house wall is a combination of zinc and board. The road used is a boarding bridge with a width of 1 m that can only be passed by pedestrians, motorcycles, and bicycle.The housing pattern is generally irregular. Based on the picture 3, the existing condition of houses in zone one is generally partly uninhabitable house and the house size is not in accordance with the residents number of the house, one of them caused by the lack of their financial ability to build a decent home or to buy land owned by the government. The structure of the house in zone one is a general emergency and semi-permanent.

b. Facilities

Street

There is a walkway as the access between houses looks very inadequate, width varies between 75cm - 1 m. made of wood and bamboo.

Figure 4. Path Condition

The path can only be passed by motorcycle and pedestrian, using wood material and narrow width. Sometimes people use it to take a bath. The distance from house to house is very narrow, we found among 50 cm until 1.20 m.

The material is used zinc or board with unplanned shape and looks very simple, material types and conditions are not important, for the community the most important is they have a shelter that can be a protection for the family and rest from the daily routine. It is seen generally used on the side and rear walls.

Sanitation

Figure 5. The Sanitation condition

Neighborhood settlements in this zone look dirty with garbage floating in the underside of the house. At some points there are public toilets (fell free Water Closet) used by local residents for metabolic needs. Being for bathing activities they do above the wooden bridge near the house.

c. Demographics date

The following data shows the house size, occupation of houses, ownership status, and number of family members who live in one house.

Table1. The House size, Occupation, Land ownership status, and the Number of HouseholdsHeads.

No.	the number of households heads (KK)	Occupation	House Size	Ownership status
1	1 KK	Urban village head	14 x 3 m = 42 m^2	Personal
2	1 KK	Fishermen	5 x 7 m = 35 m^2	Government
3	2 KK	Labor and Fishermen	5 x 13 m = 45 m^2	Government
4	2 KK	Labor and Fishermen	7 x 8 m = 42 m^2	Government
5	1 KK	Fishermen	4 x 5 m = 20 m^2	Government
6	1 KK	Fishermen	3 x 7 m = 21 m^2	Government
7	1 KK = 5	Fishermen	8 x 7 m = 42 m^2	Personal
8	1 KK= 5	Living cost from children	4 x 8 m = 32 m^2	Personal
9	1 KK = 4	Fishermen	5 x 11 m = 55 m^2	Government
10	1 KK = 4	Living cost from the child	3 x 7 m = 21 m^2	Government
11	1 KK = 6	Living cost from the child	9 x 7 m = 63 m^2	Government
12	1 KK = 7	Fishermen	8 x 15 m = 90 m^2	Personal
13	1 KK = 2	Fishermen	6 x 5 m = 30 m^2	Heritage
14	1 KK = 3	Fishermen	6 x 5 m = 30 m^2	Government
15	1 KK = 7	Labor	6 x 15 m = 90 m^2	Personal
16	1 KK = 4	Fishermen	6 x 7 m = 42 m^2	Government
17	1 KK = 1	Selling stalls	4 x 3 m = 12 m^2	Government
18	1 KK = 4	Fishermen	6 x 6 m = 36 m^2	Government
19	1 KK = 2	Pedicab driver	3 x 6 m = 18 m^2	Government
20	1 KK = 4	Fish auction	5 x 7 m = 35 m^2	Government
21	1 KK = 6	Fishermen	6 x 12 m = 72 m^2	Government
22	1 KK = 1	Peddler	2,5 x 6 m=18 m^2	Personal
23	1 KK = 3	Security	6 x 6 m = 36 m^2	Personal

Generally, the occupied land is owned by the government inhabited by fishermen and laborers, the building measuring between 30 - 44 m^2.

d. Activities

There are various activities undertaken by society in zone 1, the activities are shown in Figure 5

Figure 5. The Sanitation condition

Sequel Figure 5. The Sanitation condition

Various activities carried out by communities in zone 1 are centered on the pier, whether done by men, women or children. Men's activities are generally related to work as a fisherman, while women and children are generally only associated with leisure activities while doing interaction.

4.2. Zona 2

a. Houses

In the 2nd zone, the buildings are erected on a coastal border, the land has been dumped before building a house. The description of the housing in this zone can be seen in the picture ...

Figure 6. Physical condition of housing

The houses are located in zone 2 have 2 types, most of which is onland house type and only a small part is raised-floor structure house. The material used is also various kinds, there is material of zinc, wood, and stone or combination among them.

b. Facilities

Street

The street condition of the housing environment in zone 2is shown in the figure.7

Figure 7. Street condition

The path in zone 2 is wider, the size between 1.5 - 2 m. materials generally use paving block, only a small part of it is still a soil street. part of the street is decorated with plastic flowers handicrafts from housewives in the area. The path in addition to functioning as a circulation area as well as an area of interaction, play, selling for the surrounding residents.

Sanitation

The sanitation facilities in zone 2 are inadequate. water closet (WC) is located in each resident's house and there are no public toilets in the neighborhood. while the dirty water network flowed on the path side with unfeasible conditions (shallow and narrow), the dirty water flow is directed to the sea.

c. Demographics date

Table 2. The House size, Occupation, Land ownership status, and the Number of Households Heads

No.	The number of households heads (KK)	Occupation	House Size	Ownership land status
1	1 KK	Fishermen	5 x 6 m = 30	Government
2	1 KK	Selling vegetables	7 x 9 m = 63	Government
3	1 KK	Fishermen	5 x 5 m = 25	Government
4	1 KK	Labor	12 x 4 m = 48	Government
5	1 KK = 3 org	Selling fish	3 x 11 m =33	Contract
6	2 KK = 7 org	Labor	3 x 11 m =33	Contract
7	1 KK = 2 org	Labor	3 x 11 m =33	Contract
8	2 KK = 7 org	Labor	11 x 7 m =77	Government
9	1 KK = 4 org	Fishermen	7 x 4 m = 28	Heritage
10	1 KK = 4 org	Driver	4x 5 m = 20	Personal
11	2 KK = 5 org	Labor	4 x 5 m = 20	Personal
12	1 KK = 6 org	Security	4 x 7 m = 28	Government
13	1 KK = 5 org	Car broker	6 x 12 m = 72	Government
14	1 KK = 4 org	Labor	4 x 7 m = 28	Personal
15	1 KK = 6 org	Fishermen	5 x 8 m = 40	Government
16	1 KK = 4 org	selling stalls	4 x 6 m = 24	Personal
17	1 KK = 6 org	Fishermen	4 x 5 m = 20	Government
18	2 KK = 4 org	Fishermen	7 x 6 m = 42	Government
19	1 KK = 6 org	Labor	7 x 6 m = 62	Heritage

In zone 2, in one house there are 2 household heads, more varied livelihoods, land tenure status is no longer dominated by the government

d. Activities

in zone 2, community activities are not different from those occurring in zone 1. people generally have activities on the road. The activity can be seen in the figure 8.

Figure 8. Community activities in zone 2

The relaxed activities and social interactions of men, women and children generally take place on the street in front of their homes.

4.3. Zona 3

In zone 3, houses are not construct on coastal border, but in the proper place.

a. Houses

Figure 8. Forms of houses adjacent to the main road (jalan Barukang)

Generally, houses are onland type, with stone material. Some houses, especially those bordered directly by the main road, built two-story and using brick material, but not denied if there is also a house in the form of semi-permanent in the zone.

b. Facilities

Street

Figure 9. Physical condition of street

In general, the width of the road in zone 3 is approximately 1 m to 2.5 m., And no longer found dirt road. In zone 3 the distance between houses range 10 cm or even up to 1 m.
Sanitation

c. **Demographics** date

Table 3. The House size, Occupation, Land ownership status, and the Number of Households Heads.

No.	the number of household's heads (KK)	Occupation	House Size	Ownership land status
1	1 KK	Labor	6,5 x 4,5 m =29.25	Heritage
2	1 KK	Installment Business	13 x 7 m =91	Government
3	1 KK	Mechanic	3 x 7 m =21	Government
4	2 KK	Grocery Store	8 x 10 m =80	Government
5	1 KK	Entrepreneur	7 x 10 m=70	Personal
6	2 KK	Teacher	5 x 5 m =25	Personal
7	1 KK	Entrepreneur	18 x 20 m =360	Personal
8	2 KK	Entrepreneur	8 x 17 m=136	Personal
9	1 KK = 7 org	Labor	5 x 10 m=50	Personal
10	1 KK = 1 org	Grocery Store	5 x 5 m=25	Personal
11	1 KK = 5 org	Labor	4 x 5 m=20	Personal
12	1 KK = 1 org	Selling	4 x 5 m=20	Government
13	1 KK = 4 org	Tailor	4 x 6 m=24	Government
14	1 KK = 5 org	Labor	34x 6 m=24	Government
15	1 KK = 5 org	Fishermen	3 x 7 m=21	Government
16	1 KK = 4 org	Fishermen	6 x 6 m=36	Personal
17	1 KK = 5 org	Civil Servants	11 x 12 m=132	Personal
18	1 KK = 4 org	Selling	12 x 7 m=84	Government
19	2 KK = 7 org	Construction Workers	11 x 5 m=55	Government
20	1 KK = 2 org	Fishermen	5 x 8 m=40	Government
21	2 KK = 6 org	Entrepreneur	7 x 6 m=42	Government
22	1 KK = 6 org	Fishermen	3 x 7 m=21	Government

Can be seen in table 3, which is generally in zone 3 residential land residents belong to the government, even though already many of them who can buy the land. One of them is because, the location of their settlement is not directly adjacent to the sea, so they feel safe enough to stay for a long time. In addition, the economic

level of citizens in zone 3, is sufficient. Generally, in zone 3 local people's livelihood is very diverse. And not a few of those who open a business in front of his house. Like for example they open a food stall, internet cafe, and there is also selling clean water.

This is due to the location of their residence directly connected to the main road in kelurahan Cambaya. Although not a few who still work as fishermen and laborers. We can see in the diagram above survey results, namely the area of the building in zone 3 is dominated by a wide range of 15-45 m2, although many of them are already able to have a much wider home. Even among them, there are already a few houses of sufficient size, even very adequate for them to live in.

d. Activities

Figure 10. Street condition in zone 3

Activities of children and women and men are generally done on the street

5. Analysis and Discussion

The following chart 1 shows the differences land ownership in each zone in the study area

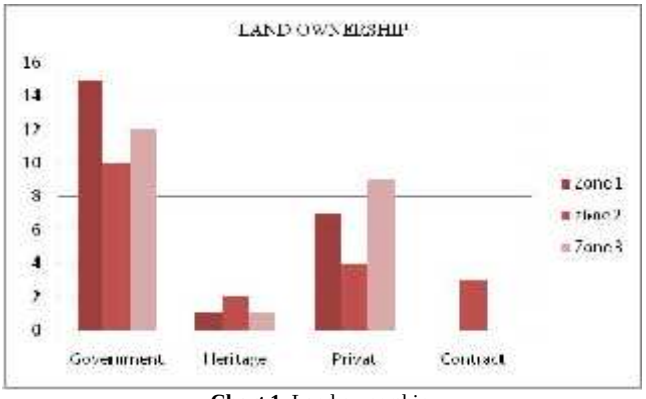


Chart 1. Land ownership

As noted in the diagram above, that is, the location of the community's residence. Cambaya is still dominated by government-owned land. Although not a few of them are able to buy their own land.Chart of Livelihood Variety Analysis of all Zones.

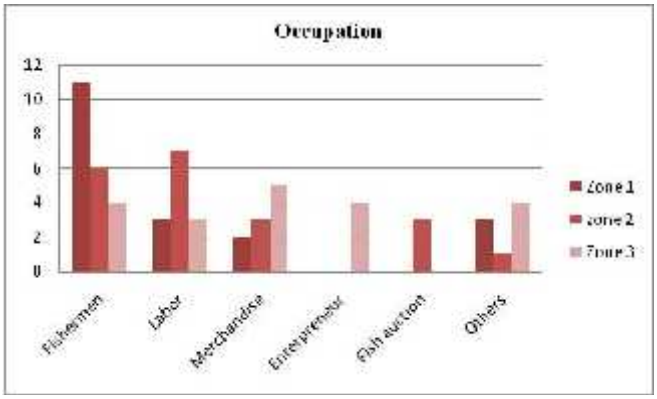


Chart 2. Occupation

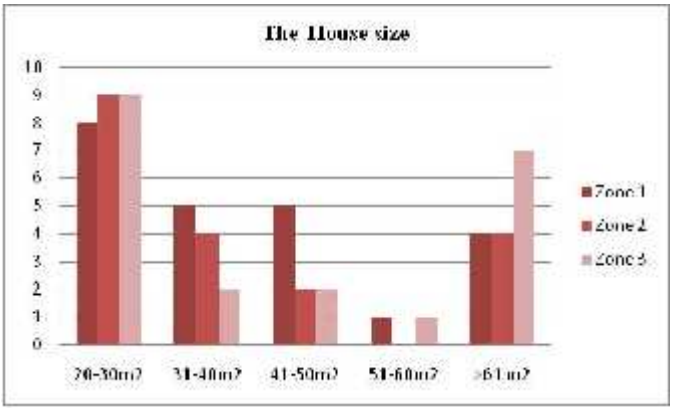


Chart 3. House size

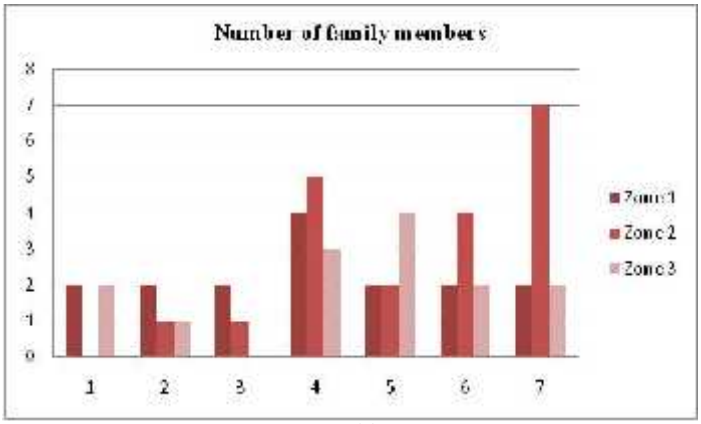


Chart 4. Number of family members

As noted in the diagram above that is the livelihood of the population. Cambayya generally inhabited by people who work as fishermen and laborers. The location of the houses is getting closer to the sea, the occupation of occupants is dominated by fishermen, while in zone 2 is more dominated by labor and in the 3rd zone, is dominated by trade sector.

If we look at the field conditions, then the area of RW 4 included in the category of wild settlements, this is confirmed by Srinivas 2007, where he defines wild settlement based on 3 characters, namely physical character, social, legal. In the area of RW 4, these three characters were found. Those facilities are very limited and with a very minimal quality. generally low levels of income (fishermen and workers), and legal because most households are established on real government land, not for residential purposes.

Although the area occupied by the government and illegal, but the community, especially fishermen and laborers still choose the place as a residential locality, this is understandable because according to UN-HABITAT (2008) the poor in their efforts to get home, the proximity to the workplace and job opportunities are a major factor in the consideration of choosing a place to live. The proximity to markets, factories, business areas, transport networks and construction sites means greater income, higher employment opportunities, and lower transportation costs. RW 4 is a support area for fishermen and laborers because this area is directly adjacent to the sea as a fisherman's workplace and also close to the port as a workplace for transport workers.

Fishermen and laborers are professions with low income. The link between income level (economic status) and the space of settlements and houses are described in several theories and concepts as Suparlan (1978) says that the house form is determined by economic affordability and cultural influence, which will also affect the physical form of the settlement environment. Meanwhile, according to Smith (in Budihardjo, 1985), low-income communities place site selection near employment as the main preference, then following the status of elections and finally the provision of social facilities and convenience. This is in contrast to the upper-income group preference / priority in the field of housing with income level of society can be seen in the following diagram

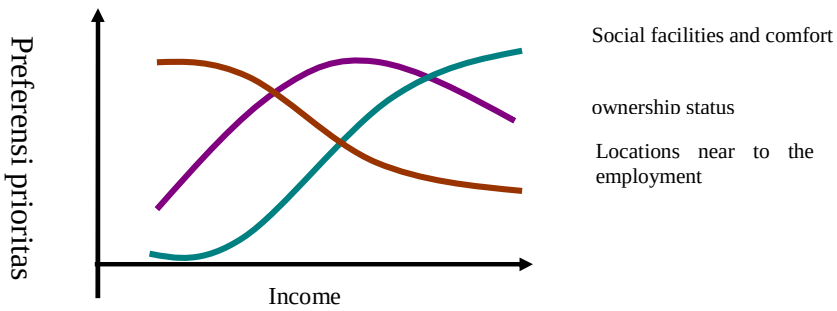
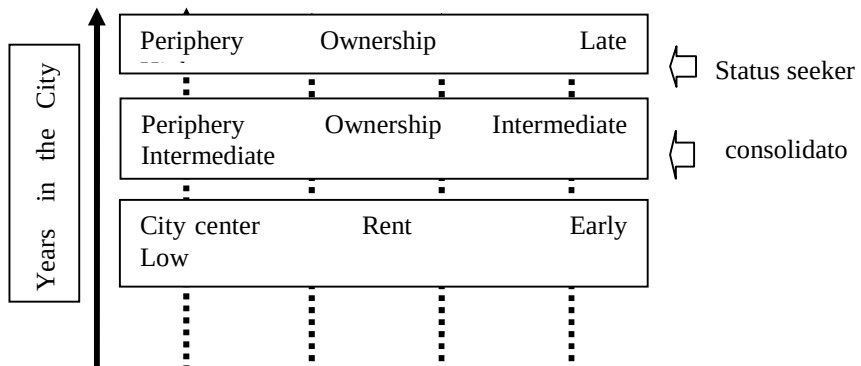
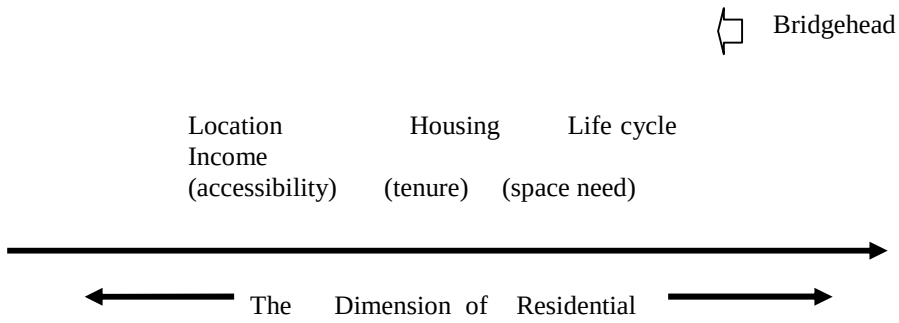


Diagram 1. The relationship between income and priority preference.

The Turner Theory (1972) also sees a connection between it, which in addition to income, location, and land positions, the cycle of life (age) also plays a role in that, this can be seen in the diagram below





Associated with the income seen in the figure that the higher of personal income level, then the status of land ownership will be increasingly prioritized. The location of housing will be further away from work.

while the study of the lower society demands in the house form revealed by Gans (1978; 29) in Budiharjo (1987) says "lower class people do not demand a beautiful and unique permanent home, yet expect adequate space to accommodate their life activities. the relationship between work and location of settlements expressed by Mulyadi (2007) in Idawarni (2013) that they (fishermen) generally live on the beach, close to the location of their activities, so it is not surprising that they live in areas directly adjacent to water.

Based on the chart 1,2,3, informing that zones 1 and 2 people work is dominated as fishermen and unskilled laborers, the house size is generally between 20 - 50 m^2 and occupied on average between 4-7 people in one housing unit. The three mentioned factors have a relationship, as expressed in the following concepts: The number of families is an important factor affecting household poverty (eg Chemichovsky Dan Meesok, 1984; Sigit, 1985; Alamgir and Ahmed, 1988; Kuznets, 1989; Gaiha , 1989, Firdaussy, 1992) in Agunggunanto (2011). A large number of families will automatically affect the real consumption level of family members, which means the expenditure is also large, but it is not accompanied by high family income. Because fishermen and laborers dominating zones 2 and 3 are low-income groups, as Satria (2009) notes, the fishing community is the poorest of the poor. Informal sector workers such as laborers and fishermen are perceived as blue-collar workers as workers on jobs that rely on physical strength, which thus requires no skills and higher education. Fishermen and unskilled laborers have generally low education levels. Payung Bangun (1997: 1) said that one of the poverty causes which is the life of some people related to the quality of human resources (HR) is low level, so it is not possible to have the ability to respond adequately to the challenges that must be faced in life (Kuemba, 2012).

A high family size, low incomes, and low human resources (low levels of education and skills) are the factors that cause poverty. Poverty of the community in the research area can be seen in the condition of housing material and land ownership.

6. Conclusion

The choice of residential location is strongly influenced by work and income. Lower class people often place occupancy on illegal land, due to the insistence on the need for shelter. The illegal lands are generally close to the location of the work. The arrangement of residential space is affected by the availability of land, land position, occupation and the number of families. Employment is a major factor in choosing residential locations for the low economically, while the land position as a government property gives the community

greater opportunity to build shelter than on one's own land, the size of the occupancy is heavily dependent on land availability and economic capacity. This can be seen in zone 1 adjacent to the sea, the width of the houses is not affected by the type of work, but the initial opportunity to build a house. Materials and construction used are the emergencies, this is to facilitate residents to dismantle their homes if the government wants to immediately take over the land.

References

Idawarni (2013) Temu Ilmiah IPLBI 2013. *Prosiding Temu Ilmiah IPLBI* 2013

Srinivas, H. (2007) *Defining Squatter Settlement, Urban Squatters and Slums*, (http://www.gdrc.org/uem/squatters/define-squatter.html-19k)

UN-HABITAT. (2008). *Quick Guide for Policy Makers No.4. Eviction: Alternatives to the whole Scale Destruction of Urban Poor Communities Nairobi*: UNESCAP dan UN-HABITAT.

UN-HABITAT. (2008*). Quick Guide for Policy Makers No.2. Low-Income Housing: Approaches to Help the Urban Poor Find Adequate Accommodation. Nairobi*: UNESCAP dan UN-HABITAT.

Suparlan, Parsudi (1987).*Tinjauan Tentang Kampung kota*, Pusat Informasi P2KP.

Budihardjo, Eko (2006). *Percikan Masalah Arsitektur, Perumahan Perkotaan*, Cetakan terbaru, Gadjah Mada University Press.

Turner, J.F. (1972). *Freedom to Build. Dweller Control of Housing Process*. Publisher The Macmillan Company, USA.

Edy Yusuf Agunggunanto (2011)Analisis Kemiskinan Dan Pendapatan Keluarga Nelayan Kasus Di Kecamatan Wedung Kabupaten Demak, Jawa Tengah, Indonesia.*JURNAL DINAMIKA EKONOMI PEMBANGUNAN, JULI 2011, VOLUME 1, NOMOR 1*

Kuemba (2012), Buruh Bagasi Kapal Di Pelabuhan Kota Bitung. Publisher: *Jurnal Holistik*• Published: 2013-04-20, Holistik, Tahun V No 10A / Juli - Desember 2012

Satria A. (2009). *Laut dan Pesisir untuk Kesejahteraan Masyarakat*. Bogor: IPB Press

Sugiyono.(2006). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung. Alfabeta

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THE ADDITIONAL FUNCTIONS OF PORCH AND VAULT IN PANTAI BAHARI FISHING VILLAGE

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Abstract

Pantai Bahari is one of the fishing villages in Bangkala Subdistrict, Jeneponto Regency, South Sulawesi Province, located in a coastal region where the community works as fishermen. The residents are still tightly holding their belief and respecting their customs, namely by living in traditional indigenous Bugis Makassar stilt house, with its philosophy of portraying the Underworld, the Middle world, and the Upper world over. The people also make some improvements over their house; one of them is against the function of porch and the space under the house (vault) that are perceived to depict 'the Underworld'. There are some factors influencing the emergence of additional functions of the porch and the vault. A single case study method was employed in this research involving Pantai Bahari fishing village. To analyse the data, both qualitative and quantitative methods were used. The results show several factors causing the additional functions of porch and vault, and the family structure, economic needs, the lack of areas to accomodate events, and the needs for mobility.

Keywords:*additional functions of porch, additional functions of vault, fishing village, Pantai Bahari village*

1. Introduction

According to Law number 27 year 2007 concerning Management Of Coastal Areas and Small Islands, a coastal area is a transition between land and sea ecosystems affected by changes both at the land and at the sea. Pantai Bahari is one of fishing villages in Bangkala subdistricts, Jeneponto Regency, South Sulawesi Province and belongs into the coastal region where the residents work as fishermen. They still highly respect their customs as they live in traditional Bugis Makassar houses. Indeed, traditional architecture is a form of cultural property of Indonesia (Abidin, 1999). The diversity of traditional architectures is scattered along the archipelago and is very rich. Traditional architecture in each area also serves as the symbol of the cultural specificity of indigenous communities (Mattulada, 1988).As a form of culture, traditional architecture is developed from a single rule or agreement that is persistently preserved and maintained from one generation to generation (Mangunwijaya, 2009). The local community will obey the rules if they are perceived to meet their needs.

The formation of settlements in Pantai Bahari village is inseperable of the geochartal conditions and the surrounding environment, supported with daily activities of citizens as fishermen/sailors. The people will also search for seaweed during the rainy season and strong wind period, and then continue fishing in the dry season where the weather is nice and friendly. Nevertheless, the local community also demands positive changes in their settlements. The characteristics of Pantai Bahari fishing illage with their traditional architecture are very interesting to research.

The typical traditional house of Bugis Makassar community is stilt house, as found in Pantai Bahari village. Today, there have been 266 houses and households living in the village. The common existing houses are rich in Bugis Makassar identity, with its philosophy of the Underworld, the Middle world, and the Upper world. As time goes by and the need for space within the house is rising, the people make some extension and improvement over their house. One of these extensions can be found in the function of porch and vault. The current issue is concerning how the additional functions of porch and vault are developed.

2. Objectives

The objective of the research is to observe the development of additional functions of porch and vault on the traditional Bugis Makassar stilt houses.

3. Literature Review

3.1. The Additional Functions of Porch

Porch or porch is transitional space between the outdoor and the indoor and vice versa, and is covered with one or two walls. It can be either at the front, next to, or behind the house; consequently, it leads to varying functions of those elements, depending on the position of the porch. The front porch serves as a service room or waiting area before the guests enter into the house. The side-porch could be a place to relax. A back porch is usually more closed, and thus could serve as a dining room, a place to perform activities or hobbies and to hold family gatherings. A porch also functions as providing air and light circulation. In traditional Bugis Makassar houses built in Pantai Bahari village, the porch is placed in front of the stilt house and comes in several types, including full porch, half porch, or no porch at all, as shown in Figure 1.

In its development, the functions become more diverse. Following the growing human needs, a porch serves not only as transitional space between the indoor and the outdoor areas; indeed, many people design their porch as multifunctional space. A porch can act as the area to welcome guests, and this has been in practice since a long time ago. It is apparent from the traditional home design. In traditional houses, a porch also serves as a meeting place where communications and social gatherings take place, as seen on traditional Bugis Makassar stilt houses called pa'daserang, with the same main function. In Pantai Bahari village, the porch varies in width, function, material and position

Figure 1. Different Types of Porchs in Houses at Pantai Bahari Fishing Village, Bangkala Subdistrict, Jeneponto Regency, South Sulawesi Province. **Source:** Site Survey, 2017

3.2. Additional Functions of Vault

The vault is a space or hollow under the colonnaded or footed objects (such as beds, stilt houses). A stilt house is constructed of pillars; (http://www.artikata.com/arti-335720-kolong.html). A stilt house contains beams and pillars, stages, and vault to store things and often as cages; moreover, the vault is sometimes used as a gathering spot (Ritalaksmitasari, 2013, Rumah Panggung Dulu dan Sekarang). Stilt houses in every region have their own characteristics based on types, the height of the stage, the roof shape, staircase, width, until the position of the house to the surrounding environment.

Based on the height of pillars, there are two types of stilt houses: a house having 1 meter or more pillar height, and a house with less than 1 meter pillar height. The function of the vault is adjusted to the height. The vault with pillars less than 1 meter are usually used for storage or enclosure. Meanwhile, the vault with more than 1 meter pillars height makes it possible for the vault to be used as shared space to socialize. Other activities in the vault are repairing fishing nets and gathering or sorting the fish/seaweed. It functions as a shared space to chat with family members or neighbors. To support the warm and friendly characters of Indonesian people, a house having a social space is perfect. The gathering activities in the vault might contain social value and stimulate creativity.

Notwithstanding, the stilt house is also designed to accommodate optimum absorption of rain water into the ground. The ground surface is not covered, allowing water to infiltrate into the ground, so as to minimize the possibility of flooding.

The residents in Pantai Bahari village often add and improve the functions of the vault. This is because the family structure has widened, the economic needs increase yet they have lack of land to accomodate the activities and needs for mobility space. The additional functions indeed have widely ranged.

4. Method

This research employed Phenomenology as the methodology. The data collected information about the houses of fishermen in particular those residing in the coastal area. The primary data to gather was concerning the porch and the vault from the physical size and changes in functions. The data collection techniques were field observations by taking photographs of the existing house conditions, interview with the local residents, and distributing questionnaires. The data from the questionnaire was needed to validate the results of purposive interview with the community leaders. Meanwhile, descriptive methodology was applied in analysing the data.

Figure 2. Exisiting Condition of Vaults at Pantai Bahari Fishing Village
Source: Ilustration and Site Survey, 2017

Existing Condition

Study Site Profile

Bangkala sub district is situated at Jeneponto Regency, in South Sulawesi Province that is potential for seaweed cultivation because it has a long coastline of over 95 km with 749.79 km2 total area. One type of seaweed cultivated in Jeneponto Regency is Eucheuma Cottonii. This type of seaweed has a very high economic value. Meanwhile, Bangkala has 121.82 km2 area with total population of 46,932 inhabitants and 385/km2 density

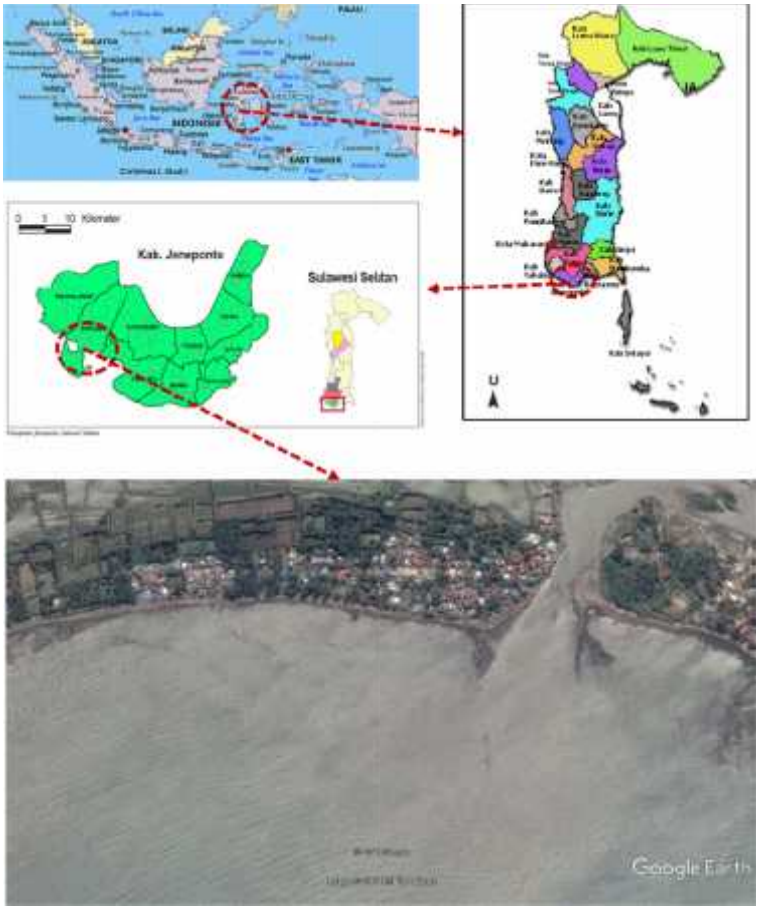

Figure 3. Site Map of Pantai Bahari Fishing Village, Bangkala, Jeneponto, South Sulawesi Province
Source: Author's Analysis from varying sources, 2017

5. Analysis and Interpretation

5.1. The Additional Fuctions of Porch

According to the data obtained, the types of porch found in Pantai Bahari fishing village can be seen in the following chart.

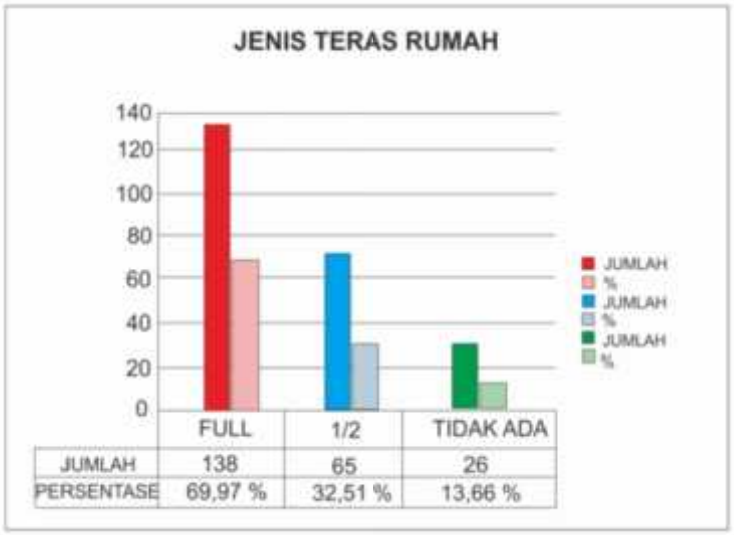

Chart 1. Types of Porch in Percentage
Source: Author's Analysis, 2017

The full and half porch in the stilt houses found in the village is generally used to conduct numerous activities, namely relaxing, socializing, as well as keeping the vehicle and storing goods as seen in Figure 4.

Figure 4. Various Activities on the Porch
Source: Site Survey, 2017

5.2. Additional Functions of Vault

This data in Chart 2 below shows the comparison of the additional functions of vault according to the position in the house.

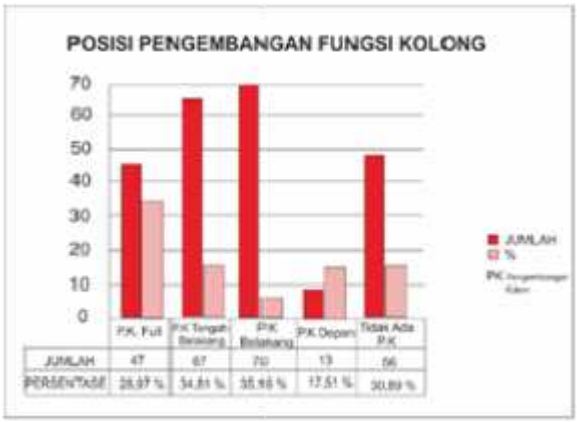

Chart 2. Comparison of Additional Functions of Vault in Percentage
Source: Author's Analysis, 2017

The additional functions of vault are adjusted to the types of activities and height of the vault. The average vault height is 2m, with the maximum of 2.5 m and the minimum 1. With such height, the vault could serve as a space to carry out various activities of the inhabitants. The activities that take place in the vault can be seen in Figure 5 below.

Figure 5. Various Activities conducted at Kolong Rumah
Source: Author Survey Results, 2017

The Development Pattern of Vault in Pantai Bahari Fishing Village

Figure 6. Additional Functions of Vault at the Back with Wood/Bamboo Cover as A Cage and Storage Area

Source: Author's Analysis, 2017

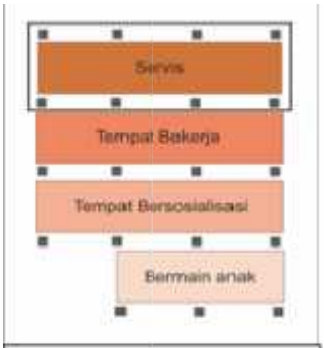

Figure 7. Additional Functions of Vault at the Back with Wood/Bamboo Cover as Kitchen, Toilet, and Laundry

Source: Author's Analysis, 2017

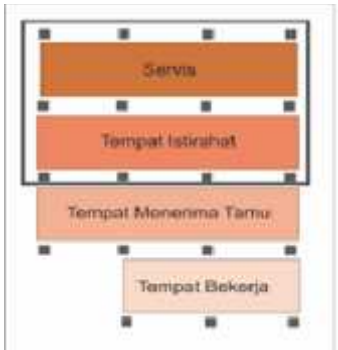

Figure 8. Additional Functions of Vault at the Back with Wood/Bamboo Cover as an Area for Service and Relaxing

Source: Author's Analysis, 2017

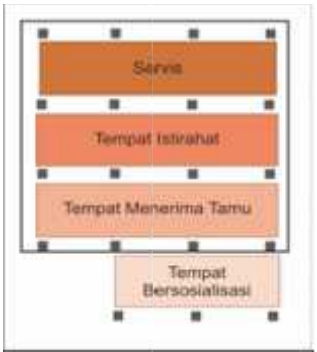

Figure 9. Additional Functions of Vault at the Back with Wood/Bamboo Cover as an Area for Service, Relaxing, and Welcoming Guests

Source: Author's Analysis, 2017

Figure 10. Extended Function of Vault at the Middle-Side with Brick Cover as an Area for Service, Relaxing, Welcoming Guests and a Living Room

Source: Author's Analysis, 2017

Figure 11. Extended Function of Vault at Back-Front with Brick Cover as an Area of Service, Welcoming Guests, Living Room, and Stall

Source: Author's Analysis, 2017

The additional functions of vault at the stilt house in percentage can be seen in the following chart.

Chart 3. Additional Functions of Vault at the Stilthouses in Percentage
Source: Author's Analysis, 2017

Based on the field survey, in addition to the description of illustration on the previous discussion, some supporting data were obtained concerning the vault cover. The materials used to cover the vault in Pantai Bahari fishing village are varying. The following chart shows the number of vaults with and without cover along with the materials used.

Chart 4. The Addition of Cover at the Vault in Percentage
Source: Author's Analysis, 2017

Table 1. The Relationship of Position of the Vault and Its Additional Functions

Position of the Vault	Additional Functions of Vault					
	Service	Relax	Welcoming Guests	Cage	Work	Storage
Full	12	16	11	-	-	4
Middle-Side	19	19	10	19	20	16
Back	22	2	-	21	9	10
Front	-	-	7	-	4	-

Source: Author's Analysis, 2017

The various activities that occur in the vault is possible because the typical stilt houses in Pantai Bahari fishing village has 2.5 m height which allows human activities and needs for shelter. Furthermore, rapid

development of the population and the increasing number of family members in a single unit house encourage the emergence of additional functions of the vault.

Moreover, looking at the positions and functions, the community in Pantai Bahari fishing village also make some development and innovation on of the use of material to cover the vault. The material choices come in several types. Chart 5 in the following will expose the material in use as the vault cover by the local people in percentage.

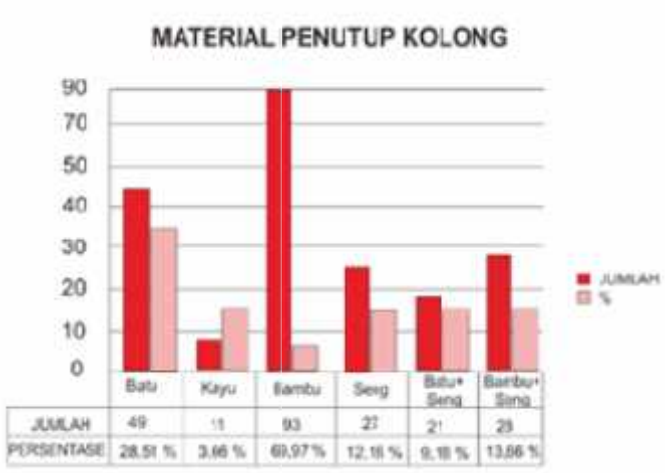

Chart 5. The Materials used for Vault Cover in Percentage
Source: Author's Analysis, 2017

Chart 5 above displays the comparison and percentage of materials used to cover the vault in houses in Pantai Bahari fishing village. When analysed further, the material choice for the cover is adjusted to the additional functions of the vault. Here are some additional functions of the vault and the choice of cover materials.

Table 2. The Position of Vault and the Materials Used

The Position of Vault	Materials Used					
	Brick	Wood	Bamboo	Zinc	Brick+Zinc	Bamboo+Zinc
Full	24	-	3	7	6	-
Side-Back	13	2	31	9	7	7
Back	5	8	53	8	8	20
Front	7	2	6	3	-	1

Source: Analysis of Authors, 2017

Based on the above data, the choice of materials used for vault cover is related to the position of the vault and its additional functions. The main purposes of vault as a service area, warehouse and cage for cattle in Pantai Bahari are correlated with the findings of Altman and Chemers (1984) that stilt houses from natural materials usually use the vault to accomodate livestock, to store fishing and farming equipment, harvest, and so on.

6. Conclusion

Traditional Bugis Makassar houses are famous for its typical stilt houses that characterize Bugis Makassar culture. This type of house is commonly found in Pantai Bahari fishing village. Generally, the houses in the village represent the philosophy of the Underworld, the Middleworld, and the Upper world.

As time goes by and there has been a growing need for space, the fisherman community in the village perform some improvement on their house, as seen in the functions of porch and vault. High population and the increasing number of family members in a single unit house encourages the exteded function of both porch and the vault as the people require wider space for accommodating the needs of the inhabitants. One alternative is to extend the space under the house or so-called the vault.

Table 3. Conclusion on the Relationship of Additional Functions of Vault and the Use of Materials

FUNCTION ROOM	MATERIAL	DESCRIPTION
Service	- Wood - Bamboo	Accomodating dish washing, laundry, and house cleaning. It needs ventilation to allow air circulation while avoiding overheat.
Rest	- Bamboo - Brick	Accomodating private activities which require tight cover
Guests receive	- Brick	Accomodating semi public activities which require semi enclosed wall that allows for convenient interaction and mobility without disruption from outside
Cage	- Zinc - Bamboo	As a shelter for cattle, cover is not significant
Warehouse	- Zinc - Bamboo	Accomodating storage, such as net and equipment for fishing
Stall	- Wood - Brick	Allowing for public occasions, namely serving buyers, thus it demands more protection for securing the merchandise

Source: Author's Analysis, 2017

Figure 12 below shows the picture representing the condition of additional functions of vault and the use of materials for cover:

Vault with Brick and Wood Cover

Vault with Brick and Zinc Cover

Figure 12. The Additional Functions of the Vault and the Materials for Cover
Source: Author's Analysis, 2017

Reference

Altman, Irwin and Chemers, Martin (1984) , "Culture and Environment", First Published by Canbridge University Press.Engglewood Cliffs N.J., New York.

Data Y., (1977). Bentuk-Bentuk rumah Bugis Makassar. Penerbit Proyek Pengembangan Media kebudayaan direktorat Jenderal Kebudayaan. Dep. P dan K. RI., Makassar.

Eko.B., (1983). Menuju Arsitektur Indonesia. Penerbit Alumni Bandung

Koentjaraningrat (1999), Manusia dan Kebudayaan di Indonesia, Djambatan, Jakarta.

Mangunwijaya (2009). Perubahan Bentuk dan Fungsi Arsitektur Tradisional Bugis di Kawasan Pesisir Kamal Muara, Jakarta Utara. Department of Architecture Gunadarma.

Mardanas, Izarwisma dkk. (1985),MArsitektur Tradisional daerah Sul-Sel, Dep. P dan K, Jakarta.

Mattulada. 1988. Sejarah Masyarakat dan Kebudayaan Sulawesi Selatan. Hasanuddin University Press, Ujung Pandang.

Tato, S. 2008. Arsitektur Tradisional Sulawesi Selatan dari Masa ke Masa. Makalah disajikan dalam Seminar Regional Arsitektur Rumah dan Perumahan Tradisional di Kawasan Timur Indonesia, Jurusan Arsitektur Fakultas Teknik Unhas dan BPTPT Makassar, Makassar 24 April 2008.

http//www.GoogleEarth.Com (diakses tanggal 07-10-2017)

Survey Lapangan. 2017. Desa Nelayan Pantai Bahari Kecamatan Bangkala Kabupaten Jeneponto

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HOUSING TENURE SECURITY IN RTLH PROGRAM OF SURAKARTA INDONESIA- HOW CAN IT CONTRIBUTE TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS OF POST-2015 AGENDA?

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Abstract

This paper evaluated the Program of Substandard Housing (RTLH) Renovation proposed for the agenda of "Surakarta Informal Settlements Clearance 2015," for solving the problem of improving the quality of 6612 substandard houses. This research took a case study approach in the small-scale area of poor settlements in the flood-prone area along the riverbank of Bengawan Solo River, namely Kelurahan Ketelan. How could this outcome contribute to achieve Sustainable Development Goals (SDGs) in terms of providing housing security to establish an inclusive, safe, resilient and sustainable city and human settlement as stated by SDGs? The case study research was conducted by multiple methods of qualitative and quantitative analysis. The results showed that the program had the highest contribution on the improvement of sanitation, in terms of the use of septic tanks (change value of 0.5750) and the use of toilets (0.203) as one of the priorities of SDGs. However, there was only little contribution in increasing access to land tenure security (0.002); It was surprising that the improvement of housing construction itself was not high. This program involved the collaboration among state, civil-society and community and other development parties and increased channeling assistance for settlements' sustainability and poverty reduction

***K**ey words: Post-2015 Agenda, sustainable human settlements, housing tenure security, inclusive development*

1. Introduction

The need for sustainable human settlements development had been understood by the governments of the third world since Habitat conference I in Vancouver 1976, as consequences of rapid urbanization processes. Habitat conference II had stressed two great agendas, of "adequate shelter for all" and "sustainable human settlements development in an urbanizing world". Due to the more complicated problems of urban life in the provision of basic services, Habitat conference III promoted a new model of urban development that integrated all facets of sustainable development to promote equity, welfare and shared prosperity (UN Habitat, 2015). The Millennium Development Goals (MDGs), which were established in 2000 to address the achievement of 8 goals in 2015, had progressively achieved some goals in reducing the number of people living in extreme poverty by more than half, from 1.9 billion in 1990 to 836 million in 2015 since 2000. In spite of this, the percentage of the population using improved drinking water had only been increased from

76 % in 2000 to 91% in 2015 (MDGs report, 2015). However, some arguments stated that the MDGs had been argued for more as top down and mostly as political discussions regarding to technical, risk management schemes, where millions of people remained left behind and with unequal development in some parts of areas (MDGs report, 2015)

Meanwhile MDGs had faced some obstacles. The Post-2015 Development Agenda gave serious attention to urban areas and the role of the local government. The Post-2015 Agenda proposed establishing more inclusive development, mobilizing stakeholders and addressing vulnerable people. The Post-2015 Agenda with 17 Goals then proposed SDGs to mobilize stakeholder, promote integrated, city level approaches and accelerate progress towards sustainable development, including the end of extreme poverty (Satterthwaite, 2003). The Post-2015 Agenda proposed for SDGs therefore addressed more sustainable living, where urban areas faced more extreme poverty, environmental degradation of the living condition of one billion informal settlements' inhabitants and low productivity of urban living over the next three decades (Revi, 2013).

Inclusive development was integrated into the SDGs especially where the target was not only to focus on assisting marginalized populations but also on the relationship among various stakeholders in addressing poverty, and leading to beneficial effects for all (Gupta, 2015). The association with Community Based Development, where the development actively involved beneficiaries in their design and management, led to mechanisms for channeling development assistance, allowed the communities to participate in the development process and to have direct control over project decisions as well as management of financial support and investment, integrating all facets of sustainable development and global community mobilization (The World Bank, 2003; Obermayr and Astuti, 2015).

Surakarta, a medium-sized city in Indonesia, has been developing a community-based approach namely the RTLH Program to solve high poverty rates and targeted towards Surakarta Slum Clearance since 2015. This research evaluated the RTLH program implementation in the small area of Kelurahan Ketelan as a pilot project of the housing poverty alleviation program in 2006. This paper has tried to evaluate how the RTLH Program contributed to the achievement of Sustainable Development Goals in terms of providing housing security for establishing an inclusive, safe, resilient and sustainable city and human settlement as stated by SDGs?

2. Human Settlement Problems in the Urbanizing World, and the Emergence of Sustainable Development Goals (SDGs)

The paradigm of Housing Policy has been shifted from structural adjustment to poverty alleviation, with indicators can be measured from: 1) security of tenure; 2) structural quality/durability of dwellings; 3) access to safe water; and 4) access to sanitation facilities. This accords with Moser's (1996) arguments that Key Indicators for Poverty Alleviation in the Housing Sector relate to access to housing, which targets the goals of 1) adequate housing for all in terms of housing production; 2) adequate housing quality and space related to floor area per person and a permanent dwelling unit; 3) secure housing tenure, in regard to increasing the percentage of the total housing stock in the urban area which is in accordance with current regulations. Sustainable Development Goals of a Post 2015 Agenda targeted (Revi, 2013): 1) reducing extreme urban poverty, expanding job opportunities and productivity, especially in slums and informal settlements, 2) ensuring the universal access to a secure and affordable built environment and urban services, such as housing, water, sanitation, waste management, low carbon energy transportation and communications, 3)

ensuring safe and adequate air and water quality for all, reduction of greenhouse effect, efficient land and resource use, and climate and disaster resilience. Out of 17 goals, 11 have especially argued to make cities and human settlements inclusive, safe, resilient and sustainable (Output Document of the Open Working Group on Sustainable Development Goals, 2014). Post-2015 it was therefore proposed to "Empower Inclusive, Productive, and Resilient Cities". This is supported by Target 11.2, that by 2030 all cities provide access to safe, affordable, accessible and sustainable transport systems for all, and target 11.7 stated that by 2030, all cities to provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities (http://un.org.au).

3. Sustainable Development Goals, Inclusive Development, and the Contributions of the RTLH Program

Rualdo Menegat (2002) saw sustainable development as integrated urban environmental management, which is concerned with: citizen participation; public environmental management programs; comprehensive knowledge of Porto Alegre's natural and built environments; and environmental education. Related to the housing sector, the argument by CESCR, 1991 in Revi 2002, stated that sustainable cities encompass the right to adequate housing, including several core elements: legal tenure security, including protection against forced evictions; availability of services; affordability, in which housing costs should be affordable by occupants; accessibility, which considered needs of disadvantaged and marginalized groups; habitability, providing physical safety, adequate space, protection from the elements; location, in relation to employment opportunities, health care, schools, childcare centers; and cultural adequacy. Chance (2009) also argued about the concept of sustainable residential communities, which stressed energy efficiency consumption, water consumption, efficient energy design, sustainable transportation usage; also services for waste and recycling. Sustainability in the settlement's development planning should be able to connect with the community demands in the wider context of urban development. The concept of sustainability and its role in housing policy should be brought into a broader concept to embrace economic and social dimensions as well as environmental concerns (Bramley, 2009)..

The RTLH Program gave housing renovation grants to poor people living in substandard housing, which were intended for secure housing for creating more sustainable living, combating poverty and environment degradation of living conditions as stated in the Post-2015 Agenda. This program has integrated urban poverty alleviation policy with Slum Upgrading, by Government intervention in the improvement of housing construction, while at the same time improving environment conditions, improving provision of infrastructure and public services, transportation accessibility as well as economic conditions, through collaboration of various stakeholders. The RTLH program was operated by community involvement, formulation of a Community-based Organization namely POKJA (working group) and widening collaboration and partnership with non-governmental organizations (NGOs) and other grassroots organizations (GROs). It conformed with the concept stated by Das, 2015 where in Slum Upgrading Programs, Community-based Organizations (CBOs), non-governmental organizations (NGOs) and other grassroots organizations (GROs) emerged as key players in the new urban development paradigm. Slum upgrading (SU) emerged as a comprehensive planning tool for providing sufficient infrastructure and services in urban poor settlements through interventions of the government physically, socially, economically, environmentally, and legally (UN-Habitat, 2003); this enabled communities to undertake key tasks, such as designing and budgeting, with the authority and flexibility role of CBOs (Krishna, 2003). Local governments were recommended to promote community participatory early in the planning cycles, from

identification, planning/design, financing, implementation/construction, monitoring and evaluation, and maintenance (Plummer 2000).

4. Research Methods

The research was a case study research with multiple methods of qualitative and quantitative analysis of the implementation of the RTLH Program in Ketelan Surakarta, benefitting 44 households. The research was conducted in several stages:

a. Evaluation of the RTLH Program implementation in Surakarta was a part of Surakarta Slum Clearance Agenda 2015. This stage was conducted through interview survey to the parties involved as follows: BAPPEDA (Bureau of Planning and Development); BAPERMAS PP PA and KB (Bureau of Community Empowerment, Woman Empowerment and Family Planning); DTRK (Government Unit of Spatial Planning); BPN (National Agrarian Bureau) and POKJA (Working Group) of RTLH. The regulatory and policy frameworks had also been explored in order to shape the formal context,

b. Field survey and a questionnaires survey to the beneficiaries of the RTLH program were carried out with 31 out of 44 households. Analysis was concerned with indicators of sustainable settlements development as follows: Access to housing and land tenure security; Access to social services and infrastructure; Affordability of urban and social services; Environmental management and Economic development.

The analysis was conducted through T test analysis, which determined the changed conditions from before to after implementation of the program, related to variables listed in Table 1. If P-Value < 0.05, therefore Ho was rejected, which meant that there was significant difference between before and after implementation of the RTLH Program and where P-value > 0.05, Ho was accepted which meant that there was no significant difference between before and after implementation of the RTLH Program. Exploration continued with analysis of explanations of the contribution of each aspect towards sustainable development goals as a post-2015 agenda, either directly or indirectly.

TABLE 1. Aspects of Housing Intervention Program contributing to SDGs on Cities and Human Settlement Development Agenda

Contribution of Housing Intervention Program to the achievement of SDGs on Cities and Human Settlement Development Agenda	**Indicators**
Access to Housing and Land Tenure Security	1. Housing affordability 2. Adequate housing for all 3. Adequate housing quality and space 4. Secure Housing Tenure 5. Provide equal access to credit 6. Provide equal access to land
Access to Services and Social Infrastructure	Access to water supply sufficiency Access to improved sanitation Quality and access to garbage management
Affordability of Urban and Social Services	1. Affordability of water supply services

Environmental Management and Economic Development	2. Affordability of Electricity usage services 3. Affordability of Garbage management services 4. Affordability of health services 5. Affordability of education services 6. Affordability of transportation services Promote effective and environmentally sound transportation systems Strengthen small and microenterprises, particularly those developed by women Encourage public-private sector partnership and stimulate productive employment

Source: Analisis Astuti, adopted from Moser, 1996; UN Habitat 2004 and other sources

5. The RTLH Program of Surakarta City and Its Contributions to sustainable development goals as a Post-2015 agenda

Surakarta is a municipal city located as the core city of SUBOSUKA region, Central Java Indonesia. This is surrounded by the Regency of Boyolali, Sukoharjo and Karanganyar, with an area of 44.04 km dominated by developed areas with population of about 600.000 people. The level of poverty has reached 22% covering 125,600 urban poor people (TKPKD, 2011). The households located in inadequate houses and infrastructure were found to be 36,933 in the five districts of Banjarsari (12,136 hh); Laweyan (5,204 hh); Serengan (3,398 hh); PasarKliwon (6,202 hh) and Jebres (9,993 hh) (BPS, 2011). Out of these numbers of households, 1571 of them live in squatter settlements on government land and illegal land such as railway and riverbank areas in Surakarta City.

FIGURE 1. Study Area of RTLH Ketelan in Surakarta
Sources : Fieldwork, 2012-2013

FIGURE 2. Map of Surakarta
Sources : Fieldwork, 2012-2013

The program of RTLH Housing Improvement was established in order to overcome the problems of decreasing housing and environmental quality in Surakarta by grants for renovation and rehabilitation of substandard houses from Rp 2 to 5 million for each house. In 2006, it was reported that the number of

substandard houses was 6612 in 5 kecamatan (districts). It was claimed that until 2011, the Government of Surakarta had acted for 4,986 houses to be renovated and a further 1250 houses in 2012. (Table 2)

TABLE2. Realization of Grants for RTLH Housing Improvement Program in Surakarta

District/*Kecamatan*	**Total RTLH 2006**	**Beneficiaries : Number of RTLH Housing Improved**						**2012**
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**Total**
Laweyan	819	16	128	188	186	111	27	656	107
Serengan	530	14	82	24	157	210	0	487	107
PasarKliwon	2115	85	322	533	448	60	30	1478	411
Jebres	1447	56	221	325	323	103	107	1135	212
Banjarsari	1701	54	247	391	386	66	86	1230	413
TOTAL	**6.612**	225	1.000	1.461	1.500	550	250	**4.986**	**1250**

Source :Bapermas, 2012

This program needed a community organization as a prerequisite of the implementation. In the pre-planning stage, the program's initiation had been by the community itself, facilitated by a key person in the community. The government responded to the initiative after 2 years. Then a working group of the community, called POKJA (kelompok Kerja), was formed based on Perwali 2007. The urban planning department of Surakarta therefore started to design site plans, and BPN legalized the land tenure ownership. In the implementation stage, the community did the housing improvement gradually, starting with the land tenure certificate as the prerequirement for housing improvement. The implementation of the program was done together among departments of the local government of Surakarta, led by BAPPERMAS. In this case, BAPPEDA acted to facilitate all organizations involved. There was an effort to access credit facilitation by BLU Griya Layak Huni and LKM CU Kapidarmo, but without success. In the post program implementation, inter-organizational networks were included: BAPPEDA, BAPERMAS, DTRK, BPN, PDAM, PNPM, BLU Griya Layak Huni. The inter-organizational networks after the program finished were continued by PNPM and BPN. The mechanism of RTLH Program implementation was in line with the Post-2015 Agenda, which was targeted for empowering inclusion for the city's sustainability, which was socially inclusive, economically productive; and environmentally sustainable. This program involved all facets of development including the government units, non-government organizations as well as the private sector.

6. Housing Tenure Security in RTLH Program and the Component of SDGs on Cities and Human Settlement Development Agenda

The contributions of the housing sector toward the SDGs on cities and human settlement development were determined from access to housing and shelter; access to services and social infrastructure; affordability of urban and social services; environmental management; and economic development

6.1. Access to Housing and Land Tenure Security

The research found that the housing conditions were improved, because a specific objective of the RTLH Program was increasing access to good quality house by distribution of grants of Rp 2 to 5 million for renovation of substandard housing for each of targeted household. Another contribution of the program was for the beneficiaries to fulfill their need for access to adequate housing, including area width and physical condition (roof, wall and floor conditions). Even though in the beginning targets of the development only focused on housing and environment improvement, there were some multiplier effects of improving land tenure legalization, improving urban infrastructure and services, especially access to water (PDAM) and sanitation (public sanitation), improving management of planned environment and increasing economy for local micro-enterprises by opening wider access to credit, using land certificates as collateral. This program created networking among the government units in providing urban infrastructure, tenure certification as well as social and economic development.

TABLE 3. Results of T-test Analysis of Housing Condition

Aspects	P-Value	Conclusions	Value of Change
Condition of roof	0,000	Significantly different	0.68750
Condition of wall material	0,001	Significantly different	0.50000
Condition of floor	0,000	Significantly different	0.93750

Sources : Field work Astuti, 2014

Land tenure security still continues to be one of the most suppressing problems of the urban poor. It proved that tenure security improved access of the urban poor to credit, housing, infrastructure and services. Legal aspects discussed here were method of acquisition, legalization of land and housing ownership status. As discussed before, one part of the RTLH Program area was located in the flood-prone area of the riverbank, which was a restricted area for residential use. This program had revitalized some areas for Greenbelt and gave secure tenure to the rest of the area. By the concept of CBD, the program had enhanced the partnership of National Agrarian Bureau in the local government to grant the land titling of the area. Legalization of land tenure, as the prerequirement condition before housing improvement program could run, increased. After the program finished, 100% of beneficiaries had legal ownership of the land. Even though the program had legalized the land and housing tenure, table 4 shows that contribution of the program toward land tenure security improvement was low (0.02). Higher contribution was in the way to obtain housing, because most of the beneficiaries obtained housing ownership from the government (0,14)

TABLE 4. Results of T-test Analysis of Tenure Security

Aspects	P-Value	Conclusions	Value of Change
Way to obtain house	0,014	Significantly different	0.344
Housing ownership	0,002	Significantly different	0.281

Sources: Analysis Astuti, 2014

6.2. Access to Services and Social Infrastructure

The Major Regulation number 17-A /2009, stated in Act 7, that the RTLH Program was targeted for increasing conditions of housing construction and environmental conditions in terms of drainage system, local street, and lowering density. As the CBD program, the overall Indonesian National Program, in spite of encouraging local communities to participate in the planning process and providing financial support to the communities, the program had also collaborated related local government units to direct their poverty alleviation programs to the area. Therefore, this enhanced the partnership of central and local governments in providing urban services to the area based on the community demand. The process of program partnerships was called "Kroyokan Program", where this process was developed during the implementation of the program, expressed in involment of the Department of Public Work (DPU) in supporting and financing of services

TABLE 5. Results of T-test Analysis of Access to Services and Infrastructure

Aspects	P-Value	Conclusions	Value of Change
Water supply services	0,103	Not significantly different	0.167
The usage of toilet	0,203	Not significantly different	0.208
Condition of Septic Tank	0,575	Not significantly different	0.042

Surces : Analysis, 2014

6.3. Affordability of Urban Services

Affordability of urban services was identified from costs in obtaining urban services which included affordability of water services; electricity services; garbage management services; health services; education services and transportation services. From questionnaire survey, it was found that there was a slightly increased payment of water supply services in the implementation of the program. Whether the other urban services payment such as garbage collection, electricity usage were not increased

6.4. Environmental Management and Economic Development

Environmental management of resources and hazards improved economic efficiency, social equity and long-term sustainability of the area, while environmental improvement enhanced the development potential of the city, benefitting human health and control of environmental hazard (UN Habitat, 2001). From the study, it was found that The RTLH Program was not had much implication on increasing environment management. From the FGD, this program showed improving management of the planned environment and increasing economy for local micro-enterprises by opening wider access to credit, with land usage certificates as collateral. However, the analysis showed that there were not many improvements on economic development as the program had been implemented for less than 8 years.

7. Analysis of Contribution of RTLH Program to the Component of SDGs on Cities and Human Settlement Development Agenda

Contributions of the RTLH Program to SDGs were seen from increased conditions from before the implementation of the program. Results of the T-test analysis showed that the RTLH program had only significantly contributed to infrastructure and public services, access to housing and secure tenure. Access to

infrastructure focused upon here included water and sanitation, and also garbage management. After the program, the beneficiaries that had access to adequate clean and healthy water supplied by PDAM increased. Figure 3 and Table 5 indicate that the RTLH Program had increased the condition of septic tanks (0.575), access to public toilets (0.203), and access to water supply (0.103). In the SDG's agenda, sanitation was among the important targets for cities and human settlements development. It was associated with target 11.7: By 2030, providing universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, and the disabled. Target 11.7 would contribute to the NCD target in SDG 3 (Ensuring healthy life) by providing places for people to be physically active (Daniel, 2015)

However, even though the RTLH program had legalized the land and housing tenure, table 6 shows that the contribution of the program to the improvement of land tenure remained low. High contribution was in the way to obtain housing, because most of the beneficiaries obtained housing ownership from the government (0,14) It was also found that the RTLH Program was initiated to only distribute housing construction grants. The improvement of physical housing conditions remained low in terms of improvement of roof condition, wall and floor material. Slight improvement was found in housing tenure condition (0,002) and the way to own houses (0.014). From T-test analysis, the improvement in physical housing condition was found, especially for wall conditions, which were permanently improved by the program. Table 3 shows that beneficiaries mostly increased the condition of wall structure rather than roof and floor conditions, partly because the housing renovation subsidy was very limited (Rp 5 million), which was only enough for wall condition improvement from bamboo or wood into brick material.

TABLE 6. Results of T-test Analysis of Contribution of Housing Intervention Program to the Component of SDGs on Cities and Human Settlement Development Agenda

No.	Aspects	P – Value	Conclusions	Value of Change
1	Water supply services	0,103	Not significantly different	0.167
2	The usage of toilet	0,203	Not significantly different	0.208
3	Condition of Septic Tank	0,575	Not significantly different	0.042
4	Condition of roof	0	significantly different	0.688
5	Condition of wall material	0,001	significantly different	0.500
6	Condition of floor	0	significantly different	0.938
7	Way to obtain house	0,014	significantly different bahan	0.344
8	Housing ownership	0,002	significantly different	0.281

Sources : Analysis Astuti et al, 2014

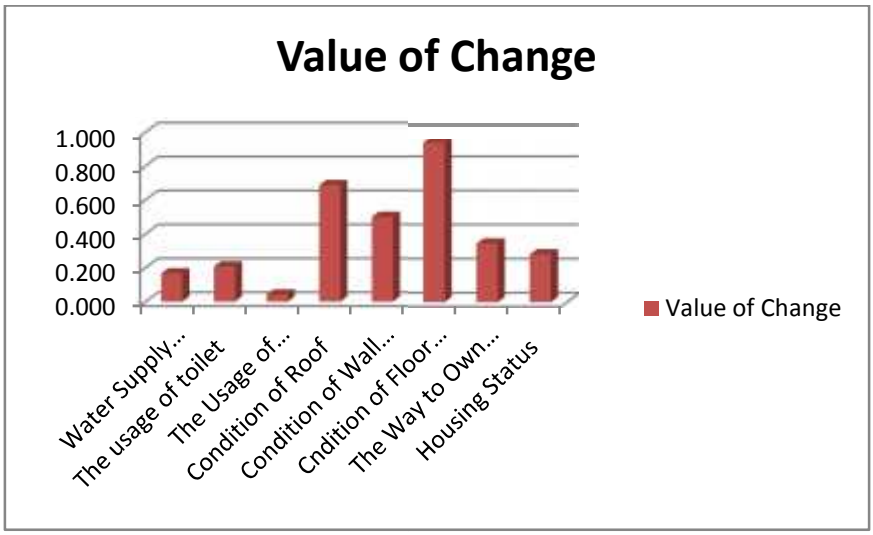

FIGURE 3. Results of T-test Analysis of Contribution of Housing Intervention Program to the Component of SDGs on Cities and Human Settlement Development Agenda

Sources: Analysis Astuti, 2014

8. Conclusion

The RTLH Program of Kelurahan Ketelan had created effective collaborative planning of state-civil-society-community during the operation of the program called "Kroyokan Program". The mechanism of the program was operated by a Community-based Organization called POKJA (Working Group), which had generated networking assistance during the program implementation with: BAPPEDA, BAPERMAS, DTRK, BPN, PDAM, PNPM, BLU Griya Layak Huni and Inter-organizational networks. This continued after the program had finished, with: PNPM, BPN. Therefore, it showed that even though the program only gave the government's subsidies for housing renovation and land purchasing, by collaborative planning of state, civil-society and community, it had generated an integrated program in achieving post-agenda benefits of sustainable human settlements development affecting housing poverty. The results of the program indicated improvement in housing and environmental quality; improvement of urbanscape quality in term of green open space availability, integrated quality improvement of infrastructure, legalization of land and reducing potential land conflict that might otherwise occur, and increased economic capacity.

RTLH program in the local area of Kelurahan Ketelan had contributed towards the sustainable human settlements program as a Post 2015 Agenda in terms in increasing land tenure and housing ownership status, increasing housing conditions and improving infrastructure. The highest contributions were in the improvement of condition of infrastructure, condition of sanitation and water supply (0.575 and 0.103). This was in line with the agenda of SDGs for cities and sustainable development which placed sanitation and water supply sufficiency as the important issues which should be addressed. However environmental management of the area, affordability of urban services, economic development and governance did not experience any change or improvement.

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References

Das.Autonomous but constrained: CBOs and urban upgrading in Indonesia. *Cities* 48 (2015) 8–20. Elsevier publisher

Bapermas, Report of Program RTLH Surakarta, 2012

BPD. Data StatistikKota Surakarta 2011

Moser, M. Gatehouseand H. Garcia, *Urban Management and Poverty Reduction Urban Poverty Research Sourcebook Module Ii: Indicators Of Urban Poverty*. UNDP/UNCHS (Habitat)/World Bank (1996)

Obermayr andW. Astuti. *Paradigm shifts in the international housing debate and its local implications for Surakarta's approaches on housing the poor*. Proceeding od 13 th International Asian Unbanization Conference, UGM, 2015

Satterthwaite. The Millenium Development Goals and Urban Poverty Reduction: great expectations and nonsense statistics, *Jurnal of Environment and Urbanization*Vol 15 no 2 October 2003

G. Bram ley. Urban Form and Social sustainability: the role of density and housing type. Jurnal of Environment and Planning B: *Planning and Design*, volume 36, pages 30-48 (2009)

J. Gupta, et all ..*Sustainable Development Goals and Inclusive Development*.POST 2015 / UNU –IAS.http://citiscope.org/habitatIII/2015

John Byrne, young-do wang, boShen and Xiuguo Li (1994). Sustainable Urban Development Strategies for China.*Jurnal of environment and Urbanization*Vol 6, no.1, April 1994. Sage Publications

K. Daniel ,, Program Director, Livable Cities Program, HealthBridge Foundation of Canada, Ottawa. . http://un.org.au/2015/06/12/sustainable-development-goals-sdgs/2015

LaporanperkembanganPencapaian MDGs Indonesia, Februari 2004

M. Rualdo,Participatory democracy and sustainable development: integrated urban environmental managementin Porto Alegre, Brazil. *Jurnal ofEnvironment&Urbanization*Vol 14 No 2 October 2002, Sage Publication (2002)

Perwali no 13/ 2007 regarding *Mekanismepemberianbantuanrenovasi RTLH*,

Revi.*The Urban Opportunity: Enabling Transformative and Sustainable Development*. Backgound Paper for the High Level Panel of Eminent Persons on the Post-2015 Development Agenda. Prepared by the Sustainable Development Solutions Netwoks Thematic Group on Sustainable Cities(2013).

S. Kruks 1983 in B Mikkelsen .*Participatory research Methodology and Efforts for* Empowerment- Books for*Practicions*, Jakarta, YayasanObor Indonesia(2001).

Sustainable Development Goals (SDGs)- Post 2015 Development Agenda .http://post2015.org/2015/...

T. Chance .Towards sustainable residential communities; the Beddington Zero Energy Development (BedZED) and beyond .*Jurnalof Environment &Urbanizat I O* N Vol 21 No 2 October 2009. Sage Publication(2009)

TKPK. A Big Job of Coordination Team of Local Poverty Alleviation . Article in Solopos 19 December 2011.

Turner(eds) Building Community. A third World Case Book- A summary of the habitat International Coalition Non-Governmental Organization's Project for the international Year of Shelter of the Homeless. In association with Habitat Forum Berlin (1987).

Turner.inAstuti, W., et al. (2012)." *Model of Empowerment for Slums Community as a Main elemen of Community-based Housing Development (CBHD)- Case Study in Tipes Village, Surakarta City, Indonesia*", Proceeding of the National Seminar of Green Urban Housing Policy, 4 th September 2012 Semarang, Planology UNDIP (1987)

UN Habitat Program.*Urban Indicators Guidelines Monitoring the Habitat Agenda and the Millennium Development Goals (2004)*

UN Habitat, *Cities without slums* (2002)

W. Astuti .*Characteristics of Community-based Housing Development and its Contribution to Poverty Alleviation*. Reseach of Competency, Directorate General of Higher education (DIKTI), (2012- 2013)

9th International Conference on
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9 November 2017

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THE CONCEPT OF COSMOLOGICAL-BASED TRADITIONAL HOUSETOWANI TOLOTANG COMMUNITY IN SIDRAP REGENCY SOUTH SULAWESI

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Abstract

Cosmological belief is Tolotang belief that recognizes the universe based on three levels, namely the upper world (bottinglangi), middle world (lino), and lower world (uriliyu) .The cosmological belief is implemented by Tolotang society in the concept of traditional house. This research is aimed to analyze the concept of Tolotang traditional house based on cosmology and function of each part. This type of research is qualitative research. Methods of taking data are with direct observation, in-depth interview, sketch, and documentation. The object of the research is the units of Tolotang traditional house. The results show that the concept of Tolotang traditional house is influenced by cosmology which becomes the basis of the belief of Tolotang society to the level division of the universe inhabited by the gods they worship. Tolotang traditional house concept is divided into three, namelyrakkeang (upper part), ale bola (middle part), and aje/awa bola (lower part).

Keywords:*Cosmology, Belief, Architecture, House Concept*

1. Introduction

The variety of culture and customs is a manifestation of existence and characteristic of Buginese tribe in South Sulawesi. One form of Buginese culture is the architecture of the building is designed based on the philosophy of life they embrace. According to Budiharjo (1997), architecture is a picture or reflection of the values and culture inherited by a community, architecture is also a cultural work loaded with a various meanings of life appreciated to the surrounding natural environment. The traditional rules adopted by the local community become the basis to form traditional architecture.

This is in line with the statement of Yudoyono (2008) stating that the better the studies of traditional architecture and sociology, the faster the local architectural wisdom is extracted. It is hoped that before the wise elders already pass, *Local Wisdom Architecture Tacit Knowledge* can be knitted again for the next generation.

The understanding of the meaning contained in Buginese architecture is an important thing for the next generation. If that meaning disappears, then the traditional architecture will lose its identity, especially there is intervention from other tribes (Anwar, 2005).

Cosmology is the basis of Buginese belief. Mardanas (1985) states that the Bugis-makassar tribe used to adopt a belief (*riolong*) that teaches cosmological views in which cosmologists studies the structure and history of the large-scale universe. According to the belief of the Bugis-Makassar tribe, the universe of the cosmos is composed of three levels, namely: *botting langi* (upper world), *ale kawa* (middle world), and uriliyu (lower world). This belief also becomes the foundation of *stylistic system* on the architecture of traditional houses of Tolotang community in Sidrap Regency, South Sulawesi Province.

Based on the urgency above, then the research questions toward *stylistic system* (stalistika system) on the architecture of traditional houses of *Tolotang* community in Sidrap Regency, South Sulawesi Province are arranged as follows:

1. How is the house concept on the architecture of traditional houses of *Tolotang* community in Sidrap Regency, South Sulawesi Province?
2. What is the function of the house concept design on the architecture of traditional houses of *Tolotang* community in Sidrap Regency, South Sulawesi Province?

The purpose of the research is that it is expected to be able to analyze the house concept and its function on the architecture of traditional houses of *Tolotang* community in Sidrap Regency, South Sulawesi Province.

2. Review of Related Literature

2.1. BugineseTraditional House Architecture

Suprijanto (2002) states that home is a part of a physical culture whose physical expression is strongly influenced by the socio-cultural factors of the local community. In addition, in the traditional context, the house is a form of expression that is closely related to the personality (behavior) of the community. The regional and cultural backgrounds cause differences in the architecture of the buildings.

Rapoport (1969) argues that the existence of architecture is not merely to create a shelter as a place for the protection of natural and animal danger. Human response to the environment will produce form and function in architecture (Crowe, 1995). Mattulada in Koentjaraningrat (1990) points out that the architecture of Buginese and Makassarese houses is often combined, and then it is called Bugis-makassar house.

Buginese wooden house (bola), since it emerged in history in the 17th century up to now, can be categorized as a model house of Southeast Asian type of Malay, which can also be found in Aceh, South Sumatra and Kalimantan (Cristian Pelras 1987).

Abidah (2010) reveals that the view of life of ontologism is an understanding to know the universe more universally which is the concept of Bugis-makassar architecture. Bugis-makassar life philosophy is called "*Sulapa Appa*". This philosophy states that all aspects of human life will be perfect if the shape is “Square”. This philosophy comes from the myth about the origin of human that is believed to consist of four elements, namely earth, water, fire, and air. *Sulapa Eppa* (square) as the cosmology or the philosophy of life of *Buginese* society is projected toward the principle of human life.

2.2. The House Concept

The house concept is the various aspects of the benchmark associated with the model that creates form. This system includes: facade, door shape, window and other elements, both inside and outside the building.

Rapoport (1969) in the book House Form and Culture explains the alternative theory of form:
The creation of a form or model is caused by several factors, namely primary factor and modifying factor or secondary factor. Primary factors include socio-cultural factors, while modifying factors include climate factors, material factors, construction factors, technological factors, and land factors. Socio-cultural factors include considerations of religion and belief, family and the structure of society, social organization, social relationships between individuals, and view of life.

According to Suprijanto (2002), the meaning of micro-macrocosmic symbol is influenced by the surrounding natural elements and the social status of the inhabitants which is the concept of form in the context of traditional culture. That influence is manifested through the form of the roof, the structural system and materials, decoration, and building order. In addition, the direction (orientation) is one of the dominant non-physical aspects in traditional architecture.

Suprijanto (2002) explains the factors that influence the manifestation of the traditional house form, they are:
1. Religion or belief factor is a dominant factor compared to other factors that affect the shape and pattern of houses. Haryadi and Setiawan (1995:64) argue that the form of the entire microcosm of the universe is transformed as a home in a traditional society.
2. According to Rapoport (1969), the factor which is the manifestation of the architecture is a socio-cultural factor because in it there is system that guides the human in seeing and understanding the surrounding world. Climate, construction, materials, and technology are only as an influencing factor.

Arifin (2010) argues that the anthropometry of the human body is manifested as a form of dwelling, that is: the upper part as the human head, the middle part as the human body, and the lower part as the human feet. The meaning of micro-macrocosmic symbols of the surrounding natural elements and the social status of the inhabitants strongly influence the concept of form in the context of traditional culture.

3. Research Method

This type of research is qualitative with rationalistic method. This research uses qualitative research because qualitative type is a research procedure that produces descriptive data in the form of oral and verbal words from people and speakers observed to be directed based on the background and individuals holistically. The rationalistic approach is an approach that emulates from the philosophy of rationalism with the assumption that science and intellectual experience are built based on the ability of logical argumentation by using the method of indexicality.

4. Findings and Discussion

4.1. The Location of the Research

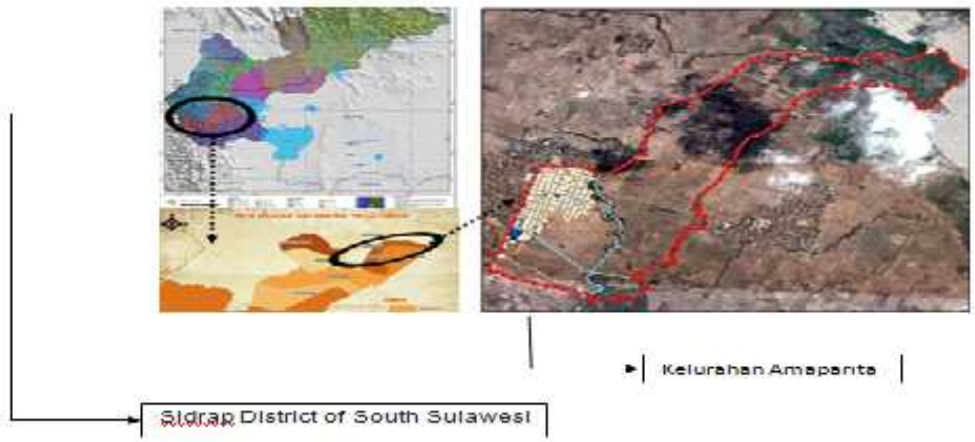

Figure 1. The general description of the location of the research
Source: DindaPujiastuti

Figure 2. The Location of the Research

Amparita Sub-district is located south of Sidrap regency with 9 km distance from south central of SidenrengRappang Regency and 221 km from the capital city of South Sulawesi Province.

Amparita Sub-district is located south of Sidrap regency with 9 km distance from south central of Sidenreng Rappang Regency and 221 km from the capital city of South Sulawesi Province.

Amparita is within the district of Tellu Limpoe. Borders are as follows:
1. Northern side is bordered by Arateng Sub-district;
2. Eastern side is bordered by Teteaji Village;
3. Southern side is bordered by Pajalele Sub-district;

4. Western side is bordered by Toddang Pulu and Baula Sub-district. The last two administrative sub-districts were parts of Amparita sub-districts before the expansion of the area by 364.74 km^2.

4.2. The Concept of Tolotang Cosmological-based House

Tolotang house concept is a manifestation of natural cosmology that affects the function of Buginese house and can be spatial vertically classified and can be grouped in 3 parts, namely:

a. *Rakeang*, consisting of attics and roofs of houses located between the top of the house and under the roof. The function is as a storage of rice, heritage objects, and also used for weaving and dressing;
b. *Alo-Bola*(*alle Bola*); the function is as a dwelling, as a living room, bedroom, and dining room.
c. *Awaso*: functions as storagefor farming and livestock tools, located at the lower part of the house.

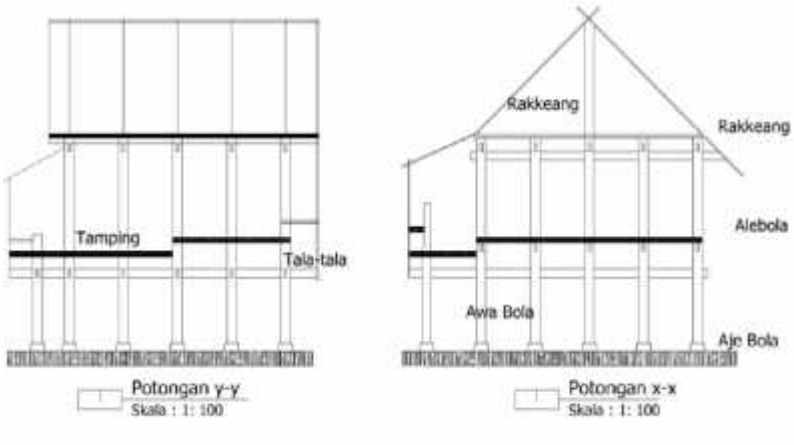

Figure 3. The Pieces of Bugis-makassartraditional house

"Cosmos Concept" is an understanding that affects the Bugis-makassarhouse, so the Bugis-makassarhouse is divided into 3 parts, namely the upper, middle, and lower part. Those three parts are important to know in establishing a house.

Figure 4. Cosmic structure of Tolotangtraditional house

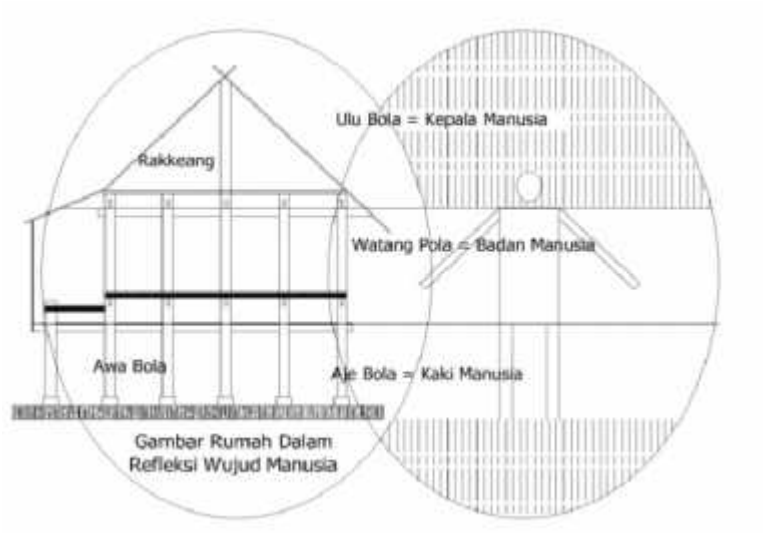

Figure 5. Tolotang House in macrocosmic replica
Source: the result of field observation by the writer, 2017

Based on the picture above, Buginese house architecture is strongly influenced by the culture and belief that existing in the community. Broadly speaking, the architecture of the Buginese house is influenced by the "cosmic structure" which is divided into 3 parts, namely the upper part (rakkeang) symbolized as the human head, the middle part (ale bola) symbolized as the human body, and the lower part (aje/awa bola) symbolized as the human feet. Similarly, the form of "square", symbolizes the creation of human beings consisting of 4 elements, namely fire, earth, water, and air.

Figure 6. Tolotang House
Source: the result of field observation by the writer, 2017

4.3. The Functionsof the division of the TolotangTraditional House Concept

a. *Rakkeang* function (the upper part)

Buginese belief toward the worship of God *Langi'* held in the attic (*rakkeang*) with offerings. *Rakkeang* as the highest place. *Rakkeang* space is used as storage for rice, corn and crops of their farm

b. Ale *bola* function (the middle part)

The worship of God *Malino* is considered to dwell in *Ale Bola* (the body of the house), also in the form of offerings. *Ale Bola* space is made as a dwelling for the inhabitants.

c. *Aje*/awa *bola* function (the lower part)

So even God *Uwae*, the worship is in the form of offerings and is considered to reside in *awa bola* (under the house). The *awa bola* room is made as a place for farming tools and all of their economic needs.

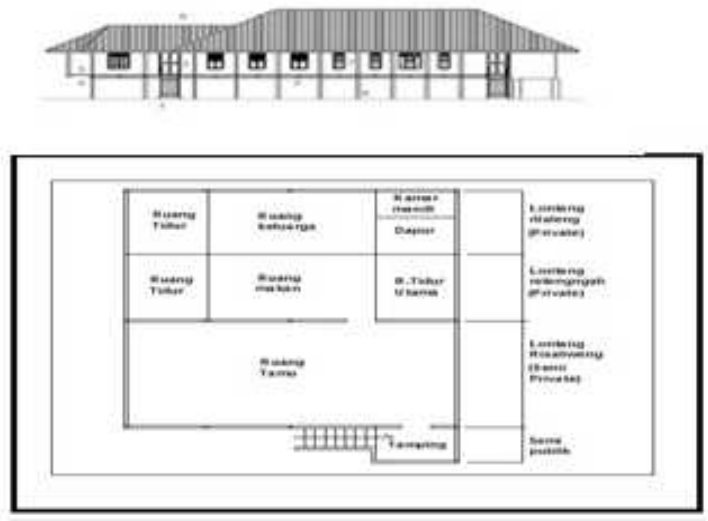

Figure 7. The Layout and Look of buginese house
Source: Architecture Development of Makassar Community

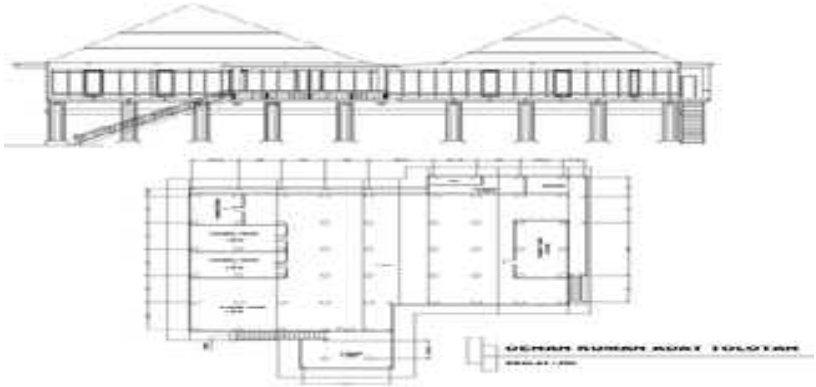

Figure 8. The layout and Look of Tolotang House
Source: Figure as the result of Field Survey, 2016.

4.4. The house concept and rooms in the traditional architecture related to the socioeconomic side of the inhabitants

Buginese people also recognize the system of socioeconomic level that is very related to architecture. The levels of social economic side include Anakarung (nobleman), To Maradeka (ordinary people), and Ata (slave).

Based on the socioeconomic level of its inhabitants, it impacts on the pattern of the house form which is differently symbolized, they are:

1 *Sao-raja e (sallasa)*, large house inhabited by the noble family (Anakarung). Usually has a pole with a multilevel pedestal at the lower part and with a roof over it (sapana) which has a three-tiered ridge or more, which has a higher socioeconomic level and wealthy
2. *Sao piti e*, the form is smaller without sapana, and has a two-tiered ridge. It is usually inhabited byBuginese society whose social level and economy are just ordinary.
3. *Bola e* is the home for the society whose social level is the lowest and the economic level is just barely.

5. Conclusion

The concept of *Tolotang* cosmological-based traditional house consists of three parts, namely the upper part called *rakkeang*, the middle part of the house called *ale bola*, and the lower part called *awa/aje bola*. The three parts have different functions, either based on the worship system to the gods or the life order they live.The division of the rooms in the house is based on socioeconomic level owned by every community. The form and division of the rooms in it also vary.

References

Abidah, Andi. 2010. *Perubahan Bentuk dan Fungsi Rumah Bugis-Makassar di Makassar*. Universitas Negeri Makassar, Makassar.

Anwar, J. 2005. *Arsitektur dan Budaya Masyarakat Bugis Makassar*. Wikipedia Bahasa Indonesia, Ensiklopedia Bebas (Online).https://id.wikipedia.org/wiki/Sinkretisme pada tanggal 7 Oktober 2016, pukul 13:29.

Arifin, Rosmiaty 2010. *Perubahan Identitas Rumah Tradisional Kaili di Kota Palu*. Universitas Muhamadiyah Palu, Palu.

Budihardjo, E. 1997. *Arsitek dan Arsitek Indonesia Menyosong Masa Depan*. Andi, Yogyakarta.

Crowe, N. 1995. *Nature and Idea Of A Man-Made Word: An Investifation Into The Evolusionary Roots Of Foorm and Other In The Built Environment.* Press Massacusetts, MIT.

Christian, Pelras. 2013. Bugis and Makassar house variation and evolution.

Haryadi dan B. Setiawan. 1995. *Arsitektur Lingkungan dan Prilaku*. Jakarta, P3SL Dirjen Dikti Depdikbud.

Mardanas, dkk. 1985. *Arsitektur Tradisional Sulawesi Selatan*. Depdikbud, Ujung Pandang.

Mattulada, H. A. 1985. *Latoa, Satu Lukisan Analisis Terhadap Antropologi Politik Orang Bugis.* Gajah Mada Universty Press, Jakarta.

Rapoport, Amos. 1969. *House Form and Culture*. New Jersey. University of Wisconsin, Milwaukee, Prentince Hall, Inc.,Englewood Cliffs, London.

Suprijanto, Iwan. 2002. Rumah Tradisional Osing: Konsep Ruang dan Bentuk. Dimensi Teknik Arsitektur. Vol. 30, No1: 10-20.

Yudono, A. 2008. *Kearifan Arsitektur Tradisional Rumah Panggung dalam Hunian Modern*. Makassar.

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KAMPUNG DEVELOPMENT TOWARD SMART CITY

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Abstract

The city of Surabaya that formed from maritime activities to lead to trade and perindutrianindustrial ,activities will form settlements in the form of-settlements called the village (kampung). Kampung became an important part in the development of a city because this area became a place to grow and move most of the middle classmiddle-class population and belowdown. However, the rapid development of the city of Surabaya towards the modern has resulted in the existence of the village kampung in Surabaya increasingly recessiveterpimpit. .LKampung long-lived kampung like Kampuong Kaliasin, pressed by the development of urban and socio-economic mobility, are experiencing so slowly the village isworsening villagekampung conditions. The pressure from the surrounding environment is sogreat. Not only social and economic issues, but also environmental issues (climate, sanitation, afforestationa forestation, etc.) are salient. TBy the Surabaya City Government is attempting to address the problem through is one of them overcome by carrying the concept of Smart City Surabaya. The question to be addressed here isn how the development of the urban kampung, for example Kampung Kaliasin, is to proceed in the direction of Smart City Surabaya.
The method used is descriptive and qualitative. The variables to be studied are aspects of smart city covering Smart GovermentGovernment, Smart Economy, Smart Lifve, Smart Living, Smart People, and Smart Mobility (Mobility smart). These are nanalyzed in relation to the readiness of the citytownship that continues to develop toward Smart City Surabaya.

***Keywords**: kampung, smart city, Surabaya*

1. Background

Surabaya is the capital of East Java province and has a diversity of activities ranging from economic, social and cultural. As a result of the concentration of these activities, Surabaya became one of the cities of choice to live life for its people.

Smart City is also defined as a city capable of using human capital, social capital, and modern telecommunications infrastructure to realize sustainable economic growth and high quality of life, with

prudent resource management through community-based governance (Caragliu, A., Et al in Schaffers, 2010). Then, Kourtit&Nijkamp (2012) has argued that Smart City has become a landmark in town planning.

Figure 1. Basic *component* of Smart City(Nam &Pardo, 2011)

Cities called smart city initially had a new breakthrough in problem-solving in their city, with the development of these cities to become the smart city. Based on Networks European Technology Platform 2011 in Smart City Applications and Requirements, a city is classified as smart city, if it exhibits 6 criteria, namely:

1. Smart Economy (Competitiveness)
2. Smart People (Social and Human Capital)
3. Smart Governance (Participation)
4. Smart Mobility (Transport and ICT)
5. Smart Environment (Natural Resources)
6. Smart Living (Quality of Life)

2. Methods

The method that will be used in this paper on the development of urban kampung towards Smart City Surabaya is historically descriptive with qualitative methods. Descriptive method is appropriate in researching a group of people, an object, a condition, a system of thought or a class of events in the present (Moh.Nazir, 1988), while according to Whitney (1960) descriptive method is the search for facts with appropriate interpretation. Descriptive research studies the problems in society, as well as the prevailing procedures in society and particular situations, including on relationships, activities, attitudes, views, and ongoing processes and influences of a phenomenon.In this study, it is associated with aspects of the formation of space and the environment of occupancy.The data to be used are qualitative, based on observations in the field. So the method to be applied is descriptive and qualitative. Variables to be studied have been determined beforehand, so it will be possible to analyze these aspects in the history of development and movement of kampung in Surabaya in the direction of Smart City Surabaya.

2.1. *Data Collecting*

The quality of data collection is concerned with the precision of the means used to collect data. Technique of collecting data was as follows:

1) Literature Review
2) Interview and Survey
3) Observation
4) Documentation

3. Findings

Field surveys have been conducted in KampungKaliasin Surabaya, Tegalsari Sub-district, Surabaya City. Various types of dwellings can be found in this area, ranging from residential series (single house), single house, business house, office house, to luxury apartments, as well as trade / services located in this region, ranging from street vendors, small merchants in front of a house, small shop to supermall.

From the results of surveys, field observations and interviews withKampungKaliasin residents, the initial analysis results obtained are as follows:

3.1. Competitiveness

Most of the respondents have their own business, both as main source of income and for additional income. Efforts are mainly triggered by the existence of market opportunities around the village. Citizens' businesses can be categorized as follows:
- Service scale; serving the city, region / region, village
- Business break-even: Sustained, long-term enterprises such as renting out rooms for workers, also short-term grocery stores such as cake making activities primarily conducted by women.

From the description above, economic activities undertaken by villagers have a turnover that varies from Rp. 1 Million to Rp. 30 million. Most of the business activities of residents have a high dependence on economic activities in the outer or more corporate ring of the village.

Figure 2. An allay in Kampung Kaliasin

Figure 3. One of home based enterprises at Kampung Kaliasin, creating a space by add non-permanen tent to cover the allay

3.2. Social and Human Capital

Villagers of Kaliasin are of diverse backgrounds, due to the existence of many temporary shelters for workers around the area. Flexibility of citizens in receiving immigrants is high,,shown by their accommodating the activities of busy migrants at certain hours. On the other hand, residents also make regulations for the comfort and order of the residential environment.

Figure 4. One corner of common space used by male residents to maintain the kampung'ssecurity

3.3. Participation

At the lowest level, citizens participate in maintaining the environment and social order in the village and are actively involved in various social organizations. At a higher level, residents channel their aspirations through the Chairman of the RT and then the Chairman of the RW. At a higher level, although not actively participating, citizens are taking note of the development of the city of Surabaya and have opinions related to the development of villages and cities.

3.4. Transport and ICT

All respondents have private vehicles, most of them motorcycles, yet some still use the city transportation mode (bemo) as a means of transportation. The reason for the use of private vehicles is the aspect of high flexibility, in terms of time and route. In addition to meeting directly, contact with other parties is also done by using the phone and internet. Almost all respondents have often used the internet, either accessed from public places (coffee shops, etc.) or using personal access (mobile phone)

3.5. *Natural Resources*

One of the characteristics of the Surabaya urban village is the high density of the buildings. Almost all respondents stated that the open space in their residential neighbourhood is less because the built-up area is bigger than the unbuilt area. Few houses have a small yard at the front of the house. Rows of houses in the alleyshave openings only on one side of the building, namely on the front. This condition will also affect the vulnerability of the kampung to the danger of spreading fire in case of a fire.

Figure 5. Open space in Kampung Kaliasin

3.6. Quality of Life

The quality of residences in KampungKaliasin is quite good, clean and orderly. The kampung's friendly culture is still very visible, in contrast to the residential real estate areas whose environment tends to be quiet. In many corners of the kampung there are residents who gather to discuss the problems of the kampung.

Figure 6. Semi-private spaces built in public spaces, belong to and can be used by all citizens

Although residents of KampungKaliasin have relatively limited space and economy, the quality of life of the people is helped by the spatial spots used for various social activities. This indicates good social relationships in the community.

4. Conclusion

The development of the urban kampung towards Surabaya Smart city grows rapidly in Kampung Kaliasin. This is caused by continuous aspects between competitiveness, social and human capital, participation, transport and ICT, natural resources and quality of life occurred in it. Although Kampung Kaliasin is so dense, its residents have started to promote smart city concept in their daily activities. In Smart Economy, some citizens who have businesses such as food and snack, shoes and boarding houses already use ICT to market their products. Not all business owners use ICT because their daily turnover and demands are already high. For certain events, city government selects Kampung Kaliasin as an example of kampung with have independent businesses. Likewise, in terms of Smart Living, in some empty lands or that included in public facilities, parks have been built so there are public spaces that can be used by surrounding inhabitants to socialize. Besides, some corner of the kampung is used as open spaces with free access to the internet that they can use free internet. This program is initiated by Surabaya government to support the kampung towards Surabaya Smart City.

References

KementrianPerumahan Rakyat (2010),RencanaStrategisKementrianPerumahan Rakyat Tahun 2010-2014.

Klein, C., &Kaefer, G. (2008), From smart homes to smart cities: Opportunities and challenges from an industrial perspective. In Proceedings of the 8th International Conference, NEW2AN and 1st Russian Conference on Smart Spaces, ruSMART 2008 (St. Petersburg, Russia, Sep 3-5) derived from http://www.springerlink.com/content/d053p7u7g42u573p/.

Marsa-Maestre, I, Lopez-Carmona, M. A, Velasco, J. R, & Navarro, A (2008), Mobile Agents for Service Personalization in SmartEnvironments. Journal of Networks, 3 (5), 30-41.

Nam, T. &Pardo, T. A. (2011), Conceptualizing Smart City with Dimensions of Technology, People, and Institutions.In The Proceedings of the 12th Annual International Conference on Digital Government Research. Derived fromhttps://www.ctg.albany.edu/publications/journals/dgo_2011_smartcity/dgo_2011_smartcity.pdf.

Prabowo, H. (2002), Acculturation Strategies and Ethnic ldentity: The Host and Guest Culture in Urban Villages of Jakarta. Presented paper at XIV International Association for Cross Cultural Psychology Congress Unity in diversity: Enhancing a peaceful world, Yogyakarta, I 5-19 Juli, 2002.

Rahardjo,M. (2011),MetodePengumpulan Data PenelitianKualitatif, http://mudjiarahardjo.com/artikel/336.html?task=view

Setijanti, P (2006),Low-income Inner-city Settlement Processes:A Surabaya Study, Unpublished Dissertation, Faculty of Architecture, Building and Planning,The University of Melbourne, Australia.

Setyawan, Bakti (2010), Kampung Kota dan Kota Kampung: TantanganPerencanaan Kota di Indonesia

Silas, dkk (2011),Kampung Surabaya Menuju Abad XXI, Bappeko Kota Surabaya

Sullivan, J. (1980), Back Alley Neighbourhood: Kampung as UrbanCommunity in Yogyakarta, Melbourne, Centre of SoutheastAsian Studies, Monash University.

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COMMODITIES SPACE FOR SOCIAL INTERACTION SPACE IN THE KAMPUNG AROUND CAMPUSES AT JAKARTA

Case Studies : Public open space at kampung in around nine university with concentration at kampung in around Tarumanagara and Bina Nusantara University

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Abstract

An interesting phenomenon in Indonesia today is that "life coexisting between urban centers with urban village features is another face" (Prof. Emil Salim, 1984), things such as those occurring in DKI Jakarta where universities are growing alongside the surrounding kampung.
Student activities melt into the kampung to meet their daily needs such as a boarding house (kos-kosan), food, and so on coloring the social interaction space. Not all the kampung that grow together with the surrounding campus have a better change in the space of social interaction. But there are kampungs that experience better economic change which then affect the changes in social interaction space.
This study aims to find a kampung in which there is social interaction space in the commodity space dominated by trade homogeneity with the criteria of the settlement of population density > 400 persons/ha, has direct achievement from kampung to campus, more kampung formerly existed rather than campus, open kampung type, at a radius of 400 m from the campus there is a building function dominated by trade activities, student activities along the way, and commodification of public open space.
Research method using case study, found kampung in around the campus where kampung grogol and kemanggisan are selected as kampung that has homogeneity of trading activities (commodity space) and heterogenity of college student activities and so in it happens the production of (new) social interaction space that produced by the relation between the aspects that effec of commodity space and various of college student activities in kampung.

Keywords: *Change Kampung, Social Interaction Space.*

1. Introduction

An interesting phenomenon in Indonesia today is that "life coexisting between urban centers with urban village features is another face" (Prof. Emil Salim, 1984). As an example of what happened in DKI Jakarta as an industrial, trade, maritime and educational center, or as a city with dual main function (Differcified Cities) which declare itself as "indamardi city (industry, trade, maritime & education) as well as the center of government. (A. Muktiono, 2005).

A reality that occurred in DKI Jakarta where there is a college (education center) with its surrounding kampung that need each other (Workshop Department of Architecture Untar, 2012), as seen in the kampung grogol in around the campus of Tarumanagara University in Jakarta.

In the coexistence of universities with the surrounding kampung there arose a phenomenon that is the melting of college student activities in the township to meet the needs of everyday life such as foraging, photocopying, boarding house or "*kos-kosan* (guesthause, rental hause/room/space for college student in kampung)" ("study results show the percentage of students living in kampung reach 51% the number of residents (of the kampung (Elly Mulyana, Haryo Winarso, Tth) ", etc. As time passes, campus settlements tend to experience spatial changes as seen in the following figure

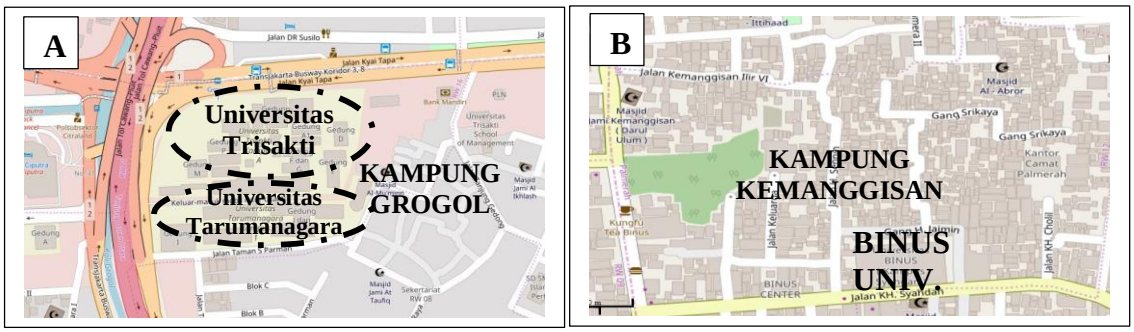


Figure 1. In the coexistence of universities with surrounding kampong in Jakarta ; (A) Kampong grogol around Tarumanagara University, (B) Kampong Kemanggisan around Binus University.

Spatial changes in the settlement affect the changes in spatial structure. Aspects of spatial structure can be reviewed and traced through three aspects (Amos Rapoport, 1993), namely: 1. social structure, 2. economic structure, 3. physical structure and activities.

Background Economic Changes In The Kampung

With the increasing demand for everyday college student needs such as boarding houses, eating places, photocopiers and so on, the value and function of land in the kampung in around the campus increases towards the commodification of its public open spaces and many people sell their house. New houseowners tend to change the function of buildings for trading activities and with other residents trade to provide for college student needs, and the occurrence of new social interaction space based on production and consumption relationships between college students and residents/traders.

Background Social Change In The Kampung

The economic growth in the kampung surrounding the campus resulting in production and consumption relations between the population/traders and students impacted the dialectics of social change such as activities that are usually done spontaneously into planned, social relations changes between citizens into relationships between citizens/traders with college students, among traders , between sellers and buyers of services. The social relations of the trade will produce their activities and social interaction space.

Background Cultural Changes In Kampung

During the process of melting college student activities into the village to find what is needed everyday tend to be consumptive to services that are easily accessible and economical.

College student consumptive culture tends to change the culture of villagers (urban kampung) from traditional culture to productive culture serving the needs of the college students as well as seeking profits for changes in the value and function of the building and welfare of citizens dominated by trading activities and even homogeneous activities that tend to trade.

Cultural change becomes a daily social practice (between productive and consumptive cultures) that shapes the culture based on the reality of life or social practice between the college students and the daily citizens called a profit-oriented culture production. Culture produces new activities resulting from relationships between college students and citizens such as opening food stalls in the yards, on the street/on the edge of the alley, open a coffee shop, and so forth. College students produce needs for daily life, citizens/traders produce services to meet the needs of everyday college students.

Background Physical Changes In The Kampung

Physical changes of buildings in the kampung toward the vertical background by changing the function of residential houses into boarding houses (*kos-kosan*), workshops, food stalls, and so on). Based on a study, the change is like a guesthouse business (*kos-kosan*) reaches 30%, business stalls reach 23%, workshop business reaches 12% and 35% homes that do not have business (Elly Mulyana.Haryo Winarso, Tth).

Other physical changes in public spaces such as changes in spatial arrangement and elements of public open space formed based on the interests of capital owners and businesses of citizens and college students, and changes in green areas such as the increasingly crowded buildings then reduce the green space before.

The physical changes of the kampung in around the campus may vary, some are changing towards a worse quality of social space but there is also a better direction of the quality of social space.

Distress, Phenomenon and Issues

The existence of knowledge of citizens to the high value and function of land in around the campus so that the optimization of physical development, commodification of space (open spaces public rent), and homogeneity

of trade activities on the function of the building. This will certainly affect how the changes in social interaction space.

From an architectural point of view, the change raises an interesting architectural phenomenon, namely that in the kampung in around the campus there is always a "Social Space Change". Based on the phenomenon, the issue raised in this research is the existence of "Commodification of Public Open Space" on the front yards house.

This issue is very important because in the township of "Social Interaction Space" is vital and very necessary considering the kampung is a community, and according to (Dinas Perumahan Provinsi DKI Jakarta, 2006) that "The urban kampung can be said to represent the complexity of urban problems".

Identification of problems

In this study, from the occurrence of social space changes in the commodity space at the kampung in around the campus, it can be identified that the commodity space occurring within the kampung in around the campus will affect the college student activities in the space of social interaction within it.

Formulation of the problem

The existence of the relation between the aspects that effec of commodity space (population density, the optimization of land use for physical development (vertically/horizontally), changes in land use (domicile to the mixture of trade, dominance homogeneity of trade activities, dominance heterogeneity of college student activities in public open space which is dominated by the main/necessary activities rather than any other type of activities (specific, additional/option, symbolic, social activities, etc).

Focus Issues

The focus of the problem on the kampung that dominated the commodification of public open space on the front yards house among the kampung residing in nine colleges in Jakarta.

Novelty Research

Through the approach of theory of social space production (lefebvre) obtained one of nine kampung in around the campus that has a new perception (shown through daily action) houseowners on the function of the building and its front yards house based on social relations trade between college students and non students will produce social interaction space in the commodity space at the kampung in around the campus.

Premise and Work Test

A premise in this study, that in urban kampung living side by side with universities always need each other and cause melting of college student activities within the kampung. Due to the melting of college student activities in the kampung there is a "Change of Social Space".

Based on the premise, the work test raised in this study is the change of social space for trading activities in the kampung in around the campus to produce new social interaction space, so that the creation of social interaction space in the commodity space in the kampung.

Based on the analogy of the meaning of a house according to John F.C. Turner (1976: 151), where the house has two meanings ; as a noun (product/commodity) and as a verb (process/activity), then a commodity space is affected by population activity/population density. There is optimization of land use for physical development (vertically/horizontally), changes in land use (from housing function to mixed-house housing, dominant homogeneity of trade activity and heterogeneity of college student activity), while college student activity aspect is affected by types of activity.

1.1. Research Question

a. How is the kampung selection process among the nine kampung in around the campus that meet the criteria for kampung selection dominated by commodity space?

b. How does the collapse of government discourse on the function of land for housing becomes a function of housing and trade mixture in the kampung in around the campus.

c. How does the process of creating social interaction space in the commodity space in accordance with the function of buildings in the kampung in around the campus?

1.2. Research Purposes

Finding the production of social interaction space in the commodity space of among the nine kampung located in about nine campuses in Jakarta whose houseowners have new perceptions of the building's function and the front yards house for trade-social relations between college students and non students.

1.3. Research Benefits and Contributions

The results of this study are expected to be useful for the science of environmental architecture to know how new college students interact socially with their environment in the space of social interaction produced by the commodity space in the kampung in around the campus.

2. Theoritical Review

To achieve the objectives required study of theories that started from the theory of the kampung, about environmental architecture, about space in architecture, social space and the production of social space.

The framework of the theory of social space as a whole confronts the theory of re/production of social space (Henri Lefebvre), as shown below.

a. Understanding of The Urban Kampung

The urban kampung (according to Y Basuki, Nurtarti Soewarno, 2005) says that kampung usually consists of physical elements and social elements, built spontaneously by the people themselves and have comfort. In terms of achievement, the kampung can be classified into 2 different types (Prof. Sandi Aminuddin Siregar, 1990), namely:

- Closed pocket areas type or closed type; that has only one achievement to the pockets of the kampung.
- Open pocket areas type or open type; ie having two or more achievements from different sides to the pockets of the kampung.

b. Definition of Environmental Architecture

In the context of environmental architecture (according to Haryadi, 1995), that environmental architecture put more emphasis on architectural relations with its environment, ... The dimensions of the environment can also be divided into three groups: the physical environment, the social and cultural environment.

While the understanding of the environment in the context of architectural space (according to Prof. Dr. Ir. Uras Siahaan lic.rer.reg., 2013) is that "The environment can be viewed as a series of relationships between elements and people, where the relationship has patterns and structures. The relationship between these objects in the environment is primarily space. "

Thus, the architecture of the environment is the organization of space from the dimensions of the physical, social and cultural environment, time, meaning, ability to accommodate activities, and has a pattern and structure of relationship/communication that is the space between people with people, between people with objects, between objects with objects, as well as outer space elements.

c. Understanding Of Space In Architecture

Space (according to Lefebvre, Paul C Adams, 2006), says that "Lefebvre argued that space is produced, the space is not finalized, space is produced, consumed, and reproduced in the never ending and itterative process". Empty space filled/consumed by the body (human activities), producing and reproducing their space, and so on without stopping.

d. Understanding Of Social Interaction Space In Architecture

Social space is a real space based on social reality, is a container/space to meet the needs for social interaction activities. As said (according to Henri Lefebvre 2000.26; Arie Setyaningrum Pamungkas, 2016), it says: "Space is real in the same sense that commodities are real since (social) space is a (social) product".

e. Understanding Of Production And Re/production Of Social Space (Henri Lefebvre)

In the production of social space (Henri Lefebvre) offers a triadic concept in the production of social space. In whole or in whole, the way the triadic concept works can be seen like the following figure 2.

In this study public open space such as on the front yards house and the street is perceived by the houseowners or citizens as a container that can produce profits to trade, thus creating/produced leased space for trading on the front courtyard house (for commodity space), and also created activities social interaction between college students and traders in trading activities or reproducing the social interaction space within the produced commodity space.

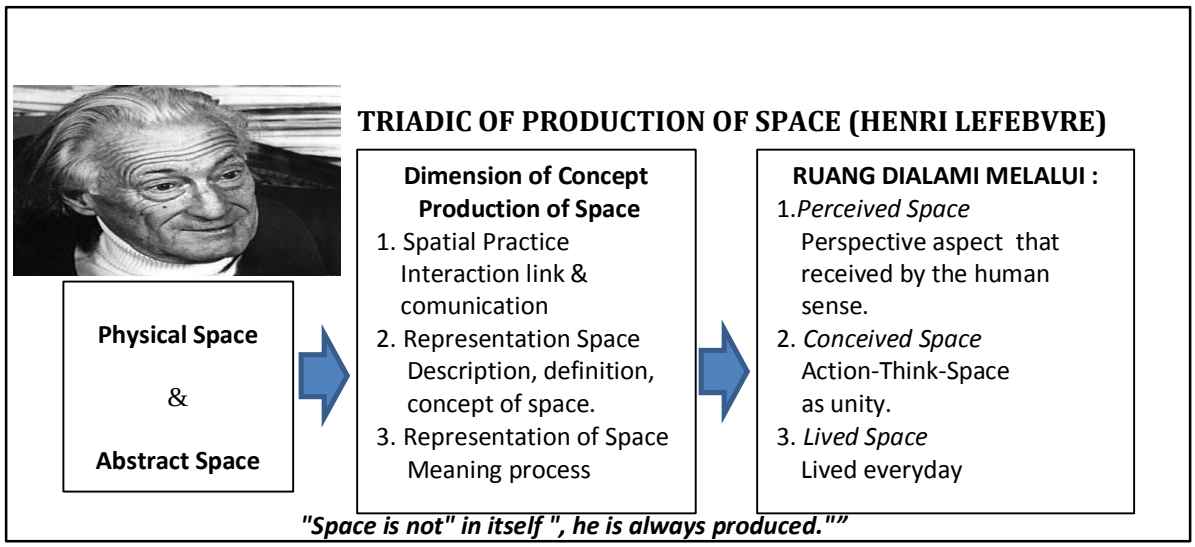


Figure 2. Triadic Concept of Production of space (Henry Lefebvre).

f. Types of Social Interaction Activities

Some outdoor activities according to (Jahn Gehl, 2010) among others necessary, optional, and social activities and acoording to (Amos Rapoport, 1977, p. 19) among others : the activity proper.; 2. the specific way of doing it, additional, symbolic activities. In this research, necessary activities and the activity proper can be said as the main activities. The dominance of activity in this study is the main activities like daily needs ; foraging, laundry, go/from the campus, typing/photocopying near where they live or campus.

3. Research Methodology

3.1. Research Method

Considering the research objectives and the interrelationships between cases, there are research variables that can already be shown, placing the object of the study as the case, as well as the research question "how" in the research question, then selected research qualitative methods (according Singarimbun and Effendi, 1995) research variables with hypothesis tesa test/preposition is explanatory case study research method.

3.2. Sampling

Taking into account the tendency of various research objects, the type of sampling in the study is the maximum variation type with the aim of being able to document the diversity of places based on specific characteristics. Researchers took six different case research objects.

4. Analysis

4.1. Analysis of Kampung Location Selection as Research Object

The nine kampung in around the nine university campuses in Jakarta are selected based on the criteria of having more than one achievement, the kampung first existed rather than the campus, there is a commodification of its public open space, the heterogeneity of student activities within the kampung, the dominance of trade activities, the direct achievement from kampung to campus, college student activities in the kampung. The following can be shown the process of each analysis on the kampung in around the nine university campuses.

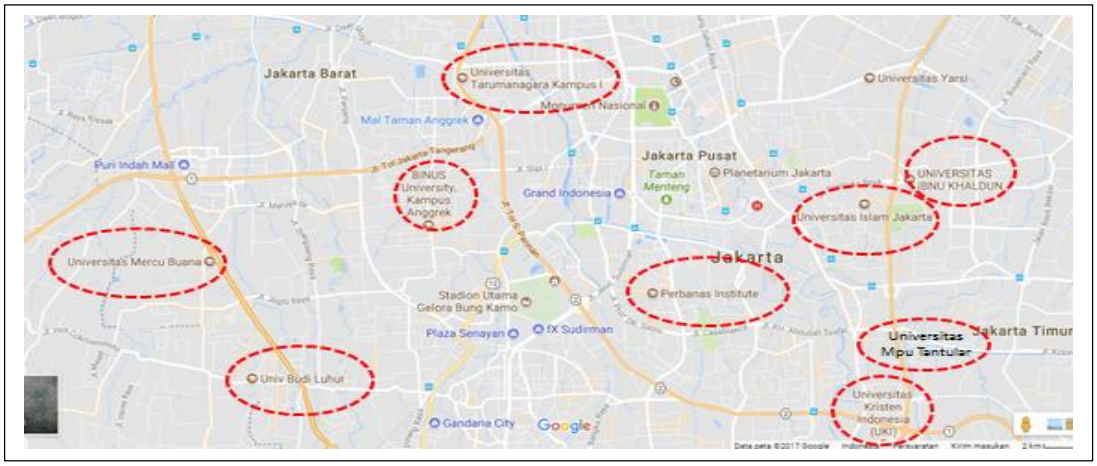
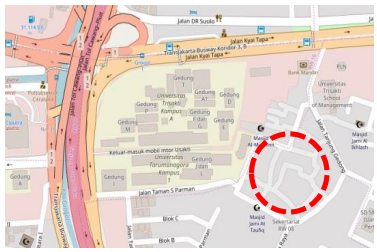
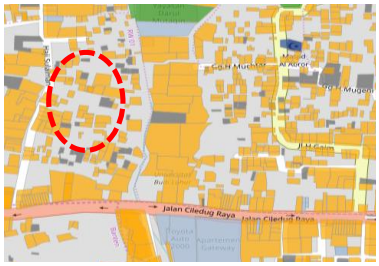
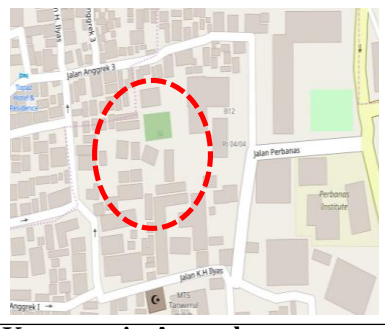


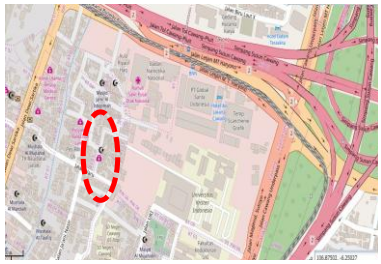
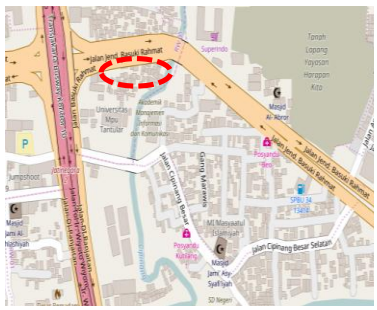
Figure 3. Location of nine university in this research.
Souce : Google map.

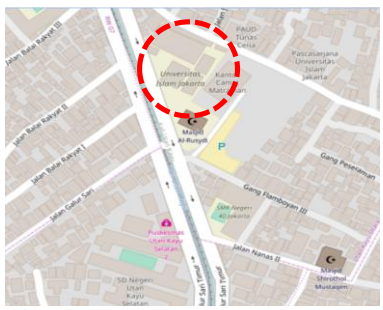
Tabel 1. Analysis of kampung location selection as case study.
Source (Map) ; Landing Map Badan Pertanahan Nasional Republik Indonesia (http://BPN.go.id)

Kampung Alternative	Selection Criteria	Selection Analysis
 **Kampung in Around Tarumanagara University** Population density 1965 = < 200 persons/Ha (Master Plan Jakarta 1965 – 1985)	**Kampung's Type:** -Open Type: has more than 2 achievements to the kampong. -Close there first rather than college. -The commodification of public open space and homogeneity of space occurs by trade activities. -Occurs dominance of commercial / commercial activities. -Have a direct achievement from	**Analysis :** -Kampung is dominated by college student activities. - Commodities occur in public open space and homogeneity of space by trade activities. -Kampung is dominated by college student activities. -Commodities occur in public open space and

Population density 2005=201-300 people/Ha Population density (RTRW Jakarta 2010) = 323 persons/Ha Land use (RTRW DKI Jakarta 2010) or housing. Building Floor Coefisien (RTRW Jakarta 2010) = 1,0.	campus to kampung. -Kampung is dominated by college student activities.	homogeneity of space occurs by trade activities.
 **Kampung in Around Binus University** Population density 1965 = 0 persons/Ha (Master Plan Jakarta 1965–1985). Population density 2005=201–300 persons/Ha Population density (RTRW Jakarta 2010) = 422 persons/Ha Land use (RTRW Jakarta 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 1,0	**Kampung's Type:** -Open type: has more than 2 achievements to the kampung. -Close there first rather than college. -The commodification of public open space and homogeneity of trading activities. -Occurs dominance of commercial /commercial activities. -Have a direct achievement from campus to kampung. -Kampung is dominated by college student activities.	**Analysis :** -Kampung is dominated by college student activities. - Commodities occur in public open space and homogeneity of space by trade activities. -Kampung is dominated by college student activities. - Commodities occur in public open space and homogeneity of space occurs by trade activities.
 **Kampung in Around Mercubuana University** Population density 1965 = 0 persons/Ha. (Master Plan Jakarta 1965 – 1985)	**Kampung's Type:** -Open type : has more than 2 achievements to the kampung. -Close there first rather than college. -Became a low commodity space. -Not a homogeneity of dominated trade space. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities.	**Analysis :** -Kampung is not dominated by college student activities. –No commodities occur in public open space and no homogeneity of space occurs by trade activities.

Population density 2005=101–200 persons/Ha Population density (RTRW Jakarta 2010) = 180 persons/Ha Land use (RTRW 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 1,0		
 **Kampung in Around Budi Luhur University** Population density 1965 = 0 persons/Ha. (Master Plan Jakarta 1965–1985). Population density 2005=101–200 persons/Ha Population density (RTRW Jakarta 2010)= 247 persons/Ha Land use (RTRW Jakarta 2010) = Housing.. Building Floor Coefisien (RTRW 2010) = 1,0	**Kampung's Type :** -Open type : has more than 2 achievements to the kampung. -Close there first rather than college. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities.	**Analysis :** -Kampung is not dominated by college student activities. -No commodities occur in public open space and no homogeneity of space occurs by trade activities.
 **Kampung in Around PERBANAS University** Population density 1965=200–300 persons/Ha (Master Plan Jakarta	**Kampung's Type:** -Kampung Terbuka:has more than 2 achievements to the kampung. -Close there first rather than college. -The commodification of public open space and homogeneity of trading activities. -Occurs dominance of commercial/commercial activities -Have a direct achievement from campus to kampung. -Kampung is dominated by	**Analysis :** -Kampung is dominated by college student activities and office employees. -Commodities occur in public open space and homogeneity of space occurs by trade activities.

1965–1985). Population density 2005=201–300 persons/Ha Population density (RTRW Jakarta 2010) = 325 persons/Ha. Land use (RTRW Jakarta 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 4,0	college student activities and office employees.	
 **Kampung in Around Indonesian Christian University** **P**opulation density 1965 = 0 persons/Ha. (Master Plan Jakarta 1965–1985). Population density 2005=201–300 persons/Ha Population density (RTRW Jakarta 2010) = 325 persons/Ha Land use (RTRW Jakarta 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 2,0	**Kampung's Type:** -Open type : has more than 2 achievements to the kampung. -Close there first rather than college. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities	**Analysis :** -Kampung is not dominated by college student activities. - No commodities occur in public open space and no homogeneity of space occurs by trade activities.
 **Kampung in Around Mpu Tantular University** Population density 1965 = < 200 persons/Ha. (Master Plan DKI	**Kampung's Type:** -Open type : has more than 2 achievements to the kampung. -Close there first rather than college. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities.	**Analysis :** -Kampung is not dominated by college student activities. -No commodities occur in public open space and no homogeneity of space by trade activities.

Jakarta 1965 – 1985) Population density 2005=201–300 persons/Ha Population density (RTRW Jakarta 2010) = 325 persons/Ha Land use (RTRW Jakarta 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 1,0		
 **Kampung in Around Ibnu Qaldun University** Population density 1965 = < 200 persons/Ha. (Master Plan Jakarta 1965-1985). Population density 2005=200–300 persons/Ha Population density (RTRW 2010) = 325 persons/Ha. Land use (RTRW 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 1,0	**Kampung's Type:** -Open type: has more than 2 achievements to the kampung. -Close there first rather than college. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities.	
 **Kampung in Around Jakarta**	**Kampung's Type:** -Open type: has more than 2 achievements to the kampung. -Close there first rather than college. -Have a direct achievement from campus to kampung. -Kampung is not dominated by college student activities.	-Kampung is not dominated by college student activities. - No commodities occur in public open space and no homogeneity of space occurs by trade activities.

Islamic University Population density 1965 = < 200 persons/Ha. (Master Plan Jakarta 1965-1985). Population density2005 = 201–300 persons/Ha. Population density (RTRW 2010) = 253 persons/Ha. Land use (RTRW 2010) = Housing. Building Floor Coefisien (RTRW 2010) = 1,0.		

Kampung changes vary (depending on financial ability, knowledge, awareness, needs, etc.), so not all of the kampungs in around the nine universities in Jakarta (kampung in around Untar, Binus, Mercubuana, Budi Luhur, Perbanas, UKI, Mpu Tantular, Ibn Qaldun and the Islamic University of Jakarta) which made his kampung as a commodity/comodity space. For students who tend to be difficult to interact socially with the environment in the kampung will create a new college student social interaction space produced by trading activities, or created interaction social space for college students in the commodity space.

4.2. Analysis Selection Of Case Study Object

The case study object was chosen based on the specific variation of the building function on the sides of the road, the adjacent building functions chosen as the case study object were:

1. The function of the building as a typing (open/open always) facing the typing (open/always open) with the social interaction space between the street space and the space within the typing.
2. The function of the shop building (semi-open) and boarding house (*kos-kosan*) dealing with residential and boarding house (semi-closed/low transparent fencing) with social interaction space between road space of the fork of road with the front yards house.
3. The function of restaurant and boarding house (high fence/closed) faced with educational building (Kindergarten/semi open/transparent low fence) with social interaction space between the street space with the front yards house.
4. The function of the building where the restaurant and boarding house dealing with the boarding house (closed/massive fence) following shops inside (semi-open) with social interaction space between the road space with the boundary of the fence.
5. The function of the building as a food stall (semi-open) and retail traders in front of the shop (over the road) facing the boarding house (closed/high fence) with social interaction space between the street space with some space inside the food stalls.
6. The function of the building as a cigarette shop under a shade tree (open) with a place of photocopy and book binding (open/without fences) with social interaction space between the cigarette stall limit with space in the place of photocopy and book binding.

Of the six case study objects, the numbers 1 through 4 are in the kampung kemanggisan in around the campus of Binus University and the object case study number 5 and 6 are in the achievement to the kampung grogol in around Untar campus.

4.3. Analysis of Government Discourse on Kampung Research Area.

Based on the master plan DKI Jakarta in 1965 (early development Untar) :

Analysis from planning the function of research area (Untar) for unplanned housing (kampung).

Figure 4 . Master plan DKI Jakarta 1965 – 1985.
Source : Government of DKI Jakarta.

Based On Detail Plan of Sub District Spatial Planning in 2005 :

Land use plan for research area (in around Untar & Binus) in 2005 is for guesthouse area dan facilities.

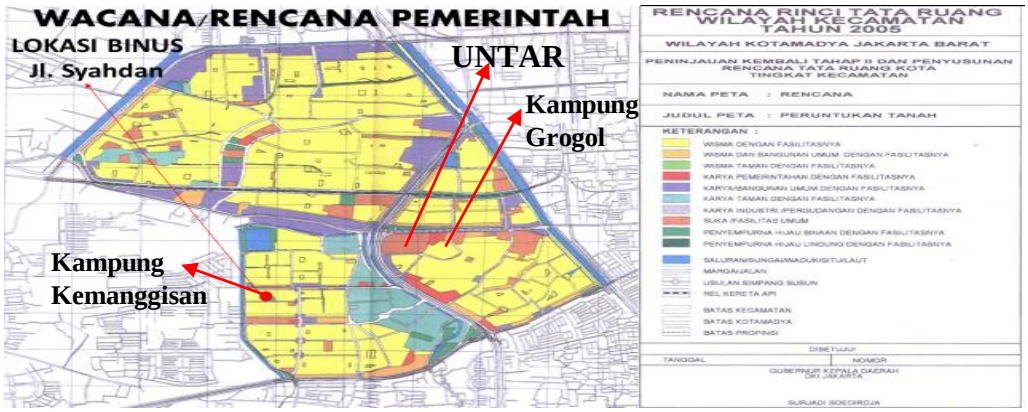


Figure 5 . Detail plan of sub district spatial planning (West Jakarta)
Source : Government of DKI Jakarta.

Based on Municipal Spatial Plan DKI Jakarta in 2010 :

Land use plan for research area (in around Untar) in 2005 is for housing.
Land use plan for research area (in around BINUS) in 2010 is for housing.:

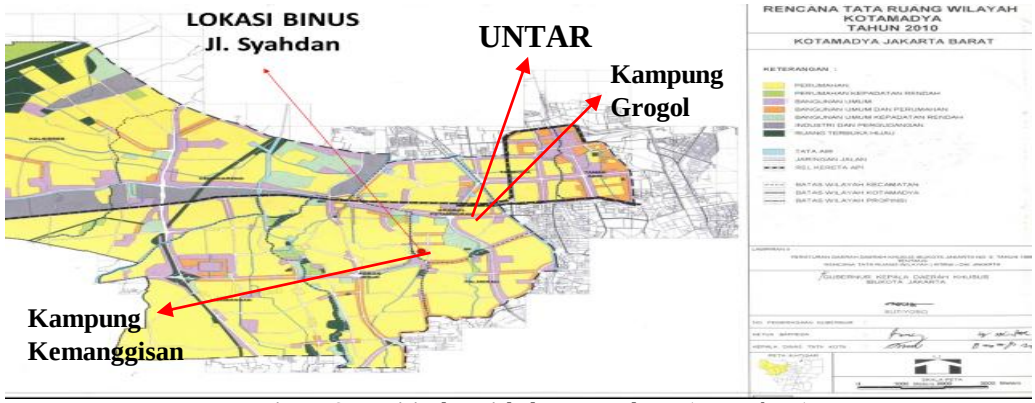


Figure 6. Municipal spatial plan DKI Jakarta (West Jakarta)
Source : Government of DKI Jakarta.

Based on Zoning Plan Grogol Petamburan in 2015 :

Land use plan for research area (in around Untar) in 2015 is for middle housing (R4).

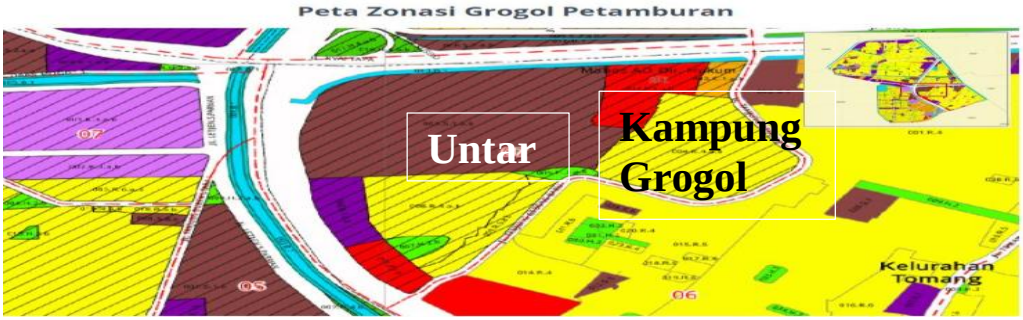


Figure 7. Zonning plan Grogol Petamburan
Source : Government of DKI Jakarta.

Based on zonning plan for Palmerah district in 2015 :

Land use plan for research area (in around BINUS) in 2015 is for middle housing (R4).

Figure 8. Zonning plan PALMERAH
Source : Government of DKI Jakarta.

4.4. Analysis of House Owner's Discourse on Owned Building Functions

The area of the settlement area around the campus which is discouraged by the government is different from what is abstracted by house owner/resident/capital owners/trader/environmental comunity, so the government's discourse collapses by the abstraction of the owner of the house or the owner of the capital where the abandoned area of the kampung is abstracted by the houseowner/resident into sub zone of the big house (R5) and sub zone of trading and low KDB services (K4) or mixed (C1).

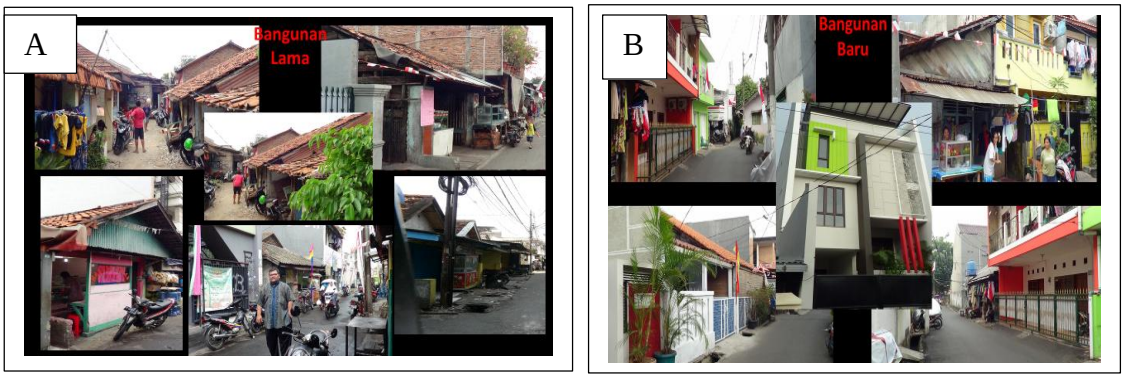


Figure 9. (A) Old building & (B) New building (Owner's discourse on building function.

4.5. Analysis of House Owner's Discourse on Front Courtyard House Function.

Residential area discouraged by the government collapsed to the abstraction of the houseowner who changed the function of the building function from residence into a place to rent (*kos-kosan*), for retail, food stalls, laundry, shops and so forth. Neither on the front yards house should not be built because within the boundary line of the building (*garis sempadan* bangunan) was abstracted by the owner of the house or the owner of capital to be a retail shop, a laundry shop, food stalls, grocery stalls, and so forth.

4.6. Analysis of Citizens and Government Discourse Every day About Public Open Space Functions

Every day, the road area on the achievement to the campus (as in the street of S Parman park on the side of the campus of Untar is abstracted by traders, local residents and local environmental officials, green spaces become stalls (*warung-warung*) and shops as a place to sell food and coffee shop (*warung kopi*)/printing/binding. Abstraction of house owner/resident/capital owners/trader/environmental comunity on his/her house or space that can be assessed more due to besides the urgent need of the college student also because have profit for home owner/capital owners/trader/environmental comunity.

4.7. Analysis Of College Student Activities

Every day (on active lecture), college student activities are dominated by the main activities in around the campus occurring during the day such as searching for food, photocopy and binding, where the dominance of the activity near/campus side (easy to reach) and some enter into the kampung approximately 400 meters from the campus (distance tired of students commuting to campus).

While at the time of the night domination of college student activities there are in around each boarding place (*tempat kos*) in the kampung in around the campus such as looking for food, looking for equipment/equipment tasks or photocopy/binding and find a laundry or laundry.

4.8. Analysis of Production Re/production of Social Interaction Space In The Commodity Space Produced By Government Discourse, Citizens and Student Activities

Based on the history (historicity) starting from the collapse of government discourse to the abstraction of citizens/homeowners/owners of capital/traders to the function of the building, the function of the land in around the campus changed its function by houseowners/citizens/capital owners/environmental community into function as a trade/comodity/space rented.

Commodity spaces result in the production of new spaces on the front yards house, on the streets, the formation of shops above the green spaces of the street by trading activities. The commodity spaces are closer to the daily activities of the college students (especially the main activities such as searching for food, for typing and photocopying/laundering clothes, laundry, etc). There is a new social interaction space that is produced from the main activities of everyday students with trading activities in around the campus.

Activities on commodity spaces (typing, photocopying, binding, food stalls,etc) are near the campus/on campus side only in the morning hours until the afternoon, while activities on the commodity space (typing, photocopy, binding, eating, laundry, gymnasium, barber shop, etc.) located near the boarding house (*tempat kos*) in the settlement activity can start from morning until night even until next morning, and so on.

The following visualization of commodity space production process and the process of social interaction space between college students and non students (traders) in the kampung (in around the campus).

5. Conclusion

Of the nine university in Jakarta, kampung grogol and kemanggisan are selected as kampung that has commodity space where there are homogeneity of trading activities and heterogenity of college student activities. The collapse of the government's discourse on the function of housing in the kampung in around the binus and untar by the abstraction of homeowners/capital owners and community environment due to dominated by factors of student needs in daily activities and opportunities of citizens/traders to seek profit.

The production of social interaction space in the commodity space is produced by the relation between the aspects that effec of commodity space (density of students, there is optimization of land use for function of building/either vertically/horizontally, changes in land use (occupancy to mixed trade), dominance homogeneity of trading activities and heterogenity/various of college student activities in kampung with the main type activities such as to/from campus, foraging (*warung tegal, warung kopi,etc*), looking for boarding house/guesthouse (*tempat kos*), laundry, typing, photocopying, binding, book store, and so on.

References

Antoniades, A.C., (1990). *Poetics of Architecture : Theory of Design.* New York : Van Nostrand Reinhold.
Budihardjo, Eko., (1992). *Sejumlah Masalah Pemukiman Kota.* Alumni. Bandung.
Groat, Linda. Wang, David. (2001). *Architectural Research Methods.* John Willey & Sons ; USA.
Government DKI Jakarta. (1965). *Master Plan DKI Jakarta.* Jakarta.
Government DKI Jakarta. (2005). *Detail plan of sub district spatial planning.* Jakarta.

Government DKI Jakarta (2010). *Municipal Spatial Plan DKI Jakarta.* Jakarta.
Government DKI Jakarta (2005). *Zonning Plan District.* Jakarta.
Gehl, Jahn. (2010). *Cities For People.* IslandPress. London.
Hoed H, Beny., (2002). *Semiotik dan Dinamika Sosial Budaya.* Komunitas Bambu. Depok.
Knox, Paul. Pinch, Steven., (2010). *Urban Social Geography.* Prentice Hall. London.
Lefebvre, Henri., (1992). *The Production of Space.* Routledge. London.
Rapoport, Amos. (1977). *Human Aspects Of Urban Form.* Pergamon Press. England.
Sabaruddin, Arief., (2016). *Permukiman Berkelanjutan. Telaah Psikologi Sosial.* Erlangga. Jakarta.
Setiawan B. Haryadi., (1995). *Arsitektur Lingkungan dan Perilaku.* Dirjen Dikti. Depdikbud RI. Indonesia.
Siahaan, Uras. (2013). *Perencanaan Kota & Permukiman.* Jurusan Arsitektur Fakultas Teknik Universitas Kristen Indonesia.
Snyder, C, James. Catanese, J, Anthony., (1991). *Pengantar Arsitektur.* Erlangga. Jakarta.
Simmel, George ; Fearon., (2004). *The Sociology Of Space, Center for Spatially Integrated Social Science.* Google ; escholarship.org University Of California.
Singarimbun. (1995). *Metode Penelitian Survey.* Jakarta. LP3ES.
Siregar, Aminuddin, Sandi., (1992). *Bandung-The Architecture of A City in Development.* Katholieke Universiteit Leuven Faculteit Toegepaste Wetenschappen Departement Architectuur, Stedebouw En Afdeling Architectuur. Leuven.
Turner. John F., *Housing By People – Towards Autonomy In Building Environments,* Marion Boyars Publishers Ltd, London. 1976.

Journal and Proceeding

Mulyana, Elly. Winarso, Haryo., (2016). *Karakteristik Kampung Kota Di Sekitar Perguruan Tinggi.* Jurnal Perencanaan Wilayah dan Kota B SAPPK V5N2. ITB.
Setiawan, Andi., (2015). *Produksi Ruang Sosial Sebagai Konsep Pengembangan Ruang Perkotaan.* Jurnal FIB. Universitas Sebelas Maret.

Dissertation

Santoso, D Dermawati. (2007). Toleransi Keruangan Dalam Permukiman Padat, Studi Kasus Rumah Kontrakan Kampung Pajeksan dan JokonegaranYogyakarta. Disertasi. Jurusan Teknik Arsitektur dan Perencanaan Universitas Gajah Mada. Semarang. http://forumriset.wordpress.com.

Other Sources.

Badan Pertanahan Nasional Republik Indonesia. (2017). *Peta Pertanahan.* http://BPN.go.id. Google.
Google. (2017). *Google Map.* Google.

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THE IMPROVEMENT OF ECOLOGICAL ASPECT ON POST-URBAN RENEWAL IN PEKUNDEN FLATS, SEMARANG

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Abstract

Urban renewal is one effort to prevent the environmental degradation of city. In the slums, one of the urban renewal efforts undertaken is the construction of flat. Pekunden flat is an urban renewal effort conducted by Semarang government in handling slum settlement. Prior to the flat, the area was a slum neighborhood with low income residents and substandard infrastructure. The purpose of this study is to review the improvement of the ecological/ environmental aspects of slum settlements into flat. The method used in this research is quantitative and qualitative descriptive. The samples taken were 50 respondents from 92 families. The technique used is a questionnaire which is intended to find data on the condition of the house before and after living in the flat. And qualitative used indepth interview to know cause and effect the building. The result of this research is there are some improvement of ecology aspect in this flat, among others are building material, sanitation and energy efficiency aspects. However, there are stagnant aspects of energy efficiency such as aspect of wind sirculation and some aspects that experienced a decrease such as daylight lighting and the use of electronic devices. Overall, the ecological aspect in the flat has improved from the previous house condition and it can be also improve of human life quality.

Keywords: *Ecological Aspect, Flat, Urban Renewal*

1. Introduction

Slum is one of the city's problems in Indonesia. Slum is inadequate settlement due to building irregularity, high building density and quality of buildings and facilities that do not meet the requirements (Law No. 1 Year 2011). Slum conditions caused certainly have a big impact. Some of the problems that often occur due to slum settlements include floods and fires, low health numbers and high crime rates (Prayitno, 2014).

In the effort to overcome slum settlement, the government is trying to do urban renewal that can be done with Kampung improvement Program (KIP), construction of flat, rental flat, simple healthy house and eviction, land consolidation and resettlement (Hariyanto, 2007). In 1990, the city government of Semarang handled

slum in Pekunden. In this case done with the construction of flat. Flat built on densely populated settlements were originally settlements dominated by low income residents with substandard facilities and infrastructure.

The purpose of urban renewal is to improve the social, economic, cultural and environmental quality of the area. This study focuses on aspects of improving the environment quality (Sujarto, 2002). The objective of this study is the physical condition of the environment before and after living in the flat so that the two conditions can be known how the improvement of environment quality in the Pekunden flat.

2. Literature Review

2.1. Urban Renewal

According to Martokusumo (2008), urban renewal is a physical change of the area as a result of changes in the utilization of buildings, land and region. These changes occur due to the needs of economic or social activities. According to Sujarto (2002) urban renewal can be interpreted as an effort to renew the arrangement of city life, which involves the improvement of behavior, life pattern, and way of life through a change of the city arrangement on a socio, culture, economic and environmental of the city scale. Sujarto (2002) said that the essence of urban environmental arrangement mechanism is to enhance or restore the vitality of functional areas, rearrangement of urban design elements, improvement of capability and capacity of urban facilities, prevention of degradation of environmental quality.
From the above statement can be concluded that urban renewal is an effort to change the physical arrangement of the city either the scale of buildings, land and region aimed at improving the quality of life of urban communities both environmental, economic, social, and cultural.

2.2. Flat

Flats is one solution of urban renewal efforts in Indonesia (Hariyanto, 2007). According to the RI Law No.20 Year 2011 the definition of Flats is a multi-storey building constructed in an environment divided into functionally structured sections, both horizontally and vertically and are units that each can own and used separately, especially for shelter equipped with shared parts, common objects, and common ground.

2.3. Sustainable Ecology

Factor in sustainable development on ecological aspects, among others are: (a) Energy efficiency, water and other efficiency resources; (b) Eco-friendly design, using local materials and construction; (c) Sanitation and prevention of disasters and pollution from materials; (d) the use of affordable resources; (e) enhancing resilience and adaptation to occupancy (UN-HABITAT, 2011); bioclimatic design, design with the climate of the locality, and low energy design (Yeang in Titisari, 2012).

According to UN-HABITAT (2011) and Yeang (in Titisari, 2012) the ecological aspects used in the context of this study are (a) the efficiency of energy sources in the dwelling; (b) using local and environmentally friendly materials; and (c) sanitation. In this case, climate-related aspects such as bioclimatic design, design with the climate of the locality, and increased resilience and adaptation to occupancy are not used because the

subject of this study is the inhabitants which will be asked the data of the house condition before living in the flat and thereafter, in addition to measurements of climate-related matters using tools and calculations.

From some of the above variables for the context of this study other than aspects related to climate, the aspects used are the efficiency of energy sources, materials and sanitation. Here is an explanation of these three aspects:

a. the efficiency of energy sources in the dwelling

Energy efficiency in occupancy involves energy efficiency in household needs and building needs. Aspects of efficiency for household needs include the use of electrical energy (Mclean-Conner, 2009); lighting, heating, energy for cooking, cooling (Limmeechokchai & Kusumadewi, 2015). While energy efficiency for buildings such as heating system, wall insulation (solid wall insulation), and roof insulation (Marshall et al, 2016); efficiency of water use and waste treatment (Molinos-Senante, 2016); environment, building orientation, carriage, and lighting (Widayanti, et al, 2013); lighting and exterior for wind circulation (Afgan, 2011); building orientation, radiation control, window placement, reduction of heat transmission (Sanyal, 2011).

b. Using local and environmentally friendly materials

Sanyal (2011) states in selecting sustainable construction materials by evaluating some characteristics such as the use of low-energy materials, low energy structure systems, waste/ recycling materials, local materials so as to reduce transport, more functional windows. According to Siagian (2005) eco-friendly building materials are reusable building materials, material authenticity, realized energy, good material production, avoid the toxic effects of materials, prioritize natural materials, consider the durability of products, buildings designed to be reusable and pay attention to the waste/ disposal of the building at the time of use.

c. Sanitation

Sanitation is the health status of an environment that includes housing, sewerage, water supply and so on (Notoadmojo, 2003). Sanitation is closely linked to improved health by preventing human contact with waste risk through solid waste management, garbage collection, waste water management, and waste treatment (NIUA, 2015).

3. Method

In this research using descriptive quantitative and qualitative method. Quantitative methode is used to know the comparison of old house condition and house in flat. The population that became the sample in this research is the resident of Pekunden flat. Samples taken as many as 50 respondents from 92 families. The data retrieval technique used is a questionnaire that aimed at looking at current home conditions and compared with previous conditions. Qualitative method used to know the cause and effect of building. The technique is indepth interview to residents.

4. Analysis

4.1. Overview of the location and history of the establishment of Flats

Pekunden flat built by the city government of Semarang. This tower aims to relocate the slum settlements in the city of Semarang. The Pekunden flat is located in Pekunden sub-district of Semarang Tengah Semarang, precisely in RT 04, 05 and 06 RW I. This area is located in the center of the city precisely behind the shopping center of DP mall, and the location of Pekunden flat is very strategic, which is located between three

major roads that are Pandanaran street, Thamrin street and Pemuda street. The distance between Pekunden flat with the district government center is 0.5 km while from the central government of Semarang 0.5 km and from the provincial government center as far as 0.5 Km (Monography of Pekunden). Here Figure 1. is the location of the flat Pekunden.

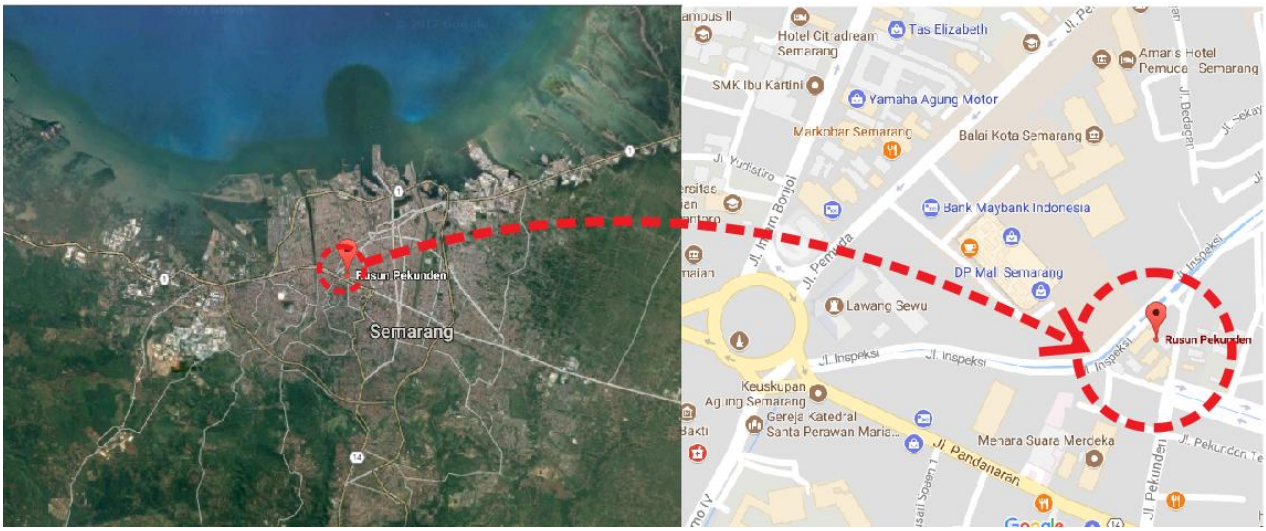


Figure 1. Location of Pekunden Flat

City Planning and Housing Agency (DTKP) Semarang city in 2008 mentioned that the Pekunden flat has an area of 3,889 m2 with a building area of 2,835 m2. This apartment was built in 1990, consisting of 5 blocks with 4 floors. The number of residential units is 92 units, consisting of Type 27, Type 54, and Type 81.

Figure 2. Condition of Pekunden Flat (www.google.com)

This flat is a rental flat. A total of 51 residential units are occupied by local indigenous people or their heirs as compensation from the previous house eviction in the location of the apartment was built. The compensation is valued at Rp.6.000.000, per family.

4.2. Ecological Aspect

a. Energy Efficiency

The survey results show that in the use of electrical energy there is a improvement quality where before living in the flat, there are still some residents who ride to their neighbors. After living in the flat, 100% of the residents are using State Electricity Company (PLN) themselves. All residents used gas for cooking fuel after living in flat, before used kerosene, wood and partly used gas. In terms of use of electronic devices, the increase is very drastic after living in the flat in terms of the use of refrigerators, rice cookers and washing machines (Table 1).

Table 1. Household Energy

	Electricity energy		Cooking fuel			Electronic device			
	PLN	Boarded Neighbor	Kerosene	wood	gas	Refrigerator	TV	Rice cooker	Washing Machine
Before	45	5	35	5	10	2	45	3	1
After	50	0	0	0	50	30	50	30	18

In the use of water energy, for drinking water there is an increase after living in the flat. Residents of flat already using container water or water Local water company/ PDAM (own), whereas before living in rusun still many people who use communal water wells. The use of water for cooking does not increase drastically, because before and after the residents alike use their own water taps and water from communal wells. But the percentage increases on the use of PDAM's own water. (table 2)

Table 2. Drinking wáter and Water for Cooking

	Drinking Water					Water for Coking				
	PDAM's Own	PDAM buy	Own Well	Communal Well	Container Water	PDAM's Own	PDAM buy	Own Well	Communal Well	Container Water
Before	15	5	0	15	10	28	0	0	20	2
After	30	0	0	2	18	33	0	0	17	0

The use of water for washing (Table 3) has increased, the residents have used many PDAMs themselves and some still use communal wells after living in the flat. Unlike the case before living in the flat, only a few residents who use the PDAM itself, some are buying, using their own wells/ communal, even using the river. Yet in this river is still found by residents who throw garbage there.

Table 3. Water for Washing

	Water for Washing				
	PDAM's Own	PDAM buy	Own Well	Communal Well	Lake
Before	15	2	10	20	3
After	33	0	0	17	0

Daylight lighting (Diagram 1) in the living room/ family and bedroom increased, while in the service room decreased. In the living room/ family and bedroom, after living in the tower there are still some residents who

utilize neon lamp during the day, but the amount is reduced from before living in the flat. While in the service room decreased in terms of utilization of natural light.

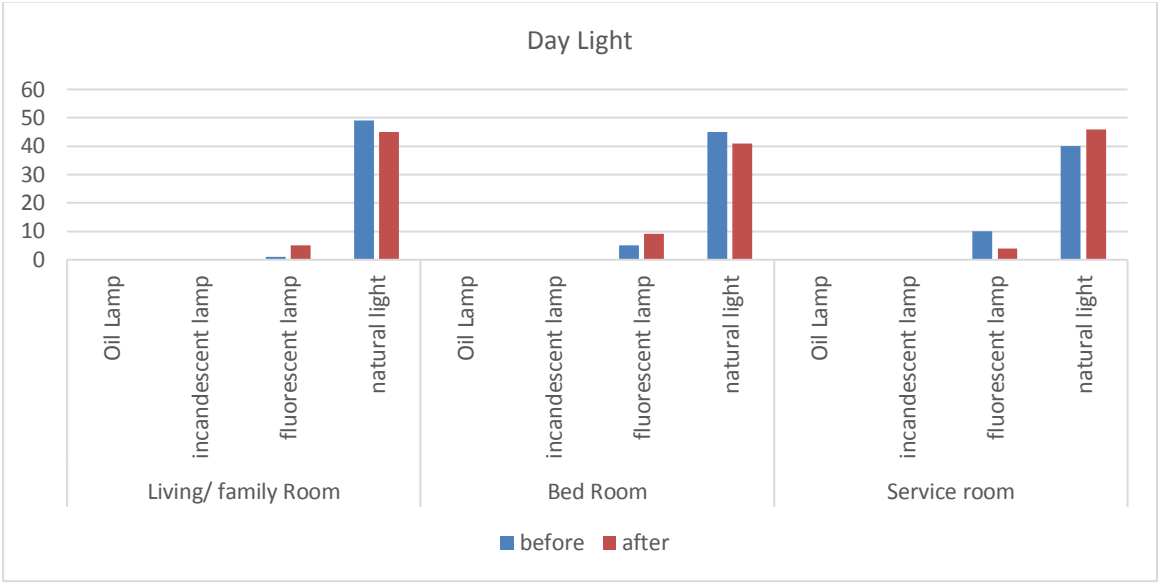


Diagram 1. Day Light

Night lighting (Diagram 2) is all the room has increased after living in the flat. Living room / family and bedrooms use neon lamp both before and after living in the flat while in the service room there are 10% of residents who use incandescent lights before living in the flat.

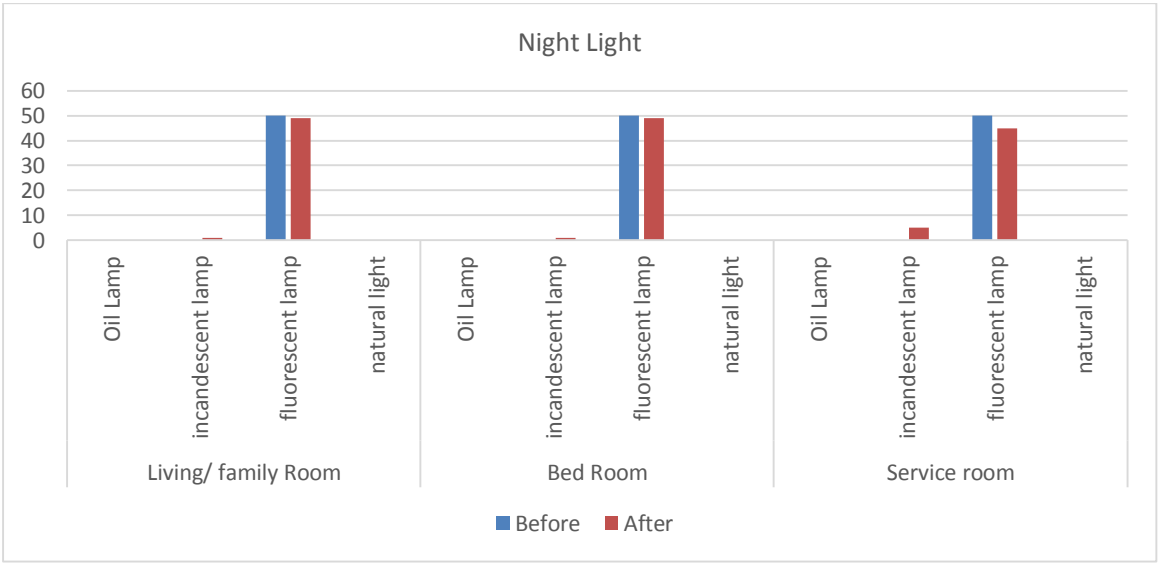


Diagram 2. Night Light

Wind circulation(Diagram 3) in the living room / family and bedroom, the use of the fan there is an increase in capacity after living in flat. While the use of ventilation has decreased. In the service room both before and after ventilation.

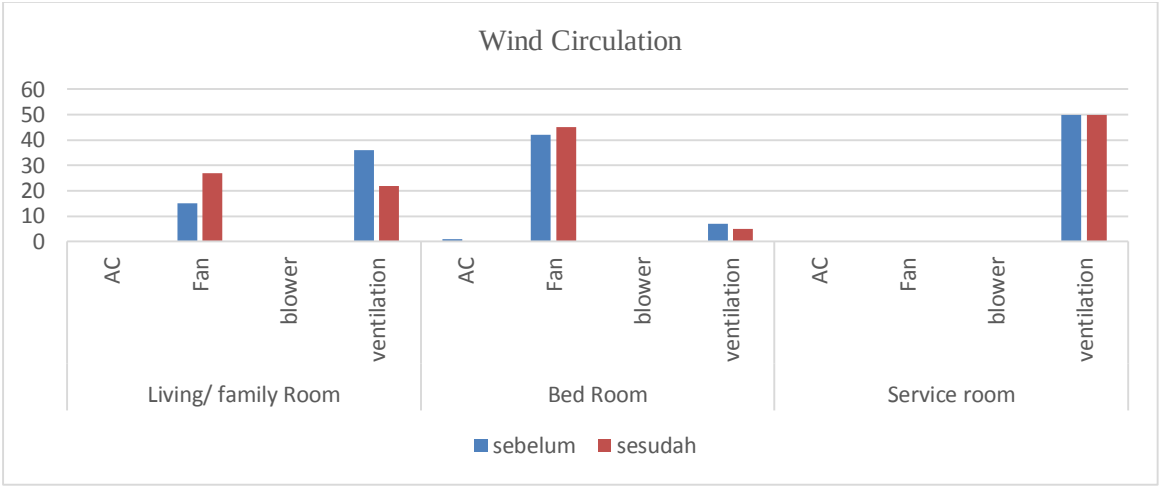
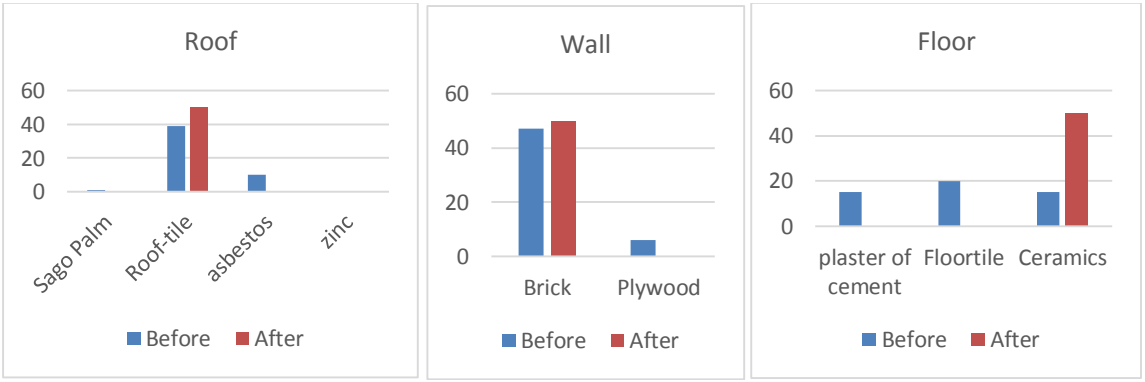


Diagram 3. Wind Circulation

b. Using local materials and construction

On the roof elements (Diagram 4a) have increased which before staying in the flat there are still some people who use asbesto material that is not environmentally friendly. On the use of materials on the wall (Diagram 4b) also increased that is no longer citizens who use plywood. The use of flooring materials in the flat has been using all ceramics, while previously still using stucco, tiles, and some of the ceramics (Diagram 4c).



(a) (b) (c)

Diagram 4. (a) Roof; (b) Wall; (c)Floor

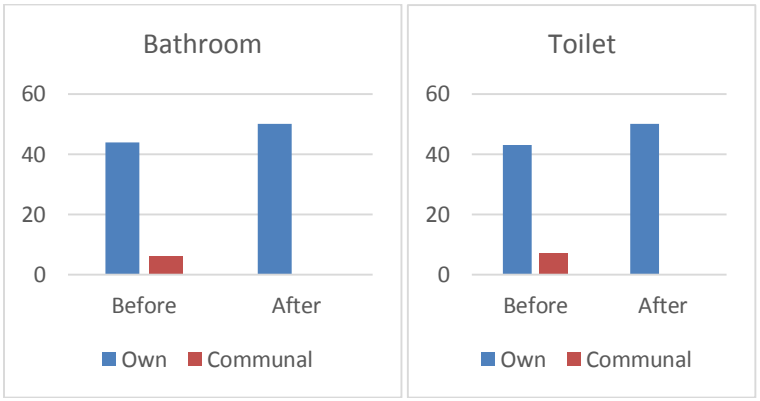
In terms of structure, roof structure material (Diagram 5a) does not change that is using wood. While the material for the main structure (Diagram 5b), before the flat there is still a house that uses a wooden structure. For the foundation (Diagram 5c) before living in the flat there are some people who use stone and bricks, and even some houses that do not use the foundation.

(a) (b) (c)

Diagram 5. (a) Roof Structure; (b) Principle Structure; (c) Foundation

c. Sanitation

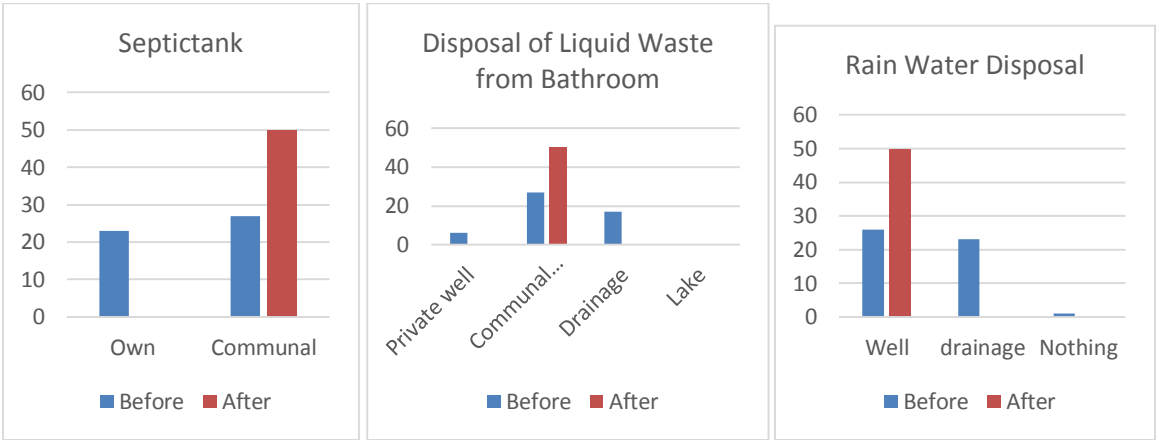
This aspect of sanitation includes the availability of bathrooms, toilets, septictank, disposal of wastewater from bathrooms, rainwater disposal and waste processing. In the availability of bathroom (Diagram 6a), after occupy the flat, residents get private bathroom facilities. Previously there were some residents who still use communal bathrooms. Neither is the toilet (Diagram 6b).



(a) (b)

Diagram 6. (a) Bathroom; (b) Toilet

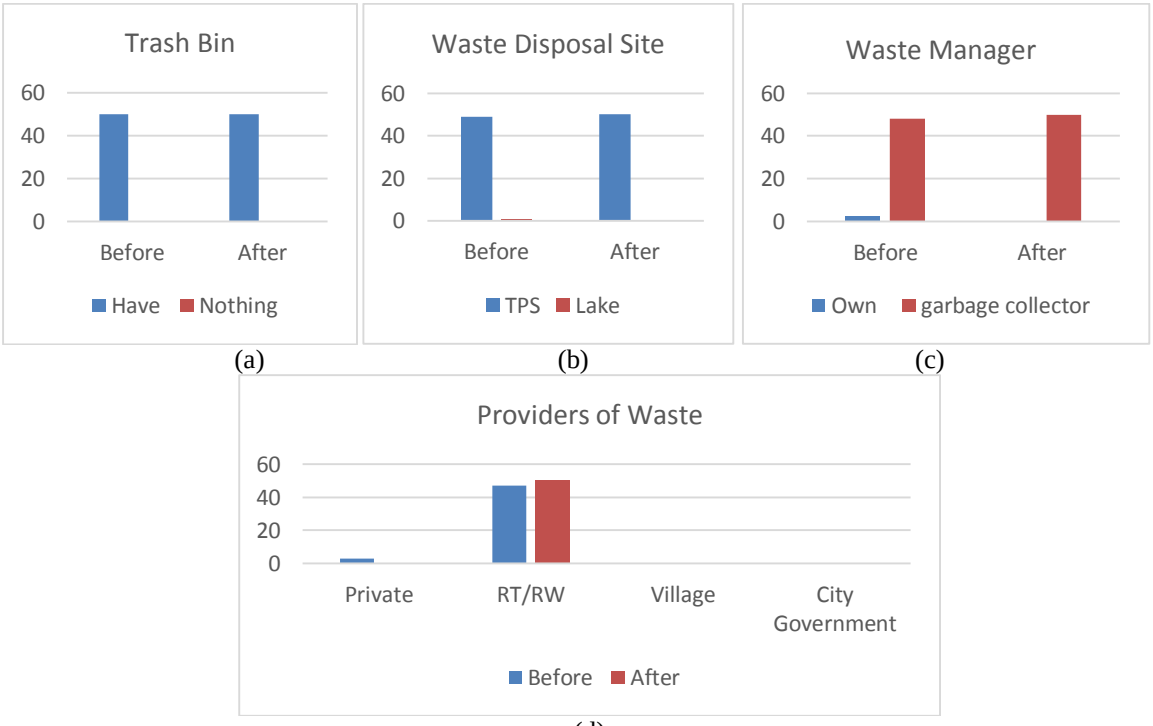
After occupying the flat then for septictank facilities (Diagram 7a), the disposal of liquid waste from the bathroom and rainwater disposal is held communally. Before living in the flat, septictank and disposal of liquid waste from the bathroom most of the residents use communal facilities. Some others use private septictank and for disposal of wastewater using drainage and private absorption wells (Diagram 7b). For rain water disposal facilities using absorption wells, drainage and some houses there are no such facilities (Diagram 7c).



(a) (b) (c)

Diagram 7. (a) Septictank; (b) Disposal of Liquid Waste from Bathroom; (c) Rain Water Disposal

In the waste processing both before and after living in the flat, there are trash facilities in each house. The average waste disposal site is located directly in the garbage dump/TPS, but before staying in the flat some residents still throw garbage in the river. In managing waste is done by garbage man who provided by neighborhood Association/ RT. While still in the slums only a few people who manage the garbage personally.



(a) (b) (c)

(d)

Diagram 8. (a) Trash Bin; (b) Waste Disposal Site; (c) Waste Manager; (d) Providers of Waste

5. Discussion

In the aspect of residential energy efficiency in the towers, natural lighting is less optimized, so there are still many houses that turn on the lights during the day, but before living in the flat most can optimize natural lighting. Lack of openings and the presence of factors coinciding with other houses make some parts of the house feel dark. This causes the use of electricity increases, which the use of artificial light is making energy waste. The use of the type of lights, residents have switched using fluorescent lights. Fluorescent lamps are very environmentally friendly. Neon lights produce lower heat and contribute to the reduction of global warming and are relatively inexpensive (Lechner, 2001). Previously people are still using incandescent lamps where this lamp is one source of lighting that produces a high enough heat and the incandescent lamp life is shorter than fluorescent lights so that more quickly die.
Wind circulation aspects before and after not seen a significant increase. Natural wind circulation less optimized in this tower so that the fan becomes an urgent tool that must be owned every home. the use of a fan is a way that does not have a bad impact on environmental quality compared to the use of air conditioning. The use of the fan will reduce the efficiency in the use of electricity. The existence of fan use in the tower is caused because the temperature in the towers unit is quite hot. Although each unit has used a cross ventilation system but it does not have a significant effect. The low airflow in the unit is due to the many partitions that are made by the occupants, so that the inter-ventilation can not work optimally.

In terms of electrical energy, every home already uses PLN and owns its own. It is intended that residents have full responsibility and authority to manage their electricity needs. The use of electronic equipment such as rice cooker, refrigerator, washing machine is increasing so that this impact on the energy consumption will continue to grow. Excessive use will lead to waste of electrical energy that will also impact on the economy of society. However, the increasing use of electronic devices does not mean a decrease in environmental quality. Because although increasing the amount of electricity energy consumption but basically it can improve the efficiency of human energy, so that residents can improve the quality of life with more productive.

The use of energy for cooking all already use gas stove. Before live in flat many residents still use kerosene stove. This is an increase because gas stoves are more efficient and can cause less pollution than kerosene stoves. In the case of water use for drinking, cooking, and washing, flat has provided clean water sourced from PDAM that has been provided by the flat manager so that residents are no longer using river water. This is an improvement in the quality of the environment because people will be protected from various diseases caused by the dirty water of the river.

The success of this sustainable ecological aspect is also evident in the use of building materials for occupancy. Because there are some residents who used to live in non-permanent and semi-permanent dwellings whereas now respondents have occupied more permanent dwellings. The building materials used in the flat on the roof using tile, the floor uses ceramics, the walls using bricks, roof structure using wood, and the foundation using a pile. The materials mentioned above are local materials and very environmentally friendly. Cement, ceramics, brick, aluminum, glass, and steel as the main raw material in making a building plays an important role in realizing the concept of environmentally friendly buildings. Like walls, Wall materials are selected that are able to absorb the sun's heat well. Natural bricks or light brick fabrication (mixture of sand, limestone, cement, and other materials) has the characteristics of fire resistance, strong to high pressure, low water absorption, soundproof, and absorb the sun's heat significantly. Flat materials using raw materials provided by the previous government in accordance with the ability and standard of living.

In terms of sanitation, sanitation in Pekunden is now very neat and the final disposal facilities are communal to facilitate both the work and maintenance. The existence of a communal final disposal facility makes residents have equal facilities, so there is no longer a citizen who does not have septictank. This is one of the

measures to prevent environmental pollution caused by waste from septic tank. In the bathroom and toilet facilities of each house have been provided privately, no more residents who do not have a private toilet facility. This will increase the quality of the environment because by facilitating private toilets people will be responsible with their ownership and use communal facilities if there is urgency. Because if not facilitated it will arise problems such as lack of self-belonging in public facilities so that there is slum. In addition, the waste management has been well organized where there are garbage suppliers provided by the RT who transport garbage every day from the flat to the TPS. This is an increase as residents no longer dump their garbage in the river.

6. Conclusion

Flats as a form of urban renewal in order to realize a decent, confort, clean and affordable residential environment for low-income people. Based on the survey conducted on the three aspects of energy efficiency, materials and sanitation, it can be concluded that

1. The material and sanitation aspects have increased significantly, while the energy efficiency aspect there are several aspects that have decreased like light and wind circulation. That cause is the unit stack, so just rely on aparture from the front and rear wall. In addition with the barriers of room that make the aperture is not maximal.
2. Increasing the standard of living of the community leads to an increase in the need for household appliances that have an impact on energy. Consumption of energy greater than before does not mean further reduce the quality of the environment, but there are other things that are prioritized that is to improve the efficiency of human power, so that residents can be more productive.
3. By living in flats, people are proven to have a better quality of life. This can be seen from previously only using semi-permanent or non-permanent materials, now people can have a house with a permanent and better material condition.
4. In previous dwellings, some residents do not have private toilets. Now residents already have private toilets in each unit of the house. This can improve the quality of the environment because citizens will have self-belonging and responsibility for ownership. As well as communal final disposal facilities can facilitate in terms of workmanship and maintenance.
5. Increasing the quality of the environment will increase the quality of life of the community

References

Afgan, Naim Hamdia. 2011. Sustainability Concept for Energy,Water and Environment Systems. Survival and Sustainability, Environmental Earth Sciences, 447-470. DOI 10.1007/978-3-540-95991-5_41, C _ Springer-Verlag Berlin Heidelberg

Hariyanto, Asep. 2007. *Strategi Penanganan Kawasan Kumuh sebagai Upaya Menciptakan Lingkungan Perumahan dan Permukiman yang sehat (Contoh Kasus: Kota Pangkalpinang).* Unisba Jurnal PWK Unisba

Lechner, Norbert. 2001. Heating, Cooling, Lighting : Design methods for Architects. John Wiley & Sons Inc (ed). Jakarta : PT Rajagrafindo Persada.

Limmeechokcai, Bundit & Kusumadewi, Tri Vicca. 2015. Energy Efficiency Improvement and CO2 Mitigation in Residential Sector : Comparison Between Indonesia and Thailand. Elsevier. Energy Procedia (79), Hal. 994 – 1000. International Conference in Alternative Energy in Developing Countries and Emerging Economies. DOI : 10.1016/j.egypro.2015.11.559.

Marshall, Erica et al. 2016. Combining Energy Efficiency Measure Approaches and Occupancy Patterns in Building Modelling in the UK Residential Context. Energy and Building (111), Hal. 98-108. Elsevier. DOI : 10.1016/j.enbuild.2015.11.039.

Martokusumo, Widjaja. 2008. *Revitalisasi, Sebuah Pendekatan dalam Peremajaan Kawasan*. Jurnal Perencanaan Wilayah dan Kota, Vol. 19/No.3 Desember 2008, 57-73

Mclean-Conner, Penni. 2009. Energy Efficiency : Principles and Practices. Oklahoma: Pennwell Coorporation. ISBN : 978-1-59370-178-9.

Molinos-Senante, Maria et al. 2016. Assessing the Efficiency of Chilean Water and Sewerage Companies Accounting for Uncertainty. Elsevier: Environmental Science & Policy (61), Hal. 116-123. http://dx.doi.org/10.1016/j.envsci.2016.04.003.

NIUA (National Institute of Urban Affairs). 2015. Urban Sanitation. India.

Notoatmodjo, S. 2003. *Pengembangan Sumber Daya Manusia*. *Edisi Revisi*. Jakarta: Penerbit PT. Rineka Cipta.

Rina Widayanti 2013. *Kajian Aspek Pemakaian Energi pada Sistem Bangunan Tradisional Jawa*. UG Jurnal Vol. 7 No. 06 Tahun 2013

Sanyal, Debashis. 2011. Role of Renewable Energy in Development of Self Sufficient Housing in Developing Countries. Survival and Sustainability, Environmental Earth Sciences, hal 425-434. DOI 10.1007/978-3-540-95991-5_39, C _ Springer-Verlag Berlin Heidelberg 2011

Siagian, Indira Shita. 2005. *Bahan Bangunan yang Ramah Lingkungan (Salah Satu Aspek Penting dalam Konsep Sustainable Development)*. E-USU Repository. Universitas Sumatera Utara

Titisari, Ema Yunita, dkk. 2012. *Konsep Ekologis pada Arsitektur di Desa Bendosari*. Jurnal RUAS, Volume 10 N0 2, Desember 2012, ISSN 1693-3702

UN-HABITAT. 2011. Sustainable Housing for Sustainable Cities.

UU No. 1 year 2011 about *Perumahan dan Kawasam Permukiman*

Prayitno, Budi. 2014. *Skema Inovatif Penanganan Permukiman Kumuh*. Yogyakarta: Gajah Mada University Press.

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