



## Global Journal of Scientific Researches

Available online at [gjsr.blue-ap.org](http://gjsr.blue-ap.org)

©2013 GJSR Journal. Vol. 1(2), pp. 52-59, 12 December, 2013

# Transformation Concept of Sustainable Architecture for Middle Income House in Indonesia since 1980 TILL 2012

Putri Suryandari, ST.M.Ars

Senior Lecturer at Architecture Department- Faculty of Engineering Budi Luhur University, Pakistan

Corresponding Author: Putri Suryandari

Received: 22 November, 2013

Accepted: 30 November, 2013

Published: 12 December, 2013

---

### ABSTRACT

Interested in the issue of Green Architecture concept that applied in Jakarta – Indonesia since 1980s, then I need to know, how far the concept was develop at middle income house since 1980s till 2012. Whether during the past 30 years, the application of "Green Architecture", "Eco-Architecture" or "Sustainable Architecture has the stronger becomes the basic concept of middle-income housing development group or just do not work out as desired by the idealism that figures to save the environment and building? The fact that in our country socially, knowledge of the community about architectural design development is like there is a missing link. These concepts just stopped in academic, professional, and community groups that close with an Architect. So even though the experts had been put forward Architects environmentally friendly problems in housing, but often people do not or do not even know the progress of the issue. People who build their homes without an architect and that nearly 70% of the total, currently only know that a trend concept post-traditional architecture is Modern and or Minimalist Architecture. These two concepts are very well known and favorite design choice communities throughout Indonesia. This research will analyze the sustainability concept of sustainable residential architecture middle income in Jakarta, the various forms of transformation, adaptation and renovation of house, from its constructions to the present. An observation area will be taken randomly in the middle class residential community in Indonesia, particularly randomly at Jakarta, Solo, Tangerang and Bali. Pursuant system operational to research, a research type is Descriptive by Survey Method, data research obtained from observation. Pursuant to procedure of research step, method of research is qualitative, with Deductive Empirical method. Deductive Empirical method is knowledge analyzing theory with existing fact, so that can be formulation a new theory.

**Keywords:** *Middle income house, sustainable architecture, green architecture.*

©2013 JAAS Journal All rights reserved.

---

### INTRODUCTION

The concept of "Sustainable Homes" cannot be separated from a "Sustainable Development" or "Sustainable Development" is disclosed in the Report of the World Commission on Environment and Development in 1987. The concept of "Sustainable Development" can be defined simply, "Development that meets the needs of the present without compromising the ability of future generations to meet their needs in the future."

Furthermore, the concept of Sustainable Development is an approach to sustainability that are integrated with 3 main aspects to be considered, Economic Aspects, Social Aspects and Environmental Aspects. This means that the choice of Sustainable Development strategy must also consider the affordability aspects of economic, social acceptance and friendliness to the environment. Although difficult, it can be re-developed for applications "Sustainable Homes."

"Green Architecture", "Eco-Architecture" or "Sustainable Architecture" movement, has given to the housing variant in Indonesia since the 1980's with figures YB Mangun Wijaya, Heinz Frick, and Eko Prawoto. In the 1990's including by Jimmy Priatman, Ridwan Kamil, Budi Faisal and others. On the other hand, the development of "Contemporary and Modern Minimalist Design" which was pioneered by the 1990s-era AMI also encourages the development of a concept on the market.(Tjanuwidjaya Gunawan, 2010).

Interested in the issue of the application concept of Sustainable Architecture, then there is a strong desire to know how far those concept have been developed for medium class house in Jakarta from the year 1980 to 2012. Whether during the past 30 years, the application of "Green Architecture", "Eco-Architecture" or "Sustainable Architecture has been getting stronger or do not work out as desired by architects who has been pionir in saving the environment.

Housing systems in Indonesia have two systems, there are systems Autonomous and heteronomous. Autonomous systems are systems that do alone in locally and self-governance. While heteronomous is a system that was developed centrally. Usually the plan, and manage the construction is done entirely alone in the autonomic system. While the heteronomous systems, most of which the government was making plans, construction and manage.

The problem is in our country socially, knowledge of the community about architectural design development is like there is a missing link. These concepts just stopped in academic, professional, and community groups that close with an Architect. So even though the experts had been put forward Architects environmentally friendly problems in housing, but often people do not or do not even know the progress of the issue. People who build their homes without an architect and that nearly 70% of the total, currently only know that a trend concept post-traditional architecture is Modern and or Minimalist Architecture. These two concepts are very well known and favorite design choice communities throughout Indonesia.

In addition, the regulation of housing and settlement development in Indonesia, depending on the political leadership and stakeholder power. From the era of President Suharto (1966 - 1988) until the Reformation era (1999 - present), legislation that created cause different traditions in the variety of forms of housing in Indonesia. (Putri Suryandari, 2007)

Transforming shapes in architecture is above all a result of socio-cultural processes. Transformation in architecture must go through a long process and adapted to the development of new cultural values that arise in life. In terms of the building there is a physical development based on the mindset of the people who keep changing according to the changing times, social status, followed by the need for space.

How does the concept of Sustainable Architecture Transformation forms that appeared in since 1980 to 2012 at the residence of the middle class in Indonesia, especially those doing construction and manages autonomously?

#### ***Problems identification***

How does the concept of Sustainable Architecture Transformation form that emerged in the years from 1980 to 2012 at the residence of the middle class in Indonesia, especially those that perform and manage autonomously construction?

#### ***Research Objective***

A. Discuss the shape transformation, adaptation and renovation, in applying the concept of Green Architecture / Sustainable Architecture, at middle income houses.

B. Discuss the concept of a form of housing that is currently the benchmark for middle-income people

### **LITERATURE STUDY**

***Mix and Match Traditional and Modern Technology, Toward Sustainable Architectural Housing in the Tropics Area (Putri Suryandari, 2007).***

Nowadays environmental concerns have become more important at the local, regional, and global level. The facts have shown that our planet is facing problems regarding the degradation of environment and it has a tendency to grow. Looking cost and environmental factors, more attention need to be drawn on the development of sustainable buildings material and technologies.

Traditional housing culture building conserved resources, environment and natural ecosystem. The geographical condition gave birth to the housing forms that fit to the condition of regions. Modern trend in building construction is to provide durability and comfort at the cost of natural degradation. The development of new building technologies often push us to ignore the balance of nature which resulted in environmental degradation, global warming, ozone depletion and rapid growth in greenhouse gases.

Housing settlement with mix and match traditional & modern technology is not cost effective and resistant to natural hazards but will also help to maintain a concept of traditional architecture in the region. The innovation in design and construction coupled with mix and match technique will leads towards the ideology of sustainable development in the housing sector.

Result of The Concept Design criteria for sustainable housing in the tropics area are,

- a. Lay out plan increasing a sun light

Geometry matters a lot in sustainability and over all construction cost of the building construction. If a housing scheme is going to be constructed and instead of rectangular plot, square plot are given then the covered area remains the same but perimeter of square is 20 percent lesser. In this case overall cost of construction may be reduced by the 30 percent.

- b. Minimum 4 m distance between houses to airflow
- c. Keep Cool and dampness decrease a house with Raised-floor construction, Steep Roof and Long over hang

- d. Solar radiation kill fungi and insects
- e. Use Local material: bamboo, wood, etc.
- f. Vegetation plan in surrounding
- g. Leading towards total sustainability zero energy

### ***Disharmony In Space Of Authorization On Settlement And Urban Facility (Putri Suryandari, 2010)***

#### ***Sukarno era***

There is disharmony in the design of urban facilities with a design of settlements. Emphasize the use of city facilities concepts of Modern architecture, while the housing and settlement facilities are still strong cultural and traditional characteristics, although some are beginning to mix with modern elements.

Housing is still much use of semi-permanent wall (60%)<sup>5</sup> in accordance with the existing climate and tradition. The Most construction materials from wood to almost all islands in Indonesia.

The cause of this disparity is one of regulation of housing design does not show a clear phasing.

#### ***Suharto Era***

The Accordance its philosophy to use a national identity without abandoning the development of technology, Design of cities in the Soeharto era facility will still use a total concept of Modern Architecture. While the design of housing and residential facilities are more often used a combination of modern and traditional elements. But the modern design elements on the housing here is more dominant in big cities than in the area.

In big cities likes Yogyakarta and Bali in the year 1988 - 1995, fairly thick cultural element in the mix with modern elements, especially at city facilities such as government offices and hotels. In Bali it has made regulations that require the use of local design concept in physical development in all fields.

Noted that uses solid wall housing in this era of increasing (50% in 1995 increased to 60% in 2000)<sup>6</sup>. The gap between the design of cities and settlement facility is not too sharp.

Regulation in the housing sector in this period clearly phases, although in this stage there is still lack of harmony with the concept of housing design, urban facility design.

The development of residential facilities such as shopping centers and mall modern concept, good shape and service had been subjected to violence in the year 1998, in the form of arson and looting the facility by the grassroots, in all cities in Indonesia. It seems that people do not easily accept this modern facility as part of their needs.

#### ***Reform Era***

In the era of the Reformation the condition of economic policy, social and political philosophy that is incompatible with the desired changes of the reform era. Design concept development of city facilities, housing and settlement facilities in fact have the harmonization or alignment with the increasingly towards the use of the concept of modern and post modern architecture is maximal. The design of the facility leading to the International Style, Housing design and settlement facilities showed that the more massive and solid (80% using solid wall construction), little ornaments, but mixed with a bit of local characteristics. Mall, hypermarket, cafes and entertainment venues increase their growth.

Regulation in the housing sector does not have stages, like in the era of Suharto is strong enough. Form design of housing and facility of settlement suppose like people of Jayaw wearing blanking but complete coat.

Disharmony is between the philosophy of the reform era with a sign and symbol designs that emerged at that time. It's visible that there is no development in the development of design concepts for both urban and residential facilities.

### ***Whether saving money with my Green house? (Gunawan Thanuwijaya, 2012)***

According to Gunawan Tjanuwijaya, Green architecture movement for housing applied by the developer and planners, much from economic concepts. The use of solar panels and green roof technology, it makes the budget for housing increases. Expectation that the application of the concept back to nature is not applied correctly.

61st World Congress of FIABCI in Bali using the theme "Save the World: Green Shoots for Sustainable Real Estate" has been changed at least the perception of the developers to develop a green property. But unfortunately many approaches "Green Homes" allegedly done to get higher profits from the sale and instead apply the concept of "Sustainable House" or "Sustainable Homes" entirely.

Neglect of the economic aspects in the planning and design of "Green Homes" may cause the application of the above concepts. This is because 60% of Indonesia can't reach the property. Instead the application of "Green Homes" half-hearted will also increase the severity of environmental problems in Indonesia.

Application planning and home design that integrates with the appropriate technology may be the solution to overcome this. The use of bamboo houses plaster has become a solution for eco-friendly housing but still affordable. Instead Flats environmentally friendly can also be a solution for the dense urban areas of Indonesia.

Other solutions such as "Low Impact Development" that collects rain water, recycle water and treat waste water also are able to overcome the problem of high cost of "Green Homes."

For the record, a variety of appropriate technology has been investigated by the research and education institutions such as the Center for Housing, LIPI, ITB, UGM, Univ. Catholic Soegijopranata and Environmental Bamboo Foundation. But unfortunately the technology is not developed due to lack of feasibility studies and the reluctance of employers to use the property and supplyeer concept - this concept.

Finally, it can be concluded that the "Green Homes" should not be applied to the half-hearted. Instead there is hope to implement "Sustainable and Affordable Homes" if all parties want to use the concept of "Low Cost, Low Technology, Low Negative Impact Development" or "Low Cost, Simple Technology and Positive Impact on the Environment."

## RESEARCH METHODOLOGY

Pursuant system operational to research, a research type is Descriptive by Survey Method, data research obtained from observation. Pursuant to procedure of research step, method of research is qualitative, with Deductive Empirical method. Deductive Empirical method is knowledge analyzing theory with existing fact, so that can be formulation a new theory. Sustainable Residential Concept Theory in the Tropics, a theoretical basis for analysis of the transformation of the concept and form of the house, in the middle income society in Tangerang, Ciledug, Jakarta, Solo and Bali.

Quantitatively, the percentage of transformation uses the concept of Sustainable Architecture at the middle-income people will be analyzed from the beginning of development until now.

The calculation is to determine how much change occurring form and the concept of what is now in use by the community.

## DISCUSSION

### *Transformasion Concept Of Sustainable Architecture In Indonesia Analisis since 1980 till 2012*

According to other research Putri Suryandari (2007), the concept of sustainable residential design for tropical regions is as follows :

- a. Lay out plan is rectangular
- b. Minimum 4 m distance between houses to airflow
- c. Steep Roof and Long over hang
- d. Use Local material : bamboo, wood, etc.
- e. Vegetation plan in surrounding
- f. Leading towards total sustainability zero energy

Based on the object of study is as much as 80 residential units located in the area, Jakarta, Tangerang, Jajar (Solo) and Tenganan (Bali). It was first built and the results of renovation, resulting in the transformation of the concept as follows:

### *Housing in 1980<sup>s</sup> – 1900<sup>s</sup>*



Figuer 1. Housing in 1980<sup>s</sup> – 1900<sup>s</sup>

Table 1. Transformasi Konsep Sustainable Housing Rumah Tinggal in 1980<sup>s</sup> – 1900<sup>s</sup>

Konsep for Sustainable Housing	First construction	Transformation	
		Housing concept	(%)
Lay out Plan is rectangular	√	√	100
Distance between houses 4m	√	Less than 4m	60
Step roof and long overhang	√	√	100
Use Local Material	√	Local and central material	50
Vegetation Plan in surrounding	√	√	80
Sustainability zero energy	√	Non renewable energy	50

Based on the results of the survey in Bali, Bogor, Tangerang and Jakarta, home building early to mid-1980s, there are still many who use wood as a construction technology inherited from generation to generation. But since the government made Housing program (National Housing), specification of residential building materials are already using a centralized system, the Indonesian national standard. Adobe building materials, asbestos roof and concrete slabs have become standar construction for lowwer-middle house. Proven respondents in Bogor, Bali, Jakarta and Tangerang are renovating the house in the late 1980s began using this type of technology is relatively similar though construction is still used local materials.

Distance between buildings in the early development is still about 3-4m, but when renovations began less than 3m and buildings getting closer. In early development, systems indoor air can be achieved with natural systems. After 10 years, nearly 70% of homes began to use artificial air system, by using a fan for comfort in the room.

Vegetation plan in surrounding still remained in the houses of the middle class, but the land for vegetation waned, due to the expansion of space requirements.

**Housing type in 1900s-2000s**



Figure 2. Housing type in 1900s-2000s

Table 2. Transformasi Konsep of Sustainable Housing in 1900s-2000s

Konsep for Sustainable Housing	First construction	Transformation	
		Housing concept	(%)
Lay out Plan is rectangular	√	√	80
Distance between houses 4m	Less than 2m	Less than 2m	60
Step roof and long overhang	Less than 1m	Less than 1m	60
Use Local Material	Local and central material	Central material	45
Vegetation Plan in surrounding	√	√	45
Sustainability zero energy	Non renewable energy	Non renewable energy	30

Lay out the shape is still the same, which is rectangular. However, dwindling open space. The distance between buildings is less than 2m. Distance overhang the smaller, less than 1 m. So that the addition of artificial systems, such as air conditioning and a fan more and more. The zero energy sustainability cannot be achieved.

Late 1990s wood technology have started to disappear from the market and the view, but there are still people who use wood mostly local materials for their home, but their use is limited because of the high purchase price. Centralization of residential building materials more easily encountered at an affordable price.

Open land for reforestation, for middle-class housing increasingly limited, in because of the high price of land. In fact, they are has no open space, to grow plants around the house.

**Housing Type in 2000s – 2012s**



Figure 3. Housing Type in 2000s – 2012s

Table 3. Transformation Konsep of Sustainable Housing in 2000s – 2012s

Konsep for Sustainable Housing	First construction	Transformation	
		Housing concept	(%)
Lay out Plan is rectangular	√	√	80
Distance between houses 4m	Less than 2m	Less than 1m	20
Step roof and long overhang	Less than 1m	Less than 1m	20
Use Local Material	Local and central material	Central material	10
Vegetation Plan in surrounding	√	√	30
Sustainability zero energy	Non renewable energy	Non renewable energy	5

Lay out the shape is varied, and the square is a rectangle, but a rectangle is still dominating. Open space is much reduced. The distance between buildings is less than 1m, even leading to a trailer. Overhang distances are also smaller, less than 1 m, even in some houses do not use the overhang. So the addition of such artificial air conditioning and fan the year continues to increase. Sustainability is the zero energy cannot be achieved.

Increasingly seen heavy building materials, namely reinforced concrete, sand, gravel, brick walls, tiled walls and floors. Concrete is the material standard for middle-class homes. Appropriate aesthetics of traditional forms are increasingly forgotten by the people of this group.

Open land for reforestation, for middle-class housing increasingly limited, in because of the high price of land. In fact, they have no open space, to grow plants around the house.

The linear system table in below, the pattern transformation of the house building form the middle class, to describe that;

**Concept Analysis for the middle-income house**

According to John FC.Turner (1972:160) in Johan Silas (2000-V-3), the housing development is an integral part of one's life (family) that can grow and develop appropriate perceptions. The issue of housing and housing for low income people not related to the physical design solution, but rather rooted in the social, economic and political inter-related (Madhu S, 1983).

Based on the results of the survey on which the autonomous communities to build their own home lives, seen some things that become the benchmark in producing the form:

1. Standardization of materials and material issued by the government and industry
2. Visual perception and knowledge of day-to-day are ideal for existing homes in the neighborhood.
3. Elements of cultural elements of the environment.

Shape the middle-income people in Indonesia from the late 1980s until 2012, has close to the same style of architecture. For example, the type of house in Tangerang, Ciledug, Jakarta and Solo, shape similarity is mainly caused due to the uniformity of the use of construction materials and building materials. However, details of buildings in specific areas such as Tangerang some elements of traditional Betawi culture. Modern shapes are simple and do not require complex elements, a visual knowledge of the aesthetic form of the middle-income people

Tahun 1980 - 1900	Th 1900 - 2000	Th 2000 - 2012
<p>Konstruksi Kayu/Tradisional</p>	<p>Konstruksi Batu Bata</p>	<p>Konstruksi Beton/Modern</p>

Only Bali which is still able to maintain the concept of the traditional forms, because for International tourist destination, Bali local government already has very strict building regulations that must be in accordance with traditional culture.

### CONCLUSION

Application concept of Green Architecture or Sustainable Architecture for the middle-income people, from the year 1980 - 2012 the quality is steadily declining. 6 principles of sustainable architecture which is used in the design of houses in Indonesia, the implementation is only a 30% (See Figure 4).

In the table below shows that the condition of housing for the middle of the concept of sustainable architecture in the tropics, the year goes down.

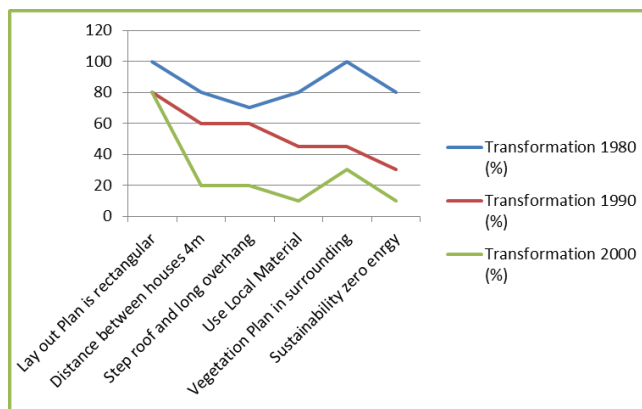


Figure 4. Transformasi konsep Sustainable Arsitektur th 1980 - 2012

The concept of sustainable architecture for middle-lower class housing that popular at this time, can be summarized as follows:

1. Lay out a rectangular plan and vary in terms of length.
2. The distance between the home is less than 1m.
3. Single roof form, using 50cm overhang.
4. Material that is in use, reinforced concrete, brick / block, lightweight steel roof, a roof cover and its variations.
5. Plants in front of the house.
6. Dependence on non-renewable energy sources.
7. Lighting systems and artificial air systems active.

### SOURCES OF REASERCH FOUNDING

The research was funded by the LPPM Univ Budi Luhur, at 6 million dollars. Six-months long investigation.

### REFERENCES

Putri Suryandari ST, Ars M. 2007. Mix and Match Traditional and Modern Technology, Toward Sustainable Architectural Housing in the Tropics, Proceeding 2nd International Conference on Environmentally Sustainable Development ESDev 2007- Abbotabad Pakistan.  
 Putri Suryandari ST, Ars M. 2010. Disharmony In Space Of Authorization On Settlement And Urban Facility, Proceeding 6th EuroSEAS Conference, Gothenberg Swedia.

- Shandra S, Transformasi T. 2009. Ruang Dan Bentuk Pada Interior Tongkonan Di Tana Toraja Sulawesi Selatan, Jurusan Desain Interior, Fakultas Seni dan Desain Universitas Kristen Petra – Surabaya, Jurnal Interior Disain, Juni.
- Thanuwijaya G, Apakah H, Uangku D, Hijau R. 2010. <http://greenimpactindo.wordpress.com/2011/05/25/desain-arsitektur-berkelanjutan-di-indonesia>.
- Tanuwijaya G. 2010. Sustainable Architecture: Berapa Hijaukah Rumahku? <http://greenimpactindo.wordpress.com/2011/05/25/desain-arsitektur-berkelanjutan-di-indonesia>.
- WCED. 1987. Our Common Future: Report of the World Commission on Environment and Development, Chapter 2, Towards Sustainable Development, sumber: [www.un-documents.net](http://www.un-documents.net)