PROCEEDINGS
INTERNATIONAL CONFERENCE

Local Wisdom in Global Era
Enhancing the locality in Architecture, Housing and Urban Environment

21-22 JANUARY 2011
DUTA WACANA CHRISTIAN UNIVERSITY
YOGYAKARTA - INDONESIA

Organised by:
Department of Architecture
Faculty of Architecture and Design
Duta Wacana Christian University
FOREWORD

It is an honour for Department of Architecture, Faculty of Architecture and Design, Duta Wacana Christian University (DWCU) at Yogyakarta, Indonesia; to be the host of CIB International Conference on Local Wisdom in Global Era. The Conference being run by the collaboration among Faculty of Architecture and Design DWCU, Institute of Technology 10 November Surabaya (ITS), International Council for Research and Innovation in Building and Construction (W110 CIB), and Nusantara Urban Research Institute (NURI). The theme “Enhancing the Locality in Architecture, Housing, and Urban Environment” provides papers and presentations on a wide range of topics indicating the breath and scope for both research and teaching within the area of architecture and the built environment.

Actually this Conference would be held on November 26-27, 2010. Due to the eruption of Merapi Volcano since October 26, 2010; especially the most dangerous eruption on November 05, 2010; the Conference has been rescheduled to January 21-22, 2011. We thank you for your kind commitment to this Conference.

These proceedings have been prepared from the papers provided by more than 60 presenters accepted from approximate 135 abstracts from about 10 countries. Finally, on behalf of the Department of Architecture, Faculty of Architecture and Design (formerly Department of Architecture, Faculty of Engineering) we thank you to all contributors to the Conference: CIB, ITS, NURI, the members of Steering Committee and Organizing Committee as well, International Reviewers, all presenters and participants, and last but not least to all members of Duta Wacana Christian University for their generous supports. Without them, this Conference would not be possible.

Prof. Ir. Titien Saraswati, M.Arch., Ph.D.
Dr.-Ing. Wiyatiningsih, S.T., M.T.

Editor
INTRODUCTION

The incongruous impact of globalization towards the existence of indigenous and national resource has gained international interest. Efforts to restore the quality of the threatened environment for the living have raised concerns on finding local strategies to understand and manage the impact world widely. Unfortunately, the most common answer to this situation cannot be done only by a single discipline. In term of design, it is not enough to give solution to the problems unless we deal with the uniqueness of the social, economic, and cultural context of the local community in each country.

One of spatial characteristics of urban areas in developing countries is the emergence of slum areas and squatter settlements which are only seen partly in the urban development. These settlements are occupied by the poor working in informal sectors around the city centre. These people demonstrate great ingenuity in developing their residential neighbourhoods, organizing open spaces and constructing their houses, even though the government views them as illegal. To view the poor not as a problem requires honest and good motivation. This International Conference explores new paradigms which focuses on enhancing and fostering local knowledge and wisdom for sustainable developments in Architecture, Housing, Urban Design as well as Urban and Regional Planning.

AIM AND SCOPE

The Conference discusses and critically examines the phenomena occurred in Architecture, Housing, and Urban Developments within developing countries. Sub-themes might be related, but not limited, to the following topics:

A. Indigenous Architecture as a Basic Architectural Design
   - The use of Local and Recycled Materials
   - Innovative Building Construction
   - Traditions and Vernacular Architecture
   - Sustainable Design and Construction
   - Indigenous Strategy for Disaster Preparedness

B. Informal Settlements as a Basic Development for Housing Improvement
   - Self-sufficient Built Environment
   - Pro-poor Housing Policy, Planning and Efficiency
   - Parametric Computational Tools for Sustainability
   - Total Participatory and Advocacy Development Planning

C. Harmony with Nature for Sustainable Urban Development
   - Assessment for Sustainable Urban Planning and Design
   - Man-made and Natural Environment in Harmony
   - Sustainable Urban Greenery
   - Appropriate Technology for Sustainable Built Environment
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PROCEEDINGS

Local Wisdom in Global Era
Enhancing the locality in Architecture, Housing and Urban Environment

Featured Speakers
INTRODUCTION TO PROCEEDINGS

“Half of humanity now lives in cities, and within two decades, nearly 60 per cent of the world’s people will be urban dwellers. Urban growth is most rapid in the developing world, where cities gain an average of 5 million residents every month. As cities grow in size and population, harmony among the spatial, social and environmental aspects of a city and between their inhabitants becomes of paramount importance. This harmony hinges on two key pillars: equity and sustainability”*

The 3 main topics in the conference “Enhancing the Locality in Architecture, Housing and Urban Environment”:

- Indigenous Architecture as a basic Architectural Design
- Informal Settlement as a basic Development for Housing Improvement
- Harmony in Nature for Sustainable Urban Development

are aligned with the modern thinking that the artificial distinction between so-called Developed and Developing countries is irrelevant when one considers how much the one could learn from the other. We now realize that while technology may be helpful in some circumstances, it is only helpful when it is appropriate technology coupled with equity and sustainability. Some of the best habitations may be ones that use the least technology and are therefore the least dependent on increasingly fragile supplies of water and electricity.

These proceedings will be a most relevant contribution to the further development of the world’s knowledge and technology in support of the much needed improvement of informal settlement and affordable housing.

Wim Bakens
Secretary General CIB

At the beginning of our common era, the world population was roughly 250 million and it took 1600 years to double this number. Today the world population is about 6.6 billion and will rise to at least 9 billion in 2050. This corresponds roughly to the maximum „carrying capacity“ of the globe, which the United Nations have calculated considering all natural resources.

At the beginning of the 21st century mankind has exceeded another threshold. Half of the world’s population is now living in cities, a total of 3.3 billion people, 1 billion in the developed countries and 2 billion in the developing world. Global urbanization has overrun Europe, North America and Latin America in the 19th and 20th century, at the beginning of the 21st century, Africa and Asia are the new focus of global urbanization.

This process goes along with a dramatic transformation from a predominantly rural to an urban society. Cities are growing due to natural population growth and migration from rural areas. Large and dynamic countries like China and India are urbanizing as rapidly as small and traditional countries like Nepal. Kathmandu, three decades ago a traditional palace and temple town, presents all the problems of a growing metropolis today.

Looking at night satellite images we see countless lights, each representing a large, medium or small city. The lights seem to be concentrated in the north, i.e. in Europe, North America and Japan, however, the large majority of urban dwellers lives in the south. There are thousands of small cities in Asia, Africa and South America hardly visible at night, due to the lack of infrastructure and street lighting.

**URBAN DIVERSITY**

The focus of our research is on rapidly growing cities in developing regions, like Mexico City, Rio de Janeiro, Beijing, Shanghai, Mumbai, Kathmandu, Oman, Dubai. Europe, North America, Japan and other highly developed regions are not included. Apart from Addis Ababa, Sub-Saharan Africa is also missing in the exhibition. This is certainly a deficit, because African cities are growing faster than anywhere else.

Looking at the approximately one thousand photos, we see an enormous diversity of urban patterns. To see are not just buildings, streets and townscapes, but many geographical, historical, economic, social and cultural characteristics of the represented cities.

Architects and urban planners are trained to study urban typologies, the exhibition is an excellent opportunity for this exercise: high-rise, high-density cities, low-rise, low-density cities, compact and fragmented cities, homogeneous and heterogeneous cities, checkerboard and organic cities.

The images also indicate the historical layers, i.e. traditional, colonial, modern and post-modern buildings and urban areas, including futuristic skylines like in Shanghai or Dubai. In some cases, the historical layers are spatially separated, in others intensively mixed.
Under an economic and social point of view we find exclusive gated communities, middle class areas, shantytowns and slums. Formal and informal urbanization, social exclusion and inclusion are key words of the current urban debate. However, cities are not strictly dualistic, because there is a broad range of official and irregular, formal and informal developments.

Architecture and urbanism are material expressions of urban culture. Terms like „Oriental city“, „Latin American city“ or „European city“ indicate specific urban cultures, although in most cases several urban cultures coexist side by side. In any case, it is extremely important for any city to think about what their specific urban culture and urban identity is.

UNIFORMITY, FRAGMENTATION, SEGREGATION

A closer look reveals that urban diversity is rapidly shrinking. Many historic cities are exposed to speculation, demolition and decay. It's not only the urban heritage which is endangered, but also the cultural identity, which fast-growing agglomerations need even more urgently than other cities. The middle- and upper class is moving into new areas with a high social status, a process which produces fragmented and segregated cities. Obviously, large urban agglomerations cannot be seen any more as a spatial and social entity, but rather as a heterogeneous mosaic of old and new, traditional and modern, rich and poor areas.

There are few serious efforts to keep traditional neighborhoods alive. The renovation of old monuments is important, but not enough to rehabilitate old towns. Old cities need new residential, commercial, cultural and touristic functions in order to stay alive.

Most megacities are located in the tropics, however, "tropical building“ is seldom taught in architectural schools. It seems that modern building technology and air-conditioning have „liberated“ architecture from natural conditions, with the result that buildings are increasingly uniform all over the world, regardless of whether the climate is hot or temperate, dry or wet.

The diversity in architecture and urbanism is further reduced by the megaprojects of international real estate investors. New commercial and financial centers, in spite of an iconic architecture and striking skyline, are more or less similar anywhere in the world, as far as urban functions and typologies are concerned. The same applies to gated communities and high-rise apartments, designed to be comfortable, secure and prestigious, in accordance with an increasingly globalized lifestyle of the urban middle class.

Globalization produces not only winners, but also losers. Informal settlements and slums anywhere in the world are looking similar, even though a closer look may indicate important differences. The images of the exhibition show two types of informal settlements: "slums of hope" with some potential for improvement and consolidation, and "slums of despair", marked by extreme poverty and exploitation.

MODERN REGIONALISM

In many cities planning is a difficult balancing act between a "pro-investment“ policy, which aims to attract international capital and projects, and a "pro-poor“ policy that fights urban poverty and social problems. There are few countries which have successfully combined both policies. Brazil is one of them, promoting economic growth as well as large scale social programs, which have reduced urban poverty significantly.

In addition to economic and social problems, there are many other challenges for urban policies and planning. The loss of urban heritage and cultural identity can be tackled through "modern regionalism". Based on local characteristics and traditions, architects in many countries are working intensively in this field. There are excellent examples of modern tropical architecture based on
traditional know how, including innovative housing and techniques of natural ventilation and cooling.

The same applies to traditional urban patterns and building typologies. A good example for this is Europe, where urban planners try to protect and enhance the „European city“ with it’s typical building blocks and public spaces, this in combination with modern architecture, an advanced building technology and new concepts of housing.

The debate on sustainability is emphasizing environmental protection, energy-efficiency and recycling of limited resources. This has enhanced not only traditional architecture, but also stimulated a „green“ high-tech architecture, often designed by globally acting star architects. It remains to be seen whether the artificial islands, new desert cities and 800-meter super-towers are really „green“, or rather spectacular icons of a post-modern „turbo-urbanism“ which has too little time for careful analysis and evaluation.

Of course, the images do not offer solutions. However, we are convinced that a look outside the box is always a good idea and necessary to clarify the own position and priorities. If the exhibition can make a small contribution to this, we are very satisfied.
SOCIAL RENTAL HOUSING: THE SOUTH AFRICAN EXPERIENCE AND ITS RELEVANCE IN THE SUDANESE CONTEXT

Amira Osman\(^1\) (Council for Scientific and Industrial Research, CSIR, Pretoria, South Africa) Ahmed Abdalla\(^2\) (Faculty of Architecture, University of Khartoum, Sudan)

**ABSTRACT**

Social housing in South Africa is defined as medium- to high-density, subsidized rental housing in inner city areas. It is seen as a main driver for integration and as a means to combat Apartheid spatial patterns and uplift decaying inner city areas. In that sense it is almost always well located in areas with relatively good quality infrastructure and is walking distance from amenities and social services. While the South African model is very much based on European models, there are some aspects of social housing that are unique.

In Khartoum, Sudan, the focus of policy has been on the problem of affordability and has neglected the concept of social housing as one possible solution. The “low-cost” debate has been to some extent exhausted in many scientific forums, the solutions reduced to cutting initial costs through various types of site and service projects (which have resulted in the private sector taking over the market), core housing and incremental housing (which have led to massive sprawl of the city) and popular housing (usually poorly designed disregard for the quality of streets and open spaces).

While Sudanese government saw its role as controlling urban growth through systematic housing plans aligned with urban and rural development plans, they continue to ignore innovative thinking about social housing provision through strong and decisive housing institutions. Past experience has not been evaluated and new resolutions emerged as the Housing and Development National Project which is expected to take over control of housing institutions and policies. Possibly experimenting with social housing has been raised in the HDNP. It might be assumed that social housing may be the wrong scenario to follow; however, research may prove otherwise.

This paper portrays the social housing context in South Africa, which is also relatively new, and identifies possible lessons for a (possible) emerging field in the Sudan.

**Keywords:** social housing, rental housing, government-subsidised housing, South Africa, Sudan.

I. **INTRODUCTION**

The role of government in housing processes remains a much-debated topic despite experiences that general practice has been minimal with regards to addressing demand and creating quality environments. What kind of support should governments offer and how can that support compete with informal processes that might remain cheaper and more efficient with regards to speed of delivery and better location? What measures could governments put in place to perhaps allow housing markets to self-regulate? An important component of housing – be it in the formal or informal sectors – is rental housing.

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While the housing debate has generally leaned towards ownership as the preferred choice and more viable option, rental housing has fallen by the wayside thus losing out on the potential benefits of this form of housing for the urban poor. This paper briefly outlines some of South Africa’s experiences with subsidized rental housing options and attempts to initiate a debate regarding the possible relevance of this type of housing to the Sudanese situation.

1.1. Social Housing in South Africa

Social Housing is defined as medium to high density housing with different tenure options but excluding immediate ownership. Social Housing is rental housing or co-operative ownership for low income households developed by accredited institutions or in accredited projects, managed by an independent institution and receiving government subsidy although this subsidy may be topped up through external sources. The SH program, by providing Rental Housing is guided by the Rental Housing Strategy.

It is seen as a main driver for integration and as a means to combat Apartheid spatial patterns and uplift decaying inner city areas. In that sense it is almost always well located in areas with relatively good quality infrastructure and is walking distance from amenities and social services. SH projects are called for in designated Restructuring Zones (RZs) which are linked to Integrated Development Planning (IDP).³

Specific objectives set by the policy for social housing include promoting urban restructuring through social, physical, and economic integration of housing developments into existing areas; placing SH in well-serviced areas is important but this issue has generated much controversy. Inclusionary Housing – which is not yet an approved policy aims to achieve a mix of income groups in new developments. This has raised numerous debates due to a NIMBY (not-in-my-back-yard) attitude.

Policy describes the role of SH within Government’s developmental agenda and outlines this sector’s function to foster the creation of quality living environments for low-income persons. This includes promoting the use of public funds in such a manner that stimulates and/or facilitates private sector investment and participation in the sector. Growth and development is envisioned through the creation of good residential alternatives, employment and more compact urban regions as outlined in growth and development strategies.

Precedents show that some countries made substantial initial state investments and have shrunk this as the demand leveled out and the institutions became more profitable. After WWII in Europe, Social Housing was the predominant product and had a major role to play in the re-building of cities in the post-war period. SH is believed to have a similar role to play in the re-building of the post-Apartheid city.⁴ SH has the potential to deliver housing at a scale and pace that other forms of housing delivery have not been able to achieve.

The SH program is targeted at households within the R1, 500 ($214) to R7, 500 ($1071) monthly income bracket.⁵ There is some confusion and overlaps when considering the accepted definitions for affordable or social housing – however, it is generally accepted that social housing is government subsidized while the affordable sector is mainly catered for through private sector initiatives. It is important to note that the social housing sector does not cater for the poorest of the poor and rather focuses on the gap market while other housing programs need to address the lower income groups. It

³ “In this Social Housing Policy document reference is made to the fact that capacity building and capital grants will only be available in designated restructuring zones.” This is sourced from Restructuring Zones: Guidelines (Dan Smit, August 2005)

⁴ Jacus Pienaar in European Programme for Reconstruction and Development (ERRD). 2007. Unpublished report on a project to provide support to selected Social Housing Institutions.

⁵ Much of this information is quoted from Osman, A., Herthogs, P. 2010, Medium Density Mixed Housing: sustainable design and construction of South African Social Housing, CSIR Conference, Science Real and Relevant
is also noted that there are several forms of social housing including options, such as Community Residential Units, CRUs, which cater for the lower portion of that income range and mostly include communal amenities.

1.2. The Sudan Housing Situation and Possible Relevance of the Concept of Subsidized Rental Housing

In Khartoum, Sudan, the focus of policy has been on the problem of affordability and has neglected the concept of social housing as one possible solution. The “low-cost” debate has been to some extent exhausted in many scientific forums, the solutions reduced to cutting initial costs through various types of site and service projects (which have resulted in the private sector taking over the market), core housing and incremental housing (which have led to massive sprawl of the city) and popular housing (usually poorly designed disregard for the quality of streets and open spaces).

At a recent housing workshop (December 2010) hosted by Khartoum University in collaboration with University of Reading in the UK, several speakers presented different views with regards to housing programs in the Sudan over diverse periods spanning from independence in 1956 till present.

Awad El Karim explained how the actual contribution of many of the government programs has actually been negligible as compared to actual need. Experimentation with hire/purchase options through a revolving fund, serviced plots, employer-supported housing and core unit sales, while delivering a good range of options, are in reality not even beginning to address the demand in terms of numbers. The presenter explained how only 311,000 serviced plots had been distributed between the period 1956 and 2007 despite the fact that this is considered a major housing program in the Sudan. He also argued that only 43% of those plots had been developed. Despite these figures, the presenter still believes that sites and services remains the most realistic and efficient program that government should support. Another presenter, Gamal Hamid, however argued that this option only delivers land and not housing. While this speaker argued for the core-house units as built through various government program (generally a 30m² unit on a 250-300m² plot where the beneficiaries pay 10% of the cost as a deposit and pay the outstanding amount over 20 years), it is also evident that this incremental option does not address the high demand for housing in the Sudanese capital. It was debated that the levels of informality in 1990 were at 60% and that this situation has probably not improved. Thus the issue of informality being cheaper and faster cannot be avoided.

Gamal Hamid and Ahmed Abdalla presented the results of a housing survey on incremental housing. It was found that 78% used their own funds to expand while 17% rented out their units. This may be indicative of a good functioning market. However, he also indicated that 50% failed to pay the deposit and the one- and two-roomed options have both proved unaffordable to the target market. Thus the validity of this as a housing solution is still questionable.

El Khalwati El Nor, the technical consultant for the National Fund for Housing and Reconstruction NFHR, an entity that is directly under the authority of the Presidency, presented some of the on-going housing programs in the country. These include options where the land is provided for free and the services are paid for by the state as well as the co-ordination of employer-supported options where the NFHR manages the contractual relationship between the employee and the employer (who is required to repay the owing amounts to the NFHR). Thus the NFHR has an instrumental role to play with regards to project implementation as well as the recovery of funds. The fund is also active with regards to experimenting with various cost-reduction techniques including experimenting to alternative technologies and materials.

In addition to the concern regarding demand, the options being delivered also seem to be perpetuating urban sprawl and peripheral developments in the majority of situations. Ahmed Abdalla also presented a study comparing densification options and benefits. According to this example study, the presenter...
argued that land value and services should be considered when implementing cost-cutting techniques. A 4 storey apartment building on a 300m$^2$ plot may cost (according to 2010’s prices) as much as four detached houses\(^7\), each on a 300m$^2$ plot (total land area of 1200m$^2$). The study proves that as land value increases, cuts in cost increase in the case of multi-storey apartment buildings. Moreover, other benefits include easier commuting, better quality of services, lower operational cost, health and cleanliness, better addressing system, a better chance at achieving good urban design and architecture. Also social, economical and environmental sustainability will be better addressed.

**While the Sudanese government saw its role as controlling urban growth through systematic housing plans aligned with urban and rural development plans, they continue to ignore innovative thinking about social housing provision through strong and decisive housing institutions. Past experience has not been evaluated and new resolutions emerged as the Housing and Development National Project which is expected to take over control of housing institutions and policies. Possibly experimenting with social housing has been raised in the HDNP. While some might assume that social housing may be the wrong scenario to follow; however, research may prove otherwise.**

II. DISCUSSION

In discussing the situation of housing in Sudan’s capital city, Khartoum, some of the socio-political dynamics need to be acknowledged. A drive through some peripheral areas will show that different groups of people, coming from different parts of the country build differently – demonstrating a wealth of local experience and heritage that needs to be considered in any future housing plan.

It is also important to note that while ownership remains an important component of the housing market, rental options need to gain more prominence due to several factors. Firstly, not everyone can afford to own in Khartoum due to the exorbitant prices (reaching levels of R9100, $1300/m$^2$. Khartoum’s prices for real estate greatly exceed those of South Africa where a similar quality product might cost R5000, $714/m^2$ or less\(^8\)). Similar to the Southern African situation, many people living and working in Khartoum consider their home towns as their real, permanent address and that is where they will build their houses. Their presence in the city is perceived as being temporary. In South Africa, the informal rental market is considered the most affordable option for many people (referred to as “back-yard shacks”). In the formal sector, rental options for lower income groups are more limited. The migration issue and resultant social dynamics are an important consideration when making decisions about the housing types to finance and deliver.

By considering well-located rental housing for the city of Khartoum, access issues for the poor, might assist in the achievement of a more equitable city. Till today, the terms first, second and third class housing is being used by professionals and laypeople alike perhaps indicating a policy and financing approach that undermines the right of the poor to the city. Social rental housing also offers excellent opportunities to explore higher density living thus addressing the environmental sustainability issue. In rental options it is possible to allow for a range of densities and configurations to suit a diverse segment of the population with regards to affordability and lifestyle.

Well-located rental housing also allows for the possible combination of housing with job-opportunities. Social housing institutions could be established that can help address the capacity issues at implementation level. In this way, instead of (mostly futile) attempts to fulfill demand quotas and waiting lists, government’s role is rather re-directed towards building institutions capable of implementing larger strategic city plans as well as specific housing projects that support a bigger vision. Perhaps government’s role should be to structure the city and let housing be?

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\(^7\) Detached houses are yet the only typology provided by NFHR projects in different states of Sudan.

\(^8\) Authors’ estimates
While individual ownership remains important with regards to personal empowerment and access of the poor into the formal sector, these options do not have the potential to restructure cities and support government’s developmental agendas at a scale that might have a felt impact.

III. CONCLUSIONS

This paper assesses the social housing context in South Africa, which is also relatively new, and identifies possible lessons for an emerging field in the Sudan. It attempts to reassess government’s role in housing. It is the start of an on-going investigation into the South African social housing model and whether it would be relevant to consider it in the Sudanese context. While far from ideal, it seems that the approach might help in addressing some housing issues in Khartoum.

The South African scenario may offer some guidelines with regards to social housing policy, financing, design and management where Sudan may benefit, not only by following the good principles but also by avoiding the potential pitfalls.
2.4
SUSTAINABLE LIVELIHOOD IN LATIN AMERICA AND CARIBBEAN URBAN INFORMAL SETTLEMENTS. VULNERABILITY, THREATS AND HAZARDS

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ABSTRACT

According to the Inter American Development Bank (BID) and the Comisión Económica para Amèrica Latina y el Caribe (CEPAL), 150 million people, or one out of every three inhabitants of Latin America and the Caribbean, are exposed to natural catastrophes. Between the years 1900 and 1989, this region confronted an average of 10.8 disasters per year and, during the 1990-1998 periods, this figure increased to 35.7 per year. In addition, it is currently estimated that 95% of natural disaster victims are located in developing countries, which are mostly characterised by conditions of poverty, and the high physical and social vulnerability of those regions’ informal settlement inhabitants, estimated at 142 million people.

Although informal settlement characterisation has been certainly fully investigated in the majority of our countries, there is still no good explanation of how these people manage to live in such terrible conditions of poverty and high vulnerability. Considering the above-mentioned elements, the purpose of this work is to identify the different types and levels of physical and psychosocial vulnerability within which slum inhabitants live in the cities of Latin America and the Caribbean. It will also try to identify some sustainable livelihood techniques developed by the inhabitants in order to survive under such circumstances, and the risks they confront every day. The research group has identified the cases presented as some of the most appropriate Latin American cases for analysis under the “Sustainable Livelihood” heading. In addition, resilience factors (endurance ability) have been identified in every one of them.

This work is part of the CIB-TG-40 research project on Understanding the interface between the environment and sustainable livelihoods in the integration of informal settlements in Asia, Latin America and Africa: A review of current thinking and practices.

Keywords: Sustainable Livelihood, Informal Settlements, Vulnerability, Hazards

I. INTRODUCTION

Latin America and the Caribbean region comprises 42 developing countries and 351 million inhabitants. The major part of the urban areas are characterized by spontaneous urban growth or “barrios de chabola”, which is considered as the more important and dynamic adoption of urban space, not only of this region but of the entire planet. This kind of growth tends to be permanent and represent a very important element of contemporary cities in developing countries.
In this region, population explosion, and the concentration of population in cities and “barrios de ranchos”, constitute the main characteristics of human settlements over the past 70 years. For example, according to the 1990 demographic census in Venezuela, more than 61% of the urban population lives in these “barrios de ranchos”, which means that 11 million people occupied 140 000 hectares. In the same vein, higher proportions than 50% have been registered in other cities. As a consequence, it is evident that the “barrios” or “neighbourhoods” constitute a major part of Latin-American cities.

This work has approached the existing problems in these kinds of settlements from different points of view: firstly from that of the physical and psychological vulnerability of inhabitants of these settlements in Latin America and the Caribbean; and secondly in terms of the types of sustainable livelihood they have adopted in order to overcome poverty. Therefore, the purpose of this work is to present a global vision of this continent, the inhabitants’ socio-economic conditions in informal urban settlements, and the types of hazards and disasters which predominantly occur in these types of settlements.

Also, some “Sustainable livelihood” cases are presented. They have been chosen because they show some characteristics and aspects of resilience or capacity for endurance that enable those communities to resist or overcome adversity.

This work is part of the CIB (International Council for Research and Innovation in Building Construction)-TG-40 group project: “Understanding the interface between the environment and sustainable livelihoods in the integration of informal settlements in Asia, Latin America and Africa: A review of current thinking and practice” financed by the CIB and sponsored by “Universidad Centroccidental Lisandro Alvarado” (UCLA) Venezuela The information reported support from World Bank (WB) records, CEPAL, UNCH and BID among others.

II. THE PROBLEM

The first reality associated with informal settlements is the poverty levels within which their inhabitants live, and the social exclusion to which they are subjected as a consequence of, among other factors, a lack of sufficient income to satisfy their basic needs, as well as the need for landownership, which classifies them as squatters, hence as violators of the law. The tough reality in which more than 140 million inhabitants live in these city sectors is evident (BID, 1999), where hunger, insalubrity and unemployment predominate, as well as marginality in infrastructural and other urban services such as education, health and transportation. Many attempts have been made in Latin America by the governments of the day to help solve this problem, the consequence of inadequate answers to explosive urban population growth and the migration from rural to urban areas. However, many of these attempts have failed and been understood as false proselytising efforts.

The second reality is the conditions of physical insecurity and vulnerability to natural threats and risks under which these inhabitants live, and the escalating numbers of disasters in the past decades. For example, according to information from BID and CEPAL, 150 million people, or one in every three inhabitants in Latin America and the Caribbean is exposed to natural catastrophes, excluding those caused by man. Between 1900 and 1989 this region has experienced an average of 10,8 disasters per year, increasing to 35,7 in 1990 to 1998. In all, 95% of natural disaster victims live in developing countries, owing mostly to their poverty. In Latin America, where such cases predominate, it can be inferred that these sectors are the most affected. Hence, it is necessary to answer the following question: what are the resilience (endurance capacity) mechanisms they have developed to strengthen their resistance to threats from natural disasters or man? This information is necessary if we are to try to decrease the extent of vulnerability, from both a physical and psychosocial point of view. For this purpose, the CIB’s TG 40 research group on informal settlements initiated the research project that outlines this work, in order to identify the levels of physical and psychosocial vulnerability, hazard and threat under which inhabitants of these Latin American and Caribbean settlements live, and the experiences or sustainable livelihoods developed in these neighbourhoods by their inhabitants, to help them survive the exclusion, the hazards and the threats with which they live. This is the main purpose of this project.
III. CHARACTERISATION OF INFORMAL SETTLEMENTS IN LATIN AMERICA AND CARIBBEAN SOCIO-ECONOMIC CHARACTERISTICS

Commonly, poverty has been evaluated based on relative criteria of income or consumption, meaning that poverty refers to people whose per capita income is not sufficient to finance the cost of elemental normal expenditure.

However, when poor people are asked what poverty means to them; income is only one of the aspects they distinguish, since they also express feelings of insecurity or vulnerability, a lack of the right to express their opinions (to family members, community or government), poor levels of health, literacy, education, and the range and quality of services. As a result, poverty is defined in terms of a lack of basic ability to satisfy physical needs, or to reach one’s objectives of participation in community life and have an influence in decision making.

In the late nineties, six out of every ten poor people lived in urban zones; this typifies Latin America as the developing region that depicts the global process of poverty urbanisation (in contrast with Asia and Africa, where the major part of the poor still live in rural environments). Now, this does not mean that that rural poverty is more serious than that amongst the inhabitants of urban environments. According to BID estimates, between 32% and 35% of the population of Latin America and the Caribbean lives on less than US$2 a day (in terms of buying power). More extreme information was obtained from a recent study carried out by the Universidad Católica Andrés Bello in Venezuela. This study registers an amount of $1 daily as the only subsistence income for the poorest Venezuelan inhabitants (UCAB 2002). Even though in the 1990s the extent of poverty (measured according to poverty-line criteria) decreased, the number of poor people increased, and the proportion of indigents continued to be the highest since the eighties.

As reflected in the following chart, Honduras and Nicaragua reflect the highest percentage of poverty and indigence. Honduras has 74% living in poverty, of which almost 51% are indigents, while Nicaragua has 65% living in poverty, with 40% in indigent conditions. Haiti is one of the countries that present the worst impoverished conditions in the region. In 1967, 48% of the Haitian population was poor; in 1980 the proportion was 68% and, in 1984, four years later, it surpassed 80%. It almost doubled in less than ten years. Meanwhile, some four thousand Haitian families had annual incomes of $90 000 or more, but the average annual income was $300 per capita. It is obvious that there is a big difference in the distribution of wealth (Galindo Lucia, 2001).

Latin America, in general, has 35% living in poverty, with urban poverty close to 30%, 14% indigent and 9% in urban zones.

![Figure 1: General urbanization and poverty](image-url)
At the end of 1990, 125.8 million inhabitants of urban areas were poor. This situation compromised 35 in every 100 households. Yet, when several countries succeeded in reducing the urban poverty level to lower levels (like Brazil, Chile, Panama, Peru and Uruguay), the reduction of poverty on a regional scale could be catalogued only as “moderate” (CEPAL, 1999), as the following chart shows.

These urban poverty figures can be seen reflected, more frequently, in our region’s cities, where most of the poor obtain their income from informal sources. In the late nineties, 48 of every 100 urban workers were had jobs in the informal sector, 32 of which corresponded to subsistence-type jobs (low-quality self-employed workers and domestic servants), while only 16 were involved in micro-enterprises (sub-segments of better productivity) (OIT, 1999). In addition, it is noted (Nora Clichevsky 2000) that rentals in boarding houses, villas, etc, as well as payments of “peajes” for the use of electricity and for services given to other indigents, constitutes an important portion of the meagre income of the poor.

According to the World Bank, Latin America and the Caribbean is a comparatively rich region, but includes two extremely poor countries (Haiti and Honduras) and three of the 10 countries weighed down by external debt (Argentina, Brazil and Mexico).

### 3.1. Land Tenancy

The urban population in Latin America and the Caribbean, which in 1970 represented 57.2% of the total, reached 73.4% in 1995, and could reach 85% by 2025 (Nora Clichevsky, 2000). This urban growth in Latin America and the Caribbean presents itself as a proliferation of informal settlements, located principally on the outskirts of cities, where land is commonly communal or federal property. It generates controversy over their tenancy: bordering on outlawed goods, urban disturbance, and housing lacking hygiene and basic services. This occupation of land with no urban-environmental facilities for residential purposes is subject to flooding, contamination, illegal garbage dumps. There is no infrastructure and access to public transportation, employment centres, elementary schools, and primary health care centres is difficult (Nora Clichevsky, 2000). In addition to this, the economic interest of the original landowners, the appearance of property sales fringing on legality, as well as the dearth of municipal resources to meet the increasing demand for services, can set up social conflicts on a great scale.

According to Prof. Teolinda Bolívar, tenancy should be understood within a social and human context, since it does drive participation and organisation of the community, its development and
strengthening, “Landownership is not a relevant problem, and inhabitants of these neighbourhoods are not bothered by it. In reality, the core of their anguish is not tenancy but the phantom of eviction, which is always present regardless of the possession of the land. Such a phantom, generally very real, can only be fought with consolidation and integration of the urban scheme and net services, as well as with provision of communal facilities comparable to the rest of the city.” (Cilento S. A. et al, 1991)

According to UNCHS estimations, approximately 29% of the families in Latin America and The Caribbean, live in “non-landowner” conditions, as the next chart shows:

![Figure 3: Land tenancy](chart)

Source: UNCHS, 2000

Latin American constitutions define land in different ways, from its social function to the absolute right of private ownership. These distinctions have, partially, marked the different specific policies over the marketing of land and its implementation. For example, the constitution that Brazil passed in 1988 established the social function of land. To do this they have defined a progressive tax that municipalities can demand, from an owner of land without any construction or sub-use. This kind of tax could amount to expropriation. Also they have another rule, which contemplates the granting of property rights to people who could retain the land for an uninterrupted period of five years, without opposition of the land owner to such possession. In other countries, just recently in the last decade, it is an obligation to service the land with basic services. In Quito, for example, since 1992 when Ordinance 3050 was approved, settlements are prohibited on slopes exceeding than 30 degrees. But on the hillsides of Pichincha, a seismic risk zone, for example, there were more than 80 000 people already living there at the time the new legislation was approved.

There are other countries whose constitutions do not contemplate social function, like in Mexico. Argentina’s 1994 constitutional reform did not incorporate any reference to urban soil and its social function. The Chilean constitution of 1980 clearly affirms the institution of private property ownership. However, interviews and newspapers articles were found that document, in countries like Peru, Mexico, Colombia and Venezuela, great efforts on their part to regulate the tenancy of land in informal settlements. In Venezuela, in particular, there is a “Ley de Barrios” proposal to urbanise popular zones. The objective is to regulate land ownership in order for those affected to become part of the formal economic system – that is to say, for them to have access to loans, mortgages and insurance and to give formal value to neighbourhood activities, revive dead capital and civic responsibilities, and provide security and stability.

3.2. Basic Services Infrastructure

One of the main deficiencies we can observe in Latin American and Caribbean cities is the lack of access to basic services, such as drinking water, electricity, sewage waters system, etc. This situation is aggravated in urban informal settlements, which are mostly located on plots of land that the government has not anticipated urbanising. Hence, no provision has been made for these services, and they are excluded from any planning in the short or medium term by the local government.
Figures published by UNCH in 2000 indicate that, in 1997, 18.63% of the Latin American and Caribbean urban population had no access to piped water supply, 13.70% did not have drinking water, 24.95% did not have sanitary housing installations, 33.15% had no access to waterborne sewerage systems, and lastly 21.58% did not have electricity. These values are reflected in Figure 4.

These statistical estimates are much higher in Haiti, a country that reflects the most critical conditions in Latin America and the Caribbean, where 78.30% have no piped water, 63% do not have access to drinking, and 66% have no waterborne sewerage system.

It is important to emphasise that, when these numbers are mentioned, we are talking about almost 80 million people who do not have these basic services that could guarantee their right to a dignified life, and could contribute to sustainable development for themselves and consequently for the region.

3.3. Hazards and Vulnerability

Hazards are considered intrinsic and latent within informal settlements, but the level, degrees of perception and ways to confront them could vary, according to the features that society chooses itself. In order to define hazard, first we have to be aware of two concepts that, besides being intimately related, are part of it, like threats and vulnerability.

A natural phenomenon could be atmospheric, topological, hydrological, tectonic or telluric, and it can represent a hazard when it becomes intense, or when it produces the sum of a variety of minor events that could cause verifiable damage to society and the environment. Vulnerability is defined as the probability that a community, exposed to the impact of a natural hazard, can suffer damage according to the degree of fragility of its elements (infrastructure, housing, productive activities). These damages could represent the impact on the development, on the economy, and on the ways the community enhances social interaction and human life. Vulnerability can be classified according to three points of view: physical vulnerability, social vulnerability and institutional vulnerability.

Hazard can be defined as the probability that damage could happen in a specific scenario, when that scenario is exposed to a hazard of specific intensity and that scenario has vulnerability as an intrinsic pre-condition. In Latin America and the Caribbean disasters are recurrent and, in the last 30 years, practically all countries have suffered a disaster on at least one occasion, with great intensity and severe consequences to the development process. Its geographical layout and variable geological climate frequently and periodically evidence a manifestation of the force of nature. The most important disasters that have occurred in this region since 1972 are showed in Chart 1.
Chart 1. Latin America and Caribbean Disasters Since 1972
Fuente: BID /CEPAL, 2000

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Disaster</th>
<th>Deaths</th>
<th>Damage (exchange rate: multiply by 106 to get US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicaragua</td>
<td>1972</td>
<td>Terremoto</td>
<td>6 000</td>
<td>2,968</td>
</tr>
<tr>
<td>Honduras</td>
<td>1974</td>
<td>Huracán Fiji</td>
<td>7 000</td>
<td>1,331</td>
</tr>
<tr>
<td>Guatemala</td>
<td>1976</td>
<td>Terremoto</td>
<td>23 000</td>
<td>2,147</td>
</tr>
<tr>
<td>República Dominicana</td>
<td>1979</td>
<td>Ciclones David y Frederic</td>
<td>2 000</td>
<td>1,869</td>
</tr>
<tr>
<td>Bolivia, Ecuador, Peru</td>
<td>1982-83</td>
<td>El Niño</td>
<td>n.d.</td>
<td>5,651</td>
</tr>
<tr>
<td>Mexico</td>
<td>1985</td>
<td>Terremoto</td>
<td>8 000</td>
<td>6,216</td>
</tr>
<tr>
<td>Colombia</td>
<td>1985</td>
<td>Nevado del Ruiz, Armero, Chinchina</td>
<td>22 000</td>
<td>465</td>
</tr>
<tr>
<td>El Salvador</td>
<td>1986</td>
<td>Terremoto</td>
<td>1 200</td>
<td>1,352</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1987</td>
<td>Terremoto</td>
<td>1 000</td>
<td>1,438</td>
</tr>
<tr>
<td>Costa Rica y Nicaragua</td>
<td>1988</td>
<td>Huracán Joan</td>
<td>300</td>
<td>1,700</td>
</tr>
<tr>
<td>Costa Rica y Panama</td>
<td>1991</td>
<td>Terremoto</td>
<td>73</td>
<td>Cerca de 2,300</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>1992</td>
<td>Tsunami</td>
<td>116</td>
<td>30</td>
</tr>
<tr>
<td>Comunidad Andina</td>
<td>1997-98</td>
<td>El Niño</td>
<td>600</td>
<td>7,694</td>
</tr>
<tr>
<td>Central America</td>
<td>1998</td>
<td>Huracán Match</td>
<td>9 124</td>
<td>6,008</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>1998</td>
<td>Huracán Georges</td>
<td>235</td>
<td>2,193</td>
</tr>
<tr>
<td>Colombia</td>
<td>1999</td>
<td>Terremoto</td>
<td>1 185</td>
<td>1,580</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1999</td>
<td>Deslizamientos y Avalanchas</td>
<td>20 000-50 000</td>
<td>3,237</td>
</tr>
</tbody>
</table>

The following figure indicates the causes of the main disasters in Latin America and the Caribbean, mostly from flooding and earthquakes.

10% land slides, 1% polar fronts, 11% hurricanes, 2% forest fires, 36% floods, 2% others, 5% droughts, 21% earthquakes, 7% storms, 1% tsunamis and 4% volcanoes.
When a disaster occurs, the most affected are the inhabitants of informal settlements, since adequate norms of design and construction, and the maintenance of construction and goods-production activities and services are not applied. Hence, the settlements have no durability and are defined as having too high a risk level.

3.4. Psychosocial Risks

Most references to physical risks have been mentioned, but inhabitants of informal settlements are also exposed to psychosocial risk. They are strongly impacted by unemployment, limited opportunity to study, a lack of public transportation, health and security, etc.

The fact that they lack all these conditions and the need for employment to generate an income to satisfy their social and basic needs makes this informal urban environment a fertile ground for illegal informal activities, such as the making of easy money, at great risk, but required for supporting their families. Examples are trade in and consumption of drugs and prostitution, especially amongst the youth. We shall make reference to each one of these risks.

When we talk of prostitution, some investigations indicate that, as Latin America becomes more impoverished. The American NGO Casa Alianza, through its director, confirmed that Latin America prostitutes one million children annually (First Global Congress against Sexual Exploitation of Children, Sweden 2001).

Also, in the last two decades, an increase in delinquent violence in Latin America has been evidenced, presenting critical indices in the last decade. During this period Latin America became the most violent region of the world (Lucía Dammert, 2000). This region occupies second place, with 68% of the population being victims of crime. This percentage is higher than the global rate of 61% (Lucía Dammert, 2000). The proportion of the population that was assaulted reaches 31%, which is much higher than the global rate of 19%, and nine perceptual points more than North America, which occupies third place.

Additionally, the inhabitants of informal settlements confront severe health problems. Enteritis and other diarrhoeic disorders have, in the last years, been the principal causes of morbidity in urban and rural areas. This is a consequence of an environment lacking in sanitary conditions; among them is a deficiency or lack of drinking water and sewer services (PAHO, 2001). Ten per cent of the diseases in developing countries are due to contaminated water and insufficient water supply (WB, 2002). For example, Venezuela annually registers more than 220 000 cases of gastroenteritis in children younger than two years, with a mortality rate of 1.2%. According to Cecodap (1999), half a million Venezuelan children present an average of 2 episodes of gastroenteritis a year. The PAHO reports, in its 1991-2001 report on cholera, 3 658 cases of cholera between 1996 and 2000, 86 of which were fatalities. The increment in morbidity indices caused by hydric events can be observed.

On the other hand, millions of people suffer from infections transmitted by vectors like mosquitoes, which may or may not grow and live around contaminated dammed-up waters. The dengue virus uses as vector the Aedes Aegypti mosquito. According to PAHO 2001, 170 000 cases of dengue were registered in Latin America for the year 2001. Among the precipitating factors that cause such diseases are the deterioration or lacking of basic services, the mosquito’s biology and the absence of community organisations to take the necessary preventive measures.

Another problem directly related to poverty is malnutrition, this being more serious in children since it directly affects their growth and development. According to a Cecodap report (1999), in Venezuela, for example, more than 4 million (40% of the population under 17 years of age) suffer from malnutrition; 1.2 million children between 7 and 14 years have an acute nutritional deficit. All this means that a malnourished generation is emerging with an intellectual deficit.
The malnutrition mortality rate increased from 3 to 4.6 per 100,000 inhabitants between 1989 and 1994. This increment was due to the association between malnutrition with infectious diseases and gastroenteritis. According to UNO estimates for the year 2005, malnourished inhabitants of Latin America will amount to 6% of the population (Torbay Malvina, 2002).

In relation to the HIV virus, in May 2002 the Red Cross shows terrifying statistics. In Latin America 1.4 million people are infected, 130,000 new cases have been reported during this past year, 80,000 people have died, 40,000 children have been infected, 8,000 of whom have died. These diseases, together with other sexually transmitted diseases, such as those caused by fungus, syphilis and the papilloma virus are on the rise, just as tuberculosis, with its association with the HIV virus, is more prevalent (Red Cross et al, 2002).

3.5. Construction Systems Used at the “Barrios” and Structural Faults

To this panorama of risk and vulnerability related to the way housing is constructed in informal settlements can be added the dangers from common construction systems. Construction in informal settlements is poor in quality, resulting in very high geotechnical, structural and health risks for the inhabitants. Informal settlements have been characterised by an almost total absence of geotechnical studies and geological risk assessments; furthermore, there is insufficient knowledge about the nature of the materials used and construction practices (Arrieta de B.L., 2001).

Two stages can be distinguished: the initial, which is the construction of the “rancho” as a provisional, highly unstable structure, and a second stage, which consists on the progressive substitution of the “rancho” for a house made of more durable materials. The materials used in the initial stage are, in general, second hand, offering little protection and of short durability. They include zinc sheeting, wood, blocks, sun-dried clay brick, clay and cardboard. Inhabitants progressively increase the occupation density by adding more floors to the initial one, creating multi-storey homes. In some barrios in Caracas they have reached 8 storeys (Bolivar, T et al, 1993). The problem does not arise from the number of flights or the “barrios” inhabitants’ occupation of almost all of the land, but from the almost total absence of technical construction criteria, producing a structure vulnerable to disaster, risk and, in some cases, even functional instability. Building is carried out without the use of appropriate tools or the necessary equipment.

The more common construction systems include:

- clay (“bahareque”),
- sun-dried clay (“adobe”),
- reinforced portico with block walls, and
- structural rubble masonry.

The work entitled “Densification and housing at the barrios Caraqueños” points out the following structural problems in house construction at the “barrios”:

- the construction of resistance elements in the structural system,
- to the arrangement and structural binding, and
- to the resistance and concrete quality.

The structural problems in the “barrios” are not evident in single-storey houses, especially if the house has a light roof. Difficulties begin, and effectively can be worse, when houses have 2 or 3 storeys. Some people even plan to construct more floors in future. The major difficulties are an absence of any project or plan, or of the necessary technical advice to integrate the structures. The problem will become most evident during and after a natural disaster such as an earthquake.

These risks confirm the social panorama of profound inequality as to wealth distribution which, added to discrimination, social segregation and urban violence, constitutes a high-risk scenario of social disintegration in informal settlements in urban areas.
IV. CONCLUSION

Throughout the study of the cases described, answers can be found to the question formulated in the original problem. These lead us to certain conclusions.

In critical situations, whenever adversity, risk and an aggressive environment predominate, survival depends on creativity, as has been clearly demonstrated by certain inhabitant of the suburbs – old squatters who, by using their initiative, have managed to turn crises into opportunities, by allying themselves with groups or associations with the common purpose of creating or strengthening their community social networks, developing resilience, and achieving important goals that tend to be difficult to achieve at government or international agency level, for the benefit of transforming their living conditions.

- Governments are failing to provide adequate land lots and housing in to satisfy existing demand. The poorest inhabitants have therefore been forced to invade empty land, without minimal security and protection, with a negative impact on the environment, poor living standards and very serious social problems arising in the surrounding city areas.

- Commitments coming from government after the disasters have passed are usually temporary, spurred by the emergency and which, after a short time are neglected, leaving the inhabitants once again abandoned to their fate, and just as vulnerable as before. It calls our attention to the fact that the types of construction, as well as the community groups organized in the suburbs, present different responses whenever they face the different types of adversities described above. This prompts our interest in resistance or resilience factors that may be like those found in other cases being studied, and leads to a confirmation of the primary need to continue these investigations through more detailed studies. This would represent an important contribution to diminishing the vulnerability, and promoting the living standards of the inhabitants of informal settlements. In this sense, we would like to refer to the work “Density of the auto-induced suburbs at the Venezuelan Capital: Risks and Vulnerability”, coordinated by Teolinda Bolivar. On the web page http://www.reconstruir.org.sv/archivos/0/89.htm, she makes a statement at the end of the document that deserves our attention as a final reflection for this work. She says: “We would like to express in writing that it is necessary to continue with the research for the purpose of detecting how and why many of the apparently vulnerable structures do not collapse during the time of very intense and very long rains. Maybe, as observed by one of our advisors, Dr Rodolfo Sancio, we are in front of discoveries that wise men have not been able to reveal.”

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The keypoint will discuss various examples on different scale levels of urban environment (morphologic, sociologic, symbolic) and will focus on how we can learn from history, real experiences, and local wisdoms on tangible efforts to achieve environmental, cultural, and economic sustainability in holistic way. It will present some sustainability lessons and design wisdoms learned from Southeast Asian urban environments, and how we may be able to respond to the current problems through examining our behaviours towards nature and culture.
I. CONCEPTION OF “MEDITERRANEAN SEA OF ASIA”

Looking from the sea towards the land, Southeast Asia is seen as a continuum of physical and cultural environments. Sustainable cosmopolitan settlements in Southeast Asia have been developing around the “Mediterranean Sea of Asia”, referring to the coastal regions around the South China Sea, Java Sea, and Malacca Strait, since the establishment of the inter-insular and inter-continental maritime trading activities from the first century until today.

The cosmopolitan culture has been formed through complex layering processes of various cultures, ideologies, economies, and ecosystems sustained over a long extended historical period and clearly manifested in the complexity and hybridity of the production of its settlements’ morphology and architectural typologies. Southeast Asian societies and cities are characterized by rich and complex collage and interweaving of cultural diversity, hybridity in the built-forms and variety in material culture.

In Southeast Asia the cultural and geographical boundaries are always blurring, overlapping, or intersecting, and cannot clearly be defined. People in different places, islands or continents have kept moving, communicating, and intermingling from past till present, influencing each other and producing hybrid, fused, diverse architecture and material culture.

In the 1980s, Sutan Takdir Alisyahbana – an Indonesian esteemed scholar – proposed a geographical term for this dynamic region “Bumantara”, literally means “region in between”, located at the centre of international maritime and commerce, and in-between corridors for trades, migrations, and exchanges, between Asia and Australia continents, and between the Pacific the Indian oceans. For centuries, this region was politically unified under Funan, Srivijaya, and Majapahit, and now ASEAN. It was continuously shaped and enriched by various cultural layers, constantly nurtured and developed along its long and intermingling historical timeline.

II. PROTECTION OF NATURAL RESOURCES AND INTEGRATION OF HUMAN SETTLEMENT INTO NATURE

Early cosmopolitan settlements that bore the seeds of urbanity in coastal Southeast Asia appeared at the connection point between the outside worlds with the interior hinterland. This waterfront settlement in many areas in Southeast Asia is known as Kampung. According to local resources, “Kampung” (in Malay or Indonesian), or “Kompong” (in Cambodian) originally refers to the area on the riverbank near the landing point and on the path to the settlement a bit further uphill from the waterfront.

The forested hills and mountains provided steady supply of fresh water through the rivers to the community living in these settlements for their daily life and cultivations. Therefore, to ensure the continuous flow of this lifeline, the forests are protected against violations and destructions, through rituals and social rules. The choice of location for the built-up area of the settlement is carefully considered against natural and supra-natural factors, in order to ensure the harmonious relationships between human, nature, and the spirits. In rational sense, it is to ensure the survivability of the community’s existence and its livelihood.

The vernacular building tradition in Southeast Asia is the results of adaptation to local climate, innovation in building materials and techniques, and creative integration of belief, function, and form. Pitch roof, wide eaves, raised floor, breathing roof, and porous walls are the responses against the

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10 Association of 10 Southeast Asian Nations, comprises of Singapore, Indonesia, Malaysia, Thailand, Philippines, Brunei, Vietnam, Cambodia, Laos, and Myanmar
equatorial tropical warm-humid climate, affected by monsoon with plenty of rain, and to ensure comfort for people who lives within it. The timber construction system using flexible joints are reactions against earthquakes, especially in the Indonesian archipelago, which are continuously rocked by active volcanoes and the movement of continental plates.

On the land based farming settlement in Southeast Asia, there is a strong indication that the vernacular stilt-house was developed out of the rice growing culture in the warm-humid tropical region, originated from granary architectural typology, which was then further developed into dwelling places. The attic under the roof works as a storage for rice, goods and valuables, while the middle space is meant for living. It is a direct respond to the forces of nature, creative innovation in using available resources, and manifestation of belief in supra-natural powers by special ornamental decorations placed on the roof.

From the earliest vernacular traditions of Southeast Asia, we learned that local architecture and native urbanism are able to offer the best and integrated solution towards human needs in their relation with nature, social, and supra-natural environments. It is the medium for human survival in both physical and spiritual worlds, for reconciling the power of nature and the desires of human being.

III. HARMONIOUS COEXISTENCE: ORDER, HYBRIDITY, AND CULTURAL SUSTAINABILITY

People of Southeast Asia had been learning from Indian philosophy and cosmology since the first century, and applying the formal and spatial ordering principles – known as Mandala to their architectural typology and settlements morphology. This is understood as the tri-partite divisions of the cosmos in macro-, meso-, and micro- levels. This tri-partite cosmological divisions or hierarchy corresponds to the metaphor of the human body (the head, the torso, and the feet), and to the metaphor of the universe: the sky where the divine spirits reign, the ground where the human lives, and the underworld where the evil spirits dwell. It may be seen in two-dimensional plane, or applied to three-dimensional space and form.

Traditional planning of the settlements in many local contexts in Southeast Asia follows this ordering principle, by situating the village in between the mountain and the water body (sea, lake, or river). The most important building or function (like temple of origin, chieftains’ house, or ancestral graves) is placed on the vantage point of the village or towards of the mountain. Functions associated with death or impurities (like temple of death, or waste disposal) are placed down towards the opposite direction. In many cases the rice barns – the most important function for the rice growing community – are situated on the eastern side of the village facing the sunrise, symbolizing life.

Islam entered and spread throughout Southeast Asia through two different main trading routes: through the Asian mainland (“Silk Road”) and through the Indian Ocean (“Ceramic Road”). The fusion process of the new Islamic design principles and environmental ethics with the pre-existed buildings and urban spatial typology was evident. The transition and transformation processes took place peacefully and naturally through absorption of the old craftsmanship and building traditions and integration with the new architectural, structural, and environmental vocabularies. The artists and builders from different racial and cultural groups worked together and blended their artistry and skill into new and unique building tradition and architectural totality. Community groups of different religions and origins lived together side by side in close-knitted settlement fabric.

The Chinese Diaspora had been passing through and many had settled down in Southeast Asia since the establishment of the maritime trading route between China, India, Arabia and Africa. During the cyclone periods of the changing monsoon seasons, the traders stayed in Southeast Asian ports, while waiting for their trading partners from other parts of the world to come. During their stay here the crew and passengers of the ships populated the city and mingled with the local population. Many of them settled down and formed early waterfront towns and coastal cities with a cosmopolitan character.
Trade came together with the promulgation of Islam in this region. Therefore it was a common phenomenon in coastal Southeast Asia that an old Chinese temple was situated adjacent to an ancient mosque within the historical urban core, in close proximity to the waterfront in the middle of a multi-racial community.

The Chinese Diaspora’s building typology and construction method were of the southern Chinese origin, but the roofs, open veranda, timber material, and its flooring were definitely local. In other cases of the same locality, visible and easily recognizable elements of Arab, Indian, and even European origins were blended into the Chinese and local-vernacular fusion typology. In many instances, the Chinese simply used and adopted the local architectural typology for specific functions, such as temples, association halls, or dwelling. The new building typology has an eclectic nature especially in details and ornamental levels. These complex layering and blending processes in architectural typology, style, and physical manifestation did not change but definitely enhance the environmental properties and performance of the buildings.

IV. MODERNITY: CONTEXTUALIZATION, MODERNIZATION, AND INNOVATION

From the fifteenth century onward, various European colonial powers (Portuguese, Spaniard, Dutch, British, and French) entered Southeast Asia. Numerous new typologies and functions were introduced into the urban infrastructures, urban design, and architecture, such as boulevards, streetscapes, façade, building techniques, and new functions (military establishments, public buildings, churches, urban squares and plazas, markets, railroads, stations, plantation houses, and many more).

At the very beginning, the European design was directly applied into tropical Southeast Asia with minor modifications, resulted in a not so comfortable living condition within the building. Responding to this, then a more responsive design solutions were invented, by adapting building and urban design into local climatic, aesthetic, and social-cultural conditions. European style buildings with deep veranda and ventilation holes, mixed with Chinese, Indian, Malay, Arab, and others design features, evolving into unique and rich regional styles. Similar to the previous process, the European influences were naturally and openly accepted and absorbed into the vocabulary of Southeast Asian architecture and urbanism.

During the late colonial period, segregation policy of dwelling areas according to different races was implemented almost in all colonial cities in Southeast Asia. In many cases there was no clear physical boundary which separated the different racial zones, although in some cases there were rivers, walls, or roads which functioned as the physical boundaries. In any case the segregation policy had caused an internal densification process within each restricted zone especially in the non-European quarters. The over-densification would later push the colonial cities into environmental disasters and worsening of public health conditions.

In early twentieth century the colonial governments’ policies shifted to a more ethical approach towards their colonies, parallel to the rise of ethics and socialist movements in Europe. New housing areas were planned and developed inside and around the city, to accommodate the rapid increase of urban population. Infrastructure and housing improvement programs were implemented to improve the well being of all segments of the urban population. Garden cities and hygienic housing typologies were developed in the capital cities, municipalities and smaller towns. Modern building codes and regulation were introduced in order to improve sanitation condition and public safety in the inner city. New building types were invented and old building typologies were improved following the new regulations to provide pedestrian arcades, open backyard with utility functions, fire escape, etc.

With the opening of new architecture and planning schools in Southeast Asia by the colonial governments, new tropical-regionalism discourses were actively debated and practiced by young architects and urban planners in the region. Fresh ideas from modern urban planners and architects
were manifested into city plans, urban designs, and architectural styles – blended with the elements from the local, natural and cultural contexts. A large dose of idealism and hopes were put into the transformation and the future of the coastal cities in Southeast Asia in early twentieth century.

The Second World War and the invasion of Japanese Imperial army to East Asia and Southeast Asia brought to an end the colonialism history in Southeast Asia, and changed the course of urban history and morphology of this region. A new chapter of the Southeast Asian history began to emerge, riding the waves of decolonization and the spirit of national independence. The International Style and the ideas of Modernism were used to express the breakaway from the colonial past and the emergence of the new spirit of Nationalism by the leader of the newly independent countries of Southeast Asia.

Modernist urban plans and locally developed modern architectural styles were produced and implemented in the cities across the region. International style buildings with strong tropical character (such as sun-shading, façade screen, monsoon window, etc.) are widely implemented in various building typologies, from low rise detached houses into multi-stories offices. Response to local climate, functionality, and efficiency are considered as the expressions of the spirit of modernity, nation building, and independence.

Fifty years after the World War II, the wave of globalization and consumerism sweep across Asia and the rest of the world. Many of the national and regional capital cities in Southeast Asia have risen into metropolis, megalopolis, and world city, which play indispensable roles in the interconnected global market and economy. Unfortunately this rapid growth has accelerated the cultural and physical transformation process, which often speeding up the fragmentation and destruction of old urban fabrics and creating serious problems of cultural identity of its citizens. Gross ignorance of sustainable environmental and cultural practices has created many problems, including extremely large carbon footprint, wasteful and irresponsible lifestyle, fragmented identity, cultural break down, social conflicts, and other ethical issues.

V. BEAUTY RADIATES FROM TRUTH11 -EXAMINING OUR CONSCIENCE

At the heart of the ancient city of Yogyakarta, RomoMangun12 in 1983 to 1985 transformed a slum and squatters settlement on a site used to be a rubbish dump under the bridge and along Code River into an environmentally and culturally sustainable settlement.13 He worked together with the local community leaders and slum’s inhabitants of about 40 families to persuade the government for not to demolish the kampung14, but to gradually improve the infrastructure and architecture of the settlement instead. The project was gaining momentum and wide-spread support from the community. He asked special permission from the Bishop to settle down and to live in the slum to carry out his mission. The whole planning and building processes were carried out with the help from local carpenters and masons, the kampung occupants, and volunteers.

Building process is a community event and effort, and as require the architect to immerse himself completely into the community and into the transformation process. The existing and living kampung became the site of the improvement and development project. The steep slope – which was formed by compacted rubbish for many years - was strengthened by stone retaining walls. A light-weight “A”

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11 “PulchrumSplendorEstVeritatis” (Aristoteles), which often quoted by RomoMangun to express his perspective in Architecture.
12 RomoMangun (Yusuf BilyartaMangunwijaya, 1930-1999)) is a Catholic priest, architect, humanist, writer, novelist, social worker, human right activist, and recipient of Aga Khan Award in 1992 for his project in Kampung Kali Code, Yogyakarta, Indonesia.
14 Kampung in this paper refers to an urban village, an enclave, or a rural-like settlement located at the middle or at the fringe of a city, characterized by low-rise high-density and organic growth.
frame stilt house structure system supported by a simple concrete block footing is used to produce a
great variations of building forms and functional spaces, and at the same time creating an earth-quake
resistant construction.

Bamboo is used extensively for the construction and finishing, because it is locally available,
inexpensive, strong, durable, and already used in vernacular buildings by the locals. It is used for
walls, floors, sun-screens, etc. which allowing cross ventilation and environmentally friendly building.
Assisted by student volunteers, the whole community was involved in painting and decorating the
exterior of their houses with vibrant and cheerful colours.

According to him the role of the architect or designer is to give form in its totality to ambience,
personality, and spirit of space which is generated or intended by the human and the community. The
building we construct is a house for human, and therefore is spirited by human life. It gives to human
spirit Function and Form (Mangunwijaya 1981: 2-9). Function refers to usage or services that man
gets, and capacity that increases human capability. Form refers to image, meaningful reflection for
human who lives in it. Form is related to level of culture, while Function is related to level of
civilization.

Design process is problem solving that moves from inside to outside. Therefore it is fundamental to
gain understanding about the fundamental problems and potentials from the inside, before we can
generate the resolutions through Architecture. Every material has its own language, and we have to be
sensitive to the message it conveys and to its characteristics.

The Aga Khan Award in Architecture jury gave this project a global recognition by giving him an
Award in 1992. The jury found that although "the scale is small, yet the achievement within the given
constraints is immense and humane - a compelling model for the world at large."

VI. RE-ARCHITECTURING OUR FUTURE

Architecture is the materialization of culture, the physical-spatial articulation of social-cultural
inhabitation processes, which is continuously transformed and enriched along historical periods.
It is a process rather than a product – “Architecturing” rather than “Architecture”.

Human, fauna, flora and the environment is one entity like a human body with its limbs. Everything is
interrelated and interconnected. Planet Earth is one ecosystem, a sum of unified and interconnected
organic and integrated life. Therefore nature, flora, and fauna should become the integral part in
designing building (Mangunwijaya 1981: 379-383). Our building has to bear common responsibility to
manage and to preserve our environment. We should not consider nature, flora, and fauna as enemies,
but to include them as organic members in the creation of buildings within the culturisation process of
the whole Planet Earth.

Ancient building tradition is the outcome of local climate, building materials and techniques, also
indigenous believes and rituals. In traditional sense, architecture is offering the best and integrated
solution towards human needs, in their relation with the nature, the community, and the supra-natural
beliefs (Widodo 2004: 1-5).

The traditional practices, knowledge, and knowhow which have been tested and implemented for
generations for its efficiency, effectiveness, and sustainability should be pushed forward into wider
public debates, academic discourses, and political processes on sustainability and climate change.
Possible socio-political-cultural barriers which prevent the integration of cultural heritage paradigms
into the current urban planning and development discourses should be understood and properly
responded, so local wisdoms can be effectively repositioned in the current architectural design and
urban planning praxis.
For more than two millennia of its urban history, many cities in Southeast Asia have been demonstrating their ability in preserving its primary elements and basic morphological patterns, tangible fragments and intangible traces, linkages, and connections, while continuing to be transformed and reborn. All of these can be learned, understood, adapted and appropriated, decoded and reconstructed, to enrich our inventory and vocabulary to educate future generation of scholars and professionals. It may provide the keys to common understanding of the sustainable nature of architecture, urbanism, and environment, which may serve as the starting point to change our paradigms towards a more sensible, sensitive, and contextual actions.

“We had to re-evaluate our concepts and practices of “architecturing”. We had to abandon the role of being mere epigones of the architectural world of thinking and designing that was based on foreign principles and ways of life.”

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Associate Professor Dr Johannes Widodo is currently the Deputy Head for Administration and Finance, the co-Director of the Tun Tan Cheng Lock Centre for Asian Architectural and Urban Heritage in Melaka (Malaysia), and Executive Editor of JSEAA (Journal of Southeast Asian Architecture) at the Department of Architecture, National University of Singapore. His research areas include Architecture History, Typology & Morphology, and Heritage Management. He is the founder of mAAN (modern Asian Architecture Network) and iNTA (International Network of Tropical Architecture). He is also a jury for UNESCO Asia Pacific Awards for Culture Heritage Conservation since 2002, member of ICOMOS Scientific Committee and National Committee of Indonesia, and the Asian Academy for Heritage Management. He received his first professional degree in Architecture from Parahyangan Catholic University (Bandung, Indonesia, 1984), Master of Architectural Engineering degree from KatholiekeUniversiteit Leuven (Belgium, 1988), and PhD in Architecture from the University of Tokyo (Japan, 1996).

(This paper uses Ecofont Vera Sans (green font with holes) to reduce the consumption of ink, downloadable for free from www.ecofont.com)
2.6
THE CHALLENGE OF URBAN POOR SETTLEMENT
AS PROBLEM AND SOLUTION

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I. THE PARADigm OF BUILDING; SPACE AND ENVIRONMENT

The concept of thinking and understanding the science of planning should always be carried out gradually, internalized and believed that essentially, it rests on a paradigm of reciprocal relations between the buildings, spaces and the built environment on earth’s surface. In addition to the role of these three components, it is also believed, that human factor as an element of environmental variable is a central component in the formation process of built environment, such as the existence dynamic and characteristic of human settlement.

Reciprocal relationship between the buildings (as human creation), space (as God creation) and built environment (as human artefacts) is one of the focus areas of planning science which is very important to be studied in depth by the planners. New approaches developed from this focus area of planning science can give important contribution in the effort of creating a balanced ecosystem on earth’s surface.

Realities as evidenced by the various phenomena of life so far, such as damage to the quality of the built environment, decline in the health quality, natural disasters, and the global warming issues, are basically caused by an imbalance between the development of a wide variety of buildings formation, space utilization, and quality of the built environment. It all stems from the human error in decision-making process.

By studying the context of building, space and built environment, the mindset of the people constructed them, can be recognized and explained. These characteristics can be described through further study on the related aspects of social, economic, culture, technology, and other human activities.

The distribution of human’s life concentration along with their artefacts such as urban settlement, rural settlement, central business area, park, industrial estate are the reflections of the mindset of social, economic, cultural and technological life in each era. In addition, they can also be regarded as the reflections of human's decision making process, both as an individual and as a community. Therefore, planners must be able to identify, explain and plan scientifically the characteristic concept and the shape of human artefacts in relation to decision making process, as a form of responsibility to the society and humanity.

Decision making is a basic mechanism in the science of planning, and the planners should take it important because human's decision will determine the shape, the pattern of human’s activity spread, space utilization and the shape of built environment.

Each comprehension on human artefacts and human activities on earth, do not only show knowledge on the various type of decision making, but also the mindset of the decision makers; humans themselves. This paradigm inspires that humans occupy central position, as a variable and the starting point of the process of earth’s surface shape changes.

Individual and community make decision comprehensively and this carries final consequences on the creation of buildings, space utilization, and the shape of built environment. It is the nature of humans to always develop their ways of thinking, concepts, methods as well as technologies they used to live the life. Humans’ decision making is always developing and changing since new concepts emerge and replace the old ones to achieve new dreams.
Built environment is product, form or shape of built environment obtained as the consequences of decision making. Built environment is also known as pattern of built environment. Built environment can be in the form of hard environment and soft environment. Hard environment is principally any forms of buildings made by humans; this category is often called architectural space. Soft environment can be defined as natural environment and is often called non architectural type of space.

Built environment is a combination of hard environment and soft environment, because basically humans always want to create harmony between buildings and natural environment. Built environment, in turn, will become the consideration for the decision making process in spatial context. By studying the built environment in the context of human artefacts, there are many things that can be learnt the characteristic of human factor either from social, economic, technology, function, art, symbol or humans’ message in their era.

Good example to explain these entire things is the dynamic, characteristic and development of human settlement due to the rapid changes occurred from either the changes of humans’ mindset themselves or the influence from the changes of surrounding environment.

II. THE NOTION OF HOUSE; HOUSING; SETTLEMENT AND HABITAT

According to several drafts on the notion of human settlement, house is defined as building which functions as residence or dwelling place as a means of family education, it also functions as a shelter from natural disturbances and other creatures.

House is related to the values and status as well as dignity of its inhabitants, in which the people living on it are categorized as creatures of social, economic, politic, as well as culture. In their relationship with modernization process and the changes of life values system, people view the function of house as instrument to fulfill social cultural needs in constructing a society. In economic context, house is viewed as having investment and long term monetary values which can give prosperity and life assurance in the future.

House is a structural sign, of which the form and organization are greatly affected by the environment it has, and closely related to the life of its inhabitants. The meaning of symbolism and the function of house reflect social cultural strengths such as trust, compatibility, family relationship, organization, as well as social interaction of the inhabitants. The relationship between the inhabitants and the house is transactional interdependency, which is humans influence the house and vice versa.

House is not only physical means of life, but more as a process of settlement, which is the presence of human beings as inhabitants in the context of creating space for life inside the house and its surrounding. Values completely occupy primary position in the process of house setting, so that the attitude, desire, and the needs of the inhabitants are the factors determining values, philosophy, quality, form as well as the environment. Hence, house can be exposed well, if it is related to the characteristics of its inhabitants to accommodate the dynamic needs of humans’ life which are multidimensional.

Housing is a group of houses which functions as residence or dwelling place completed by environmental means and infrastructure. Besides functioning as a dwelling place to develop family life and livelihood, housing is also a means to implement social life in limited scope.

Space arrangement starts to become important, because housing deals with several interests of diverse families and different characteristics they carried along. Space arrangement and the completeness of environmental means and infrastructure are aimed at creating a healthy, safe, and harmonious as well as well-ordered environment as what the inhabitants expected. Housing has started to enclose complexities of peculiar relationship problems, because it does not only function as a shelter but also an intact part of community dynamics and the whole social and economic environment.
Settlement is part of the environment outside conservation areas, both in the form of urban areas or rural areas which function as residences or dwelling places and livelihood environment (Act no 4 on Housing and Settlement Law of Republik of Indonesia). There are 5 main elements in settlement, i.e.: nature, shell, network, people or family, and society. Some researches concluded that there are 3 types of settlement’s focus, i.e.: shelter, production and service.

Looking at the definition aforementioned, it is clear that settlement has wider scope than housing, an area dominated by dwelling places with main function as residences completed with environmental means and infrastructure as well as working places providing service and limited job opportunities to support life and the livelihood of the society. This settlement term can be defined as the blend between the housing and humans' life that inhabit it.

Habitat means residence as well as a place where citizens’ housing is built. Thus, habitat can be defined as a place where a species lives, develops, and continues his life.

Basically, habitat is environment, at least in the form of physical environment where a group of community influences and utilizes the area. The definition of habitat is often related to people or communities’ dwelling places in the form of housing and settlement in controlled environment so that people can live appropriately as what they need. Habitat can be defined as residence or dwelling place of people along with its environment, thus a harmonious habitat is very important in humans’ life.

The relationship of house, housing, settlement and habitat can be analogized as nest and habitat in the context of animal life. Nest is shelter for animals, a place to where they always return, raise their offspring, store their food, and probably a place for organization. Meanwhile, habitat is an environment where the creatures mingle, looking for food and probably meet and socialize with the opposite sexes. Certainly, humans' habitat is much wider and complex due to their unlimited socializing reach.

It is apparent now that the relationship between house, housing, settlement and habitat can be seen gradually. Housing as a group of houses functions as physical place, settlement as a group of housings with all the socio economic and other human aspect activities inside and habitat is viewed as an environment which completely shelters people’s activities in it.

Discussion above may draw the basic components of human settlement, and they are important to establish our mindset concerning with the development of human settlement. The component are in habitants, mindset, policy, socio economic, technology, compatibility, society, network, and environment.

III. URBAN POOR SETTLEMENT AS PROBLEM AND SOLUTION

Urbanization becomes one of the greatest socio-economic changes during the last five decades and has caused a rapid development of new kinds of urban poor settlement, such as the growth of squatter and informal housing all around the rapidly expanding cities in the developing world. Urban populations have increased explosively in last five decades, and will continue as the number of people born in cities increase and as the people continue to be displaced from rural areas that are almost at capacity. The creation of formal sector urban jobs is well below the expected growth rate of the urban labour force, so in all probability the majoring of these new residents will eke out an informal living and will live in urban poor settlement.

There were around 3,3 billion people living in the world in 1970, two decades later, there were already 6 billion people. The world’s urban population had nearly doubled within only two decades, it means that the developing world were predominantly rural, then is quickly becoming urban. In 2000, 40 per cent of people in developing countries live in the cities, and is predicted to be 60 per cent urban within the next 25 years. Future urban growth in developing countries will be absorbed by urban centres, which have average annual urban population growth rate lower than the developed world’s have. It is important to note that population exists beyond which cities generate more negative than
positive effects of their countries. The rapid growth of population and enormous size of the population have overwhelmed the capacity of municipal authorities to respond. There has been an evidence that millions of people in the developing country cities can not meet their basic needs for shelter such as water, food, health and education.

Developing countries will face intensified environmental problems due to urbanization. Then, the following question may arise, how to improve the living condition for the millions of urban people densely live into cities and compatible with their natural resource.

The challenges of all of these are really concerned with the shelter condition of the majority of the urban poor. It is about how the urban poor struggle to survive within urban environment, mainly through informal shelter an informal generation strategies, and about inadequacy both public and market responses to the plight of the urban poor. It is hoped that building on the foundations of the urban poor’s survival strategies and what needs could be done by both the public and non-governmental sectors, and by the international communities.

The phenomena and development of urban poor settlements seem show a negative condition on one side, but it seem also show a positive condition on the other side. We may say a problem for negative aspects and solution for positive aspects.

The problems side of urban poor settlements describes that the settlements have the most intolerable urban housing condition includes insecurity of tenure, inadequate building structure, lack of basic services, overcrowding and some of them are located on hazardous areas. In Indonesia for example, 7 per cent of the people living in hazardous location such as river bank, within hazard zone of volcano and landslide zones. Urban poor settlement has a high concentration of poverty and of social economic deprivation such as physical and social exclusion, unemployment and broken families.

The inhabitants have mostly limited access to financial source, formal job markets, discrimination and isolation. The settlement is often the recipients of the city’s nuisance, industrial effluent, frigile and polluted environment. Inhabitants suffer ordinarly from water borne diseases such as typhoid or colera and all are the greatest victims of all, although these are not universally proved if urban poor settlements are supported with proper social and economic system may will a much more better conditions.

Urban poor settlements may show positive aspects as good solutions. The settlements may become the first stopping point for immigrants, providing low cost and affordable accommodation that enable the immigrants to save for their eventual absorption into urban style and society. The specific environment of urban poor settlements give possibility to inhabitants to keep the wheels of the city turning in many different ways. The inhabitant are people struggling to make an acceptable living condition within the context of extensive urban poverty and formal unemployment compatible with their actual condition.

In the other side the settlements show a place in which the vibrant mixing of different cultures frequently result in new form of artistic expression. The situation of unhealthy, overcrowded and often dangerous environment may establish a cultural movements and strong solidarity within the community. Urban poor community have developed economically rational, innovative and fit with their economic and social condition.

From above specific attributs of urban poor settlements, we should not in any way justifying the conditioned existence of settlements and should not be an excuse for the slow progress toward the goal of the adequate shelter for all. We should believe that the problems of urban poor settlements have been based on the erroneous belief that provision of improved settlements and related service through upgrading program will solve the problem comprehensively.

It should be emphasized that the need of comprehensive future policies to support the livehoods of the urban poor by enabling urban informal sector activities to develop, providing an appropriate location for low income settlements, ensuring an easy acces to job through affordable transport.

From above discussion, we may draw some understanding as follows.
1. We often misperception that urban poor settlements are an unnecessary part of the city, they only for poor people and are all the same problems. We have to accept the fact that urban poor settlement are accommodation of most labour force in the city, providing a number of important urban services and are interesting and compatible in their own right. In fact, very few city authorities recognize this critical situation properly, even forward housing policy to address even the current problems. In community terms, they are melting pots of different original tribes, cultures and languages. Many of them are actually not so poor and living in harmony with the others.

2. In fact that urban poor settlements are staging ground of people moving to the city, and some of them are temporarily in trouble. The settlements are a place where they can live cheaply and compatible with socio economic situation until they can establish them selves. They have a dream and long term aim to make sufficient money and find a better place to live, and these phenomena are all people dream.

3. Urban poor settlements are the most disadvantaged part of city, they are distinguished as settlement for poor people, poor quality of housing, lack of services or under standard, isolated in terms of poor integration into border urban community, facing a health problems, poor education and other negative perceptions.

4. Land tenure becomes an enormous obstacle in the path of urban poor in their searching of a place to live. In most developing countries legal and regulatory framework including land market, registry / valuation and legal instruments are ineffective to accommodate the need of urban poor.

5. Urban poor often do not have proper access to financial resources needed to buy proper house for them, most housing finance system are not accessible for them including subsidies for them are not properly targeted.

To achieve the future dreams as most people perceived, a world where every one has a basic needs for sustaining of life; where people has enough and affordable food, get a healthy home with proper sanitary services, unpolluted environment, proper access to health care and education, has the opportunity to earn a decent living, we should concern and work together at least to provide a minimum provision.

1. Concern with an appropriate and affordable house with security of tenure.
2. Concern with developing a secured job under safe working condition to obtain a decent earning for reasonable livelihood.
3. Concern with basic environmental services such as access to clean water, basic sanitation, and attractive environment.
4. Concern with common urban services such as affordable public transport, especially access to working place and related to other works facilities.
5. Concern with access to participate in broader urban society, and the last,
6. Concern with positive response and honest government, proper regulations and social movement for pro urban poor settlement.

The style or method to implement such programs above might be different from country to country, some countries have more and stronger government involvement than other countries. But all approach should involve government, private sector and civil society to work together based negotiating style and tradition.

Above discussions roughly show a various angles of critical urban poor settlement problems, and are still considerably more sophisticated than a simply engineering solution. We should support the calls that strengthening dialog and increase networking among people responsible for developing knowledge, mutual understanding, especially in the area of urban settlement management to promote more awareness of world community.

We hope this conference can offer a new platform for mapping a research issues, report and publication related to formulating a better recommendation in responding to urban settlement problem and establish harmony of urban life.

In closing, we wish all of us have a productive discussion and have an enjoyable conference.
INFORMAL SETTLEMENTS AS A BASIC DEVELOPMENT FOR HOUSING IMPROVEMENTS:

USER’S INGENUITY IN IMPROVING SHELTER: THE CASE WITH INFORMAL SETTLEMENT OF KUCHING, SARAWAK

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I. INTRODUCTION

The development of informal settlements in any parts of the world is always associated with the low-income households who have migrated to urban areas and build their spontaneous shelter. The notions of urban – rural migration as used by the United Nation may also encounter a conflict of definition as that of the municipal boundary that is happening in the urban areas of the developing countries; the third generation (migration is tremendous in 1950’s) in urban areas is experiencing the expansion of the territorial boundary that pressed on their living conditions. It is mainly due to the urban populations that have grown in the last 50 years. It is recorded that in 1950 the world’s population is estimated at 29.1% living in urban areas, and in 1975 this figure had reached around 37.3%. The figure is alarmingly reached to almost double in 2007 and expected to increase to 50%. By the year 2030 the United Nation estimated that 60.8% of the people are living in cities (UN, 2003: 5) where 43% are said to live in slums. In the face of ASEAN nation alone with a population of more than 600 million people is the attention of the new world order either in economics, politics or environments. The impact on urban areas as a result of the spontaneous shelter is said to affect largely in the form of environmental problems that threaten household health and the region’s main economic activities and the urban environment. This is because the living conditions in the slums are always associated with poverty that became part and parcel of developing world urbanized environment. Subsequently, the economic development of these regions slowly improved and the government’s program to build housing units is taken over by the private and public sector who believed that the problems can be solved entirely. Therefore, the provision of a 'complete house' based on building legislation and regulations is put forward and considered as the ultimate goal of housing. In spite of this, the built environment is always under pressure of change and the role of the public and private sector could not meet the increasing demand of housing. Then again, the people as members of a group build their shelter and rearrange their given environment for various reasons in order to suit their requirements. They will do the changes and alter their living environment; these will result in the improvement of the shelter, either by replacing the deteriorated components or by increasing or reducing the space, showing that there is a reason for such changes. The frequent change to the structure that is in accord with the changing needs and lifestyle of the user indicates that housing is a continuous process. The absence of these processes in formal housing also led to the failure of housing. The underlying advantages of informal housing is often subdued by other housing activities that is always associated with housing industry, in reality looking at practice of informal housing it is always taken into consideration of indigenous techniques, and gives work to semi- and un-skilled labour, contribution to income multipliers, and backward and forward linkages in the economy.

II. DILEMA OF HOUSING SUPPLY

Generally in theory, the basis for the development strategy in the developing nation is mainly on political economic development which is focused on the market economy that is based on a theory of
modernisation emphasizing on the potential of economic development paralleled to that of other developing countries. This strategy has been mentioned by Rostow (1964) - forty five years ago where he stated that the economic development of this manner was initially started with an intensive investment. Frequently, a large amount of money is borrowed from the world financial institution and utilised for agricultural development which will end up as an agricultural based industry. Obviously, the consequences of the investment for agricultural industry will give opportunity for jobs opening and facilitate to increase the national income. The later will allow the increasing growth in demand and domestic market and hoping to stabilized growth and developed the market economy. These are the ultimate objectives of the developing countries anticipating that progression will take its toll.

Closer to our discussions, the strategy for economic development as that of ASEAN nation is basically based on an assumption that the developed countries will advance through the process of modernisation and its relationship to the comparative economy of the advanced government throughout the world. This theory clearly rejects the traditional values which is deemed to hinder the internal development as a causal for the backwardness of most developing countries. Besides, to allow for the accumulation of capital as well as to enhance growth, consequently, the monopolistic policy is adapted and the accumulation of wealth only enjoyed by a small number of entrepreneurs. In other words, the economic growth is one of the parameters frequently used to measure the success of the development as well as modernisation. Therefore, the economic stability is an essential prerequisite prior to the formation of a stable market economy, whilst the effect on inequality in social and economy of the populace may exist. There is still the present of the different level of excessive suppression due to the wrong doings and dictatorship. It is noted that various malpractises by the entrepreneurs and local traders through controlling the products and money by investing in the non-agricultural industry especially the raw materials are imported from the developed countries. The situation is worsened by the monopolistic system where in the beginning was planned to anchor local industry and later became the effect of the high cost inefficient economy that creates an isolated competition. At the end of 1997 along with the monetary crisis the strategy resulted in the worst condition, the ASEAN nation experienced a serious impact. By allowing the housing policy and national ideology relying on the market system will show the incapability of the policy itself. The failure of housing provision is evident when the nation is intervening and held full responsible in the housing development. Although the “housing needs” is institutionalised as “social right”, however, the housing problems will not be solved immediately with insufficient fund. Alternately, the government seems to encourage the participation of the people through independent and self help approach where urbanisation has affected the population growth that went beyond the limit of the land use in urban areas.

III. SUSTAINABILITY AND HOUSING DEVELOPMENT

The issues of housing development in the developing world are varied, the environments is another aspect that is widely raised by all sectors. Sustainable development is defined as development that meets the needs of the people without compromising the ability of the future generation to meet their own needs (Elliott, 1994). However, sustainability requires a holistic approach across sectors and across environmental, economic and social factors. Undeniably, it has motivated and provoked scholars and practitioners in different disciplines to seek patterns for human settlements that will meet the requirements of sustainability. Regardless of the long understanding of sustainable development in practice as opposed to the theory of sustainable that became a buzzwords. The local community around the world either in Asia or even Europe has embedded the practice in their traditional way of life. Only recently the concern and awareness on sustainable became an immense political agenda. The issue on Green Architecture and the misconception of the word “sustainable” is loosely used by all walks of life especially by unscrupulous traders as that of the Y2K syndrome in the late 90’s. The word became a new source of buzzing adjective in any physical development agenda. These strategic and marketing approaches do not really realized that the action made by the informal settlements has an input of sustainability that already embedded in their soul. Compact urban settlement is considered as an acceptable concept in urban morphology. It is believed that compactness of urban space can minimize transport of energy, infrastructures that form an integral part of the built environment and provides the environmental support to maintain quality of life in and around buildings. Generally,
sustainable development is primarily aimed at maintaining a good quality of life for people, now and in the future. The environments created in and around buildings are where people spend the majority of their time and these environments need to be healthy, comfortable and safe. In addition to environmental factors, sustainable design should also address the social and economic factors that impact on the quality of life. The practise of informal housing has strong linkage with other sectors of the economy, the process of construction, materials usage, income and employment generating later benefits the community. Generally, the concern on energy is only stressed on the consumption on heating and cooling of corporate building in the urban areas, and yet the amount of consumption became the main issue related to sustainable development. Throughout the centuries the application of appropriate technology by the urban poor is not developed further in all aspects of daily practise. Until recently, the immense energy crisis and the thinning of the ozone layer only affect our awareness in turning into appropriate technology that has been propagated by Schumacher in the early seventies.

“Appropriate Technology reflects an approach to technological development, characterized by creative and sound engineering that recognizes the social, environmental, political, economic, as well as, technical aspects of a proposed technological solution to a problem facing a society. Generally appropriate technologies are smaller scale technologies, that are ecologically and socially benign, affordable, and often powered by renewable energy. Areas of interest include energy conversion systems, waste and water management, community and shelter design, technology assessment, small scale production systems and technology transfer.”

The practise of appropriate technology also stops the migration and develops the community participation in the informal sectors. The low tech and efficient results enable the people to adapt to the availability of resources and technology available in order to sustain the environment. In large scale development, sustainability issues are the choice of the professionals to ensure the housing units are sellable.

IV. PEOPLE’S INGEUNITY

The urban village in Kuching is studied to observe the significant of informal settlement in this part of the world. It is used as the case study to relate the involvement of the people in the informal settlement. This is a good example of unplanned settlements where housing is not incompliance with current planning and building regulations. The area has been occupied since the early fifties. Although the units are compact and substandard (if definition of permanent and temporary were used to judge the unit) however, the community participation and enablement helped to improve the living conditions according to their lifestyle. The village itself is compact with no physical boundaries to demarcate the areas. In some instances only a stream or a small path indicates the boundary, and with these boundary markers the villagers identify themselves as residents of specific villages. Generally, the village is an effective social unit or local grouping. In other part of the world the authorities have found removal politically impossible. On the other hand, the living conditions in other informal settlement are considered in lacking of water and sanitation as the determinants of risks. However, in this area the water supply is available since the early dwellers first built the house here. Although the village is compact and overcrowded but the ingenuity of the people have proven otherwise. The community organisation helps to maintain peace, stability and welfare of the dwellers. Thus, instead of relocating the village, the government improved the infrastructure and the rest is taken care of by the people.

V. THE CASES

A working sampling of 78 houses were observed and examined where the response of the dwellers and their participation in the physical change of the housing unit, as well as the possibilities of intervention in the process. The urban village households in this case are examples of typical informal settlements where horizontally extended families are common. The father will inherit the house to his eldest son or daughter. The practice of inviting relatives or married children to live close by resulted in the
increased number of houses in the village. In lieu of land price in urban areas, the members of the family will work to improve the living conditions align with their culture and daily activities. With an average monthly household income of RM 3,500.00 per month the family members are competing with the high cost of living. However, the households also have cars, motorcycles, bicycles and household appliances including washing machine, refrigerator, colour television and gas cooker. The ever changing lifestyles according to modern living also affect the housing changes and improvements.

VI. THE APPLICATIONS OF APPROPRIATE TECHNOLOGY

**Original house** – There were few houses built in the early 1950s and consists of a kitchen house and a living area. The house represented a typical basic house in the area where the spatial distribution in the dwelling was not demarcated or divided into rooms. A large living room were used for entertaining guests as well as a sleeping area for the male members during night time. The kitchen house, similarly, was used for cooking and dining during the day and early evening, and as a sleeping area for the parents at night.

![Figure 1.0 Informal Settlement](image)

**Extensions** - In 1969, when the economy improves and the improvement of roads network, changes were made to the houses. It is like a wave of changes to the entire village where the front part of the existing house are the main part to be changed. However, the kitchen house was maintained and subdivided into specific spaces including one bedroom, and dining, cooking and wash areas. The thatched or *atap* roof of the old house was also replaced with zinc sheets and the entrance to the house has been relocated (Fig. 1.0). The frequent change to the structure is in accord with the changing needs and lifestyle of the user indicates that housing is a continuous process. However, if changes are made without a related change in needs and lifestyle, these physical changes then need to be looked into. Contrarily, formal housing restricted changes which are dictated by the structure of the units designed by the professionals that is lacking in understanding the user's socio-cultural backgrounds.
Table 1. Typical spatial distribution of the House

*Source: fieldwork 2003*

<table>
<thead>
<tr>
<th>Space</th>
<th>Original House (area m²)</th>
<th>After Extension (area m²)</th>
<th>Area (increase or decrease) (area m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porch</td>
<td>-n.a-</td>
<td>35.3</td>
<td>previously none</td>
</tr>
<tr>
<td>Living room</td>
<td>28.5</td>
<td>50.3</td>
<td>21.8 increase</td>
</tr>
<tr>
<td>Bedroom 1</td>
<td>16.8</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Bedroom 2</td>
<td>10.9</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Bedroom 3</td>
<td>11.7</td>
<td>-n.a-</td>
<td></td>
</tr>
<tr>
<td>Bedroom 4</td>
<td>-n.a-</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Bedroom 5</td>
<td>-n.a-</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Bedroom 6</td>
<td>-n.a-</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Bedroom 7</td>
<td>-n.a-</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Kitchen</td>
<td>9.9</td>
<td>9.9</td>
<td>no change</td>
</tr>
<tr>
<td>Dry kitchen/dining</td>
<td>-n.a-</td>
<td>40.0</td>
<td>extra 'dry' kitchen on the lower level</td>
</tr>
<tr>
<td>Family</td>
<td>-n.a-</td>
<td>36.0</td>
<td>previously part of living room</td>
</tr>
<tr>
<td>Toilet</td>
<td>(outside)</td>
<td>2.3</td>
<td>2.3 increase</td>
</tr>
<tr>
<td>Wash area</td>
<td>9.9</td>
<td>9.9</td>
<td>no change</td>
</tr>
<tr>
<td><strong>Total area</strong></td>
<td><strong>87.7</strong></td>
<td><strong>231.9</strong></td>
<td><strong>144.2 increase</strong></td>
</tr>
</tbody>
</table>

The close proximity to the main road\(^{15}\) gave access and an opportunity to the family members to proceed with renovation. After several years the houses in the area experienced another changes, the new extension this time is taking place within the unoccupied space on the ground level and the renovation on the upper level (most of the houses were built on stilt). The utilisation of the ground level for habitable space is an example of a downward extension in the village. Since the houses were built on stilts, the height of the main house, which is about 2.4-3.0 m above the ground, allows the unoccupied space on the ground floor to be enclosed for habitable space. The technique of construction applied is commonly practised in the neighbourhood; the ground beam is laid as a base (connected to the existing foundation of the column) for brick walls. At a height of 0.9 m, a window frame is installed with a lintel which is placed above the window frame to support the weight of the brickwork on top of it. The walls were plastered on both sides and painted with gloss paint. The average cost of the extension usually around RM 10,500 and the work was executed by the household members. The owner claimed that the technique of house construction is simple and what they saw from the others is what they followed. The living room in the house after the extensions was converted to bedrooms and family room. The extended area of the lower level is utilised for the dry kitchen cum formal living area. After the changes, the house has five bedrooms on the upper level, and a bedroom, living room, family room and a kitchen cum dining room on the lower level. The floor space has been increased tremendously. The increase in the number of bedrooms is mainly for the growing household size.

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\(^{15}\) The close proximity to the main road enables the occupants to transport the building materials easily.
VII. CREATIVITY AND UTILIZATION OF LABOUR

Habraken (1980 a:12) points that:

'To build is to exercise power and to change the environment. The study of housing processes yields an understanding of the powers that bring about these changes. The evaluation of the role of the dweller with respect to his dwelling is basic to the understanding of housing processes. My position is that the dweller should be recognized and understood as power. Only when users themselves exercise power, by directly influencing and controlling a part of the physical environment, can we expect healthy, vital, steadily improving environment'.

The exercise of power in the process of owner’s participation is inclined towards territorial expansion, utilization of labour and quality according to the user's preferences and aspirations (Habraken, 1980). The presence of power alone does not seem to be adequate without the availability of resources (money, materials and skills); thus the power and the physical opportunity are the determinants of change.

The changes to the dwellings in the study areas are characterized by the technique of construction, the materials used, the nature of the house design and the availability of land around the dwelling. However, the patterns of living of the people are moulded by their cultural values and lifestyle, and these criteria have a significant impact on the spatial distribution and built form. The changing processes in the three settlement areas do not seem to be as complex. The magnitude of the changes also varies and is largely influenced by the nature of the dwelling unit, the territorial boundary, and the resources of the people.

VIII. INFORMAL ACTIVITIES AND EMPLOYMENT OPPORTUNITIES

Tipple (1994) compounded that the construction industry involved in housing is particularly good at supplying work to the lowest income sector in the economy, they also need jobs and business openings so that they can afford housing and the other good things in life. There are unprecedented numbers of young adults in the urban population for whom work must be found. In the village, the involvement of the local builders in the house changes has caused a significant influence on the style, typology of the house form left a trace on the style of the built form of his limited technique of construction technology. It was revealed by the informants that the same local builder was employed to do the changes for many people (Table 2.0). It is noted that the services of the local builder are needed in implementing the changes, and their participation in the changes also helps to create employment for the locals and, in addition, develops skills among the younger generations. The role of the builders is based not only on their contribution to the physical form but also on the employment they provide, especially to those who do not have steady jobs. The increased number of school leavers provides a continuous supply of labour. Such informal sector activity can be a starting ground for a young school leaver or unemployed individual. The transfer of skills or trades also occurs through the informal sector. The development of builders drive the process of housing development. The example of the builders below help us to check the sequential trade of housing that may benefit the continuous transfer of skill that can change the scenario
of informal sectors in housing development (Fig 2.0). Tipple (1994) concluded that the most important suppliers of the dwellings themselves, and their ancillary services, are the millions of small-scale building contractors; the single artisans or small groups of skilled people and the labourers to service their needs.

Table 2. The profiles of the carpenters and contractors
Source: Fieldwork2003

<table>
<thead>
<tr>
<th>Description</th>
<th>Adiman (33)</th>
<th>Mohammad Obeng (37)</th>
<th>Ali Safuan (43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>5 years - licensed contractor (Class E)</td>
<td>18 years experience, does not wish to register due to income tax and paper works</td>
<td>25 years experience not registered</td>
</tr>
<tr>
<td>Aim</td>
<td>to get more projects and making profit</td>
<td>needs constant and manageable jobs</td>
<td>relies on small scale jobs to supplement income</td>
</tr>
<tr>
<td>Employment (Type)</td>
<td>full time</td>
<td>full time</td>
<td>part time (also involved in other informal activities)</td>
</tr>
<tr>
<td>Scale of work</td>
<td>the scale of the jobs varies from government works to residential renovation</td>
<td>the village house and other new housing schemes that require extensions; involved in the construction of core houses from 1976-1978</td>
<td>village house and other housing schemes that require his skills</td>
</tr>
<tr>
<td>Labour force</td>
<td>skilled and unskilled workers from the village 3 permanent and 20 temporary workers 75% of the workers are from the village</td>
<td>skilled and unskilled workers from the village. 5 permanent skilled 11 temporary worker</td>
<td>friends and relatives who are unemployed. 3-5 helpers (relatives)</td>
</tr>
<tr>
<td>Salary of workers</td>
<td>fixed - based on the skill of the worker</td>
<td>not fixed</td>
<td>not fixed</td>
</tr>
</tbody>
</table>

Although Adiman is a registered contractor he is more interested in doing the work for the residents in these areas.

The fast expansion of the informal sector is always associated with the fast growth of the Asian economies. The informal sector or underground economy, as it is known, is an economic activity that is unreported and unregistered and is therefore not subject to taxes. The sector provides goods and services that are not formally reflected in the compilation of a country’s gross national product (GNP). These activities ranged in nature and scale from subsistence income generating project to small profit-making commercial ventures.
<table>
<thead>
<tr>
<th><strong>Tools</strong></th>
<th>highly mechanised except the part that required manual skill such as plastering and brick laying. Heavy machinery such as back-hoe and crane are used, based on the nature of the job.</th>
<th>partly mechanised such as electric saw, electric drills, electric planes.</th>
<th>traditional tools (manually operated such as hand saw, planes and drills)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials and technique</strong></td>
<td>Time saving techniques are applied such as ready mix concrete for super-structure, and mass concrete flooring, ready made doors and window frames are used. The style is based on the owner's requirement. Tries to make the work fast and simple.</td>
<td>- materials are fabricated on site  - the concrete is mixed by hand  - ready made door frame and windows are used. Tries to assimilate the technique commonly used in the neighbourhood.</td>
<td>- materials are fabricated on site  - concrete is mixed by hand  - application of the technique based on experience.</td>
</tr>
<tr>
<td><strong>Service</strong></td>
<td>The estimate is made as part of the package which includes the material, and labour (the extension for a kitchen at the low cost terraced house cost 8-10,000 RM -cement screed floor finished, metal roof and blockwork with cement plaster on both sides)</td>
<td>- materials are bought by the owner  - provides labour and helps to decide on the type of timber, length and approximation of the area to be extended charged around 500-800 RM for low cost terraced house extension (excluding material)</td>
<td>mainly labour and skill, not involved in the estimation, the payment is negotiable, specialised in timber construction and extension jobs</td>
</tr>
<tr>
<td><strong>Traditional custom</strong></td>
<td>still believes in the traditional belief</td>
<td>depends on the owner whether he/she needs to express the cultural belief.</td>
<td>follow the owner's instruction.</td>
</tr>
</tbody>
</table>

Commenting on the scope of the informal sector in construction activity, Tipple (1993:23) writes that:

*The informal sector’s lack of regulatory hurdles is said to benefit both the self employed and their employees. Owing to its ease of entry and the lack of contractual relationships, the informal sector can be expected to act as a buffer between employment and unemployment. Some job seekers who are unable to find regular employment in the formal sector may, for short or long periods, participate in the informal sector rather than be wholly unemployed. The lack of regulation allows employers to take on these workers more readily than if long term commitments were involved.*

However, the scope of work of the informal sector is also limited by the amount of capital operators have. Many of the informal sectors builders are not registered with the any associations, hence, are facing problems in getting credit from the financial institution to expand his business. In most cases they also faced a strong competition with registered builders who are well equipped with tools and capitals.
IX. PEOPLE VERSUS AUTHORITY

According to WHO (2005:14) “Governance, defined as - the management of the course of events in a system consisting largely in the policing of social relations, environmental conditions and the allocation of resources essential to well-being”, is a critical pathway for addressing determinants of health, especially in the urban setting. Slums represent a failure of governance”. However, in the case study area the traditional social organisation of the village and the role of the “headman” is very influential and significant to administer the village with the help of the JKKK (Safety and Welfare Committee of the Village) and the Surau Committee so as to control and maintain the growth and development of the urban village of a specific area, and to promote the welfare of the people. Therefore, a close relationship between the villagers and the headman facilitates effective administration of the urban village. In this situation the close knit of the community enable the political parties to seek an important interest from the existence of the informal urban kampong and attribute to halt the intrusion of the authority. The social organisation among the dwellers also strengthens the social bond in all aspects. However, all the activities of extensions and changes made by the owner to the house are made without consulting the community leader or the authorities. Instead, the agreement of the neighbours is sought. There are huge vested interests among groups with power in keeping to the status quo on regulations but the authorities do not interfere with the changes for several reasons. Obviously, the main reason is that the City Hall authorities do not have enough manpower and are more concerned about the industrial estates and commercial establishments than the residential areas. As the extensions are within individual plots, they do not seem to create any serious danger to the individual units or the building blocks. The City Hall authority has more or less a ‘wait and see’ attitude towards the phenomenon of new settlers and any interference to the community may refer to the political parties in the areas.

Consequences of the informal settlement

- User participation in housing process
- Sustainable development
- Income multipliers and linkages
- Tailor to socio-cultural requirements
- Applications of Appropriate Technology
- Transfer of skill to young school leavers
- Development of local building materials
- Creativity and ingenuity developed
- Flexibility in planning layout
- Community participation (unity and compromise)
- Home-based enterprise
- Reduce poverty (vigilant for the poorest)

X. CONCLUSIONS

The above examples explained the role of the user or the occupants in improving their living conditions. The informal settlements may yet serve as continuing gateways for people experiencing the urban. “Housing”- according to the policy makers is also seen as an evolving asset or feature of urbanization. Perceived housing choice represent wishes for advancement in the urban scene. These are nevertheless local symbols of the urban – as different as possible from the rural. The contribution of the informal sector to urban development should be recognised and assisted, especially as it is highly efficient in providing dwellings and employment at the same time. The building of the unit to suit their taste and socio-cultural contests the uniform trend of formal housing that is capital intensive. The housing policy introduced by any government to tackle the housing problems cannot meet the growing demand and population growth. However, there is a need to consider some improvement in the policy such as the changes in ownership status as well as gazetting the urban kampong. Otherwise people are trapped in informal settlement gateway housing when they have outgrown it. The
outgrowing shows a sense of success by the effort of the dwellers in improving their living conditions but then that success would have been hindered by the trap. Another point is that there will allow new entrants readily available low cost housing units which otherwise would not be freed or available. The application of appropriate technology is evidently yielded the continuous practice of sustainability in the urban areas. It is realized that appropriate technology works from the bottom up; it is not an overlay to the situation; it is a genuine grassroots solution to economic needs. Hence, the sustainable development strategy should be a long term public interest rather than short term private interest.

These housing attributes have long been recognised by the professionals but there is no complete approach that can be accepted in professional practice. Zulficar (1990:19-20) contends that: "there are no clear-cut, ready-made, uniform solutions to the housing crises, but there are imaginative ways of seeking the rational and efficient use of scarce resources and of mobilising individual initiatives and potentials such as self-help, self-reliance, communal participation'. The individual initiatives in the housing process are not limited, however there are other restrictions that may hinder the continuity of such actions. The requirements of those for whom the houses are intended are closely related to personal choice and control, and hence the ways of experiencing meaning are rather different from a single architectural meaning or interpretation. However, the meaning of architecture itself is approached from the ethnocentric viewpoint of the professional subculture without further regard to other people involved in the design process. Architectural determinism tends to support the paradigm of these professionals (Lang, 1987). Broady (1968:12-14) even proclaimed that 'the architect (or designer) who builds a house, or designs a site plan, who decides where the road will and will not go, and who decides in which direction the houses will face, and ho­w close together they will be, is to a large extent deciding the pattern of social life among the people who live in these houses'.

The mental designs of housing users, however, are more amorphous, and are often sketchy, with new ideas planned and integrated throughout the span of their life. Some had their mental design long before the implementation itself, but others were only able to visualise the change when the need presented itself. Meanwhile, the physical changes are greatly influenced by the cultural context in which they occur. It is observed that culture is inseparable from the user and physical changes were made when the need arose. It is also noted that housing either formal or informal has been defined as both an object and a process. These two differing viewpoints may define the policy with regard to its provision. A policy that looks at housing merely as an object will focus on the construction and quantity of houses whilst a policy that views housing as a process will emphasize the development of the home and community. Another point highlighted from this issue is why and how people intervene in the housing process. The opportunities and constraints in changing the built environment are placed in the context of the need for change and the intend to make changes. However, the involvement of the user to fulfill their need is often affected by social, physical and financial constraint. The importance of religion, custom and belief formed a basis for uniting the mind and the soul of the dwellers. Generally, the clear definition of community responsibility is not dictated by the government, it is by the community themselves. With respect to these, the activities of the community continue to thrive.

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ABSTRACT

Human activities always modify the natural environment and cause both positive and negative effects in environment. One of human activities in creating built environment is urban areas which are inhabited by the low, middle and high income people. In developing countries the development of urban areas are always influenced by the growth of low-income settlements which is mostly developed around the city center. Those settlement both slum areas and squatter settlements are occupied mostly by the poor people. This paper will discuss about how to harmonize built and natural environment within the urban areas and the focus of discussion is on the development of low-income settlements in urban areas.

Keywords: Harmony, Built Environment, Slum, Squatter

I. INTRODUCTION

Talking about the built environment, it refers to human activities which modify natural environment in order to provide what they need for living. Those activities have ranging scales from personal shelter and buildings to neighborhoods and cites that can often include their supporting infrastructure, such as water supply or energy networks. Human activities have damaged the earth gradually over the years and this damage cannot be reversed. Many experts are now trying to stop any more damage being caused to the environment. Not all effects of human activity on the environment are harmful, some are beneficial. Conservation work is going on across the country and this is helping to preserve the wildlife and countryside as well as the good urban areas that we have left. The balance between natural environment and man-made environment should be taken into consideration carefully both in planning and design.

In general there are two causal factors that can change the formation of natural environments. Those factors are human activities and natural phenomena. Human activities always modify the natural environment and cause both positive and negative effects in environment. Positive effects benefit the environment, because they beautify the god quality of environment and fix the bad quality of environment like limiting the use of natural resources, reducing environmental pollution, controlling the urban growth, etc. While the negative effects are mostly destroy the good environmental quality like develop industries without thinking the pollution control, uncontrolled urban growth, etc. There are so many evidences that human activities cause negative impact in natural environment and then influence natural phenomena that can cause natural disaster like flood, landslide, fire, pollution, etc. [Herrle, etc., 1981]
Natural Phenomena can also change the formation of natural environment specifically natural disaster like Tsunami, Volcano Eruption, Earthquake, and Hurricane. These natural disasters cannot be avoided by the people, but they can do disaster preparedness, if they live in areas which have potency to natural disaster, for instance the people who live in the settlement located in steep areas, along the riverbank, and near the volcano. A disaster may strike anytime, anywhere. It may take many forms like an earthquake, a tornado, a flood, a fire or a hazardous spill, an act of nature. It may build up over days or weeks, or it may hit suddenly, without warning. The discussion in this paper will be focused on the human activities that create the built environments within the urban areas especially in the cities.

Sustainability and Cities examine the urban aspect of sustainability issues, arguing that cities are a necessary focus for that global agenda. All cities have their slums and informal settlements. [Zahnd, 2005] Their extent, proportion and character vary not merely with income level but also with the socio-political or legislative environment and law-enforcement regime. Ironically, it is not so much the absence of a legal framework and its application that leads to slums and informal settlements; its very presence can frustrate efforts to prevent their formation and growth. In each country, there is a name for slum and squatter settlements such as bidonville, katchi abadi, bustee, favella, barrio, kampong, that reflect either their rural character or material status. Those settlements mostly develop spontaneously in developing countries and the inhabitants are also marginalized by the social intercourse of the people within the city.

Harmonize the built environment with the nature in the urban areas especially in low-income settlements is very important in order to reach sustainable development of urban areas. The Green Development Strategy will be discussed also in this paper for improving the environmental quality in low-income settlements and in urban areas as whole. With giving some evidences or real situations in the Indonesia cities, the discussion in this paper can be understood clearly.
II. BUILT ENVIRONMENT WITHIN URBAN AREAS

As it was mentioned above that one of the human creativities is the built environment within the urban areas. The development of urban area always follows the growth of its population numbers, because the more the population numbers within the city increase, the more the urban facilities in the city will be improved. Since the urban form is a result of human intervention in a natural environment, the quality of relationship among the Natural and man-made environment is depend on the men as human being who carry out their activities in urban areas. (see Figure 2) If the activities do not consider the ecological aspects of urban areas, the environmental qualities will be worst. Whereas if the human being carries out their activities with taking into consideration the ecological aspects, the development of urban areas will be in harmony and sustain. [Bawole, 2009]

![Diagram of Human Intervention in Natural Environment](image)

In landscape architecture, the built environment is identified as man-made landscapes as opposed to the natural environment. In architecture and environmental psychology, the phrase is a useful acknowledgment that the majority of urban environments already exist, that a small fraction of buildings constructed annually, even in the industrialized world, are designed by architects, and that users of the built environment encounter issues that cross the traditional professional boundaries between urban planners, traffic engineers, zoning authorities, architects, interior designers, industrial designers, etc.

From the statements above it can be understood that almost all built environments within the city are created by the human being which has either en architectural education background or not. In general people living in the city can be divided into three categories namely low-income, middle-income and high-income people. The settlements of those three categories of the people either planned or unplanned are separated in several zones of the city. (see Figure 3) Middle to high-income people live in formal housing areas located inside the cities and in suburb areas. Whereas the low-income people live in Kampong settlements or in unused areas around the city center like areas along the railway tracks, along the riverbanks, in cemetery areas or in many vacant areas inside the cities.

In general housing areas of middle to high income people have good environmental qualities and the infrastructure facilities are very good. In the other way around the low-income settlements both slum
and squatter settlements have minimal infrastructure facilities. The low income people can be divided into two groups namely upper low-income and lower low-income known as grass root people. Since the infrastructure facilities are very minimum, the inhabitants in such housing areas should be creative in developing their houses and surrounding environments. The built environment in low-income housing areas is developed spontaneously without helping architects or urban planners.

The middle to high income people have good financial capability, so that they have no problem with their houses. They can buy any type of houses with very good environment situation, because they have enough money. Whereas the low-income people especially the grass root people usually live under the poverty line. They often have problems with their houses including the surrounding environments, because in reality they are very poor and the environmental quality in their settlements is bad. Due to the bad environmental qualities of the settlements, this group of people is often blamed by the others. They say that those groups of people destroy the good image of the city and finally the local government will demolish the low-income housing areas in order to build the new facilities for other reach people.

III. GREEN DEVELOPMENT STRATEGY FOR DEVELOPING URBAN AREAS

There are many definitions of Green Development stated by the experts. The use of term “Green” is intended to be associated with the concept of ‘sustainability’ or ‘sustainable development’. Sustainability was popularized by the 1987 report of The World Commission on Environment and Development titled “Our Common Future”. In the report the commission defined sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. In another word it can be said that the sustainability is a responsibility of one generation to the next and the interdependencies between social, economical, and ecological systems.
A Green Development Strategy is a blueprint that provides strategic direction and a framework for action on addressing sustainability. The Green Development Strategy includes the Council’s priorities and plans of action to integrate sustainable development into its policies, programs and operations, and to deliver sustainable development with its partner organizations and in the wider community, which will make the urban area a better and more sustainable place to live. [Scarbourough Council, 2010]

According to the definition above the development of urban areas should be equal to the whole community of urban areas without seeing the income level of the community. In reality the development of urban areas in developing countries is dominated by the people who have more capital. The poor have no bargaining power to live in urban areas. If their housing areas are needed by the local government or private companies, they have to move to other areas. The government or private institution will bulldoze their houses, if they do not want to move. There are many evident about demolishing the kampong settlements developed by the poor spontaneously. (see Figure 4)

The implementation of green development is always closed to all aspects related to the environments without seeing the economic level of the inhabitants. The development of low-income settlements which are already more than one generation or more than 10 years should not be demolished. The appropriate program for those settlements are to implement the upgrading program for the physical aspects of the settlements and advocacy program for the inhabitants especially in socio-culture, micro-economic, and the awareness of better environmental qualities. Understanding the green development strategy, the architect and urban planner and designer should not only improve the quality of physical aspect of urban areas, but also improve the living quality of the people specifically their socio-culture, economic and their consideration of healthy environment. As whole the implementation of green development strategy will be closed to the ecological aspect of urban areas.

Concerning the ecological aspects of urban areas, several issues should be taken into account. Those issues are explained below:

- Community quality of life - Create opportunities to enhance and develop the identity of the Town and its people
- Design - Support the effective use and development of land and buildings for the benefit of the local area
- Economics - Support opportunities that enhance industrial and commercial growth and promote job creation within the local area
- Environment - Promote development that minimizes environmental impact and support initiatives to conserve and enhance natural areas
- Health - Create a safe community and healthy place to live

Figure 4. The Settlements of the poor in Jakarta and Surabaya were Demolished by the Local Government

- Housing - Encourage the provision of a variety of housing types and the enhancement of lifestyle options
- Transport - Provide infrastructure which supports a variety of transport choices such as walking, cycling and public transport
- etc.

IV. THE ROLE OF INFORMAL SETTLEMENTS IN URBAN GROWTH

Poor people demonstrate great ingenuity in developing their residential neighborhoods and in organizing the open spaces and construction of housing, even if the government regards them as illegal. (Hardoy, 1989) The statement above is understandable, because if a man is forced by the bad situation in his life, automatically his strength will appear and he will face the problems with all creativities he has. People in informal settlements have limited capabilities and the bad situations of their life force them to be creative in handling their problems. Usually the government takes into account their creativities as illegal actions of the inhabitants. (Srinivas, 2008)

Based on the observation in several informal housing areas in 4 cities, the problems of the informal settlement begin to appear when the local government considers the informal settlement as a bad image of the city that must be removed. In fact the informal settlement has been developed up to the second generation or more than 15 years. Socio-culturally and economically, even psychologically they have roots in that area of the settlement. By removing the settlement, in one side the local government tries to beautify the area based on the concept of beauty idealized by the city planner and the staffs of the local government. On the other side, the local government stimulates indirectly the appearance of the informal settlement in other areas, because the grass root people who are not able to buy a formal house will look for another empty area in the city centre as their place to build a new informal hut. (Munt, 2008)

The grass root people in informal settlement do not have a chance to live in formal settlement, because they are too poor to reach the formal housing prize. In other word it is quite difficult for them to save their money for their future better live. (UNHCS, 1996) The only alternative to stay around the city center is in a piece of land in which they do not have to buy the land or to pay for the rent. That is why so many poor people occupy vacant areas within the cities, in which the government or private institutions have not used them yet. At those vacant areas automatically there are no adequate infrastructure facilities, but the grass root people with their great ingenuity can struggle for their life. Since they live in informal settlement with minimal infrastructure facilities, they have to be creative and used the facilities within the settlements effectively. Therefore their ways, plans, designs and building materials are often far better suited to local needs, incomes, climatic conditions and resources than the official, legal standards demanded by governments. (Hardoy, 1990)

Spatial form in informal settlements can be seen as public open spaces and pathways in which many people carry out their daily activities. After finding out the spatial forms including inhabitants’ activities inside, it is necessary to choose several active open spaces within informal settlements and then use them as an orientation of the plan for urban revitalization program. The active open space is chosen because it is a place used as a centre for human activities in the settlements. The circulations connecting the open spaces available should be considered as a secondary pattern of the settlements, because the main pattern of the settlement is linear pattern following the river flow. Afterwards the houses developed along the circulations or pathways should be improved step by step individually with the strategy of self-help development. (Ribbeck, 2002)

Understanding the activities of the poor in architectural space within the informal settlements is very useful for arranging a development strategy based on the character of the inhabitants. By paying attention to the economical situation of the low income people living in informal settlements, it can be understood that they are hard workers, who are persevering in looking for their basic necessities of life for their family. (Bawole, 2007) Not only the husbands work, but also the wives work to help their husband in order to have additional incomes. Their dependence to the centre in the bustle of the city is very strong, because in the centre they can get their income every day.
The role of the informal settlements including the poor people living there is very important for the growth of the city, because they serve cheap labors to the middle to high income people and their work as a second hand collector can help the problems of solid waste. Besides the micro economic created by the low-income people in informal sectors has also contribution for the regional economic rotation. Even though the income and education level of the people are usually low, the poor knows far better their housing areas and their capability to improve them. Therefore it is much better to involve the inhabitants at the whole planning and design process for developing the low-income settlements within the urban areas.

V. HARMONIZING THE BUILT AND NATURAL ENVIRONMENTS

The Dialogue on Environmentally Harmonious Cities is ultimately focusing on reducing urban poverty and addressing the challenge of slums by improving the environmental living conditions, protecting resources and achieving better access to basic urban infrastructure, such as water and sanitation. For the middle to high income people it is necessary to implement strictly the regulation which can harmonize the built and natural environment, because they have good financial support and mostly they are educated people. The poor people who live in slum and squatter settlements have no access to information especially the information about a good environmental quality in urban areas. Besides they are very poor and their whole day work is only for their living in one day. Therefore to harmonize the built and natural environments in urban areas should focus in improving the living standard of the low-income people as well as their surrounding housing environments. [Wilcox, 1994]

As it was mentioned in Figure 2 that the human being has an important role in harmonizing the built and natural environment. If the development of built environment within the city does not consider existing natural resources and the capability of the people who carried out their activities in urban areas, the harmony among those three aspects cannot be reached well. As a group of human being, the community should have also a Harmonized Community System, in which its approach can be seen below: [Weston Soultions, 2010]

- Harmonized with the environment (nature)
- Harmonized with the buildings
- Harmonized with each other—water, wastewater, energy, storm water, transportation, energy, security, etc.

In addition to the explanation above there are three most important contexts for creating sustainable design and harmonizing the built and natural environments. Those important context are stated below:

- **Ecological**: The natural forces that shape landscape, including climate, geology, soils, water, elevation, and vegetation.
- **Cultural**: The human forces that shape and define landscape, including history, development patterns, agriculture, and social uses.
- **Economic**: The budget realities and cost-saving considerations that shape the built environments

VI. CONCLUSION

From the whole discussions above some important conclusions can be taken into account in regard to create a harmony with nature for sustainable built environment. Those conclusions are:

- Harmonizing the built and natural environment within the urban areas should give more attention to the low-income people, who live in slum areas and squatter or informal settlements
The green development strategy can be implemented well, if the implementation of the strategy is based on a responsibility of one generation to the next and the interdependencies between social, economical, and ecological systems.

The development program with demolishing the informal settlements cannot solve the poverty problems of inhabitants. In one side such development program solves only a part of the city, but in the other side the program stimulates the new informal settlements in other part of the city.

The opinion which sees that the informal settlement is garbage of the city should be changed in the other way around; it should see that the informal settlement is a special housing area that has to be developed specifically.

The grass root people in informal settlements can struggle for their life with their great ingenuity and creativities in improving their house and surrounding environments.

If the inhabitants are involved in the whole process of development program in informal settlements, the program will be sustainable.

The development of informal settlements can be more sustainable for improving the environmental quality within urban areas if total participatory strategies and advocacy development program are implemented carefully.

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