INFORMAL SETTLEMENTS
AND
AFFORDABLE HOUSING

CIB Report
Publication ………………..

Editors

Johan Silas
Happy Santosa
FX Teddy Badai Samodra
Erika Yuni Astuti
Johanes Krisdianto

CIB Working Commission W 110
Informal Settlements and Affordable Housing

Published by: CIB General Secretariat

ISBN : ……………………..  November 2005
PREFACE and ACKNOWLEDGMENT

This book represents the works of the researchers in the Asia region which are compiled together in the international conference on “INFORMAL SETTLEMENTS and AFFORDABLE HOUSING” organized by the Department of Architecture, Institute of Technology Sepuluh Nopember (ITS) and the International Council for Research and Innovation in Building and Construction (CIB) –Working Commission W 110 – Informal Settlements and Affordable Housing; 17-18 November 2005.

The purpose of the conference is to obtain a global network and international exchange and cooperation in research, particularly in Informal Settlements and Affordable Housing.

The discussion in this book covers the following topics:
1. Sustainable livelihoods in the informal settlements, incorporating the inhabitants participation.
2. Stakeholders role in the transfer of technology and assistance to the community in the development of settlement physical, social, and economic conditions.
3. Affordable housing for the low income families.

Special thanks are directed to associate professor Dr. Paul Memmott from University of Queensland and to Nele Peeters from Department of Mechanics of Materials and Constructions (MEMC) Vrije Universiteit Brussel, Brussels, Belgium and Dr. Amira Osman from the Department of Architecture, University of Pretoria South Africa, for their paper contribution (invited papers). Appreciation and thanks also directed to all the writers in this book.

The book is printed with the supporting funds from Ir. Putu Rudy Satiawan, MSc from the Dept of Regional and Town Planning ITS and from Prof. Ir. Nyoman Sutantra, MSc, PhD head Research Institute and Public Service ITS.

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Aboriginal Environments Research Centre
University of Queensland, St Lucia, Australia

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Nele Peeters*, Amira Osman**
*Department of Mechanics of Materials and Constructions (MEMC) Vrije Universiteit Brussel, Brussels, Belgium
**Department of Architecture
University of Pretoria, Pretoria, South Africa

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‘Sustainable livelihoods in the informal settlements, incorporating the inhabitants participation’

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*Department of Architecture – Faculty of Engineering Duta Wacana Christian University, Jogjakarta
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Informal Settlements and Affordable Housing
Meeting and Conference, Surabaya 17-18 November 2005
Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

INVITED PAPERS
POSITIONING THE TRADITIONAL ARCHITECTURE OF ABORIGINAL AUSTRALIA IN A WORLD THEORY OF ARCHITECTURE

Paul Memmott
Aboriginal Environments Research Centre
University of Queensland, St Lucia, Australia

Abstract

Classical Australian Aboriginal cultures evolved over many tens of millennia, largely shaped around hunter-gatherer and fisher lifestyles with complex development in social organization, kinship, language, religious and philosophical practices. Four major periods can be differentiated in the recorded history of Aboriginal architecture. The first is the classical Aboriginal ethno-architecture as practised prior to the arrival of the colonists and at the time of their first arrival. Then during and following colonization, acculturated ethno-architecture occurred in the sedentary camps of the 19th and 20th centuries. The third period comprised the outstation ethno-architecture during and after the 1970s, paralleled by increasing collaborative projects between Aboriginal groups and non-Aboriginal architects. The most recent fourth period is the architecture of the late 20th and early 21st centuries designed by the first Indigenous architects with western professional qualifications and training; cross-cultural collaborative projects also remain ongoing.

In this paper I briefly describe some of the most characteristic and noteworthy properties of the classical Aboriginal architecture. I shall also put the case that traditional Aboriginal architecture has continued throughout the post-contact period. However to mount such an argument, a theoretical position needs to be advanced on the nature of ‘tradition’. ‘Tradition’, in its primary or core sense means the
process(es) of the transmission of culture across generations (Rigsby 2002:10-16) which, if applied to the phenomena of buildings and architectural activity, implies processes of enculturation, conceptual encoding and decoding of meanings, as well as technological adaptation to sites and landscapes, socioeconomic contexts and user group needs.iii These are all dynamic properties of traditional architecture. Far from reifying the concept of vernacular architecture, the current paper is concerned both with the dynamic qualities of the many dimensions of people-environment interaction that characterize the various cultural categories of architecture, and the position of building traditions within human cultural landscapes.

I shall present these finding such that they might contribute to a broader theoretical question of how can we configure a world theory of architecture that encompasses not only Western architecture as commonly taught within the University pedogy, but also Indigenous and vernacular forms of architecture whose properties may appear to be of an opposite nature and indeed, to challenge the conventional paradigm of what ‘Architecture’ is.

**Keywords**: traditional architecture, settlement properties

**Regional and Seasonal Diversity of Aboriginal Ethnoarchitecture**

In the order of 300,000 Indigenous people were distributed across the entire Australian continent when the British colonisation began in 1788. Local groups were organized into larger regional groupings whose members intermarried according to strict rules, and shared some common aspects of language,iv social organization, beliefs and customs. Aboriginal Australia was divided into a set of distinct cultural regions corresponding with natural land systems and geographic features, and we can recognize in each region a particular body of architectural knowledge employed in settlement life. Each such regional body of knowledge can be termed an ‘ethno-architecture’.v The dominant category of the
ethno-architecture was domestic, comprising a considerable range of shelter types used in residential camps. Particular styles were largely a function of the available structural and cladding materials and the extent of dominant climatic influences; however Aboriginal ethno-architecture was also an expression of diverse and sometimes complex relationships between the religious, behavioural, social and physical environments.

For most of the seasonal year, small local groups or bands were scattered throughout their respective countries engaged in hunting, gathering and (except in very arid areas) fishing. Although people were nomadic in the sense that they moved between a number of contiguous ecological systems to effectively exploit seasonal foods and resources, the territorial range of groups of Aborigines was in most areas restricted by various forms of territorial rules as well as by the need to maintain local religious obligations in one’s own estate (either land or sea estates) and those of one’s grandparents and spouse(s). People were conscious of their place within their own local territory, intimate with its geography, and spiritually attached to its sacred sites and sacred histories.

The seasonal year was divided into a discrete number of climatic periods, each with its own patterns of geographic focus, settlement use, food collection activity, domiciliary behaviour and ethno-architectural types. Aboriginal bands occupied a series of camps in a permanent pattern of seasonal rotation. Most tribal or language groups employed a repertoire of up to seven or eight shelter types, one of which was selected for construction and use under particular circumstances of prevailing weather, availability of local raw materials, planned purpose and length of stay, and size and composition of the group to be accommodated.

**Sociospatial Properties of Settlement**

Domiciliary architecture was supplemented by a highly structured use of space as well as a complex geography of place. Camp size varied from a single family up to several
hundred people or more. The logistics of spatial organization were generated and regulated by complex social structures and associated behavioural customs and moral codes. For example, in a typical larger-sized settlement, separate shelters were commonly used for diurnal and nocturnal activities. Men and women congregated apart during the day, while family groups resided together at night. Unmarried men and women slept in separate domiciliary groups. Nocturnal domiciliary groups were spatially arranged in clusters according to a variety of social principles: age and gender identity, tribal or language group identity, as well as close family relationship and other classificatory kinship structures (Memmott 2002). These clusters were usually close enough for visual and aural communication. External orientation was a key attribute, but at the same time there were kinship rules which forbade specific relatives from camping in proximity to one another. Movement around camps was also restricted by prescribed avoidance behaviours and the existence of gender-exclusive ceremonial grounds.

Since camps were organized spatially and constructed by their residents, the types and distribution of physical structures displayed a ‘cultural fit’ with the activity patterns and settings contained within the settlement space. Space was “…a function of the forms of social solidarity, and these were in turn a product of the structure of society”; or put in an alternate way: “society [had] a certain spatial logic” whilst “space [had] a certain social logic to it” (Hillier & Hanson 1984:22). In Aboriginal Australia today such sociospatial behaviours may have been lost in some communities, whilst in others they have survived for contact periods of up to 150 years and continue to represent important social identity systems.

**Classical Architecture of Short Duration**
The mobile hunter-gatherer lifestyle often resulted in relatively impermanent or semi-permanent dwellings which were occupied for periods from a single day to several
months. In pleasant weather, preference was for open living with minimal structures. A widespread continental type for cold windy weather was the windbreak constructed of grass, foliage bark, or vines, together with warming fires. Shade structures were also widely used, and readily constructed (in the absence of shady trees) by implanting leafy boughs in the ground, or erecting a horizontal roof structure or making a lean-to with a ridge pole. In reflecting on these types, let us consider the idea of minimalist architecture. This is of special interest because Australian Aboriginal architecture has regularly been portrayed during the colonial and post-colonial periods as little more than primitive huts, and certainly not deserving of the label ‘architecture’. The nature of these short-duration forms of Indigenous architecture thus poses both a political threat to the conventional construct of ‘architecture’ and a theoretical challenge.

Perhaps the most striking example of culturally constructed use of domiciliary space which employs minimal (if any) structure, is that of a ‘travellers’ camp’. A travellers’ camp is a quickly-made camp, comprising domiciliary spaces, hearths and artefacts, and sometimes with windbreaks or shades, that is used overnight or perhaps for only a few hours (such as a ‘dinner’ or midday camp), by a group travelling through the country. As there is little time to invest in the construction of shelters, the natural qualities of the chosen camping site are of paramount importance in enhancing residential comfort. Although such travellers’ camps continue to be in daily use in many remote parts of Australia, there are few recorded examples. The following case study concerns two Central Australian tribesmen, Elder Paddy Woodman a revered ritual leader, and a younger man, Stephen Bob (Paddy’s nephew).

Paddy’s preferred campsite location is in mulga woodland. He will be grumpy if there are not any mulga tree communities available on the late afternoon route at which to camp for the night. In other types of tree communities, there is more likely to be prickles, burrs, grass and
ground cover which can shelter snakes, centipedes, scorpions or the nests of stinging ants; whereas the floor of the mulga forest is free of grass and easy to sweep clean of loose dirt and needle leaves with a branch. Mulga is also a superior wood for cooking and warming fires as it produces long-burning hot coals. In the mulga camp one notices the whirl of certain fast-flying flocks of birds that adopt the mulga as their habitat. There is also a constant familiar and secure sound of wind in mulga.

Campfire discussion ranges across many topics but includes reflection on local Aboriginal history in the region surrounding the campsite eg the totemic history and creation of sacred sites by Ancestral Beings, the history of mortals from past generations in perpetuating the Dreamtime history in ceremonial performance and sacred site maintenance, and the violent contact clash with white pastoralists who settled in the region during the period from the 1890s to the 1930s. P.W. tells gruesome stories of his boyhood during this ‘revolver time’.

…Paddy and Stephen sleep side by side with a small mulga fire burning between them. Several mulga limbs protrude to one side of their sleeping area, and are gradually fed into the fire through the night. Paddy travels with a ‘swag’ of two thin frayed blankets - one blanket laid under and one over him. He always sleeps in his clothes and points his head to the east and feet to the west to prevent the infiltration of bad spirits during sleep. In the early morning, Paddy warms and smokes the inside of his hat over the fire; his first activity after sitting up. Stephen blows and fans the embers to produce flames for boiling tea.
Consider the properties of this camp. There are comforts of surface, vegetation, sound, smell, warmth, security, spatial definition, customary domiciliary behaviours, and connection with nature. In the circumstance of a strong wind, a windbreak would have been quickly constructed of mulga limbs. If there was a rain-shower, the fire would have been stoked up; while persistent rain would have possibly resulted in the stretching of a plastic sheet or blanket over a tree. This is ‘architecture’ at its most minimal, yet the campers retain a certain level of comfort. Security partly stems from a shared understanding of the sacred meanings attached to the cultural landscape in which the campsite is located. There is a sense of the presence of Ancestral Beings from the Dreamtime having an active presence at the campsite, and linking the ancient past to the present. Indigenous constructs of time with their historical and geographical references pervade camp properties. Parallels have been drawn by Bill McKay for Maori architecture.

...the Maori space and time construct can be thought of more like a constellation with the past and the people of the past always felt in the present, like the constellations of the sky - enmeshing, surrounding - always before you, always behind, forming patterns that can be interpreted in various ways. (McKay 2002:2.)

More Durable and Complex Classical Architectural Genres

In a wide distribution of locations across the continent, there are reports of technologically crafted styles of strong, weatherproof shelters, sufficiently high to stand in, and supporting sedentary or semi-sedentary occupation. In some cases the structures covered large floor areas to permit occupation by several families or a gendered group and thus facilitated internal social interaction during the day. The
reasons for the development of such styles are varied, but seem largely limited to one or several of the following circumstances: (i) the occurrence of long periods of inclement weather, usually with continual rain, which may have also reduced mobility; (ii) the presence of an abundance of local resources to enable long-term local residence, and (iii) the social motivation to sustain large-scale gatherings for ceremony and initiating, arranging marriages, trading, settling disputes and executing forms of emotional reconciliation.

For example, in the largest and wettest tract of tropical rainforest on the continent, in north-east Australia, clusters of inter-connected domes were made of lattice cane or sapling frames and clad with layers of thatched grass or palm leaves or bark. In central Australia, where there are extremes of daily temperatures, the more durable styles were dome forms covered with a thick layer of spinifex overlaid with mud or clay plastering. Similarly, on the inclement parts of the south-eastern coasts, winter domes were up to 3.6m in diameter and 2.4m high, earth-clad, cupola-shaped, often fitted with a porch, and with a circular smoke vent at the apex, covered with a sod; and in certain areas low circular stone walls were also included to carry the reed or timber-framed roofs. These taller structures had to be of sufficient strength to bear the weight of an adult carrying out roof maintenance after bad weather. There are many more examples that could be cited.¹ Ethnographers have reported tribal base camps which were continually occupied by at least some people all year round. (Memmott 2004.)

**Symbolism and Meaning in Australian Aboriginal Architecture**

All people encode meanings into their built environments and decode meanings from them. Such meanings can be analysed into ‘high-level’ meanings relate to cosmologies, cultural schemata, world-views, philosophical systems, and the sacred; ‘middle-level’ meanings communicating identity, status, wealth, and power; and finally, ‘low-level’ everyday
and instrumental meanings comprise mnemonic cues for identifying uses for which settings are intended as well as the associated expected behaviours of such social situations, making co-action possible. (Rapoport 1990:221.) We can refer to these three levels or categories of meaning as respectively ideological, socio-economic and behavioural.

Examples have been recorded in the ethnographic literature, of Australian Aboriginal domiciliary architecture having specific meanings. If we turn to northern Australia, we find that ethno-architecture is rich in high-level meanings and symbolism, so much so that structural forms and shelters were used as ritual components in a variety of contexts. In certain sacred histories, flaming dwellings act as ‘vehicles for change’ in which ancestral beings are metamorphosed into another state and then continue their respective journeys. In a *Wagilag* story from Arnhem Land, the shelter represents the womb and its regenerative qualities, amongst other meanings.xi The evidence on the archetypal forked-post and ridge-pole in Arnhem Land and Cape York, indicates that these components were ritual symbols in these regions of Aboriginal Australia. This clearly corresponds to a high-level meaning category. Elsewhere (Fox 1993:14)xii such architectural elements have been termed ‘ritual attractors’ and are usually a focus of ritual or at least acknowledged in ritual, and generally recognized as such from the time of construction. They represent the house as a whole in a concentrated or symbolic form.

We can turn to Aboriginal ceremonial grounds as a special category of architecture displaying the most sacred levels of meaning. In the secret religious life, it was, and still is in many cases, the Elders who are the holders of the sacred designs of ritual artefacts and their associated meanings, and hence who are the architects of the ceremonial ground. They oversee the preparation of the ground, the creation of the appropriate structures to be used in them, and the enactment of the songs and dances, all carried out in a highly ordered process (Fantin 2003).xiii Painstaking energy is devoted to the
construction of artistic and symbolic representations of cosmological contexts used in the ritual retelling or re-enactment of the activities of Ancestral Beings. For many Aboriginal groups, the creative synthesis of song, dance, ground sculptures, ceremonial artifacts and shelters, is believed to imbue the ceremonial ground with ancestral presence and power, and constitutes a temporary religious architecture containing ancestral aesthetic qualities.\textsuperscript{xiv}

\textbf{Post-classical Aboriginal ethno-architecture and cultural change}

What can be identified as Aboriginal Architecture in the contact era of the 19\textsuperscript{th} and 20\textsuperscript{th} centuries is no longer readily discernable as regional styles. Nevertheless self-designed and self-constructed building persisted to varying degrees, with acculturated building materials and artefacts adapted to suit Aboriginal behavioural patterns and social organization. Divergent architectural genres have emerged, due to the dissimilar processes and differential impacts of cultural change across the continent, viz pastoral camps, mission camps, government settlement camps, and town camps. These settlements displayed the properties of the large camps which were described earlier as the more durable forms of the classical architecture. This customary origin explains the ongoing high degree of external living and the maintenance of structured sociospatial layouts and other spatial behaviours.

By the end of the 20\textsuperscript{th} century, improved housing services had resulted in the provision of conventional Western housing or pre-fabricated huts to most Aboriginal people even in outstations. Classically traditional shelters and houses were no longer common, being predominantly used by remote groups on hunting and holidaying expeditions, whilst travelling, or at ceremonial and mourning camps. One may well ask whether the ‘tide of history’ had washed away traditional architecture? In considering the nature of cultural change of architectural traditions, it is useful to return to the construct of ‘tradition’ as defined earlier. A closer
examination of the anthropological literature on tradition reveals two competing theoretical paradigms of what ‘tradition’ is as a scientific construct. In the first, anthropological tradition is defined within an atomistic paradigm whereby:-

…culture and its constituents are regarded as entities having an essence apart from any interpretation of them; anthropologists may prescribe, for example, which traits are old, which are new innovations, and show how such traits fit together to make up the larger entities that we call a ‘tradition’ and a ‘culture’.” (Handler & Linnekin 1984:273.)

But if we return to the earlier point about change occurring to traditions within the processes of inter-generational transmission and enculturation, we note that a key reason for this is because "interpretations are made of the tradition presented" from one generation to the next. The alternate paradigm then, is that tradition is an interpretive process and that any tradition is continually re-interpreted. Unchanging traditional societies never existed (Shils 1981:13). Since all cultures change ceaselessly, there can only be what is new, although what is new can take on symbolic value as ‘traditional’ (Handler & Linnekin 1984:273).xv If we accept this latter view of ‘tradition’, then we can find a continuity of traditional Aboriginal architecture albeit with a gradual process of cultural change, right up to the present time.

**The emergence of collaborative Aboriginal architecture**

What can be said about the architecture of the late 20th and early 21st centuries. How have non-Indigenous architects who have undertaken Western professional training at universities, approached designing for Aboriginal clients? Is such design culturally distinctive? Can it be called traditional ‘Aboriginal Architecture’ in the sense of it being an evolved, but still separate genre?
Up until the 1970s there was no Aboriginal voice in the design or management of government controlled Aboriginal settlements. The Commonwealth Government then facilitated a simplified procedure for Aboriginal community groups to form housing co-operatives and apply for Commonwealth funding. Many rural and urban-based groups exercised their rights under this new self-determination policy to take control of their own architectural projects. This brought some flexibility in design but, taken overall, government housing programs tended to stifle or suppress the principles of Aboriginal architecture. There were some important exceptions, especially within the work of a small number of architects who dedicated a decade or more of their careers to working exclusively with Indigenous clients. Thanks to these practitioners, the collection of specialist knowledge and skills related to the design of housing for Aboriginal Australians has emerged over the last 30 years as an architectural sub-discipline, comprised of three architectural paradigms: the cultural design paradigm, the environmental health paradigm and the housing-as-process philosophy, all of which contribute to its distinctiveness as a field of study and practice (Memmott & Chambers 2003).

The cultural design paradigm involves the use of models of culturally distinct behaviour to inform definitions of Aboriginal housing needs. Its premise is that to competently design appropriate residential accommodation for Aboriginal people who have traditionally oriented lifestyles, architects must understand the nature of those customary lifestyles, and their patterns in space and time, particularly in the domiciliary context. Such an understanding is a pre-requisite to achieving a design ‘fit’ between people and their built environment and aims to avoid stress in planned domiciliary environments and promote quality of lifestyle. This knowledge also increases understanding of the needs of groups who have undergone cultural changes, including those in urban and metropolitan settings, by helping to identify those aspects of their customary domiciliary behaviour that have been retained. The third significance is understanding that the continuity of a
traditional sociospatial structure may contribute to the contemporary maintenance of social identity and internal social control.\textsuperscript{xvi}

The second paradigm, \textit{environmental health design}, aims to develop an understanding of the critical relationships between poor Aboriginal health and housing technology performance.\textsuperscript{xvii} These two approaches lead into a third architectural paradigm: \textit{the housing-as-process philosophy}, which aims to firmly situate housing design and provision within the broader framework of an Aboriginal community’s planning goals and cultural practices, as well as its socio-economic structure and development, and its housing management capacities. The integration of social planning and architectural design may be necessary in metropolitan settings rife with drug abuse, violence and police conflict, extending the role of the architect to one of social planner.

The sensitive working relation between an architect and his or her client Aboriginal community, as achieved in the housing-as-process paradigm can be termed \textit{Collaborative Architecture}. Collaborative Aboriginal Architecture projects can be defined as architecture in which an Aboriginal client retains conceptual, stylistic and management control of the project but who forms a collaborative partnership with other professional and skilled personnel (eg funding agencies, architects engineers, tradesmen, manufacturers), resulting in ‘Bi-cultural Architecture’ which draws on ethno-architectural tradition.

In Australia, the collaborative approach has attracted most attention in the architectural media in respect to public architecture projects. For such projects there are extensive domains of Aboriginal environmental knowledge and cognitive styles and meaning systems, which provide great potential in generating semantic ideas for architectural expression. For a local Aboriginal group, despite the extent of cultural change, there will exist a number of traditional
signs (iconic, indexical, symbolic) which draw on visual references from the cultural landscape in the immediate environment of the building site (and are thus applicable to two or three-dimensional representation or reference). Apart from the classical base of environmentally and religion-inspired knowledge as a source of signs, there may be other domains of post-contact identity which Aboriginal clients may wish to express, drawing on the themes of resistance, oppression, and cultural adaptation during the colonial and contemporary periods. The role of the architect is to offer ways in which such identity elements can be distilled and realised in architectural form (Memmott & Reser 2000). xviii

21st Century Indigenous Architecture

In the late 20th century the first Indigenous graduates of University-based architecture and design courses in Australia emerged; nevertheless at the time of writing they numbered no more than eight or nine individuals. The only practice group with an Indigenous identity, partly formed due to this scarcity of Indigenous architects, was the Merrima Aboriginal Design Unit, within the New South Wales Department of Public Works and Services. This was established in 1995, by Dillon Kombumerri, a descendant of the Kombumerri people on the Gold Coast (Qld), who was joined by two other practitioners, Kevin O’Brien, of the Meriam Mer people of the Torres Strait and Alison Page, of the Tharawal people of La Perouse (Sydney).

At times we see aspects of the cultural design paradigm applied within Merrima’s work; for example, a certain emphasis on external orientation and ‘position in the landscape’ in their Wilcannia hospital project where new spaces are created “between buildings, between river and town, between turn of the century and contemporary health practices” (Tawa 2002:76). Further, the site configuration and externally oriented architecture at Wilcannia…

…harbour(s) a way of being close to place
and country – protecting and making room for memory and for stories…It contributes to cultural sustainment by reconciling person and place, community and country. Its function is not disembodied or abstracted from the socio-cultural, but grounded in it. Rather than being isolated, objectified, aestheticised or monumentalised, architecture exists primarily as a site of cultural practice...
(Tawa 2002:76.)

Merrima has partly drawn from the tradition of the classical Aboriginal Architecture in casting its ideology. Alison Page writes of both low and high level meanings upon which Merrima draw.

Buildings were [traditionally] used as a *skin*, as living and breathing extensions of the body. No matter what form they adopted, they were receptive, flexible, sensitive, and constantly renewing. This concept is still applicable today, and new technologies can be adopted in its service. This is what will make buildings clever, and uniquely Indigenous…There is also in place an elaborate yet intangible organization of space, which is marked geographically, with spirits, totems, and songlines. Understanding both the tangible and intangible aspects of culture lends clues to the interpretation of identity and place in the modern world… (Page 2000:424.)

The Merrima Design Unit also works within a community relationship paradigm that parallels the *housing-as-process philosophy* as Alison Page also describes:

The way I see it, Indigenous architecture is not a style but a culturally appropriate process
based on communication, trust, and community development....From the moment a building idea is conceived to the moment it is realised, communication, in whatever form, and community involvement will determine the Aboriginality of the architecture. Within the process, there are many considerations which may not necessarily exist in a non-Aboriginal project. Designers are asked to consider culture, place and identity as well as employment and training opportunities, social justice, and health issues. (Page 2000:423,424.)

Thus, although the three above design paradigms emerged from collaborative housing design in the 1970s and 1980s, they are also being increasingly applied to public architectural projects, as indicated by the writing of the Merrima group in relation to its projects of the 1990s. Merrima itself is thus generating from traditional architectural principles with varying levels of meaning.

**Summary of attributes of Australian Aboriginal Architecture**

A number of the characteristic properties of traditional Aboriginal architecture have been outlined. Firstly, an outcome of lifestyle mobility was the variability of architectural lifespan and design complexity, with minimalist architecture for short periods of occupation at one extreme, to sedentary base camps and villages of more robust construction at the opposite extreme. Second was the influence of sociospatial structures on domiciliary and settlement use and configuration, which in turn drew from the multiple and complex systems of Aboriginal social organization. Third and fourth were seasonal regional diversities of architecture, which were partly a product of the diverse geography and climate of the Australian continent. But Aboriginal architecture was not simply a material response to climatic and environmental circumstances, it was
also generated by distinct spatial and cognitive rules, constructs, and behaviours. Cultural symbols encoded into the physical form provided another overlay of architectural meanings. Finally, both ethno-architects and more recently conventional professional architects have interpreted aspects of the classical traditional into contemporary architectural expression.

The emergence in the late 20th century of the various design paradigms outlined above, combined with the principles and practices of Indigenous architects, are all slowly evolving into a truly modern Aboriginal Architecture, one which will undoubtedly provide a substantial contribution to the future Australian identity as well as a cultural heritage of local, national and global significance. But how does this assist with a world theory of architecture?

A reconsidered definition of architecture more suitable for a world theory of architecture
The ‘travellers’ camp’ described earlier introduces the idea of ‘minimalist architecture’ in achieving a culturally distinct environmental ‘fit’, a level of comfort and a phenomenological position in the landscape; the idea of an ‘architecture’ without buildings. The ‘architecture’ is initially defined by the selection of the site and then by distinct spatial and cognitive rules and behaviours juxtaposed on the site or in many circumstances generated by the site. This idea of position in the landscape is not dissimilar to the recent philosophical writings of Christopher Alexander (2002:429,430) in which he argues that space and its surroundings can be alive, creating bounded centres in either the landscape or the townscape.xix

From this there follows a definition of ‘architecture’ which is more appropriate for the cultural circumstances of many indigenous and vernacular people-environment contexts:

*Architecture as a selected, arranged and constructed configuration of environmental properties, both natural and artificial, in and around one or more activity spaces or*
behavioural settings, all within a surrounding cultural landscape, and combined with patterns of behavioural rules and meanings as well as incorporating cultural constructs of space and time, to result in human comfort and quality of lifestyle...

This definition includes selected environmental features, mental and behavioural rules, spatial properties, hearths and artifacts. It can also include buildings, but not by necessity. It incorporates such concepts as socio-spatial settlement structure, avoidance behaviour, diversity of construction detailing and its impact on spatial experience, and ceremonial architecture imbued with meaning and theatrical moment. There are clear parallels here with Mike Austin’s description of ‘Pacific Architecture’ as:-

…an architecture of spaces open to the sky rather than closed rooms, or sticks and grass as against mud and stones, poles as against walls, of single cell pavilions rather than labyrinthine complexes, of buildings raised in the air on stilts rather than sunk in the ground, of temporariness as against permanence, tension and weavingxx rather than compression and building, an outdoor existence and ocean voyaging as against a life grounded in the land. (Austin 2001:17.)

Within this broad definition of architecture, we can still situate the entire genre of Western architecture, but there also may sit many other genres from all human societies and cultures, past and present. And within these diverse cultures there are a range of cognitive, invisible, ephemeral and symbolic properties that can instil architecture with a culturally distinct nature, in addition to the physical attributes of buildings. (Memmott & Davidson 2004.)

[word count: 5,080]
Figures

**Figure 1:** The repertoire of Yolngu shelters.

**Figure 2:** Sociospatial structure of an Arrernte Camp.

**Figure 3:** Paddy Woodman’s overnight camp.

**Figure 4:** Rainforest houses.

**Figure 5:** Victorian village.

**Figure 6:** Sturt’s village.

**Figure 7:** Burgess’s Brambuck Centre.

**Figure 8:** Merrima hospital, Wilcannia.
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Endnote

i  See Memmott (1991, 1996) and Memmott & Go-Sam (1999) for writings on these types.

ii  It is to be noted that vernacular styles of building occurred in the Torres Strait Islands, which were distinctly different to those of Aboriginal Australia combining split bamboo, woven pandanus and coconut palm leaf, and grass thatch. Architecturally this is best classified with Melanesian styles, albeit with Polynesian influences. However there is an interesting transition zone in the Western Islands where there is a tribal group of islanders, the Kaurareg whose territory extends on to the tip of Cape York, and who identify as Aboriginal. Torres Strait ethno-architecture is a separate cultural study with a number of regional styles and is justified in having separate treatment. An outstanding study of the Torres Strait ethno-architecture, comparable with that of Roth’s in mainland Queensland was made by Wilkin and Haddon (1912) of the Cambridge Expedition to this region. A more recent and a useful overview of all of the old data has been prepared by Gadke (2001).


iv  Altogether there were about 200 different languages spoken on the continent, but many of these had numerous dialects.

v  This term will be used interchangeably throughout this paper with ‘Aboriginal architecture’ and sometimes ‘vernacular architecture’.

vi  A survey of the various cultural regions reveals such technologies as stone wall construction, flagstone roof cladding, grass thatching and plaiting, split bamboo, woven pandanus and coconut palm leaf, clay and mud plastering, excavated floors, earth platforms, sand-weighted roofs, split cane ties, and the weaving of foliage between wall rails.

vii  In Northern Australia, these five seasons are the cold south-east wind season, the dry transitional season (cool to hot), the ‘first storms’ season, the wet season proper, and the transitional season (wet to dry) (Thomson 1939: 214).

viii  The anthropologist Donald Thomson was there first to document the roles and forms of seasonal shelter types and settlements in his 1939 paper, The Seasonal Factor in Human Culture Illustrated from the Life of a Contemporary Nomadic Group. His paper pertains to the Wik Mungkan language group. The Wik people reside along the west coast of Cape York from the Embley River near Weipa to the Edward River in the south. The Wik people became widely known in the 1990s, due to their winning an important and significant Native Title claim in the Australian courts.
A version of this was previously published in Memmott & Go-Sam (1999:237).

For example, a seasonal marine hunting village of rock-walled houses is also documented for High Cliffty Island off the Kimberley coast. At Pulan or Amity on Stradbroke Island and opposite on nearby Moreton Island (Moreton Bay), large seasonal runs of fish supported inter-tribal gatherings. At the former, a 1.8 metre high and 15 metre diameter, dome was observed in 1824 adjacent to the seasonal, mullet-netting channel. The Aboriginal people were aided by dolphins in herding the fish towards the shore. (Memmott 2004.) Urgent investigation is required of the evidence on these locations of the more sedentary villages where socio-economic intensification and architectural elaboration are likely to have occurred, and a better understanding is required of whether specialist architect-builders were more widespread than what is understood at present (eg from the Lake Eyre region case study).

Dwelling names can act as mnemonic devices to the ancestral histories in which they feature (Fantin 2003).

In the analysis of Austronesian houses by the anthropologist James Fox, drawn from Malaysia and Sumatra in the west, to New Zealand and Goodenough Island in the east, and from south-east Asia to Melanesia and the Pacific. Ritual attractors in Austronesian houses are the post, the ladder, the ridge-pole, and the hearth within an encompassing roof.

Fantin (2003) builds on the work of others such as Donald Thompson and Joseph Reser, as well as her own fieldwork.

For example, in the case of the Yolngu of Arnhem Land (Memmott & Fantin 2004:Ch.10). This form of religious belief is also true for many other groups in Central Australia, the Western Desert and Cape York. Shaneen Fantin has written “that in particular Indigenous regions such as Arnhem Land contemporary Indigenous people continue to interweave their ethno-architectural, spatio-behavioural and religious traditions with Western architectural components in their commentaries and that this is slowly evolving into a truly modern Aboriginal Architecture, one which will provide a substantial contribution to the future Australian identity and global cultural heritage.”

Austin (2001) has addressed the concept of ‘hybrid architecture’, as ‘bi-cultural architecture’, being a syncretisation of customary and Western elements. In his ‘Pacific Building…’, Austin examined the dynamic nature of the construct of ‘architectural tradition’: In Aotearoa/New Zealand tradition is continually being reinvented, and every denial of tradition is a restatement of it while every representation of tradition is a modification of it…Modernism in constructing itself in opposition to its own tradition referred to the primitive. However the primitive was the invoking of another tradition…Elsewhere Linzey (2001) has defined ‘biculturalism’ as the phenomenon of two cultures co-occupying one place.
During the 1980s and 90s an interesting architectural concept emerged as a result of the application of the cultural design paradigm, particularly on outstations; that of the ‘decentralized house’. The decentralized house is generated by upgrading an acculturated camp to satisfactory health and structural standards using Western construction and material technology, with the least disruption to the spatial fabric of the camp. This generic design type has now evolved from a design process which: (i) is informed on the subdivision of Aboriginal domiciliary space and behaviour in vernacular settings including night/day, dry/wet, cold/hot and gender-specific distinctions, and (ii), thereby generates the design outcome of different types of structures, forms, materials, and degrees of enclosure for different activities at different times. This results in a house as a set of separate structures, combined in a spatial field with other site elements, natural features and services, rather than the conventional concept of the house as a single structure containing a range of internal subsaces for different activities. Examples of the successful application of this collaborative approach have been documented for outstations at Palm Island, the Wik homelands in West Cape York, and Barkly Tableland (Memmott 1994).

This involves linking causally-related complexes of health problems with sets of design features and ranking them in a set of priorities based on the likelihood of improving health standards. See Memmott & Chambers (2003).

Critical writing on the creation of buildings which in some way aim to reflect or portray Aboriginality, alerts architects to the difficulty of this task. For example, a warning has been issued by Dovey (1996:101,102) that most architecture for Aboriginal people arguably has its source in a power structure in which “the native ‘other’ finds a voice only within the framework of a dominant discourse”, and that “the State has an interest in seeing Aboriginal identity ‘fixed’ in built forms; its dangerous, amorphous power ‘arrested’.”

There is also an ethical obligation for project architects to consult with and obtain permission from local Aboriginal traditional owners before using Aboriginal meanings drawn from local Indigenous knowledge. The traditional owners, through their intellectual property rights, need to be incorporated as stakeholders in such a project. In this regard, the architect must carefully differentiate between an Aboriginal client group and the local traditional owner group, as the two may not be the same. (Memmott & Reser 2000.)

To illustrate how such a place can appear to ‘have life’, Alexander uses one example of a meadow in a hilly northern Californian brushland, identifying how the different types of visual symmetries, gradients and repetitions (echoes) within the flora combine to generate a sense of a live place.
xx We note the emphasis on weaving here, and the properties of texture and low relief that accompany such. (compare
GENERATING AN IMPROVED QUALITY OF INFORMAL HOUSING IN MAMELODI, SOUTH AFRICA (*)

Nele Peeters  
Department of Mechanics of Materials and Constructions (MEMC)  
Vrije Universiteit Brussel, Brussels, Belgium, e-mail: nele.peeters@mail.be

and

Amira Osman  
Department of Architecture  
University of Pretoria, Pretoria, South Africa, e-mail: amira.osman@up.ac.za

Abstract

Human settlements play a central role in determining the progress of a country; housing is an indicator of wealth or poverty. In developing countries, satisfactory housing is often the exception to the rule. The people living in poor conditions are not merely a marginalized part of the population but the vast majority. This housing poverty is best exemplified by the sprawling slums and informal settlements on the peripheries of almost every city and town.

In this paper, a proposition for the improvement of housing quality in one of these informal settlements is made, thus focusing on the poor and informal housing situation of the 1.2 billion people worldwide who are living in poverty – with particular reference to the situation in South Africa. Despite restricted opportunities squatters form an unrecognized, unexploited economic base. The transformation of informal settlements into quality neighbourhoods with socio-economic strength, will not only benefit the target population but will also strengthen society as a whole. This approach supports current policy directions in South Africa, with a view to “in-situ” upgrading of squatter settlements rather than demolishing and relocation and is also supported by global agreements and approaches such as the
Millennium Development Goals. Pro-poor policies mean that all efforts are being directed towards a large percentage of the population that is at present being excluded from environmental and economical developments.

Thus, this paper starts by identifying the context, analysing current building techniques and proceeds to offer a proposal of how to develop shacks (or zozos) as they are being constructed in the township of Mamelodi in Pretoria, South Africa.

Key words: informal housing, shack quality, generative system, Mamelodi, South Africa

(*) Special thanks from the organizer of the conference “Informal Settlements and Affordable Housing” to ir. Arch. Nele Peeters and Dr. Amira Osman for sending this paper to be included in the conference proceeding, the paper has been presented before at the World Congress on Housing, September 26-30, 2005, at Pretoria, South Africa.

1. Informal Housing

1.1. South Africa in The Context of Africa and the ‘South’

According to the Census Report of 1996, 1,049,686 households in South Africa lived in informal dwellings/shacks in squatter settlements at the time [1]. This implies that policy and professional efforts need to be re-directed towards the needs of the poor rather than the ideals of the middle class. Patterns of emergent systems in cities become indicators of real need and the imposition of pre-determined plans is then handled with more sensitivity to context. “Small” interventions grow and guide development [2]. Emergent systems would become catalysts for future interventions and a process of “negotiated reactions” – a phrase coined by Dewar & Uyttenbogaardt [3]. Policies would be flexible enough to allow for this process which might take a longer time, and need more complex systems of coordination between all the role players; it would most certainly challenge the traditional role of the state – this complexity would ultimately generate a complex, multi-layered and vibrant pattern of human settlements that serves a
wide variety of needs and lifestyles and makes sense economically and socially [4].

Designed and emergent systems are equally important and it is strongly believed that any approach that does not acknowledge the presence of the ‘informal’ as a force that cannot be eradicated and as a legitimate power, energy and form of expression is doomed to fail. Current debates regarding development, in general, and housing, in particular, attempt to position the issues in the broader perspective of the ‘south’, the African continent and new policy directions in South Africa. A regional focus appears to be the current approach to development and sustainability. In this sense, the ‘south’ and Africa need to set their own agenda, based on their own understanding of informality and their own perceptions. While we need a global understanding of the issues of human settlements, research models need to be specific to a particular country [4]. It is acknowledged that a large percentage of the labour market are from informal settlements and robust, socially inclusive growth is only possible through the development of the informal market and thus of informal settlements.

1.2. Relocation Versus “In-Situ Upgrades”

In South Africa, the focus on eliminating informal settlements – from 1994 on – slowly shifted from relocation to upgrading of the settlements [5]. This could ultimately take the pressure off government to produce en masse. It is interesting to note that demand for houses increases proportionately to the government’s subsidized provision of housing [6]. The issue is complicated even further by the fact that the Minister of Housing has indicated that the number of houses the government can build per year is equivalent to the number of people who move to urban centres in the same period [7].

Informal settlements appear to be an undifferentiated zones of squalor, yet closer research has highlighted complex and dynamic contexts with differences apparent in terms of relatively “wealthier” families grouped together on the peripheries, or other groups created due to dependence on
shared resources and childminders, etc. [8]. Although the current housing situation is not the ideal one, it is acknowledged that every shack is in reality a home and no one’s home should be put into jeopardy by forced removals or lack of developments. Many times a middle class understanding of “home” is imposed on these settings. It has been debated for decades that “every building is an asset” and “more dangerous than slums are slum shortages”, people still need to be reminded of this. There is a danger of dictating to people what is a decent life – the lifestyles of the rich could be equally challenged.

1.3. Theoretical Premise

As a conclusion to the above it is recognised that for a place to function as a dwelling, it must first be accessible. It has been argued before that an environment can be “disabling” and can promote exclusion. Issues of access are not just restricted to discussions on the physically disabled [9]. Location is one of the key elements that promote or destroy this disability or exclusion of people. A dwelling must provide secure continued residence for a minimum period, and it must provide a minimum of shelter from hostile elements, whether climatic or social. Other basic human needs important for a person experiencing a qualitative housing environment are the need for temporary escape, the need for experiencing nature, the need for privacy, the need for security and safety for self and family, the need for affiliation and belonging, the need for social recognition and status, the need for physical exercise and the need for tension release. Although these are very subjective needs, that will differ for each person functioning in his or her environment, it is important to keep them in mind and think of planning and design strategies that will be able to integrate at least the possibility of access to these functions of a housing environment. This has to remind designers that housing is more than the provision of an asset, but includes a whole process that is integrated in its environment. For housing to focus on the “qualitative” rather that the “quantitative”, it has to be acknowledged that it is more than a physical shelter.
The focus of this paper will thus be on providing shelter for informal dwellers, more specifically in South Africa, and how to improve on a form of shelter that can evolve and that has the potential to ultimately provide for all of the above-mentioned functions. It is acknowledged that informal housing serves an important purpose – hopefully without overly romanticising it.

2. Transformation and Mobility: “I Will Take My House with Me”

The built environment is not static: it is interesting to study the relationship between stability and transformation in the built environment [10]. Changes happen around us all the time: John Habraken continuously insisted on major distinctions between ‘structural supports and detachable units’ [11 & 12]. Many people have experimented with this concept throughout the relatively recent history of architecture [13] and Habraken has explained that this quality of changeability is inherent in houses throughout history and in many places throughout the world [12]. These notions, however, take on a different meaning when speaking of informal settlements. In squatter settlements transformations happen at an enormous rate compared to formal (static) designed environments. Furthermore, the relationship between structural supports and detachable units is unclear. There is a degree of permanency in a squatter settlement – such as the layout of the site, but the overall set up is experienced as short term. The tension between stability and transformation thus gains importance when designing for informal settlements. Any design intervention will need to support a process, which will evolve quickly over a short period. Transformations will not only apply to structural elements but also to location and function. House ownership will change as well as the number of inhabitants or the owner might decide on moving the shelter to another site, which proves to be more beneficial.
Harber [14] explains how a squatter settlement develops in a process that is the exact opposite of a formal settlement: that is the land is occupied, the buildings put up and finally, dependent on the acquiring of legal tenure, the services are installed. He believes this usually generates an environment that is more layered, develops gradually and is less disruptive to the existing features of the site. These are the positive attributes of informal settlements that need to be incorporated into future housing programmes. Thus, alternative methods of housing delivery would allow for choice, variety and full involvement in decision making regarding every aspect of the environment from location to the design of a neighbourhood or an individual home.

Yet, this volatile nature of squatter settlements also inhibits long-term development. When asked about a possible relocation the inhabitant of a squatter area in Mamelodi, replied simply: “I will take my house with me.” Reflecting on the lack of security in tenure, as well as the abiding hope and expectation that, in the new political dispensation, there may exist opportunities to move into better areas, many shack owners are reluctant to invest substantially to convert an informal dwelling into something more permanent. This often results in people living in structurally compromised buildings for years [15]. Proposing an alternative system of construction that can improve the housing situation could be a viable starting point to address this problem.

3. Mamelodi, Pretoria, South Africa

Mamelodi is a large, historically designated black township in Pretoria. It is similar to other townships on the peripheries of all South African cities planned by the apartheid authorities as temporary dormitory zones for black labour. Its problems are typical of other townships that are mono-functional residential areas, isolated from the CBD and job opportunities, with poor quality housing and a large component of informal settlements.
3.1. The Shacklands of Mamelodi

Many people in Mamelodi live in shacks, either in areas occupied through illegal land invasions or on legalised plots still awaiting the queue for government-provided houses. A shack in South Africa is often built from industrial by-products, scrap and unwanted materials as well as purchased materials or a combination of both. Most shacks are built from either timber, corrugated metal sheets, fibre cement or a combination of the three. Corrugated iron is by far the most popular because it is durable, lightweight and readily available. But the material also has its disadvantages. For instance, its insulation performance is non-existant. Heat streams into the shack during the summer months and out of the shacks during the winter months. Rudimentary systems of heating create safety hazards and raise questions regards the depletion of natural resources and pollution. Construction yards provide squatters with prefabricated walls that can be put together in more or less standardised sizes of shelters (also known as a ‘zozo’ – which means house).

When a house is bought, the prefabricated walls and the roof are transported to the plot of the new owner, where it is assembled first, then the floor is finished with a sand cement mix. It lays on the ground surface with no foundations. A simple roof of corrugated sheeting is nailed on
purlins and the gaps between the walls and the roof sheet are filled in with a plaster mix – this is according to Cedric who sells his zozo components on the side of a main road in the area.

3.2 Paulos Novela’s Zozos

The construction yard used as a case-study belongs to Paulos Novela. Paulos sells zozos – flimsy shacks of timber frames and sheet metal that can be found all over the landscape of Mamelodi. These zozos, however, are built differently depending on the construction yard and the availability of materials. Despite this, one can assume that the sizes of the zozos are similar – and thus basically standardized; and although the types of materials used may not be exactly the same, the basic features are similar.

The price of a zozo depends on the size. Paulos sells his one room house (3m x 3m) for R900 (app. $140) a one and a half room house (3m x 4m) costs R1150 (app. $177) and the two roomed house (3m x 6m) costs R1500 (app. $230). The materials that are used for the construction of the zozo are the following: galvanized corrugated metal sheeting, coated metal sheeting and timber frames. Some of these are purchased from stores, such as the corrugated galvanised sheets, the rest is discarded material, such as the coated metal sheeting which is comes from a refrigerator factory close by – it is bought as scrap metal (priced per kg).
3.3 The Current Building System: Construction Principles

Since it is not possible to rely on the strength of the metal sheeting (firstly due the qualities of the material and secondly because it is relatively more expensive), the current building system relies on a timber frame as the basis for stability of the zozo. Corrugated sheets are nailed onto the frames to form an exterior barrier. The assembling of the four “walls”, and only in conjunction with each other, creates a relatively stable structure. Windows and a door are only made in the front side of a zozo, which is generally higher than the back side – so that a slightly sloped roof is formed.

Figure 4:
1-roomed zozo as it is being constructed now.

Figure 5
Materials used at the construction yard
(information as obtained from Paulos Novela)
3.4. A Proposed New System

An analysis of the building system that Paulos uses to produce his shacks guides the proposal below to implement modifications to the system in order to improve the quality of the shelter. The materials that are used for the design of the alternative shack are the same materials Paulos uses for the construction of the zozos. It is proposed that the panels be broken up into smaller modules which are then staggered to achieve more stability. They are also easier to transport in this way, and easier to use for alternative combinations which may ultimately offer more variety. The modules are, as far as possible, based on the dimensions of existing materials in the workshop or yard.

The juxtaposition of the smaller panels offers more stability and allows for space for insulation or various coverings to be applied. At the junctions of these panels a hollow column is formed which may be filled with loose sand which offers more stability without losing the potential to move the structure easily. The main aims of a new optimized building system are increased stability and insulation, whilst respecting the current entrepreneurial initiatives of the so-called secondary market, addressing demand and achieving economic viability. By achieving this, other benefits are gained such as flexibility and variety. The shelters maintain the benefits of existing zozos by being easily transportable, re-sellable, extendable and adaptable. The proposed system may ensure a better quality shelter immediately that also has more potential to be up-graded into a more permanent house with complete facilities and services.
It is however not enough to just improve the walls and roof structure – issues such as enhanced thermal insulation have to be further investigated. It is not possible to suggest a conclusive solution: solutions need to be proposed for a specific “yard”, at a specific time, depending on availability of materials and need at any specific time. In this context, a pre-determined and measured response may be inappropriate. The cost implications of this system still have to be researched.

4. Informing Target Groups

In order to implement a successful project in squatter settlements, it is necessary that dwellers as well as constructors understand the advantages and principles of a new building system. It is thus important to educate dwellers about the possibilities of improvement inherent in a system that they are familiar with. Both parties, yard owners and dwellers, need to be informed of the advantages of change in the existing system, the former benefiting by reaching more potential buyers and perhaps increasing profits, the latter benefiting from better housing quality and more diversity. A careful and integrated approach is thus required to encourage the beneficiaries.

A few, understated interventions such as applying paint to the outside of their shack, not only adds colour but
also decreases the radiation through the steel sheeting; the application of (discarded) insulation material on the inside of the shack will contribute to a higher insulation level; etc. Simple variations may offer solutions to increase the energy efficiency of the shack: The use of different building materials, building orientation, window size, exterior colour, ventilation and the application of insulation are all possible means to achieve this. Extensive research on how shacks are built in informal settlements – by dwellers or construction yards – will lead to viable and sustainable solutions to improving the housing quality of many people.

One way to implement this is by providing squatters with an illustrated folder. Easy to access information can be compiled in such a way so that people can be guided through some measures of improving their home. Research on engaging with the community to inform a possible illiterate target group should be undertaken and convincing communication methods developed. This is not a new approach, but its success still has to be tested in the transformation of living environments. A similar initiative could inform construction yards of the various possibilities of developing their construction systems.

Active engagement may lead to better results – for example, workshops could be organised that inform the constructors on different building concepts. It will be important to work together with them on site so that it becomes a mutual learning process. This is research in action – or action research.

5. Conclusion

The modularisation and improved stability of building components is investigated, yet issues of enhanced thermal performance, improved floor construction and adaptation to accept services need to be further explored in a future study. The intention of the study is to propose an approach to the problem rather than to suggest a conclusive resolution. A calculated and precise response would be inappropriate in this context.
The implementation of a pre-defined modular system may prove problematic and must be approached with caution in order to be sensitive to the realities of local conditions. Various approaches are possible but it is important not to be confined to one kind of solution. Therefore, the proposal is made to engage with the target community by means of an illustrated folder, indicating measures of improving living conditions within informal constructions. This becomes a valuable mode of implementation and also needs to be investigated further regarding appropriate communication methods aimed at a possibly uneducated target group.

The proposal also needs to be tested through actual application, a response from the community needs to be obtained and perhaps an assessment tool could be developed or an existing tool be adapted to allow for a holistic evaluation of the proposed interventions. The opportunities that become available through the development of the corrugated panels are numerous – one of them being the development of partitioning and facade systems for future higher density residential developments. This study believes that enterprises emerging from informal settlements are more suitable for low-income groups and that support of the informal sector better addresses the urgent need for poverty eradication.

Acknowledgements
The valuable input from Paulos Novela and other residents of Mamelodi is acknowledged. Leon de Klerk was our guide and advisor on Mamelodi.
Special thanks to Prof. Dr. W. P. De Wilde of the Department of Mechanics of Materials and Construction of the Vrije Universiteit Brussel, for assisting N. Peeters to attend the World Congress on Housing 2005.
References


[7] Radio interview with Minister Sisulu, 26th August 2005 on Radio 702. Another indication of this is that despite the large government programme for housing delivery (approximately 190 000 houses per year), the housing backlog in South Africa remains stable – Mark Napier is acknowledged for this insight.


[14] Rodney Harber’s ideas on processes in housing are acknowledged.

Conference Topic

1 ‘Sustainable livelihoods in the informal settlements, incorporating the inhabitant’s participation’
BUILDING HOUSES AND LIVES
FOR THE MARGINAL COMMUNITIES

Henry Feriadi
*Department of Architecture – Faculty of Engineering
Duta Wacana Christian University, Jogjakarta
**Habitat For Humanity – Jogjakarta

Abstract

Providing a simple and decent place to live for the poor is one of the biggest housing challenges in Indonesia. At present, millions of poor families are still living in the unhealthy living environment which can be found not only in the urban area but also in the rural area. Realizing that the initiatives and strategic plans taken by the government were not sufficiently to solve the problems, the greater roles and more active participation from the other stake holders are expected. Community education needs to be well planned and implemented innovatively as an important step in any community development before the physical (building) project would be initiated. This paper highlights some thought and experiences about the community development and how the education can be brought into concrete and synergetic action.

Keywords: community, participation, volunteerism, revolving fund
Introduction
National housing strategies in Indonesia have been implemented for more than five decades. As part of the national plan since Indonesia proclaimed independence, providing affordable housing for all the people is one of the important mission to achieve. It is indeed a very difficult mission to accomplish within a short period of time i.e. to see all Indonesian families could live in the healthy and affordable houses. In the past 60 years as an independent country, the housing sector has been facing different challenges and problems. During the 50’s and 60’s, Indonesia was experiencing the political turbulence which led to the frequent change of government policies. In the 70’s to 90’s as the government stabilized and many industrial sectors grew, the property business had followed quickly to grow. In the late 90’s, the private sectors had been a motor to create a “boom” era in the property sectors. Unfortunately, during the “booming” property era, more houses were built for the middle, rich and super rich families and little attention had been given to the poor families or marginal communities.

At present, six years after the worst economic crisis in Asia including Indonesia, the role of government in providing the houses has been drastically reduced, taken over again by the greater initiatives from the private developer. With the current “unbelievable” national debt that will be paid after few generations, the government is experiencing financial difficulties to take a lead in housing sectors. On the other hand, the greater emphasis of any private developer on gaining profit as much as they can, the noble policy to provide a simple and decent houses to live for the poor become more complicated and almost impossible to implement.

This paper will not discuss any quick solutions on the above issues nor tell what the government and private sectors should do to address these problems. The objective of this paper is to share thoughts, experiences and approaches in raising the
people’s awareness and getting the wider community support on this issue.

**Housing: Product or Process?**

Building a house can be viewed from many different angles. From the technical point of view, a house might be as simple as putting together mortar cement and brick into the wall, timber and metal roof into the roof, each building element that can be joined with other elements to form shape. From the social point of view, a house would tell more than just a physical shelter. For example for the Javanese, a house (“omah”) is not only the building but also the symbol of the family commitment. It is embedded with deep philosophical values and dignity of the family who live in it. The house will grow as the family grows; it is expanded and beautified as the family members enjoy their living process in it.

Do we consider a house as a product or a process? When a house is considered only as a building, the people tend to use it as a product. In general, there are some consequences if people consider or perceive simply a house as a product, such as:

- *Industrialization of the housing industry.* Undoubtedly, in one hand there are enormous benefits of industrialization on many products in our lives. But in the other hand, with the mass production process a house become loses its own uniqueness, it is like one size for all product. The families who buy and live in the houses never have participation during the design and building process. The housing industry will seek the maximum benefits by reducing the production cost and maximizing the selling price. As expected, industries only want to build luxurious houses or private apartment for the rich because these projects give them maximum benefit compared to building houses for the poor. A house becomes a commodity which can be bought and sold as part of business speculation to gain the maximum benefit.
- **Built with the “size for all”**. It means that houses are manufactured as a product that must be fit for all (similar to clothing, jeans). Thousands of new houses have been produced every year with the same size of land, the same size of room plan, and the same color of windows and doors. All families who bought them need to be fit within the standard design of houses. Is a house for the family or a family for the house? Is it possible to give more room for different family needs, different ideas and financial capabilities? Is it possible to accommodate the growing needs of the family in more simple ways in the housing design?

- **Exterior appearance**. As a product, houses need to be beautiful enough to attract buyers. The most important factors after the location is the exterior design of the housing product. If necessary the architectural housing styles which are copied plainly from other countries such as Mediterranean style, European style are adopted for the housing projects in many cities in Indonesia. Is it relevant to bring in the magnificence of our own traditional architecture into the housing design? Is the exterior design is more important than the suitable room layout which fit in with the need of the family? So far, however, there is little evidence that these ‘new architecture styles’ have contributed to the sum of human happiness. They may have added to the quality of ‘architecture’; they have little added to the quality of life [Oliver 1976].

It is furthermore important to realize that for the poor a house is not only a product. The process of building a house needs active participation from the poor home owner. Some successful low income housing projects in the past have shown that home owners (community) played very significant roles during the building process [Panudju, B 1999]. The
community was actively involved since the housing project was shared, planned, negotiated with the local government, built and managed after construction. What the community need are group leader and facilitator who can facilitate the communication with the local government during the legal process and help them in counseling to understand their own problem and potencies. The facilitators can come from individual person who has a strong commitment for the poor (such as YBM Mangunwijaya in the Code community project), Non Government Organization (LSM), Universities community service (Lembaga Pengabdian Masyarakat), etc.

**Housing: Numbers or Needs**

This year, the government has a commitment and set the target to provide one million housing units for the low income families in all provinces of Indonesia. It is indeed a noble commitment and “not easy” mission to accomplish. If it is assumed that one family would stay in one house, this year hopefully one million low income families would be able to live in their new built or renovated houses. Some questions arose are: Is it relevant to set the target in term of number of houses rather than number of families in needs? Do we know actually how many poor families are still living in the sub standard houses in Indonesia? How many poor families who have been alleviated from poverty through housing projects each year?

Undoubtedly, by using the number of houses as a target, the evaluation of the project realization might be much easier. The evaluation would focus on the success of failure to build and renovate one million houses within a year. This approach is seemed to emphasize a house as a product rather than a process. Many solutions can be proposed on how to achieve one million houses within a year from technical (technological), legal and financial (funding) point of view. Theoretically, when the above three factors are solved, the construction of one million houses are achieved. But, providing a house for the poor is not only through technology, regulation and money. Without sufficient attention and
commitment on the social cultural development process, the problems and potencies of the poor community would be easily ignored. Figure 1 shows that there are some lessons to be learnt on how the people in the kampong used to interact socially with their neighbor in their living environment and public (communal) space.

Figure 1:
Enchanting corridor and communal space for the social interaction in kampong Code, Jogjakarta

Building Houses is Building Lives
It is believed that building a house for the family in needs is not only a physical constructional process but also social process. Millard Fuller, the founder of Habitat for Humanity (HFH), shared his experience in the past 35 years in more than 100 countries by emphasizing the most important mission of HFH i.e “Building houses is building lives” [Fuller, M 1989]. In most cases, for the family need a house will be able to restore their hopes and dignities. Their children would be proud to show their homes and enjoy their lives within an improved quality of neighborhood. Often, a house
changes attitudes, brings people together, and equips them for new and better opportunities in life [Fuller, M 1995].

The vision and mission to provide simple and decent place to live for the low income families will not be achieved without the active participation of community, government and other stack holders. The role of government will not be presented here but this paper will now discuss the roles of community as a subject in the process. The community will be generally grouped into two categories: *internal community* (home partner, owner of the house) and *external community* (volunteer organization, individual supporter etc). The type of participation and partnership between two groups are presented in the Table 1.

**Table 1:** The role of the community participation

<table>
<thead>
<tr>
<th>Stage of process</th>
<th>Role of the participation</th>
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<tbody>
<tr>
<td></td>
<td><strong>Internal Community</strong></td>
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<td></td>
<td><strong>External Community</strong></td>
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<tr>
<td>Preliminary</td>
<td>▪ Understanding the need</td>
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<td></td>
<td>▪ Group organization</td>
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<td>▪ Community education</td>
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<td>▪ Problem identification</td>
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<td>▪ Public awareness</td>
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<td>Pre Construction</td>
<td>▪ Community commitments</td>
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<td></td>
<td>▪ Criteria of the family in needs (family selection)</td>
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<td>▪ Seeking permission from local government</td>
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<td>▪ Group savings</td>
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<td>▪ Location and land division</td>
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<td></td>
<td>▪ Homeownership counseling (family selection process)</td>
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<td></td>
<td>▪ Legal counseling (land status, building permit etc)</td>
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<td></td>
<td>▪ Resource development (fund, donations etc)</td>
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<td></td>
<td>▪ Design and appropriate technology assistance</td>
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**Informal Settlements and Affordable Housing**  
Meeting and Conference, Surabaya 17-18 November 2005  
Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

<table>
<thead>
<tr>
<th>Construction</th>
<th>Post Construction</th>
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| - Active and collective participation (“gotong royong”)  
- Construction labor  
- Sweat equity  
- Administrative and delivery mechanism | - Volunteer  
- Resource development  
- Project management assistance |
| - Repayment mechanism (right and responsibility)  
- Neighborhood management  
- Operation and maintenance | - Family nurturing  
- Synergetic supports (health, education etc) |

It is shown in Table 1, in the each process the home partners (internal community) are playing a significant role to ensure that the process is well carried out. Firstly, the community needs to aware about their own need and problems. Secondly, they should give their commitment to work together to find a solution. Lastly in the following steps, the community need to rely on the own a

Some of the supportive activities which can be introduced as part of community educational program are briefly explained as follows:

- Raise the awareness among the youth (students):
  - Live in – Share in project. During the program, the students would have an opportunity to live for few days and to work closely with the poor family. They lent their ear to listen and tried to understand and proposed some alternative solution for the community problem. During the
program, students were guided by several social workers (could be staff from NGO, LPPM from University) which could help them with their experiences. In most cases, the housing problems are only one of the real problems which the community was facing.

- Carry out the social works (KKN) in the poor kampong (slum) in the urban areas. In DWCU, the social work is a compulsory program which requires the students to participate in the community works for about two months before the finish their study. The student’s experience with the poor is proven to be positive to educate them with social empathy and concern to the poor.

- Encourage the spirit of volunteerism. In the past five years, the university students have shown their potential and dynamic spirit of volunteer for the Habitat projects. They have set up the youth organization called “OMAH” which is stand for Orang Muda Habitat. HFH Jogjakarta has organized three creative events called “Global Village” which could bring in some groups of volunteer from USA, Korea and Singapore (see Figure 2). During the events, more than 80 student volunteers from five local universities had worked together for one week with the international volunteers.
Field studio for architecture students:
- Bring in the real social problem into the curriculum (problem based learning). In the Architecture Studio of Duta Wacana Christian University (DWCU), the students will discuss real problem of the slums, carry out the survey and interview into the community, and understand the real problems of poor families. From the educational point of view, architectural design is never merely a form of purposive action. It is not only the technical factors that determine the design but by the social situation in which it is anchored [Laurens 2002].
- Students are invited to help building a house together in the project’s site. This event provides first hand of experience for them to make concrete blocks, lay blocks to form a wall etc (Figure 3). The experience gave them not only the experience as an “amateur construction labor” but also taught them how challenging the work in the construction site is. The famous designer and writer Victor Papanek suggested that the people native of developing countries
have an enormous amount of design and technological expertise. Problems can now be solved in a better way by local designers and architects whose familiarity with local ways of living yields better and more appropriate solutions, rather than a quick fix leading to eventual disappointments [Papanek 2000].

Figure 3: Student are learning by doing in low cost housing projects

Discussion
The initiatives and strategic plans taken by the government were not sufficiently to solve the problems in providing the housing for the poor. The greater roles and more active participation from the other stakeholders especially from the community themselves need to be encouraged. Community education needs to be well planned and implemented innovatively as an important step in any community development before the physical (building) project would be initiated. This paper has shared some thought and experiences about the community development and how the education for the youth can be brought into concrete and synergetic action.
Reference


INNERCITY SETTLEMENT AND ITS PROCESS OF CHANGE

Purwanita Setijanti
*Department of Architecture – Faculty of Engineering
Duta Wacana Christian University, Jogjakarta
**Habitat For Humanity – Jogjakarta

Abstract

The emergence of complex urban settlements has been accelerated by the processes of modern urbanisation, which are linked in part to the lure of the city, since urban areas have been the places for most modern-era innovations in industry, commerce, education, health care and broader culture, with their attendant opportunities. The aim of this paper is to follow up the above statement, by exploring the phenomenon of ‘modernisation’ and the process of urbanisation.

The paper consists of three parts. The first illustrates the debate on urbanised city and its attractiveness. The second part describes the impact of modernisation in mobilising population and transforming culture, and the extent to which it could have an effect on the performance of the city. The last part describes the growth of the city to accommodate this development, and the effect of this growth on low-income urban settlements.
The ‘Urbanised’ City

Clark (1996) claims that urbanisation, understood as the increase in the proportion of the population in towns and cities with a significant shift of population from rural to urban areas, has a long history, but was accelerated in the late nineteenth century by the emergence of industrial capitalism as a dominant economic and social formation. It was associated with the expansion of employment opportunities in the city and the decline in agricultural work caused by increased agricultural efficiency. This section will describe the process of urbanisation as it initiates the growth of a city, and will look at its impact on culture, especially as it has occurred in Indonesia, where cities are being urbanised principally by agglomeration and densification of local settlements.

To explain the present process of urbanisation, Clark (1996) pulls together the ideas of Taylor (1973), Castells (1977), Pred (1977), Goldfrank (1979), and Chace-Dunn (1989), to show that urbanisation has been in large measure a consequence of colonialism and imperialism in establishing external relationships, yet nowadays this is changing with the developing world phenomenon of global economic demand. He emphasised that capitalism, with its concentrations of productive activity whereby workers and their spending are also concentrated in specific centres, underlies these later processes of urbanisation. Further, Gugler (1996) argued that the distinct patterns of urbanisation in different regions are shaped by the legacy of their urban history as well as differences in per capita income. However, he noted that as long as employment conditions and transport costs permit, ‘life in a dual system’ pattern could be quite enduring for many urban men who work in the city and regularly visit their village-based families. One consequence of its development program is that Indonesia has experienced this ‘dual system’ phenomenon that is in some ways akin to the situation prevailing in the industrial revolution of Europe. Factories, machines and cities and their proliferation were characteristics of the era of the New Order government.
Populations in cities and most industrial areas grew larger, as people from rural areas migrated for work.

However, Gugler (1997) states that the urbanisation process in developing countries did not follow the western pattern. The urbanisation process in developing countries is a result of the unbalanced growth of population and development between rural and urban areas. The faster growth of urban areas should have driven the emergence of the service sector along with the manufacturing sector and industrial growth. Since the formal sectors could not, however, support the levels of need for services, there have risen many informal sectors. Undoubtedly the new occupations associated with these rising informal sectors also allowed and encouraged people to move off the land.

Firman (1990) predicted that in the decade of the 1990s global economic development would effectively encourage more developing countries, including Indonesia, to enhance their industrialisation and participate in the global economic system. He urged that Indonesia should anticipate changes in the global economic movement, otherwise it would jeopardise its urban environment. He noted that industries will prefer big cities and their surroundings as their operational location, since these areas provide better infrastructure and production facilities and are equipped with support facilities such as services and accommodation. Big cities such as Jakarta, Bandung, Surabaya and Semarang can participate in these global economic activities, by attracting not only industries but also people. The rapid industrialisation and urbanisation will not only increase the demand for land and urban facilities, but also change the nature of rural economic activities. With the ratio between land and population decreasing, peasants cannot depend on agricultural activity any longer, and are therefore much more involved in non-farm economic activities or the informal sector.

Urbanisation, which ESCAP accepted was closely related with national economic growth policy, has not only led to the growth of mega-urban areas, but has also compelled governments to look for new management skills. The report stated that governments should embrace urbanisation as an
important resource for urban economy and productivity, as well as a great challenge to ensure that physical, environmental, social and economic development can complement each other, although urban poverty and urban environment are the crucial issues. There were six recommendations and proposals for actions that could be applied, namely: formulate and implement urbanisation strategies and policies; reform economic policies and resource allocations; promote intra-governmental coordination and cooperation; strengthen local authorities; invest in human capital; and improve urban information and research.

Tjiptoherijanto (1997) remarks that in 1990, 30.9 per cent of the total Indonesian population (or 55.4 million people) lived in urban areas, with forty per cent of these people living in big cities (of more than 1 million population), 20 per cent in medium cities (from 500,000 to 1,000,000 people) while another 40 per cent lived in small cities. However, it should be noted that 62 per cent of the 43 cities with more than 100,000 people are in Java Island, and these will increase as economic activity drives most migrants into cities, and increasingly into those of Java. Government policies on economic development that offer work opportunities are especially significant in underpinning the direction and flow of the migrants.

**Cultural Transformation**

‘Urban’ is a label for a particular type of place and specific patterns of association, values and behaviour. Traditionally it was only used to refer to those who experienced and actually lived in cities, and whose lifestyles were distinctively urban in character and fundamentally differed from those elsewhere. In 1996, Clark argued that many people who live in remote locations have a lifestyle similar to that of the city as a result of long-distance travel, telecommunications, and the mass media. He did however also note that there are many people in the developing world’s mega-cities who retain associations and behaviour patterns that are more like those in rural areas: their attitudes and
values are permeated and constrained by the traditional influence of religions, family and geographical parochialism. He also believes that the first and second generations of immigrants have not yet been fully affected by incorporation within urban society.

Illustrating urban culture, Clark (1996) cited Wirth (1938) to the effect that the size of the social group determines the nature of human relationships. Increasing the number of inhabitants in a community beyond a certain level reduces the possibility of knowing all other members personally. On the other hand, Gugler (1996) argues that the history of urbanisation and current patterns of migration have had a major impact on urban social organisation and culture, since kinship patterns still tie the migrants to kin and to the people of their home villages. However, Schech (2000) claims that there are some important points of contact that should be looked at between culture and development. Some of these are at the point where development, modernisation, and westernisation occupy the same place, even stand in for each other; but also at the point where reflection on development and culture is equated with modernisation as a process and in anthropology is seen as a field of study; and the point where modernisation is equated with development and defined as ‘the right culture’ and, most importantly, where the culture and development cannot be understood without each other.

**Culture of the Low-income Urban Communities**

Following the above discussion on human settlements and the character of the dwellers' daily lives, a specific culture of low-income communities can now be identified. Hardoy and Satterthwaite (1989) argued that people’s culture has always been reflected in the houses, neighbourhoods and settlements that they develop for themselves, as culture represents accumulation and refinement of experiences over long periods of time.

Pratt (1998) has emphasised the links between place and identity, and if we accordingly accept that identities are ‘a process, a project, and a performance’, then it is compatible
with such an understanding that a stable identity is re-enacted through daily life. Therefore, places not only enable but express the performance of particular gender, class, and racial identity. Therefore she argued that there is a need to take seriously the historical geography of identity formation. Massey (1994) also argues that it is inappropriate to view places as bounded because any boundaries are permeable, the global flows through the local, and the local is always dynamic.

In the specific low-income settlement forms of Indonesia, the kampung communities are similar to other low-income neighbourhoods in third world countries, which Clark (1996) indicates are blended communities resulting from an urbanisation process, but retaining strong characteristics of rural community. The kampungs that served the agricultural communities have changed in character to serve the people of the cities. The transformation from rural-like settlements into urban kampungs involves a process of transformation from village dwellers into kampung dwellers (Haryadi, 1989, after Atman, 1975 and Williams, 1975). At the same time the occupational structure of the kampung dwellers has changed from agricultural to non-agricultural work, which then brings about the emergence of new forms of social organisation. Geertz (1956) claimed that this change had been a period of adaptation; it was not simply disintegration, as urbanisation is so often described. O'Connor (1983) described it as the growth of communities within communities. He argued that this was characteristic of the structure of the later cities and the distinctions of the social hierarchy in indigenous Southeast Asian urbanism. Further, he noted that the transformation from rural-like settlements into urban kampungs involves a process of transformation from village dwellers into kampung dwellers. This supports Silas’s (1999) argument of kampung as a nurturing place for cultural sustenance.

Although kampung communities have changed from homogeneity to heterogeneity, they have however successfully maintained their relationships, as Haryadi (1989) noted in his examination of the strategies of residents in
coping with environmental pressure. The story of *kampung* Kebon Kacang, as studied by Jellinek (1992), described the close relationships among the residents, although this *kampung* accommodated migrants from a range of ethnicities and origins. In some cities *kampungs* can become a place to accommodate specific ethnic groups from other places. However, they tend not to become isolated settlements that do not accept others.

### Inner City Change

The city as an engine of growth (Hall, 1992) would lead one to expect the value of land to reflect the level of economic activity. Therefore, the debate on inner city change is usually based on the transfer of high value land from poorer groups to business activities, since the land would become too valuable for their settlement conditions. This process of city development based on economic development can scarcely be argued against, as we observe cities becoming more spatially differentiated, with relatively prosperous areas and pockets of deprivation surrounding. The developed countries experienced this condition decades ago and have had to face the problem of how inner city based business and nearby employment opportunities can proliferate and grow for the benefit of the inner city residents. They thus recognised that inner city regeneration will require a radically different approach, which includes social programs (Boston, 1997). Home (1982) in this context argued that: first, problems and perceptions of the inner-city situation constantly change; second, adverse effects of rising unemployment and structural changes in the economy have overtaken the approach of tackling localized pockets of urban deprivation through social programs, and third, local government and local agencies have a specific role in seeking real solutions. He stated however that third world experience and that of the developed world cities are not transposable, as causes are very different. However, despite the different causes of change, similar situations are also arising in modern cities of the third world,
with reducing opportunities for low-income people staying in inner city areas.

**The Urban Settlement Enigma**

Hardoy and Satterthwaite (1995) explain that the rapid growth of cities in developing countries has been caused by the movement of rural people to cities since the 1950s or 1960s, as most of the colonial empires broke down and independent governments were set up after World War II. They see rapid and uncontrolled growth as a big problem for third world cities, since many people are living in illegal settlements or slums, and are unemployed. However, they insisted that the growth of those illegal settlements can be viewed not as the growth of slums but as the development of cities in a way more appropriate to local culture, climate and conditions than that advocated by the government.

Government low-cost housing projects have delivered too little and their products have usually ended up in the possession of middle-income groups. This is usually due to the government's limited financial capacity and the complex and poorly organised bureaucracy. The affordability of housing is a major concern (Hardoy, 1989). The elaborate stages of the process required to get a house, and the difficulties of the low-income community to get ‘formal’ housing which is safe, convenient and legal, have especially been commented on by Marcel (1979).

Usually low-income people who try to find an adequate income or to make a living in cities end up in low paying, poor quality jobs. Family income is never sufficient to pay for a decent house; therefore moving becomes an escape from unsatisfactory conditions, giving hope of better conditions in a new location. Low-income housing in the formal sector is unaffordable (there are fewer options and a greater gap between the wish and the fulfilment), and the government is blamed for its unwillingness/inability to increase the supply, reduce the cost, provide land, assure provision of infrastructure and services (Tipple, 1998, Hardoy and Satterthwaite 1995). Therefore the consequence is that
low-income housing is always inadequate, dangerous, overcrowded, insecure and typically poorly located.

However, in understanding the need to develop ties between local authorities and national or international agencies, the inadequate quality of low-income houses is a point of dispute. The simplest example of a housing program to address inadequate quality is eviction. In simple terms, eviction prohibits people from living in a particular house or place, and requires their movement to other areas. However, in some places eviction could have a similar meaning with simple displacement, forced removal, house demolition, land expropriation, population transfer, relocation, resettlement, slum clearance or even ethnic cleansing or expulsion. Although the right to adequate housing has been strongly advocated by the UN Commission on Human Rights, Resolution 1993/77, its full attainment is still a long way off.

In the urban context, there are various excuses made to justify eviction, but ‘… for the sake of development…’ is usually the preferred one. Such development could be associated with projects such as re-organising urban spaces, removing or reducing housing subsides for low income groups, holding a prestigious international event (e.g. world summit, sports), implementing infrastructure projects (e.g., construction of subways, new central business districts), doing urban redevelopment projects or city ‘beautification’. This condition puts the community under the threat of forced removals, housing demolition, land expropriation, population transfer, relocation, or resettlement.

In describing such a displacement, Jellinek (1997) tells of an experience of migrants to Jakarta who were subsequently forced to take involuntary resettlement. She quoted the case of Sumira, who was representative of other people who had lived in a kampung for many decades but had to move. The government replaced her old and illegal kampung with new apartments, which then became available for the previous kampung dwellers. Living in apartments was a different experience from living in a kampung. They had to adjust to the ‘modern’ system such as paying instalments, being a good customer for electricity and water corporations,
maintaining their new apartments and, last but not least, being prohibited from using their flats for making their living as they used to do in their old kampung houses. Jellinek (1997) noticed that life in the apartments was empty compared to kampung life years ago; she remembered the colour, and the hustle and bustle, with neighbours beavering away at different activities.

Forced evictions and associated forms of displacement have emerged as a key form of social disruption. For example, the changes of school and loss of friends cause great difficulties for the whole family in maintaining social relations, and business people have to set up new business relationships. Yet, this is similar to the process of gentrification in western cities, a transfer of high value land from poorer groups (although in the third world case their ownership or occupation may always have been illegal). This practice of forced displacement has many serious aspects that should be highlighted (Smith, 1986).

Low-income people will always struggle for houses if the opportunities are reduced. Therefore the more they are unable to find affordable houses the greater the gap between their expectations and the realities. The point is, if low-income families could find decent housing that they could afford, it could break the cycle of constant moving and the heavy cost imposed on all family members. The traditional kampung, it will be seen following, has tended to supply those opportunities.

Conclusions

From the above discussion, we can draw a few observations relevant to the low-income settlement pattern of Indonesian cities. First, we would expect a disorientation among the new residents of the city, as they bring poor levels of ‘urban’ skills, poor education, limited experiences, but great expectations to a modern metropolis. Stated otherwise, expectations are likely to be unrealistic. Second, the old mutual-help (gotong-royong) is eroded by money economy. Third, money economy in turn implies the eroding effect of
the formal economic sector: the *kampung* could manifest all the confusions of a dual (formal and informal) economy. Similarly, there can be a dual social structure, as the *kampung* dwellers might reside in their *kampung*, but their hearts and identity are back in their rural village (*desa*). And following on from this dual social structure and identity, there will most likely be a long persistence of essentially rural customs, values and ways of seeing the world.
ROLES OF COMMUNITY ALONG CODE RIVER SETTLEMENT-YOGYAKARTA IN VEGETATION PLANTING

S. Felasari
Department of Architecture, Faculty of Engineering, University of Atma Jaya Yogyakarta
e-mail: psf@mail.uajy.ac.id

Abstract

This study describes the roles of community along Code River settlement in implementing the vegetation planting program of Yogyakarta City Government launched in June, 2005. The lack of technical guidelines especially in relation to the appropriate design of urban vegetation make the priority in vegetation planting program become ignored. It seems that low economic background, lack of environment, land limitation and housing ownership system are problems that have to be faced by this dense settlements in applying the vegetation planting design. As a result the function aspect seems to be less important than aesthetic aspect. In order to sustain the vegetation planting program, the community needs not only technical guidelines in detail but also accessible consultation chances to an expert.

Key words: community roles, urban vegetation
Introduction

On 6th June 2005 the City Government of Yogyakarta have been awarded an honourable prize called ‘Adipura’ as one of the cleanest cities in Indonesia. This prestigious achievement could not have been done without Government’s persistent initiative in terms of cleanliness in the city.

‘Towards An Environmentally Friendly Yogyakarta City’ is a yearly development theme determined by the City Government of Yogyakarta during the year 2005. Many activities have been done in order to realize a city that is not only clean but also green such as cleanliness competitions and vegetation planting in several areas of the city. “Let Jogja be clean and green” seems to be a slogan that can be easily found in every corner of the city through many media like posters, billboards, and any other communication medias.

Besides those activities, the City Government tried to involve the whole community’s role in Yogya inner city by giving an incentive (stimulan grant) as much as 2 million rupiahs for vegetation planting program for each neighbourhood (called Rukun Warga or RW\(^1\)). By giving this incentive, the government hopes that the community will involve in the whole process of vegetation planting program, from planning, designing, implementing to decision making. The community should accommodate the vegetation planting program between the need priority and the character of each areas based on the discussion among the member of the community.

Code River Settlement is one of the areas that received the grant. This study will focus on the settlement area in the Suryatmajan Sub-Distric (Kelurahan Suryatmajan). As an area located in the city centre with limitation in many aspects, the City Government have carried out many program to increase the condition of the area either physically or socio-economic. By implementing the

\(^1\) ‘RW’ is the administrative unit at the next-to-lowest level in city
Vegetation Planting Programs

The allocation of the stimulan grant for The Vegetation Planting Program had been regulated in Peraturan Daerah Kota Yogyakarta Nomor 1 Tahun 2005 (Yogya City Regulation) regarding the Budget Estimation for Yogya City and Surat Edaran Sekretaris Daerah Kota Yogyakarta Nomor 900/45/SE/2005 (a circular letter from the Secretary of Yogya City Government).

The City Government required a procedure for getting the grants. According to the Technical Guidelines, every neighbourhood has to propose a proposal in which it has to include activities description, total budget estimation (including self supporting budget from the community as many as 10% minimum), site/location map, photos showing 0% progress and time schedule (including planning and implementation). The grants can be claimed if the proposal is feasible technically and economically, and has been approved by a coordination team at the city level.

Mechanism of the proposal submission and assessment, project implementation and report can be seen in the figure below:
Figure 1. Mechanism of vegetation planting program

The approved proposal is made into five copies and has to be submitted to the Mayor via ‘Ka.Bag.Tata Pemerintahan Setda Kota Yogyakarta’ (Division of City Government Administration), District, Subdistrict, and for neighbourhood’s archive. If the proposal is approved by the team, it will be submitted to the ‘BPKD’\(^2\) (Committee of Regional Finance) as the stimulan grant organizer. From the ‘BPKD’, the incentive will be cleared to every neighbourhood through the District (managed by Distric Cashier), and Subdistrict (managed by Subdistric Cashier).

Implementation of this program have to be reported as a kind of supervision to a coordination team at city level, ‘LPMK’\(^3\) (Urban Community Empowering Groups) and the

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2 BPKD stands for Badan Pengelola Keuangan Daerah  
3 LPMK stands for Lembaga Pemberdayaan Masyarakat Kota
community itself. The report has also to be conveyed to the Mayor via ‘Ka.Bag.Tata Pemerintahan Setda Kota Yogyakarta’ (Division of City Government Administration), District, and Sub District. Monitoring will be done by the team and ‘LPMK’.

Based on the technical guidelines, the vegetation planting program can be prior to:

1. Planting activities, such as
   a. Tress for shelter like mahogany (*swietenia macrophylla*), tamarind, almond tree, ‘angsana’, ‘tanjung’ (*mimusops elengi*), etc.
   b. Vegetation for herbs like betel vine, ‘mahkota dewa’, ginger plant/the galangale, laurrellike leaf, etc.
   c. Ornamental plants like bougenville, hibiscus, palm, casia, stivera, alamanda, oleander jasmine, etc.

2. Garden Renovating

3. Developing new facilities

**Implementation of Vegetation Planting Program**

Having seen the process of the vegetation planting program started from proposal submission to implementation, it seems that the Government aims are to involve the community’s role as many as possible. According to Arnstein (*Panudju, 1999*) this is called a delegated power in which the Government delegate the power to the community to decide a kind of activities which is needed by themselves. Participation are conducted from formatting a team at the neighbourhood level, collecting self supporting budget, providing the land for planting, designing the garden, implementing the planting program, up to reporting the result of the activities when it is finished.

Based on field observation and discussion with the ‘kampung’ board, there are several constraints faced by the community in implementing the program i.e.:

   a. Financial restriction
The Government’s incentive seems relatively too small compared to the width of the settlement area that has to be utilized. Meanwhile, it is almost impossible to trade on the community’s financial ability since most of the inhabitants are low-income families. As a result, it is only a small number of areas that are planted with vegetation. On the other side, the financial restriction have created initiative from the community to find another way in order to get an optimum result with limited budget. This is done by making the flowerpots instead of buying, using the old bucket or cans, garden renovating and constructing by community self-help/mutual cooperation, etc.

Figure 2.
Example of garden at Ledok Macanan Kampung. The flowerpots are made by the communities themselves.

b. Land limitation
Most of houses in this area are about 50-100 sqm width on average and are inhabited by more than one family. It is very rare to find houses with a yard or garden. Only houses near the main street usually have their own garden. Generally, houses are built on most of their site without open spaces. Having lack of spaces, the inhabitants use flowerpots to overcome the land limitation instead of planting.
directly on the ground. These flowerpots are put on the ground or hung under the eaves of houses. In addition, some try to use passageway corner as a planted area.

![Figure 3. Hanging flowerpots](image1)
![Figure 4. Passageway corner](image2)

The vegetation planting is a little bit difficult to be implemented on a rented house unless the landlords/owners have given permission which sometimes difficult to be done as they live in the other area.

c. Implementation constraints
This is due to the lack of community’s knowledge in terms of vegetation types and their suitability for a certain condition. As a result, sometimes the vegetation uses are inappropriate. Ornamental plant is the most often chosen by the community as they can be used for attractiveness. There is even a neighbourhood allocated the grant to buy orchid plants which are expensive and difficult to take care of. During the implementation of the program, the community has problems in finding information or discussing with an expert (e.g. landscape expert) about technical aspects in vegetation planting and its
maintenance. They design the garden based on their individual experiences.

Identification the Potential Use of Vegetation for Code Settlement

The unique character of the Code settlements in Suryatmajan Subdistrict make the Vegetation Planting Program have to consider factors such as:

a. Financial constraint due to middle-low income level
   It is very important to make priority of vegetation planting needs. The priority have to consider vegetation with economical value and can be used to increase the community’s health and nutrient such as herbal plants (e.g. ‘mahkota dewa’, ginger plant, etc) or fruit trees (e.g. mangos, guava, sapodilla, bread fruit tree or rose-apple trees)

b. Land availability
   Hanging flowerpots have been used by the community in order to solve the limited space problems but it is very important to share the newest information about planting methods in a narrowed space such as stacked planting, rooffgarden, etc.

c. Physical Environment
   In general, the settlements environment along Code River are characterized by:
   - Having been in the flood-risk area
   - Potential to get air pollution and noise as the area closed to the main streets and commercial area (Malioboro)
   - Narrowed and contoured passageways (it cannot be passed by cars, but motorbikes still can be pushed by hand)

Based on the environmental condition along the Code River, vegetation can be used to:
   - Protect from flood. Vegetation with high evapotranspiration and tough roots such as mahogany, jackfruit, leucaena glauca, etc., are suitable to be placed along the river embankment/dike. When the river overflowed, it
helps the evaporation rapidly and protects the area from the stream.

- Minimize the air pollution caused by motorvehicles. These benefits are gained from mahogany (*swietenia macrophylla*), nutmeg (*mirystica fragrans*), ‘asam landi’ (*pithecelobium dulce*), and ‘johar’ (*cassiasiamia*) by absorbing the smokes caused by the motorvehicles. In order to get optimum results, the vegetation should be placed at the border of the area next to the main street (like Mataram Street, Suryotomo street, Jambu Street and Abubakar Street).

- Reduce noise. Vegetation with dense leaves and thick crown are able to reduce noise. Therefore it should also be placed at the border area.

- As shelter. A shade tree with dense and wide leaves such as mahogany (*swietenia macrophylla*) and ‘ketapang’ can be planted along the ‘kampung’ alley or open spaces (such as football
or badminton field). It also can use fruit trees such as mango, guava, sapodilla, or rose-apple trees.

- Increase attractiveness. Ornamental plants with attractive forms, textures and colours can be used to increase the beauty of the environment. Its composition can be arranged to increase aesthetics and visual image of the surrounding area (such as obscure visual views from garbage disposal or laundry)

**Conclusion**

The City Government’s persistent initiatives by subsiding and giving chances to the community in terms of vegetation planting program are deserved to be appreciated. The communities are free to plan and design the garden but it should be balanced by sufficient knowledge of garden design or vegetation planting. As a result, it is the Government’s responsibility to provide a technical guidelines in detail not only in relation to the vegetation’s types but also to the wide use of vegetation including its suitability with a certain environment.

It is very important that the City Government inform the community many kinds of vegetation planting methods and maintenance so that inappropriateness between vegetation types and planting area can be avoided. As a result vegetation will grows for a long time and the program will be sustainable.

The City Government has to provide accessible consultation chances for the community to an expert. By means of expert’s consultation and assistant, the community is able to solve the technical problems at the implementation level.

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PROCESS OF SETTLEMENT FOR MARGINAL PEOPLE POST EARTHQUAKE AND TSUNAMI IN NANGGROE ACEH DARUSSALAM - INDONESIA*

Case Study in Marginal People at Malahayati Port, Aceh Besar

Setyo Dharmodjo, Diana Perwitasari*
Department of Architecture.
Duta Wacana Christian University, Jogjakarta
and volunteer of YAKKUM Emergency Unit

Abstract

We still remember that Province Nanggroe Aceh Darussalam of Indonesia (Aceh) just had earthquake 9.2 Richter scale and tsunami on December 26 2004 that destroyed natural and human-made environment. Next, many of various national or international humanity organization built houses for refugee. In fact, there was difference in distributing aid for refugee, because some of refugees was status as marginal people.

Building the houses was started from study about background of marginal people and search of location and proper building style for refugee, especially for marginal people. Later, how many consideration of defence on disaster used, and how the house can be suitable for refugee to begin their life, can be better than before.

1. Introduction

* Presented on International Seminar of Sepuluh November’s Institute of Technology, in 17-18 November 2005, Surabaya
Disaster is unpredicted horrible event. Each year history of Indonesia was colored by headline news on disaster. Effect caused can be extraordinary including having many victims, and wealth and change form of people life, immediate poverty, trauma, environmental damage and disease. Those facts are examples of case that happen after disaster rise. Disaster is really an unpredicted event and often come repeatedly. Therefore, human culture inside including building house in the development is greatly influenced by defence on disaster.

Disaster caused by natural incidence directly or indirectly can be effected by human behavior. They include; land sliding, earthquake, mount eruption, typhoon, flood and tsunami, fire, drought and disease. Indonesia is as an archipelago country and located in crossing two continents, followed by socio-economic problem as developing country, then natural environment often become backgrounds to aware and train to fight natural disaster. Some building offered as solution in facing the disaster, such as:

a. Land Locked Floating House of Paul Winston is built in water front region. House can move following air level so flood will not damage it.

b. Traditional House of Flores (Sikka Model) is built flexible and easy to suitable to the earthquake.

c. Traditional House of Alor is built to prepare itself in facing drought threat.

d. Traditional House of Aceh had thought about defence on fire by way of releasing roof of building body so fire is relative easy to extinguish. In addition, house with light concrete and
metal and finishing with powder coating and polysterene is built to give example for people about fire-resist building (ADMI, Surakarta, 2005).

c. A group of house in side of Merapi Mount with Bunker to prepare itself from Phyroclastic disaster beside there are houses equipped by clean water supply 5 x 7 x 5 centimeter in size. In case of house around side of mountain two disaster consider, they are phyroclastic and drought.

d. Fisherman’s house in Papua is located around abundant fish/shell, available of water source, avoid of west wind attack and find land texture, so dirty of fisherman’s settlement can be loss by flow of sea water. Location liked by fisherman in Papua is around mouth of river, bay area and back of island. This location is founded many kind of shell fish that cannot move and can be spread over under space of house and maintained as substitute food when storm happen.

Capability of human to build their settlement is based on consideration of defence in facing disaster, it generally happen in people who have organization and live permanently. This condition opposite to marginal people who do not have strong group bound and still called as immigrant. Marginal people existed in Indonesia add the problems if their presence in a region is not equipped by Identity Card. Intimidation and un-humanity punishment can happen any time on marginal people.

2. Theoretical Study
Factors influencing people to take decision to immigrate are caused by four main factors: factor that happen in original region, factor that happen in destination, limiting obstacles and personal factor (Lee, S. Everett, 1979). First three factors are external one of immigrant, while the last factor is greatly influenced by personal, intelligence, awareness about condition in other place that influence their evaluation in original place, knowledge about condition in destination depend on one’s relationship or various general available informational sources. Role of generalization on race, religion, origin, job level often help someone to move and joint to the destination though they should place in marginal land and they have no Identity Card. Therefore, decision to immigrate never met rationally, many personal factors support human to immigrate and place marginal land.

This phenomena can cause growth of dirty area (slum area) in destination, therefore Indonesia through Agency for Labor and Transmigration develops concept of local transmigration termed by Ring I and Ring II. It means that people who immigrate between regency in one province are called Ring I and transmigration between district in one regency is called Ring II. In order to meet Four of Proper (proper house, proper to use, proper to develop and proper to the environment). It is suitable to opinion of Charles Abram quoted from Amos Rapoport (Houseform and Culture, 1978). He explained that house should meet 4 objectivities in order to exist:

a. House need social and cultural relationship (in this case traditional house shows the best result)
b. House also should support economic growth (in traditional people but not at all, each must have house)
c. House should protect inhabitant to keep their health (in relation to climate, this house usually success, but if it is related to disaster and sanitation and varied parasite in home, it is not succeed).
d. House at least need maintenance in particular time (it has little evidence).

So, from this theoretical study it can be concluded that human can move because both internal and external factors.
Human is adaptive, creative creature, settlement they live can be built anywhere and any condition. Slum area rise because poverty and lack of availability of houses to meet the proper criteria of environment, proper to live, and proper to develop.

3. Fact and Discussion
Marginal people who lived at Aceh are those who migrated from their original. Commonly, they came from region where had disturbance of security. In related to low educational level and lack of skill, they were more likely to choose to be farmer, breeder and fisherman. Most villagers were doubt on these marginal people, they commonly could not show Identity Card called as “Red-White Card”, so villagers called them as criminal who escaped from their original. Location of marginal people base was still in administrative limit of village but it was more likely to use as village land or state’s land outside of people’s agricultural land. It dramatically can be explained as follow:
Then it revealed a problem related to the status of village’s land and those who had no Identity Card. Finally, time was running, marginal people group rise as follow;

1. Group that villagers received them, because consideration was in length of stay, showing good intention and worked in Village Lamreh. In this matter, role of villagers recommend marginal people who they knew to be received as local people and they had Identity Card.

2. Group who had to wait to be received as villager. This group had not obtained yet appointment of villagers because they were not consistent to manage land around village or there was no local people who interact with them.

3. Group who did not want to wait long time to be received as local villager, because people’s mobility factor was still as commuter between original region and the destination. This group was unknown by local people, chief of village (chief of Lorong) or keucik (chief of district).

Though these three groups lived in one region of settlement, they actually had conflict, including there was no equal distribution of either governmental or non-governmental aid coming to help earthquake and tsunami victims. After non-governmental organization and citizen helped each other in releasing land for place where marginal people could stay, then the group who had Identity Card was given a chance with one condition; getting a moving letter from original region.

Next, program of building house for refugees was followed by non-physical one, they were health mobile, psycho-social therapy, building lend-borrow association, and credit for business tools. Main requirement for admitting of house for refugees was there was a clear status of land, whether it is Right of Ownership, Right of Use or rent on state’s land and decided not as restricted area. Admission of settlement aid and the appointment was done by Chief of Refugee’s Camp, Chief of Lorong, Keucik, chief of district,
Committee of District People (Muspika) and related institution in order not to happen crossing with other NGO by the same program. Program of settlement for refugees was commonly performed by people empowerment system or involved people since early. Working process and application of empowerment done was divided into three stages:

a. **Pre-Project.** People/refugees were involved in preparing house they built, giving aspiration on design of house that they would use. People made map and determined location of house they would build. Socialization was done by way of performing a meeting with other to give information about planning to build house. Meeting was started by formulating the problem about description of house need, space need, construction, model (fasade, construction style, building and roof material) to size of house that could be realized suitable to the available budget and suitable to the planning as stated by government.

b. **Run-Project.** People/refugees were involved in process of building their owned house. In addition, giving a chance for local worker to be partner of NGO, it also empowered local people as daily worker. This method involved economic empowerment and it is a “gotong royong” system to be applied in order to have feel as owner on object of aid they got. In other word, NGO was only as facilitator and run-coordinator of program. Worker or apprentice is technician who could give training program indirectly to local people (work demonstration to build house).

c. **Post-Project.** This program was awareness on the importance of maintaining house and health living system at home as community. This program was one that tried to improve quality of life for people by improving skill of small enterprise, environment health, and home credit for making septic tank, repairing kitchen, or providing clean water supply. Improving land management was also required as program that tried to help people to have Permit Letter of Building House (IMB) and land certificate. Next, for continuing program
it was required to organize people in improving capability of building settlement, it was tried to form Board of Developing Village, Joint Business in Lend and Borrow and it need a supporting group in looking for and managing queuing fund.

From refugee side, suitable house is one being easy to maintain and easy to develop. Considering in the ease stimulate refugee to choose house with local material, technology, and knowledge. NGO could develop design using varied same material, in order not to have waste wood or unused material. In addition, size was suitable to the dimension of available building material. Some basic consideration of design concept were:

a. Building style. Many building style developed from traditional house of Aceh and based on climate (especially on west wind). Some house was made like stage, where lower floor was used as public space and upper floor as private room. This house next could be developed by inhabitant to be an Islamic Aceh house. Style should not be same as original house of Aceh, but every one could feel that design of house for refugee has adapted to climate and local culture.

b. Space Organization. Each design of house for refugee had at least 36 square meter in size, though standard of Social Agency one house 25 square meter. Spaces generally provided are bedroom, kitchen and living room. So this house was grouped as core house or simple one. Therefore, by house of stage, vertical space organization was divided into public and private space. While space organization in upper floor consisted of living room and bedroom. Later, inhabitant could develop public space with kitchen, bathroom and guest room. Thoroughly, separation of space only existed in kitchen and bathroom. Both was made for same interest and it was due to security reason on fire and health.

c. Fasade. Some houses looked vernacular one (contemporary house) that usually seen before disaster of tsunami and others were the simplifying of traditional
house of Aceh. Of course, it was suitable to material used (wood and zing). In order to have comfortable space, it was required higher roof corner, so the space under zing roof did not feel hot. If roof is not steeper, then plafond would cool space.

d. Use of Material. All material were coming from North Sumatra and deepen region of Aceh. Price consideration, available of building material and ease of transportation are main factor in building house. Worried providing of wood in large number caused forest damage. Therefore, buying material was under the authority in order not to happen mismanagement of material. Varied material needed in limited number was wood in 4 – 5 meter in size, and wood in 5/10, 10/10, zing lathe in 5/5 in size and zing. Later, this material of building influenced size of building and the style in order to create efficiency of material use. Choosing material was also considered if refugee would change or replace the house they would not have difficulty.

Building Core House as basic tool for refugee to have Islamic House of Aceh (YEU, Banda Aceh, 2005)

Building Kiosk as utility of developing economy for family and improving spatial view of Malahayati port (YEU Banda Aceh, 2005)
4. Conclusion

Disaster created by natural or human being will always be remembered in our memory and it influences in determining location for settlement, mass organizing pattern, building style, use of material, technology and given construction. Disaster also gives awareness for each to help each other. Using land as stated by government and ease to get Identity Card can help marginal people. A settlement could be far from dirty area if the inhabitant with the partner can try the settlement as proper house, proper to use, proper to develop and proper to the environment. Physical and non-physical program is presented jointly to create the four of proper. And the program can continue if there is an people-based organization to manage.

Proper house for marginal people should be developed on Islamic nuance as Aceh House in order to build old culture more applicative at present.

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MAGERSARI AS AN ALTERNATIVE OF HOUSING AND SETTLEMENT DEVELOPMENT CONCEPT

Winarna
Department of Architecture, Faculty of Engineering
Duta Wacana Christian University, Jogjakarta
e-mail: winarna@yahoo.com

Abstract

Based on the law, Indonesian government has conducted many programs of housing and settlement development to fulfill appropriate housing demand. Housing and settlement done, tends to pay attention to a quantity of physical housing supply. Socio-cultural need which has human environment quality has not been paid attention yet.

Housing and settlement development is to create a good environment supporting the improvement of living and people welfare, because housing function is as a place for weather protection and also for educating in order to achieve better personality.

“Magersari” concept applied in housing and settlement around Yogyakarta palace is able to be taken as an alternative of housing and settlement development today. By Magersari concept, many kind of economic level (low income and high income people) can live together in the same areas. By living together in the same area, the good relationship among inhabitants can happen and each group gets advantages. Infrastructures become more efficient and low income people can live in a good environment.

Lurah (village chief) is given more authority so he is able to arrange his area by allocating area for housing and settlement of much kind of economic level people. By good regulation, utilizing and controlling of land can be done, properly.

Keywords: socio-culture, magersari, relationship, regulation
Introduction

Housing and settlement problem needs to solved by adequate planning. Settlement and housing, and its environment can support people need to achieve good quality of life.

The cities population growth causes low quality housing within the cities, and the growth of uncontrolled of a new housing settlement on a fringe area.

An other housing problem which can be found in many cities is a new exclusive housing settlement or enclave settlement so it tends to generate social jealousy, inefficient and expensive infrastructure and public facilities, high social cost and also high land price which low income people can not afford to have house.

To solve the problems in Indonesia government has conducted the construction of housing and settlement so that each family occupies an adequate house and good environment. In reality the housing development has been done, gives more attention to physical housing supply, economic and number of housing point of view than socio-cultural demand consideration which have human environment quality (Eko Budihardjo, 1997).

The phenomenon can be seen by the growth of luxurious and exclusive housing lying on nearby downtown and city facilities.

While low cost housing for low income people having minimum quality and quantity of facilities, lays far away from city facilities and work places. The difference of housing condition and character causes bad relationship among inhabitants.

This paper uses socio-history to discuss housing and settlement arrangement around Yogyakarta palace when Yogyakarta was a Kingdom form by studying the philosophy within housing arrangement around the palace in the past, a better housing construction and arrangement which pay attention to improving of people welfare, can be found.
Housing And Settlement Concept

The law No. 4 Year 1992 says that settlement is a housing group as a living environment having infrastructure. While settlement is a part of environment which it is out of protected area, it is urban area or village area that has function for living place or living environment and activities place supporting life. The definition gives understanding that settlement is for living together. Therefore house function is for living, where people can socialize their selves.

Housing function is not only for protecting people from sunrise and rain but it is a place where human to be educated, improved to become good personality people. Hence, housing has to be able to open and give a way to the needs, aspirations, and desire of people in order to achieve better live and welfare.

Recent Housing And Settlement Development At This Time

Basically, communities have own responsibility to provide their houses. They constructed houses both individual and collective. Some people could not improved their houses. Therefore, government has to help them. The help is based on subsidy by giving subsidy to poor people directly. Government can also create a good atmosphere so community are stimulated to construct houses by themselves (Batubara Cosmos, in C. Djemabut Blaang, 1986).

Government has supplied housing and settlement to people through many kind of programs. The programs are improvement of physical quality of housing settlement, sites and services, modest housing construction and very modest housing, flats, apartment, condominium etc.

Government has issued of housing and settlement development law which pay attention to environment aspect. These law are:

1. The law No. 4/1992 contains about housing and settlement regulation
2. The law No. 24/1992 contains about spatial arrangement
3. The government regulation No 80/1999 contains about Kawasan Siap Bangun (Area is ready to be built) and lingkungan Siap Bangun Berdiri sendiri (Lisiba BS). Those laws and regulation tend to pay attention to physical environment. They do not express to socio-cultural aspect yet. The law no 4/1992 express that the aims of development of settlement area as follows:

1. Creating settlement area which arrange from unit of settlement.
2. Integrating and improving quality of housing environment which has existed within or around housing settlement.
3. Unit of settlement is linked with other unit by transportation network which appropriate with area need giving services and job opportunity.

The law mentioned above can be seen that the aim of housing and settlement development is every people can live in a health house, in order to support sustainable and improving socio welfare. Therefore the goal of housing and settlement development is appropriate housing and settlement supply for many kinds level of community, especially for low income people (Batubara Cosmos, in C. Djemabut Blaang, 1986)

The quality of housing and settlement construction could not afford to balance the dynamic of rapid population growth. Hence, it is needed to pay attention of technical regulation and creating condition of settlement which is able to support improvement of living and community welfare.

Housing and settlement construction often meet obstacles caused by many aspects because housing construction covers many factors which link one factor to other factor. The factors as follows (Sarwono Yudohusodo, dkk, 1991):

1. Population
2. land
3. affordability
4. technology and construction industry
5. institutional
6. law
7. self supporting and community involvement
8. socio-cultural

Because of the reason above the housing and settlement development needs an integrated and comprehensive approach by emphasize to structuring, arranging, provisioning, and using.

**Housing And Settlement Around Yogyakarta Palace**

Many kind of community character and community dynamic cause the change of housing and settlement character in the course of time. The change of housing and settlement character is influenced by the change of government and also government policy.

As a former kingdom, initially Yogyakarta construction was influenced by ambition of the King who had power to govern in the city. Sri Sultan Hamengkubuwono. I was a prince having military spirit, hence planning and building construction in Yogyakarta were based on a defence system from enemies. The King built kampong as a residence for soldiers, palace technicians and nobles around his palace.

There was kampong laying inside fortification and because of land limits inside fortification so the king also built kampong outside fortification. Only very important noble and servant lived inside fortification (Kota Jogjakarta 200 Tahun, 1956). To name the kampong, it was just added a suffix “an” to the noble, palace technician or servant name. Here some example (Tim Pengkajian Sejarah dan Antropologi, 2004):

- The residence of GPH Suryoputro is called kampung Suryoputran
- The residence of BPH Pakuningrat has a name kampung Pakuningratan
- The residence musician is called musikanan
- Dagen is residence of undhagi (wood craftsman).

The noble’s residence mentioned above is called “dalem” and become orientation of its surrounding. Its building architecture is a prototype of Javanese architecture which referred to inner palace architecture.

2-15
Most noble’s families share their “dalems” with “abdi dalems” (servants). “Abdi dalems” work as servants for noble in exchange for a place to live, to received the good fortune of blessing, and the benefits of “magang” (study of the etiquette and practices of high Javanese culture by working for and serving the aristocratic family). A symbiotic relationship between a noble and his servants is based not only that the noble and his family required services of “abdi dalems” but also they need a symbol of their status as an aristocratic family. The relationship also led the noble manage his land in compensating his servants for their loyalty to take care the noble’s grand life style. The right of “abdi dalem” to occupy this land is known as “magersari” (Ikaputra, 1995:42).

Furthermore, Ikaputra divides of magersari into three types:

1. Magersari kraton: all lands and building belong to the king. He acts as landlord who gives the property right to use the land either to nobles or abdi dalem. The former relation usually consider the blood tight or as the king’s closed relatives, and they use property right of relatively big piece of kraton land; while the latter had a tendency to cultivate the work-tight, and they occupies the relatively small land. By magersari, the king had motivation to strengthen his power and loyal bureaucrats.

2. Magersari dalem is applied in noble’s residence and its land at the level of the elite’s priyayi’s group. Nobles are allowed to have extensive control upon their parcels of landed property in which dalem was built within the wall. Magersari has not gained a commercial but a more symbolical tendency through its function in giving a social assistance to people who work for the noble demanding blessing, and in providing the place for doing suwito or magang priyayi.

3. Magersari kampong is applied in the kampong. A landlord has a block which can be fragmented into small lots and rented out to tenants called
“pengindung”. The relation between the landlord and pengindung has built a form of a social assistance to the poor family who were then regarded as a close friend. Therefore, there is no economic reason, landowner expected “pengindung” to maintain the land and path, take care plants, trees of the land and also to protect any kind of intervention by unexpected urbanities on the land illegally (Ika Putra, 1995:93-95).

Magersari Concept In Housing And Settlement Development

The explanation mentioned above can be understand that housing and settlement development at this time causes emerging an exclusive housing environment, infrastructure and public facilities are inefficient and expensive. There is also social cost of inhabitant to do life their activities and land price always increases. Therefore, the circumstance causes big social gab among community, and other social problem.

In other side, there was a traditional housing and settlement around the palace in the past, it is called magersari. Landowners permitted to lower people to occupy on a part of their land. There was a good relationship between rich people (landowner) and poor people. Poor people got a place to live and work proudly, and assistance from the rich people to improve their knowledge and skill. The rich people got loyal workers, proud and security feeling.

The magersari system also causes a problem now, because abdi dalem who have stayed for a long time on noble’s land, have many children and grand children. The whole family are living on the noble’s land and they refuse when landowner want to utilize the land and asked them to move from the land. The problem is caused by no clear regulation and agreement which regulate such relationship.

By understanding of housing and settlement character in the past, magersari concept can be used to develop housing and settlement now. It can be built housing and settlement where high income and low income people can live together on one
area. When housing and settlement are developed by magersari concept, the socio-culture problem can be solved. Housing and settlement are not exclusive because of mixed level of income stay, live and make activities together, both rich and poor people can live in good environment. Infrastructure and public facilities are efficient.

Magersari concept can be applied well by giving bigger authority and responsibility of land usage to lurah (village chief) who has good understanding of his area. Therefore, lurah can decide and arrange settlement within his area by allocating land to be occupied by rich and poor inhabitant.

Agreement and regulation are required to avoid negative effect of magersari concept. The regulation contains how big size of land which can be utilized, how long time the poor people can occupy the land. The agreement is about poor people who can not bequeathed the land to their children or grand children, and their mature children can not stay on the land.

References
Direktorat Perumahan dan Perumahan Wilayah Jawa Tengah (2003), Panduan Umum Kasiba dan Lisiba Berdiri Sendiri.


NEIGHBORHOOD UPGRADING AS AN ALTERNATIVE HOUSING SOLUTION FOR INFORMAL SETTLEMENT
A Case Study of Tipes District Surakarta

Winny Astuti
Laboratory of Urban and Human Settlements Development,
Department of Architecture Sebelas Maret University
Surakarta (UNS)

Abstract

The development of a commercial facilities (hypermart) in the Tipes Square has been a conflicting issue of Surakarta City recently, due to implies to the change of Land Use specified in the General Spatial Plan of Surakarta (RUTRK 1993 – 2013) from the public space to commercial activity. Therefore Development Control Plan (RTBL) was needed in order to control the development of the area. The RTBL recommends the substitution of green area in surrounding area for balancing the environmental condition due to the loss of public space (the Tipes Square) generated by the development of hypermart. The only alternative land possible for development of green area is revitalization of Greenbelt of Premulung River located in the area. However, right now the Greenbelt of Premulung River has been occupied by informal squatter settlers, which should be evicted when the Greenbelt is revitalized

The research aims to find out the housing solution alternative for resettlement of the squatter communities affected by the project. Neighborhood Upgrading concept was developed in order to integrate the housing solution physically, socially and economically.
Methodology conducted in this research was participatory planning by involving the people affected by the project including two Neighborhood Areas of XIII and XV of Tipes (about 250 households). Three approaches were developed as follows: participatif, inclusive and transparency. Result of the research was the need of Neighborhood Upgrading. Several phases were conducted as follows: Developing similar perception among communities related to Neighborhood Upgrading; Revitalization of Premulung Greenbelt; Development of Low-cost Rental Apartment on the Cemetery land; relocation of people from squatter settlement on the Greenbelt and resettlement of people to the apartment.

**Key words:** Neighborhood Upgrading, Housing; Informal Settlement; Low-cost Apartment

**Introduction**

This study was conducted in relation to preparation of Development Control Plan (RTBL: *Rencana Tata Bangunan dan Lingkungan*) of Tipes District Surakarta. The Development Control Plan plays a role as a Development Management tool in order to create adequate, identity, and productive building environment condition.

The Development Control Plan of Tipes District was necessary due to initiation of investor to develop the Tipes square for business activity (hypermart). This leads to the change of land use of Tipes Square as a public space and urban green area to the business/ commercial activity.

At least 5 predicted issues implies to the development of Hypermart on the Tipes Square,

1. Management conflict of the area.
   Strategic location of the area in the border of Surakarta and Sukoharjo becomes the destination of people from Sukoharjo and surrounding, which mostly occupy state land illegally.

2. The Role of Premulung River as a greenbelt of border area.
Premulung River does not play a role as greenbelt area due to over occupation of squatter settlement on there.

3. Land use Plan of the Area
4. Implications of the Change of land use of Tipes Square
5. Accessibility and Urban Image and Identity

The change of ownership status and land use of Tipes Square as an urban green area to commercial implies to disturbance of urban ecosystem, which is not conducive to create the safe, healthy, comfortable and productive environment quality. Therefore this need reestablishment of land use strictly in order to revitalize the role of Premulung Greenbelt, the role of settlements and infrastructure.

Substitution of the loss of green area of Tipes Square is necessary. The only land possible for development of green area is revitalization of Greenbelt of Premulung River in the area. However, right now the Greenbelt of Premulung River has been occupied by informal squatter settler, which should be evicted when the Greenbelt is revitalized.

This study aims to find out the housing solution alternative for resettlement of squatter communities affected by revitalization of Premulung Greenbelt. Concept of Neighborhood Upgrading were developed in order to integrate the housing solution with the economic and social development. Relocation and Provision of Low cost rental apartment and infrastructure is necessary for resettlement of affected communities. Several steps were conducted from developing similar perception among people; Revitalization of Greenbelt; Development of low-cost rental apartment; and Relocation of people from squatter settlement on the greenbelt to the apartment. Strategies and program were developed to come up with the problems.
Figure 1. Idea of Future Tipes
The Nature of Neighborhood Upgrading

Regulatory Basis

Neighborhood upgrading implemented in the area is based on the legal basis as follows:

a. Ministerial Regulation of Public Work no. 63/PRT/1993:
   "Area of 10 meter from right of river should be released for greenbelt and green area"

b. Local Regulation no 6/1998 article 7 (1)
   "Head of Local Government has obligation to relocate all area of cemetery as well as part of the area to be used for public interest"

c. Directorate General of Housing and Human Settlement no. 46/KPTS/DM/2002
   " Neighborhood Upgrading and Shelter sector project (NUSSP)"

d. Local Regulation no. 25/ 1981 related to clean city and garbage collection

Project Components

Neighborhood Upgrading is the program implemented in the local government, which aimed to solve the problem of poverty through partnership among the Government, Private sector and community for preparing housing program and infrastructure, building capacity of housing financial institution in order to satisfy urban poor people. It has three components of project as follows:

a. Neighborhood Upgrading through increasing quality of housing and human settlement, developing the sustainable and flexible housing development in the local area (city/ regency) depend on "demand drives"

b. Shelter and housing financing through provision of housing ownership loan scheme for low income people

c. Capacity Building of government and society institution for development of housing and human settlement for the poor.
Concepts
a. Tridaya Enablement
b. Area Based Development
c. housing/shelter as central component

Figure 2. Neighborhood Upgrading with Tridaya concept and Housing Based Community Development
Sumber: Neighborhood Upgrading and Shelter Sector Project, 2002

2-25
Concept of Tridaya includes concept of:
- Housing and infrastructure development
- Economic development
- Social development

Approaches
a. Participatory: Those that are affected are able or enable to have control over the whole process
b. Inclusive: All those affected must have opportunity to participate
c. Transparent: The making and taking of all decisions must be clear and made known

Environmental Condition of Affected Area
General Feature of the Study Area

Tipes Village (District) is located in Serengan subdistrict in Southwest of Surakarta City. It has 6.4 sq km with population of 12,859 people. This area is bordered by:
In the North : Jl Moh Yamin
In the East : Jl. Honggowongso
In the South : Premulung River, and
In the West : Premulung River as a border with the Sukoharjo Regency

Tipes District consists of 15 community units (RW) and 64 Neighborhood units (RT). However only RW XIII and XV include in the study area. Generally, economic activity of people is engaged in informal sector mainly as Home Based Enterprises such as garment and batik. The number of illegal squatter settler are seen to occupy non residential land such as cemetery, green area, and greenbelt of Premulung River. This partly because of the strategic location of the area in the boundary between Surakarta City and Sukoharjo Regency, which contribute to fast process of urbanization.
Figure 3. Map of Tipes District

Figure 4. Land use of the Study Area
Housing and environment condition

Housing condition
Housing condition is dominated by Home Based Enterprise mainly conducted on garment and Batik activities. Housing condition in the South and West, especially along greenbelt of Premulung River is dominantly in a poor condition, whether in other areas There are dominated by middle to high class of houses and environment.

Public Space
There are 6 areas of Public Spaces. One of the public space (Tips Square) has been been changed the ownership status from government state land (belong to Indonesian ARMY/ POLRI) to the private ownership land. The investor plans to develop commercial activity (hypermart) on the land. Therefore land utilization of Tips Square as a public space will be changed to the Commercial Activity (Hypermart).

<table>
<thead>
<tr>
<th>No</th>
<th>Name of Public Space</th>
<th>Sq meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POLRI (Tips Square)</td>
<td>10,000</td>
</tr>
<tr>
<td>2</td>
<td>Open Space</td>
<td>1,000</td>
</tr>
<tr>
<td>3</td>
<td>Tips Cemetery I</td>
<td>3,840</td>
</tr>
<tr>
<td>4</td>
<td>Makam Cemetery II</td>
<td>3,050</td>
</tr>
<tr>
<td>5</td>
<td>Historic Park Surakarta</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Agricultural field belong to DKP</td>
<td>500 m2</td>
</tr>
</tbody>
</table>

Sources: RUTRH 1993-2013

Cemetery
Land status of Cemetery is the local government's state ownership land. Some part of area belongs to Religion Institution (Arabic). However, recently the cemetery has been changes utilization as settlements of 73 households of squatter settlers of migrant and local people.

Greenbelt of Premulung River
Even though according to the Detail Plan of Southern Surakarta 1996 - 2016 (RDTRK) the greenbelt has a function as the green area. Right now, the greenbelt of Premulung River has changed function as illegal squatter settlement occupied by local people as well as migrants.
Socio-Economic Condition
Out of 12,791 population, demographically, Tipes District has relatively high low-income people (pra sejahtera) for about 29.6% with education level is low (62.6% people are elementary school and below). This can be understand that a lot of people engaged in informal economic activities such as street traders (PKL), becak drivers, etc due to their limitations to involve in formal sector. It found that percentage of labour is very high (69.5%). However, potency of local economic is very high with a number of people engaged in home industry especially sewing industry, garment and batik. The have high expectation for having economic partnership with hypermart, which is planed to develop in Tipes Square.

Neighborhood Upgrading as an Alternative Housing Solution for Informal Settlement Overview
Change of land ownership status and land use of Tipes Square from public space to commercial activity contributes to unstable of ecosystem condition in the district. As public space, Tipes Square also has a role as "City Lungs", recreation space, and social interaction among local people. This condition decreases the creation of safely, healthy, comfort, productive and sustainable environmental quality. Therefore this pursue land use reformulation and plan clearly, especially related to the role of: Premulung River, human settlement, public space, and other infrastructure.

Substitution of the loss of public space of Tipes square generated by development of Hypermart has to be done. The only alternative land possible for development of substitute of green area is the Greenbelt of Premulung River. However, recently the Greenbelt has been occupied by informal squatter settlement, which should be evicted when the greenbelt is revitalized.

Neighborhood upgrading is necessary to integrally reform the human settlements environment quantitatively as well qualitatively involving participation of local community and stakeholders affected by the project. Therefore, this will be gradually create adequate human settlements environment
safe, healthier, more productive and sustainable according to the Master Plan of Surakarta.

**Identified Problems**

(1) Existing Problems
- Unclearly land and housing ownership status of informal squatter settlement in the Greenbelt of Premulung River
- Inadequate environment infrastructure in the area quantitatively and qualitatively.
- Relatively low standard of socio-economic condition of local people

(2) Predicted Impacts
- Existence of economic activity (Hypermart) on the Tipes Square will be not conducive for pursuing safe, healthy, comfort, productivity and sustainable human settlements environment
- Predicted migrants sue due existence of Hypermart needs provision of housing.

**Basic Idea**
"Necessary for revitalization of land use clearly related to the role of: Premulung River, human settlements, and infrastructure"

**Potency for Development**

(1). Relocation and establishment of land status and ownership of informal squatter settlers of Premulung Greenbelt.
(2). Resettlement of squatters of Premulung Greenbelt
(3). Development of Low-cost rental Apartment and rental apartment for migrants
(4). Upgrading of human settlements environment
(5). Control plan of development of human settlements environment.
Figure 5. Framework of Neighborhood Upgrading in Tipes District

- For monitoring process of development
- For managing micro-finance

- Density
- Building High
- Carrying capacity

Social infrastructure
Physical infrastructure
Housing improvement with rolling credit
Sarana-prasarana dan prasarana
for migrants: 80 unit
for resettlement: 80 unit

Establishment of land status
resettlement

Low cost rental apartment

Settlements Upgrading

Settlements of RW XIII and RW XV

Greenbelt squatter settlement

Neighborhood Upgrading

Predicted problems/ Demand of houses

Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)
From the framework above, there are 3 strategies of Neighborhood Upgrading as follows:

1. Development of Low-cost rental Apartment:
   - Planned to provide 80 households of Greenbelt Squatter settlements, which also intended to establish land status of settlers. The process is conducted by resettlement.
   - This also intends to accommodate increasing demand on housing due to predicted migrant after development of Hypermart. Planned number of unit is 80 units.

2. Upgrading of Human Settlements Environment
   - Conducted by gradual and integrative process of human settlement upgrading of community in RW XIII and RW XV, related to improvement of social and physical infrastructure, housing improvement through rolling micro financing, and development of Community Based Institution (CBO).

3. Controlling the development of Human Settlements Environment, related to;
   - Building density
   - Building High
   - Carrying capacity

### Strategy and Programs of "Neighborhood Upgrading"

<table>
<thead>
<tr>
<th>No</th>
<th>Strategies</th>
<th>Programs</th>
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<tbody>
<tr>
<td>1</td>
<td>Development of Low-cost Rental Apartment</td>
<td>1.1. Socialization and building similar perception of the community toward Neighborhood Upgrading</td>
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<tr>
<td></td>
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<td>1.2. Revitalization of Premulung Greenbelt as an urban green space.</td>
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<td></td>
<td>1.3. Establishment of land right and status for the squatter settlers of Premulung Greenbelt.</td>
</tr>
<tr>
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<td>1.4. Planning and Prediction of increasing demand on housing generated by development of Hypermart</td>
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<tr>
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<td>1.5. Development of Low-cost Rental apartment and infrastructure.</td>
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<tr>
<td></td>
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<td>1.6. Resettlement of the squatter settlers to the Low-cost rental apartment.</td>
</tr>
<tr>
<td>2</td>
<td>Upgrading of the Human Settlements Environment</td>
<td>2.1. Approaches to the concept of land provision for infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2. Approaches to the concept of land</td>
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</tbody>
</table>
Informal Settlements and Affordable Housing
Meeting and Conference, Surabaya 17-18 November 2005
Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

|   | provision and upgrading of infrastructure.  
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<tr>
<td>2.3</td>
<td>Approaches to the concept of housing improvement</td>
</tr>
<tr>
<td>2.4</td>
<td>Approach to the concept of Community Based Institution Development</td>
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<tr>
<td>3</td>
<td>Controlling the development of human settlements environment</td>
</tr>
<tr>
<td></td>
<td>Control of Building density, building high and carrying capacity.</td>
</tr>
</tbody>
</table>

### Conclusion

Development Control Plan (RTBL) has to play a role to enhance the environmental quality and life of people surrounding; and to decrease social disparity and conflict in the back area. In the development of a large scaled urban commercial activity, conceivable impacts affected by the project should be identified and solved especially related to the social impacts (housing and human settlements). People affected by the project, which are usually informal settlements (squatter) should be resettled to the more adequate housing and human settlements condition followed by enhancement of environmental quality and life of people surrounding. Neighborhood Upgrading is an alternative housing solution for informal settlement by establishment of land right and status; provision of low-cost rental apartment; relocation of people.

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Ministry of Housing and Infrastructure Development. 2002. Directorate General of Housing and Human Settlement no. 46/KPTS/DM/2002 related to" Neighborhood Upgrading and Shelter sector project (NUSSP)


2-33

Monography of Tipes District 2002, 2003, 2004


LAND LOT AND AFFORDABLE HOUSING
A Case Study in Surabaya, East Java

Dahliani, Deasy Widyastomo, and Sarah Cahyadini
Department of Architecture
Institute of Technology Sepuluh Nopember (ITS)
Surabaya, Indonesia

Abstract

Population growth in all part of the world has reached a significant number, especially in the city. This automatically causes the increasing needs of housing and its infrastructure. The provision of housing then becomes important as shelter is one of the basic human needs. In most developing countries including Indonesia, informal housing conducted by the people is one of the efforts done to overcome the problem of housing provision.

The purpose of this study is to investigate the people’s strategy in order to provide affordable housing through the use of land as one of the resources of housing. Problems may arise because of the legal status of the land, the increasing price, or the regulation by the government.

The method of study is by survey and interviews. First the paper will briefly describe the condition of land use and informal housing in Surabaya. Second, the paper will elaborate the theories in housing relating to land, affordable and informal housing. Third, the case study, the opportunity and constraints especially relating to the lot of land will be discussed.

The result of the study shows that by the lot of land, people obtain a more flexible scheme in providing affordable housing by themselves. They also managed to provide housing infrastructure without having to rely on the government.

Key words: lot of land, affordable housing, informal housing
1. Introduction

Surabaya as one of the big cities in Indonesia with population of 2.6 million people [1], had undergone an enormous development since it was first established, about 700 years ago. The development reaches many aspects, including housing and human settlements. The most rapid development in housing and human settlements is in the eastern and southern part of Surabaya.

According to RTRW Surabaya 2005 (Surabaya’s Structure Plan), the development in the east is focused for education facilities. This is supported by easy access from city central. This automatically led to the growth of settlement in the eastern part, because people tend to build housing near to education facilities.

The development of housing take place both formally and informally. The formal settlement was managed by the government (YKP and Perumnas) and private sectors (real estate agents). The informal settlement was developed by the people and community. There are two factors that determine the informal housing in Surabaya. One is the method of choosing the location which was done by the people themselves, and the method of building the house that was also done by them. In other way of saying, informal housing occurred when house or land was built by the people, without the support from the government or other formal institutions.

This paper will focused on discussing the informal housing in eastern and southern part of Surabaya.

2. Theoretical Background

2.1 Land

According to the articulation of land supply for popular settlements [2] there are three kinds of land supply: commercial, non commercial, and administrative. The supply of land through non commercial articulating refers to situations where those who build on it either do not pay for ownership or use right or, if they do, the payment is a “voluntary gift” according to social customs.
The commercial articulation of land supply refers to the land market, now almost taken for granted in the analysis of land supply both in developed and developing countries, where land has a monetary transfer price. An important character of commercial articulation is that owners can defend their property, for it is not land but land ownership which commands a price.

The third form of articulation is administrative. This refers to the capacity if the state to acquire and dispose of land, change its form of tenure or regulate its used and development. Administrative power plays a dominant role in government participation in the management of urban land.

### 2.2 Informal and Affordable Housing

Housing provision in Surabaya takes place through the operation of three major systems [3]: the informal housing system, the public system and the private system. The informal housing system is comprised mainly of two types of settlements, the kampungs and the fringe villages. It also includes squatter settlements and minor arrangements for service housing. Informal housing may involve persons earning their living in both the formal and the informal sectors of the economy.

The main characteristics of informal housing are the more personal approach in transactions, the flexibility and variety of arrangements, the less restricted standards and regulations, and the more communal and traditional character of the neighborhoods. These factors determine the affordability of housing by most low-middle income people.

### 2.3 Housing Infrastructure

Infrastructure includes services from [4]:

- Public utilities – power, telecommunications, piped water supply, sanitation and sewerage, solid waste collection and disposal, and piped gas.
- Public works – roads and major dam and canal works irrigation and drainage.
Other transport sectors – urban and interurban railways, urban transport, ports and waterways, and airports.

In housing infrastructure the major services needed are the public utilities and roads. The adequacy of infrastructure helps determine one settlement’s success and another’s failure. It has to expand fast enough to accommodate growth.

In the case of informal housing, often the service or infrastructure provided by the government did not sufficiently fulfills the people’s need. Whereas the urban poor—mostly living in the informal settlements -- often benefit most directly from good infrastructure services because the poor are concentrated in settlements subject to unsanitary conditions, hazardous emissions, and accident risks. In many rapidly growing cities, infrastructure expansion is lagging behind population growth, causing local environments to deteriorate.

3. Case Study
The study was done in three areas, two in settlements located in eastern Surabaya, and one in southern Surabaya. These locations were chosen because the spread of informal settlements in Surabaya mostly happened in these two regions. The settlements are Keputih Perintis, Kedinding Tengah Sekolahan and Pagesangan Agung.

3.1. Location
- **Keputih Perintis**
  Keputih Perintis is located at East Surabaya, Sub District Sukolilo. It consists of 2 RT, with total area of 41,910m². The boundaries are Kali Bokor River, Keputih Street, Kejawan Putih Street, and Keputih Timur Street.
- **Kedinding Tengah Sekolahan**
  Kedinding Tengah Sekolahan is located at East Surabaya, Sub District Kenjeran. It consists of 1 RT, with total area of about 30,000 m². The boundaries are Kedung Cowek Street, Taruna Bakti Junior High School, Kedinding Jaya settlement, and Kedinding Taruna settlement.
- **Pagesangan Agung**
Pagesangan Agung is located at South Surabaya, Sub District Jambangan. It consists of 2 RT, with total area of about 20,000m². The boundaries are Surabaya-Gempol free way, the railway, Al-Akbar Mosque, and Pagesangan Baru settlement.

3.2. System of Land Acquisition
The system of land procurement discussed here are mostly by the lot of land. Land lot was done by individuals, sometimes with a little help from his/her colleague in arranging the paper works. The former use of land that was changed into housing/settlements was varying, including rice field, fishpond, or garden/farm.

- **Keputih Perintis**
The former use of land in this area was a fishpond (made by damming). The fishpond was owned by one family. Since the pond does not produce enough fish/shrimp anymore, the family decided to sell the land. The family was helped by their colleague that has experiences in selling houses/land for housing. The colleague then divided the land into a 10x20m area for each lot. The lot can be bought in one, two, or even half lot (size 5x20m). The method of payment is cash. The price of one lot is about two to eight million rupiah. When someone bought the lot, he/she will be given a petok D letter, which acknowledges the ownership of the land. This paper however, did not have the same validity as land certificate issued by BPN. Petok D was issued by the office of urban village (kelurahan). The area was divided into 144 lots. The process of selling the land lots was done during 1978 – 1990. Now, the lots are already sold out.

- **Kedinding Tengah Sekolahan**
The former use of land in this area was a rice field, under the authority of the urban village office (kelurahan). In early 80ies, a man bought the land from the urban village office, by handing them some amount of money and an area in west Surabaya. He divided the land into 10x20m size. He also builds a private junior high school in the area, because at that time (1980) there were limited numbers of school available. The lot can also be bought in one, two, or even half lot (size...
5x20m). The method of payment is either cash or credit/installment (between 24 to 48 months). The price of one lot is about 5 to 8 million rupiah. When someone bought the lot, he/she will be given a petok D letter, which acknowledges the ownership of the land. The area was divided into 82 lots. The process of selling the land lots was done during 1985 – 1995. Now, the lots are already sold out.

- **Pagesangan Agung**
  The former use of land in this area was rice field. The fishpond was owned by one family. Since the rice field does not produce enough, the family decided to turn the area into housing area by dividing the land into lots. The family was helped by their close friend that has experiences in selling houses/land for housing. He then divided the land into some sizes (6x14m, 6x13m, 6x12m, 6x8m, and 6x7m). With these varying sizes, the buyer has many options in buying the lot according to their budget. The method of payment is by credit/installment (between 12 to 24 months). The price of one lot was described here in table 1.

<table>
<thead>
<tr>
<th>Size</th>
<th>Price (in rupiah)</th>
<th>Advanced Money</th>
<th>1-2 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 x 14</td>
<td>10.290.000,-</td>
<td>4.000.000,-</td>
<td>262.000,-/ month</td>
</tr>
<tr>
<td>6 x 13</td>
<td>9.750.000,-</td>
<td>4.000.000,-</td>
<td>239.000,-/month</td>
</tr>
<tr>
<td>6 x 12</td>
<td>8.820.000,-</td>
<td>4.000.000,-</td>
<td>200.000,-/month</td>
</tr>
<tr>
<td>6 x 8</td>
<td>5.880.000,-</td>
<td>3.000.000,-</td>
<td>120.000,-/ month</td>
</tr>
<tr>
<td>6 x 7</td>
<td>5.145.000,-</td>
<td>3.000.000,-</td>
<td>89.000,-/ month</td>
</tr>
</tbody>
</table>

When someone bought the lot, he/she will also be given a petok D letter, which acknowledges the ownership of the land. The area was divided into 98 lots. The process of selling the land lots was done during 1995-2000. Now, the lots are already sold out.

**3.3. System of Housing Provision**
Housing provision is mainly done by the land lot owner. They built their house in some stages, according to their ability at the time.
- **Keputih Perintis**
  The land lot in this area was bought by cash. So the new owner can build a house on the land as soon as he/she complete the transaction. Most residents in this area design and build their house themselves. The building process was done in several stages, from small house or sometimes from non permanent materials such as bamboo to a more spacious building and permanent materials (brick and cement). Almost all of the houses built without having IMB (Building Permit) because to have IMB, one must first have land certificate.

- **Kedinding Tengah Sekolahan**
  There are two kinds of housing provision in this area. One is built by the resident; the other is built by professional builder/contractor. The contractor usually bought the land lot and built permanent house, providing it with electricity and water supply (PDAM), land certificate and IMB (building permit), and then sold the house to other people. People who bought the land lot by installment system can not built the house before they had paid the entire obligation. One can built a fence around the land lot to secure their property after they had paid 50% of their obligation. About 50% of the land lot has been built. The land lot that has not been built was used as farm by some farmer in the neighborhood. This way, the land lot is still productive while waiting to be built by the owner.

- **Pagesangan Agung**
  Housing provision in this area is similar to Keputih Perintis in the way of how the residents build the house, but similar to Kedinding Tengah Sekolahan in the way of financial aspects. There is no urgency of having a building permit before building the house. The house was built in several stages according to their capability at the time.

3.4. **Housing Infrastructure**
Housing infrastructure in a settlements include footpaths, water supply, electricity, telephone, sewerage system, and drainage system.
- **Keputih Perintis**
The land lot here is not equipped by footpaths in the first place. The residents built their own footpaths from the house to the main road. The footpaths are now 2.5 meters wide paved. Water supply is collectively provided by the residents, by having one main water pipe located in Mushalla (little mosque). Telephone and electricity network has been provided by the government.

- **Kedinding Tengah Sekolah**
The footpath in the area is in good condition, made from asphalt and the size is 4 meters wide. This condition was influenced by some people living in the area who had the benefit from government/formal sectors. Almost all of the residents get their water supply from government (PDAM) and all of the house equipped by electricity and telephone. The street lamp was provided by the individual houses. The drainage system was set by each house. Therefore, land lot that has not been built, did not equipped with drainage system.

- **Pagesangan Agung**
The footpath in the area is paved, some is gravelled and the size is 3 meters wide. Almost all of the residents get their water supply from government (PDAM) and all of the house equipped by electricity and telephone. The street lamp was provided by the individual houses. The drainage system was set by each house. They usually located along the front side of the house. The sewerage system was located rear the house, but not all houses have it. Therefore, the sewerage system was fragmented, not effectively functioned.

### 4. Conclusion
Land acquisition through land lot has supported people–especially low-income–with a more flexible scheme in providing affordable housing. These supporting factors were summarized in table 2 and table 3.
4.1. Comparison in Land, Housing, and Infrastructure Between Land Lots

Table 2. Land Acquisition and Housing Provision
Source: Survey, April 2005

<table>
<thead>
<tr>
<th></th>
<th>Keputih Perintis</th>
<th>Kedinding Tengah Sekolahan</th>
<th>Pagesangan Agung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former Land Use</td>
<td>fishpond</td>
<td>Ricefield &amp; farm</td>
<td>ricefield</td>
</tr>
<tr>
<td>Total Area</td>
<td>41,910m²</td>
<td>30,000 m²</td>
<td>20,000 m</td>
</tr>
<tr>
<td>Size of Land Lot</td>
<td>10 x 20</td>
<td>10x20m</td>
<td>6x14m, 6x13m,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6x12m, 6x8m,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and 6x7m</td>
</tr>
<tr>
<td>Total land Lot</td>
<td>144 lot</td>
<td>82 lot</td>
<td>98 lot</td>
</tr>
<tr>
<td>Price of Land Lot</td>
<td>2 – 8 million rupiah</td>
<td>5 – 8 million rupiah</td>
<td>5 – 10 million rupiah</td>
</tr>
<tr>
<td>Land Status</td>
<td>Petok D</td>
<td>Petok D</td>
<td>Petok D</td>
</tr>
<tr>
<td>System of Payment</td>
<td>Cash</td>
<td>Installment</td>
<td>Installment</td>
</tr>
<tr>
<td>House Builder</td>
<td>Community (occupants)</td>
<td>Occupants and small developers (30%)</td>
<td>Community (occupants)</td>
</tr>
<tr>
<td>Stages of Building</td>
<td>Some stages: according to the capability of the owner at the time)</td>
<td>Some stages: according to the capability of the owner at the time)</td>
<td>Some stages: according to the capability of the owner at the time)</td>
</tr>
<tr>
<td>Building Status</td>
<td>Without IMB</td>
<td>Without IMB (70%)</td>
<td>Without IMB</td>
</tr>
</tbody>
</table>

Table 3. Availability of Housing Infrastructure
Source: Survey, April 2005

<table>
<thead>
<tr>
<th>Types of Infrastructure</th>
<th>Keputih Perintis</th>
<th>Kedinding Tengah Sekolahan</th>
<th>Pagesangan Agung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footpath</td>
<td>Paved – 2,5m</td>
<td>Asphalt - 4m</td>
<td>Paved &amp; graveled-3m</td>
</tr>
<tr>
<td>Water supply</td>
<td>V (government &amp; community)</td>
<td>V (government)</td>
<td>V (government &amp; community)</td>
</tr>
<tr>
<td>Telephone</td>
<td>V (government)</td>
<td>V (government)</td>
<td>V (government)</td>
</tr>
</tbody>
</table>
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Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

4.2. Opportunity and Constraint
- Prices of land lot by individuals are cheaper than those organized by real estate agents
- Access to land is more simple in terms of bureaucracy
- The building process can be done in some stages/phases, according to the ability (financially or else) of the owner
- The provision of basic public services/infrastructures may take longer time, or is not even ensured.
- Less legal right for land ownership (because they do not have land certificate, only Petok D letter).
- Mostly the house is constructed without an official building permit.

5. Notes and References
THE TRANSFORMATION PROCESS FROM INFORMAL SETTLEMENT TO FORMAL SETTLEMENT IN SEMARANG CITY, BEFORE AND AFTER REFORM ERA.

Sri Yuwanti
Department of Architecture
Institute of Technology Sepuluh Nopember (ITS), Surabaya,
City Development Planning Board – Semarang.

Abstract

Semarang is a city at the Northern Coastal of Java, it is also the capital of Central Java Province. The Semarang inhabitants consist of the indigenous, or native (means has been lived in the city for many generations) and the incoming people that come to the city mostly for working, or doing other activities, then become dwellers and permanent resident of Semarang. Both native and new dwellers occupy the entire part of the city. Topographically, Semarang city divided into two parts, the down town, at the north and east, around one third of the city width, and the upper town at the hilly area, at the south and west, around two third of the city width. The new dwellings, both in the form of real estate housing or of kampong type housing, flowering together with the growth of the city and its population. Some of them emerged from the informal settlement at the garbage dump sites, or on the free swampy land close to the seashore developed from the silting up coastal or sedimentation. The dwellers of the new informal kampong are the family of the garbage collectors or fishermen that are not the legal resident of Semarang. They live together and form a special community of low income and poor people.

Some of those informal settlements, have been transformed to be legal settlements nowadays, through such
administrative process, and now the settlements are part of kelurahan, for example some RT or RW of Margorejo Timur and Tambak Sari. Both settlements experienced a success transformation process in the pastime, before reform era and before the autonomy law applied for the city administration. However, some illegal and informal settlements emerge today, in the reform and autonomy era, such as the abandon land at Cakrawala, faces different situation caused by different pattern of legalization process and different factors of the dwelling formation.

This paper try to learn the difference, on the view of dweller in term of their needs and intention, and on the social, politics, law, and economic view of the city administration.

1. Introduction

Indonesia population is estimated to be 273.7 millions in 2025, spread unequally and mostly live in big cities in Java island. This development is a gloomy picture, linked to the increasing needs for public infrastructure sufficiency and provision on housing in the city for low income groups.

Semarang as one of the big cites of Java, faces the smaller but similar problems to Indonesia, since the trend of its population growth increases side by side with the growth of housing needs. Ideally, every family must dwell in a house which meets the city standard of health and safety. The existing number of housing units does not reflect the back log, since some members of community may have more than one house. The local culture has also lessened the need for ideal housing units, since some families may live in one house in the case of extended family. The people dwelling in Semarang consist of resident and non resident who live in the city but actually is a member of neighboring city. This case shows that need for housing may have been bigger than merely calculation of families, which also accommodate other type of dwelling like pondok boro, rented housing, panti-
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The people choice for the location of their housing highly depend on their affordability and practical daily activity, such as availability of public transportation, close to public facilities as school, market, their working place, or to find a better environment, etc. The weight factor is their economic level or income level. The have will cluster in a better settlement, but the commoner will scatter in kampongs behind the big building in the center, or in the low income housing complex surrounding city outer boundary. Normally, the people live in housing complex or in a kampong, managed by the smallest government administrative unit called Rukun Tetangga or RT.

The housing development in Semarang, along with the city development, grows slowly. The city itself has expanded from 5 kecamatans (sub-districts) to 16 kecamatans since 1997. It has been 8 years, many new settlements flowered in new addition areas, but they have not given yet a view of modern city with modern residential area. Slums, river bank, and illegal site still operate and become the choice for those have not asset, nor access for legal and appropriate dwelling. Relocation and pemutihan (make it legal administratively) have occurred many time, but the new problems pop up along with the population changes and formation of new squatters, dizzying the city administration to maintain order, relocate, demolition, or doing other repressive actions.

2. Problems on informal settlement in Semarang

Informal settlement is not new issue for Semarang city administration. Many cases on informal settlement in the modern city context have happened in Thomas Karsten era before independence until now. It seems that people living squatter everywhere is the part of the culture. The inlands usually living extendedly in one house with all member of the family of three or four generations together, while the coastal people tend to build or erect many houses or huts in one piece of land, closely. Even though there is a holistic concept of
dwelling reflected in the structure or room division, but the old dwelling complex always irregularly lied for practical thing, i.e., need to be close to water source or river, must not rearing the elderly house, avoid taboo, etc. The new dwelling concept put the importance of road, fence for border, windows, land legal paper, health reasons of the house face direction, separation of animal place from the master house, the benefits of trees and open space surrounding the house, and others. Some tribes do not have a very sophisticated housing structure, some prepare it meticulously, and the Javanese is in between, and they like to live crowdedly. The have says: *Mangan ora mangan kumpul*, means: better together whether you can eat or not. Togetherness is importance, more important than the wealth. Togetherness make people stronger, doing something together bring for success. This element seems support the formation of slums or informal settlement, and possibly illegal settlements.

Previous informal and illegal settlements in 1990’s in Semarang, which today become legal formal settlements, were processed specifically by the Semarang city administration in order to rearrange the house numbering of new administration area (after the annexation of 11 new sub districts) and for increasing land and building tax revenue (*Pajak Bumi dan Bangunan/PBB*) during year 1995-1997. The previous illegal settlement location were swamp areas, dump sites, and government vacant lands close to the old railway line or the waterfront. The process gone easily since it was part of city administration’s program. Example of informal settlements turned to legal formal settlement is located in Bandarharjo, Tambak Lorok, Kemijen, and other more, with land previously own by Railway Station Service, Road Construction Service, and Semarang Port Administration. The new case is about the illegal but formal settlement of Cakrawala Baru that has many different aspects compared to the older case of informal and illegal settlement. The Cakrawala Baru case, which is still going on process, and the problem has not been yet resolved until the time this paper is written.
Today’s problem faced by Semarang city administration related to this illegal settlement case is differ in two reasons. First, there is no rearrangement and program *pemutihan* goings on, and secondly, today’s illegal case is the confrontation of a group of illegal settlers to the landowners. In the previous case, illegal settler were saved by regulation, that is the annexation, on the contrary, the Cakrawala Baru case confront illegal settler to the enforcement of law and order in the reformed era, and for maintaining a good governance. Some questions related to city administration ability to accomplish their duty of solving the problem, which heavy on law enforcement over land dispute between citizens, in the realism that law and justice condition is very shaky in Indonesia. How far city administration can prevent such practice from happen again? Will political and social reason affect the city decision over the regulation?

Watching the process and comparing it to the older cases process, there is a thought that some similar cases will happen again in the future, with different actors and different reasons. For this thought, if the city administration fails to perform their responsibility to protect the right and serve the poor, and they solve the problem by abusing the law and order, instead, the future case will follow the example.

### 3. Objective

The paper objective is to give comprehensive view about legalization process of informal settlement in Semarang city administration, the urban people struggle and the effort of the government to implement such policy.

The shifting paradigm on government practice in the reform era lead to different pattern and result of such process, especially when people know more about rights and have more free environment to express their voice or play more in the social political field. Hopefully, the pattern and practice can educate both city administration and community about law enforcement and how to do their rights. The case elements can be learned to anticipate the similar problems.
4. Methods

To write this paper, some field information in the form of secondary and primary data is compiled. This empirical study on cases of informal settlement is using city administration and resident of the unit observed as the source of information.

Unit observation purposively chosen for process description, consist of two settlement: the Tambak sari (now is called Karang Rejo) of Kemijen, in East Semarang sub district, represents the older case, and the Cakrawala Baru of Gisik drono, in West Semarang sub district, represents the newest case.

The data used for explaining the change of population, housing condition and status of the settlement over time period. The data is compared to get the different in the pattern and process, and qualitatively analyzed, with focus on the affordable housing and good governance concept.

In this work, affordable housing is defined as the government effort to provide a proper and affordable dwelling unit for low income group. Good governance is defined as the government’s effort to create and elevate constructive interaction between the government as the legitimate power holder institution and the community, the true owner of the power, based on the broad commitment for the benefits of the majority and the poor. In the implementation, the government must guarantee the social norms to function and empower the community, in order to give them opportunity to control the development and practice their rights. (NUDS-2, www.geocities.com)

5. The Case: its process and pattern of development.

a. Findings
1) The Tambaksari settlement (now is called Karang rejo)
An old settler, Mbok Mulyono, 65, a widow with 9 children, all have married, two of them live in the same house, said
that she was first came to the settlement in 1975 and has been there for 30 years, now she live in RT 04/RW V quarter. She and her late husband entered the location through the Railways Service official. In that time, they did not have place to stay and both worked as garbage scavenger. In 1975, the location was inhabited by 25 families/households. It was previously a vacant land owned by Railway Services Offices (PJKA), while people were allowed to use the land only. This informal but legal settlement formalized in 1995, when city administration renewed the housing number and arranged the city parts, in order to give both rights and taxation to every legal housing unit. When the house was legal and formally adopted as part of the city administration system, it will then given post code, infrastructure, and public facilities. Every member of the community over 17 years old was given identity card since then. Electricity awarded 4 years ago in 2001, and public phone (pay phone) network was built in 2003. The city administration has allocated budget for paving path in the settlement, clean water, public toilet (MCK), and built public elementary school close to the settlement.

Other respondent, Budiono, 41, the head of RT 04/RW V, said that today settlement has 40 households. He himself entered the settlement in 1983, by given compensation for the land to the first settler, while Subagyo, 42, member of RT 04/RW V, entered the location last year in 2004, by buying land around 112 square meters. Subagyo chose the location to be closed to his work place, the tambak (swampy water)

Ibu Rondiah, a staff of Kelurahan Kemijen, explained that in 1990, the land ownership of PJKA was aborted due to failure to pay taxes, and the land goes to the city government administration.

2) The Cakrawala Baru squatter

Cakrawala Baru is a formal but illegal settlement. It grew 5 years ago, when all Indonesian people struggled to
fight economic crisis, political unrest existed everywhere, and no safety guarantee of anything. It is located in the eastern side of Semarang North Ring road, total household live in the location are 540, clustered in 14 group similar to RT. Normally, one RT consists of 20 household.

The occupation of Cakrawala Baru relates to the construction of the ring road which divided a housing complex of Cakrawala into two parts, demolished houses, and left some vacant land. The housing complex is for middle class, which some consumers bought vacant land from the developer for later construction. The ring road is very important to give alternative way for incoming vehicle or transportation from Jakarta to Surabaya that pass Semarang to get the shortest path of Northern Coastal Line (Jalur Pantura). The importance is caused by the poor road network at Semarang city, which had only one hub that connecting the west part to the east part of Semarang, the bridge of West Banjir Kanal. If there was a troubled on the bridge, all vehicles and people had to wait until it was cleared, before the could drive or used the bridge again. That can be weeks. The construction of the north ring road has opened many path alternatives and created many new public city transportation lines, which not only developed the city economically, but also open many new settlements.

When negotiation process occurred for clearing the land, some house owners refused to go, except they were relocated close to their old houses that would then demolished. In the deadlock, a land owner, Mr. Nelwan, offered his land for the relocation since the land is located close to the ring road, around 7000 square meters, of the total 20,000 square meters. The problem solved and the people moved to the relocation area. It was in 1990.

The squatter development started in the year 2000, when a group of people, indicated under a sign of political party in power, occupied illegally the rest of Mr. Nelwan’s vacant land altogether with other people’s land, totally of 2 hectares. (WWS, 8/11, 2005, p.3). Shortly, along the road side is full with housing constructions. The problem arise when Mr. Nelwan and two other land owners, asked the city
administration for their land rights protection. In the other hand, the settlers do not want to move out of this location. They will pay for the land, or exchange the land with other location, but they can not do it now. This offer is refused by the land owners since they want back the land vacant.

To solve the dispute, the city administration discussed with law experts from the university and professionals in September 2005. They all agree that the occupation of the land by the people was wrong and Un-accepted action, so the land must be given back to the owners, in order to maintain law and order. This means all settlers have to get out from their houses. However, the experts suggested city administration to do the law enforcement in persuasive way. (SM, 13/9, 2005, p.3)

City administration then went down to the field, in the third week of September 2005, to give explanation and socialization to the settlers, to enlight them about the importance of land titled and that they had conducted a wrong action. Apart of those steps, 3 notification letters have been sent to the settlers, warned them to move out from the location, otherwise they will given repressive treatment. The latest letter numbered: 590/5061, dated 25 October 2005, warns the settlers that the clearance action from the city administration will taken place in 25 December 2005. The 3 previous letters, No: 640/1855, 640/1971, and 640/202A, were not reacted by the settler. (WWS, 7/11, 2005, p.3)

The Semarang city administration had counted and classified the settlers based on the housing ownership of the dispute land, in 4 groups:

(1) Has another house in the other part of the city, and the house is rented to other people.

(2) Tenant that rent other people house, the owner stay outside.

(3) Stay in their own house

(4) Stay in their own house and use it for work (home industry or small shop)
Some member of community underline that law enforcement must be taken to show that law in Semarang administration is properly conducted. Otherwise, it will give bad impact on investment development and city economic development. Community must respect other rights and must get rights protection. The city administration has decided to act properly, and will pay attention to the poor household among the settlers, that do not have house other than those in Cakrawala Baru, to be given affirmative action, to have place to stay by assistance from the city administration.

The settlers have contacted Semarang Law Firm to help them, but the firm said to the media that they will learn the case first, so the will not told to help the wrong doers. However, they will look on the community welfare side. The will recommend a standard practice for the city administration. (WWS, 12/10, 2005, p.2).

The firm also reminds city administration on the social unrest may happen since hundreds families will be affected by the city law action. The deputy mayor of Semarang said that whatever happens, the people must move out from the land first, to clear the land ownership status. Moreover, he warns the law firms not to mix the law matter with social and political matters and that city government action in this case is just to maintain order, but not to discriminate people by acting for the side of the landowner, as told by some medias. Legalization of the settlement, however, is not in the agenda of the Semarang city administration.

**b. Discussion**

Economically, settlement development has benefited developer and city administration, especially when vacant and unproductive land has changed into rich and expensive housing complex, in term of housing tax revenue and city beautification. More over, the development of housing is more beneficial than building public infrastructure that will add cost for maintenance. However, a formal and rich beautiful settlement, if it is built on the illegal land, it is
considered informal settlement non slum, and will bring negative impact for the social life of the city. The Tambak sari success story is based on the type of the settlers: low income people and the poor, that really need place to stay, and blessed by the annexation process of the city. It may not be model of formalization or legalization of an informal settlement for other area, for it is a unique case. The Cakrawala Baru, is representative of major cases in Indonesia or other Third world country, the occupation of a land illegally. It may happen in a low educated underdeveloped society and could be a poor community. However, the cases of Cakrawala Baru is also unique, since the settlement is growing beautifully in a very short time, lively, and developed. It is obviously not a slum, but still, since it is illegally built on private property, the government has to demolish the settlement.

The development of Tambaksari informal settlement and it implication to the affordable housing concept.

The concept of affordable housing works normally and slowly in 25 years, when almost all old households have their own land, and step by step they got facilities and public infrastructure from the city government. Most of the housing unit may never pass the health standard and considered slums by appearance, but it grows peacefully, with the most supporting aspects: the legal ownership of the land and adoption of the settlement as part of the city administration. The affordable housing concept may have to consider further provision of the healthy living environment with empowering the settlers, in order to give them opportunity to actively participate in the program.

From the field information, the settlement development process of Tambaksari mainly based on the affordability of the settlers, that mostly poor. The process step is legal and orderly, and helped by the annexation process of the area. Formalization process of Tambak sari of Kemijen actually is coincidental with the needs of city administration for tax revenue and orderly city settlement area.
The Cakrawala baru case and its implication to the good governance practice.

The Cakrawala Baru illegal settlement grows very fast. In five years it developed from zero to 500 and more households, and they shortly built the permanent houses. The settlement appearance is just like middle class housing complex, and the settlers obviously are not the poor. Unfortunately, the settlers occupy the land illegally that caused land dispute involving law. The worst is that most of the settlers affiliate to the political party in power in the reform era. In result, in the effort to solve the case to giving back the land to the legal owner, may face political threat. However, since in the reform era, every act that break the law is considered wrong and unaccepted, and government has to protect the rights of every member of the community, equally the first thing to do is: law enforcement.

In reality, the notification letter and the warning given by city administration does not give enough time to the settlers to prepare. Actually it was four years late, since the occupation was taken place in the year 2000. Some of city officials release information that the occupation was related to the campaign of such political party to gain support, but it is now not an important matter anymore, so the city administration could take action more freely. The implication of the repressive action will taken place to the settlers is not yet in real, but presumably will not far from what happen in Jakarta or other places, when the demolition and clearance process is imposed. Hopefully, Semarang city administration and community will be able to get the best resul, which reflect the good governance and made all side happy.

6. Conclusion

Lesson learned from the cases, it is obvious that in the reform era law has to be equal for all, the haves and the poor. In the concept, all citizens were assumed to enjoy equal right, but law also has to protect everybody rights from substandard practice or services. The different between the
Third World and the First World countries in practicing law is that it is relative set and practiced lower in the Third world. In the Cakrawala Baru case, The Semarang city administration has taken such step for law enforcement, even it was told only represents the landowner side. The steps, however, have supported by most of Semarang community, apart of the illegal settler’s side.

The case almost obvious will be won by the land owners, since the illegal settler never contact city administrative before they occupy the land nor they have the right to stay on this piece of land. The weakness of the illegal settlers, many of them are not low income people, have other houses at the other parts of the city, and some have rented the houses to the outsiders. In reality, all settlers have stolen other people property, so they have to be punished. However, for the poor that also steal the other’s property, such affirmative action will be given by the city administration.

Watching the growing process of the two settlements, there is an important point, as the key of the formalization, that is: the legal status of landholder and adoption of the settlement by city administration to be the part of city unit system (the smallest unit is Rukun Tetangga or RT).

This importance is related to the legal system and regulation, about rights and duty. Since after the settlement is adopted by the city, the people can then proceed to build the settlement together or by privately, and city administration will also responsible to fulfill the settlement with public facilities and allocate with city budget. This is the story of informal settlement tambak sari, one which still be the target for affordable housing program.

The Tambaksari settlement grows very slowly, even this kampong has existed for 25 years. This situation caused by the reality that the settlers are mostly poor and the do not have mean to build their houses, but struggle for their daily live. In 30 years, the settlement appearance does not change much from it’s first A
appearance. From 25 households, it now becomes 40 households, which means it only increase of 15 households in 30 years, and consist of the extended family live in one house and the new settlers. In other hand, the growth of Cakrawala Baru happens very fast caused by the settlers’ affordability to built and develop their houses. Some of them, in reality, have more than one house, and some have rented their Cakrawala Baru house to others. In five years, the settlement has been developed to 14 groups similar to 14 RT, with 540 households. It works as/like a formal settlement, but illegal.

The real fact that illegal settler are non poor household will hamper the legalization process even more, and the affirmative action taken by city administration for the poor of Cakrawala settlement, while the city enforce the law to the other in order to give back the rights of landownership to the holder, is considered a right step for the good governance.

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Conference Topic

‘Affordable housing for the low income families’
THE CONTINUED LIVING ADAPTABILITY FROM TRADITIONAL KAMPUNG TO MULTISTORY HOUSING

Budi Prayitno
Center for Human Settlement and Environmental Planning
Graduate School of Architecture and Planning
The University of Gadjah Mada, Jogjakarta
e-mail: budi_prayitno@atmospheremagz.com

Abstract

This paper is a basic study which examines an affordable flat housing in the Indonesian cities by both macro level and micro level, that is housing needs and market analysis, and the living style transformation of low-income inhabitants. Firstly, we describe the characteristics of low cost flat market through the examination about the house ownership, typology of rental house, the subsidy and its affordability. Secondly, we make sure of the problems of who intend to own houses through the survey of inhabitants of rental flats on kampung redevelopment areas.

Based on these circumstances, we suggest that, when rental housing is implement target for low-income people in the Indonesian large city planning, it is necessary to make an appropriate planning for business and living space, not simply of living, and at the same time, to design the space and use in consideration of the continuity with traditional kampung living style.

Keywords: low cost rental flat, gentrification, transformation of kampung living style
Introduction

The housing demand especially for urban area is very high in Indonesia. Most of the urban people prefer to own houses than to rent them. But, on the other hand, the scarcity of land within the city’s boundaries makes the land’s and housing prices so unaffordable that they can’t purchase houses. In 1960s, Kampung Redevelopment starts for this housing and infrastructure problems, and its policy has been changed from “Demolition and Relocation” into “Improvement” and “Community-based”. Recently many low-cost urban housing have been implemented, but the programs of owning houses have not become the main solution against the urban housing problem because of land’s price sky-rocketing. The affordability for purchasing houses for low income people became slowly increasing during the last decade. Based on these facts and land shortage, the choice solution for “low cost rental flat” has become to be the important policy for urban housing. While, it is true that there is a remarkable change in the pattern of space use in rental flat housing owing to the transformation of living style from traditional kampung to multi-story housing. In this paper we would like to explain the pattern and characteristics of low cost flat development concerned to the significance of rental housing market (“rental types and subsidy affordability”) and the problem of kampung living style transformation. First, for this purpose, we review the low cost flat development in relation to the type of rent and subsidy affordability. Second, we mention the results of our investigation on 3 areas in Jakarta and Surabaya by POE (Post Occupation Evaluation) mainly about community’s character and inhabitants’ spatial behavior. Finally, we evaluate some facts and findings in planning and designing problems to make the recommendation notes redevelop the kampung and build low cost flat in the inner city areas.

Low Cost Flat: Historic Overview

In Indonesian large cities (metropolitan cities), 38% of households rent houses, and 3% don’t have to pay the rent
fee because their house is provided by family, relatives and friends, or by employer for special services (Table 1) The distribution of this ownership varied according to the city size. In medium cities, owned houses are more popular than metropolitan cities. But in small cities, the ratio of rental houses is higher than medium cities (29%), but the renters generally are young people (more than 80% under 30 years old) and 67% are students. Thus, the percentage of houses in metropolitan cities is very high.

Table 1. Ownership Type of Household (%)  

<table>
<thead>
<tr>
<th></th>
<th>Owned</th>
<th>Rent</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan Cities</td>
<td>38%</td>
<td>59%</td>
<td>38%</td>
<td>3%</td>
</tr>
<tr>
<td>Jakarta</td>
<td>17%</td>
<td>65%</td>
<td>35%</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>21%</td>
<td>55%</td>
<td>40%</td>
<td>5%</td>
</tr>
<tr>
<td>Others Urban Areas</td>
<td>62%</td>
<td>84%</td>
<td>16%</td>
<td>-</td>
</tr>
<tr>
<td>Medium Cities</td>
<td>39%</td>
<td>92%</td>
<td>8%</td>
<td>-</td>
</tr>
<tr>
<td>Small Cities</td>
<td>23%</td>
<td>71%</td>
<td>29%</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>75%</td>
<td>24%</td>
<td>1%</td>
</tr>
</tbody>
</table>

( Source: Indonesian Housing Survey in 1999 (ref.4.) )

Given the demand for rental houses, quite number of individuals make variable space or add a room to their owned houses for the purpose of renting out. This individual initiative is the construction of ‘pondok’ (means ‘dormitory’) living system for circular migrants which sometimes include their family. There are two types in rental apartement; ‘pondok’ and ‘tinggal’. The ‘pondok’ type consists of several or many apatement usually without facilities, of which rooms are inhabited by separate household. The ‘tinggal’ type is apartement with more than one room and facilities, which more than one household inhabits.

The composition of types of rental houses in urban areas except metropolitan cities is 5% of ‘pondok’ type and 11% of ‘tinggal’ type. Looking back to the clonial period in 1937, the survey of 1.073 coolies showed that a small proportion (4%) was living in municipal dwelling. The remainder fell into three groups: those sharing dwelling with other families (20%), those living in rented dwelling (57,5%), and those owning their own dwelling (18,5%). And the
‘pondok’ type was the most common type of dwelling (54.5%) and the ‘tinggal’ type was 23%, and together with occupant owned houses as much as 26.5% of all type of dwelling.

In 1992, 76% of the new housing development in Indonesia was allocated for replacement and new construction, and 24% was done for improvement and renewal program’. The total housing demand for Jakarta city covered 15% of total urban housing stock, and this is only supply 10% for the total need per year. The classification of the city size shows that 23% of urban household lived in small towns, and that 39% lived in big cities excluding Jakarta. The Jakarta metropolitan city covered 17% of the total urban households. The average size of one floor of each dwelling unit in urban area is about 50 m2 with the composition range that 25% is less than 28 m2 and 10% is more than 130 m2. The average plot size of one for middle income is 120 m2 and 60% for building (it means ‘plot ratio’) whereas 14% of the houses have 100% plot ratio or having no open space. Smaller the city size is, slower the plot ratio becomes increasing. This indicates that land in the big cities is very scarce even in Jakarta. 23% of the houses have plot ratio of 100% contrast to the small cities which only 4% of houses have the plot ratio of 100%.

The housing target for low cost flat of Jakarta city is 7,500 units per year, but the projection of supply capacity is estimated only 3,150 units per year from 1995 until 2000. It means that they have 15,750 units of low cost flat in the end of the year 2000 at least.

The Jakarta local government has two types of subsidy for low cost flat that is for rental type (‘sewa’ in Indonesian) and for ‘rent to purchase’ type (‘sewa beli’). The housing need for the people with the income under 2000,000 rupiah in Jakarta reaches 9,675 units (15%), as people in this category have no affordability for purchasing houses. Based on the standard of the household, the limit of an expenditure for purchasing houses is 30% of monthly income. The affordability for purchasing houses by loan for this low
income category can be estimated only under 50,000 rupiah per month, or just purchasing a house with the price of 3 million rupiah. This is still far for purchasing the one unit of rental flat with the price 10 to 15 million rupiah per unit, even for purchasing landed simple housing in urban fringe with the price of 4.9 million rupiah is unaffordable. The housing demand for the middle income (300-400 thousand rupiah) reaches 19,350 units per year (30%), and that for the income of more than 400,000 rupiah reaches 12,900 units per year (20%). The people of this income level can buy the ‘rent to purchase’ type with the affordability of paying 100-150 thousand rupiah per month or purchasing house with the price of million rupiah. This shows that there is also the need of the subsidy for purchasing houses in the inner city area, because it costs almost 500,000 rupiah per m2 to get a houses or smallest unit flat excluding the land’s price. Thus, the rental flat development for low income level is very unprofitable for developer.

Gentrification of Low Cost Flat

The urban renewal projects was implemented the flats for accommodating the kampung people with low income with the basic principle concepts; it has no displacement and gives the opportunity for running their informal economic activities and community empowerment.
Table 2. Income According to Origin Place Before Living in Flat Housing (%)

<table>
<thead>
<tr>
<th>Income (rupiah)</th>
<th>Same Location of Flat (%)</th>
<th>Same Kecamatan of Flat (%)</th>
<th>Other Kecamatan Area (%)</th>
<th>Total (n)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 300,000</td>
<td>45</td>
<td>31</td>
<td>14</td>
<td>253</td>
<td>25</td>
</tr>
<tr>
<td>300,000 – 500,000</td>
<td>34</td>
<td>29</td>
<td>21</td>
<td>259</td>
<td>26</td>
</tr>
<tr>
<td>500,000 – 700,000</td>
<td>11</td>
<td>11</td>
<td>15</td>
<td>128</td>
<td>13</td>
</tr>
<tr>
<td>&gt; 700,000</td>
<td>10</td>
<td>29</td>
<td>50</td>
<td>356</td>
<td>36</td>
</tr>
<tr>
<td>Total (%)</td>
<td>100</td>
<td>302</td>
<td>497</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Total (n)</td>
<td>197</td>
<td></td>
<td></td>
<td>-</td>
<td>996</td>
</tr>
</tbody>
</table>

Source: Kompas, 1999

The social survey this kampung flat housing by Kompas Research Institute has been conducted on 9,336 units low cost flat, 996 respondents in 18 locations from 18 to 27 March 1996. The result identified that the target of low cost flat for low income inhabitants was missed the target for middle income people. Low Cost Flat Regulation (UU No.16 Tentang Rumah Susun 1985) targeted the low cost flats for low income people, while Master Plab for Low Cost Flat Development of Jakarta 1995 targets ones for low and middle income people. So the target of low cost flat development shifted during 10 years.

The Kompas survey (Table 2) showed that majority of the low cost flat inhabitants in Jakarta have the income more than 700,000 rupiah. The category of low income people in Jakarta is under the 300,000 rupiah, and the survey found that only about 25% of the kampung flat inhabitants were categorized in this income level, and that the remainder was the middle and income people. The majority of the inhabitants there was the former local inhabitants of the location where the flat had been built, and the percentage is 45%. But only 10% of them had the income of more than 700,000 rupiah. Meanwhile the others who had middle and high income were come from other location. Each kampung flat has the different characteristics. The high percentage of high income inhabitants was found in Pluit, Pulo Mas, Kebon...
Kacang. Tanah Abang and Klender, while, the high percentage of the low income inhabitants was found in Cengkareng, Jati Rawasari, Tambora, Pondok Kelapa, Pondok Bambu, Tanah Tinggi and Bendungan Hilir in Jakarta.

The other result of the investigation showed that only very small percentage of the kampung flat households came from the local former inhabitants which can be found in flat occupied before 1990 that is in Tanah Abang(1981), Klender (1982), Jati Rawasari(1988), Pluit(1988), Pulo Mas(1985), Pondok Kelapa(1986) and Cipinang Besar(1982). In Tanah Abang, all of the householdswere new comer from other location, whereas, in the earlier occupation of the flat in 1981, all of them were the former local households. In the new kampung flat occupied after 1990, the amount of the former local householdsstill showed the relatively high percentage that is Tanah Tinggi (1994) and Bendungan Hilir (1996). In Kemayoran which built in 1990, the inhabitants were only about 500 household (10%) of the 5,000 evacuees of the flat development area.

The survey also provides the results that 80% of the kampung flat inhabitants came from other location, and only 20% were former local households. Most of the status of ownership of the former local households were ‘rental’ ownership. The survey also found that 10% of the former local households have owned houses in the refuge area for flat development and from this amount only 37% have the owned status and the reminder (63%) have occupied with the rent status or just occupied with their relatives with no rent.

The type of flat’s units could be categorized into types that is small type, middle type and large type. The small type has 14-16 m² space consist of 1 room (3x4 m² or 4x4 m²) with a kitchen (1x1 m²). The middle type has 18-28 m² consist of 1 room (4.5x3 m²) and a kitchen (1.5x 0.8 m²). And large type has 36-54 m² consist of 2 or 3 rooms with a kitchen and a bathroom. Most of the households from other location occupied the middle and large type, and the small type is mostly occupied by former local inhabitants. It could be seen from the comsumption level, the inhabitants of the
flat housing have relatively high affordability, for such as the percentage of having car in Tanah Abang and Kebou Kacang was 41%, in Pulo Mas it was 35%, and Pluit is was 37%. And that of having the telephone facility in Tanah Abang was 77%, and it was 61% in Kebou Kacang and Klender, 47% in Pluit, 26 in Kemayoran, and 23% in Pulo Gadung.

In the process of occupation of kampung flat, there is the allocation terms of ‘jatah langsung’ (means ‘direct allocation’) that means the allocation for former local evacuees to occupy the flat which built in the former location of their houses. For the type of ‘owned’ or ‘purchased to own’ of the flat, the ‘jatah langsung’ could be in the form of ‘tukar guling’ (compensation) for the households who had the owned land or house in the evacuation area for the flat development. And for rental type, the ‘jatah langsung’ could be in the form of ‘hak sewa’ (rental right) for the households who just rent the house in the evacuation area.

The households who come from other area and want to live in the flat usually purchase or rent the flat by taking through developers or changing hands from the first owner or renter. The survey results identified that 32% of the kampung flat households obtained the flat from the second owner either through the first owner or the broker. This showed the relatively higher percentage than that of the households (it was only 25% of the owner households) who got the ‘jatah langsung’, and 21% got the flat from the second owner, third owner, and so on. Or almost 40% of the renter households rent from second renter, third renter, and so on. Therefore, the kampung flat housing has high possibility of changing the function into commodity goods for middle and upper households. In other words, it can often indicate the ‘gentrification’ phenomena and miss the target of kampung community who most of them were low and low-middle income households. The investigation results showed that the heads of households who live in kampung flat have the educational background of, at least, graduating from high school (63% of all), and that most of them have the job in formal private sector (46%) with the income of 785,000 rupiah (60%). Working in formal sector of either public
Informal Settlements and Affordable Housing
Meeting and Conference, Surabaya 17-18 November 2005
Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

private companies (62%) also characterized the kampung flat housing. This is very different from the characteristics of the kampung houses which most of the inhabitants work in the informal sector.

These facts show that the areas of kampung flat development project was gradually changed hands to become residential areas owned by new households from other location, who mostly had middle and upper income level. That is why the former local kampung inhabitants had to move out again toward cheaper areas to survive.

Kampung Living Style

With changing the residential place from traditional kampung houses into the flats, it happens an inevitable change in the patterns of living style. We conducted the social and spatial-behavior survey in Penjaringan rental flat in Jakarta as the conventional type, and the Dupak and Sombo rental flat in Surabaya as the innovative type (Fig.1). From the results, we have done the comparative study on the three cases for the purpose of investigating the changes of living tradition.

Characteristic of Household

We conducted the survey against the samples of 150 respondents in Penjaringan 30 samples in Dupak and 70
samples in Sombo: the samples were randomly chosen households, and we surveyed them by hearing and observation. According to what we have analyzed the results, it was found that there are 4 main groups of living types; a) one person, b) group, c) nuclear family, d) extended family. The following tables (Table 3-6) give the breakdown of household’s basic characteristics.

**Dwelling Unit Living Activity**

The mapping of space use and living activities in dwelling units can be cataloged as the following anatomy. The anatomy presents the pattern from which based on the mapping of multistory kampung setting and is activities. The pattern defines sections: 1) definition of territory, 2) social occasion or timing of event, 3) users, 4) activities or behavior, 5) elements of reference, or place of scene. The following tables (Table 7-10) give the breakdown of dwelling unit space typology and its space use.

**Pattern of Extension, Interchange and Conceptual Change**

This survey formulated initial questions to assess the pattern and tested them on the case study through the process of developing questions and answers which dealt primary with three main interacting themes: 1) Room arrangement, 2) Interchange, 3) Extension (Table 11-13). To answer the question at the level of detail, this survey provided a basic order of: 1) Categories of activities space by functions, 2) Variety of change modes as residents’ control of the setting. The following tables give a breakdown of room arrangement, interchange and extension (Table 14,Fig.3).

In these circumstances, the settlement in kampung flat housing is realized by flexible and various patterns of space-use transformation, and the extension of many functions, even sleeping and guest’s spaces, to balconies and corridors, and it is not only because people make up for the smallness of dwelling units.
Shared Spaces and Facilities

In Dupak and Sombo, shared bathing/toilet facilities and shared kitchens are provided on the 2nd, 3rd, and 4th floor. The observation shows that the shared and toilet are more acceptable or better reception by kampung community compared to the shared kitchen. It is assumed that this phenomena due to their having experience on the using of MCK (communal bathing, washing and toilet) in their former living in traditional kampung. The observation shows that, compared with using shared kitchen, providing the shared facilities for laundry is more acceptable for community, especially the women (Table 15).

Table 3. Household Type (%)

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A, B, C, D</td>
</tr>
<tr>
<td>One Person</td>
<td>-</td>
<td>-</td>
<td>6.0</td>
</tr>
<tr>
<td>Group</td>
<td>3.3</td>
<td>-</td>
<td>22.0</td>
</tr>
<tr>
<td>Nuclear Family</td>
<td>73.3</td>
<td>68.6</td>
<td>64.0</td>
</tr>
<tr>
<td>Extended Family</td>
<td>23.3</td>
<td>31.4</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Table 4. Number of Household Member (%)

<table>
<thead>
<tr>
<th>Penjaringan (Block)</th>
<th>Dupak</th>
<th>Sombo</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, C, D</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>E, F, G</td>
<td>12.0</td>
<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>E, F, G</td>
<td>12.0</td>
<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>E, F, G</td>
<td>12.0</td>
<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>E, F, G</td>
<td>12.0</td>
<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>2.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Table 5. Head of Household’s Job and Spouse’s Job (%)

<table>
<thead>
<tr>
<th>Penjaringan (Block)</th>
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<th>Sombo</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, C, D</td>
<td>10</td>
<td>21.4</td>
</tr>
<tr>
<td>E, F, G</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>H, I</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>13.3</td>
<td>31.4</td>
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<tr>
<td>E, F, G</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>H, I</td>
<td>60</td>
<td>-</td>
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<td>A, B, C, D</td>
<td>76.7</td>
<td>47.2</td>
</tr>
<tr>
<td>E, F, G</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>H, I</td>
<td>34</td>
<td>-</td>
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</table>

Table 6. Household Income (%)

<table>
<thead>
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<th>Penjaringan (Block)</th>
<th>Dupak</th>
<th>Sombo</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, C, D</td>
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<td>-</td>
</tr>
<tr>
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<tr>
<td>H, I</td>
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</tr>
<tr>
<td>A, B, C, D</td>
<td>6.7</td>
<td>-</td>
</tr>
<tr>
<td>E, F, G</td>
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<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>10.0</td>
<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>26.7</td>
<td>8.6</td>
</tr>
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<td>E, F, G</td>
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<td>6.0</td>
</tr>
<tr>
<td>H, I</td>
<td>22.0</td>
<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>20.0</td>
<td>15.7</td>
</tr>
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<td>E, F, G</td>
<td>12.0</td>
<td>14.0</td>
</tr>
<tr>
<td>H, I</td>
<td>20.0</td>
<td>-</td>
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<td>E, F, G</td>
<td>24.0</td>
<td>12.0</td>
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<td>8.0</td>
<td>-</td>
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<td>-</td>
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<td>16.0</td>
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<tr>
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<tr>
<td>E, F, G</td>
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<tr>
<td>NA</td>
<td>33.4</td>
<td>65.7</td>
</tr>
<tr>
<td>H, I</td>
<td>18.0</td>
<td>10.0</td>
</tr>
<tr>
<td>H, I</td>
<td>2.0</td>
<td>-</td>
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</tbody>
</table>

Table 7. Typology of Dwelling Unit Space (%)

<table>
<thead>
<tr>
<th>Penjaringan (Block)</th>
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<th>Sombo</th>
</tr>
</thead>
<tbody>
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<td>A, B, C, D</td>
<td>6.6</td>
<td>8.6</td>
</tr>
<tr>
<td>E, F, G</td>
<td>26.0</td>
<td>32.0</td>
</tr>
<tr>
<td>H, I</td>
<td>40.0</td>
<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>23.3</td>
<td>17.1</td>
</tr>
<tr>
<td>E, F, G</td>
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<td>24.0</td>
</tr>
<tr>
<td>H, I</td>
<td>18.0</td>
<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
<td>36.6</td>
<td>22.4</td>
</tr>
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<td>16.0</td>
</tr>
<tr>
<td>H, I</td>
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<td>-</td>
</tr>
<tr>
<td>A, B, C, D</td>
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<td>12.0</td>
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<tr>
<td>H, I</td>
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<td>-</td>
</tr>
</tbody>
</table>
Extension to Balcony | 16.7 | 27.1 | 12.0 | 38.0 | 30.0
Extension to Corridor| 43.3 | 81.4 | 60.0 | 72.0 | 66.0

### Table 8. Having Space for Each Space Use (%)

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
<th>A, B, C, D</th>
<th>E, F, G</th>
<th>H, I</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Sleeping</td>
<td>93.3</td>
<td>92.8</td>
<td>94.0</td>
<td>98.0</td>
<td>94.0</td>
<td></td>
</tr>
<tr>
<td>For Dining Room</td>
<td>10.0</td>
<td>18.0</td>
<td>2.0</td>
<td>6.0</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>For Guest Room</td>
<td>73.3</td>
<td>44.2</td>
<td>36.0</td>
<td>24.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>For Small Business</td>
<td>13.3</td>
<td>17.1</td>
<td>14.0</td>
<td>20.0</td>
<td></td>
<td>34.0</td>
</tr>
</tbody>
</table>

### Table 9. Means for sleeping (%)

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
<th>A, B, C, D</th>
<th>E, F, G</th>
<th>H, I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mata</td>
<td>20.0</td>
<td>15.7</td>
<td>10.0</td>
<td></td>
<td>-</td>
<td>28.0</td>
</tr>
<tr>
<td>Mattress</td>
<td>-</td>
<td>27.1</td>
<td>64.0</td>
<td>24.0</td>
<td>32.0</td>
<td></td>
</tr>
<tr>
<td>Bed</td>
<td>90.0</td>
<td>94.3</td>
<td>86.0</td>
<td>92.0</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td>Sofa</td>
<td>6.6</td>
<td>5.7</td>
<td>4.0</td>
<td>12.0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Folded Bed</td>
<td>-</td>
<td>-</td>
<td>18.0</td>
<td>26.0</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Table 10. Space Use for Sleeping (%)

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
<th>A, B, C, D</th>
<th>E, F, G</th>
<th>H, I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad Room</td>
<td>93.3</td>
<td>92.8</td>
<td>94.0</td>
<td>98.0</td>
<td>94.0</td>
<td></td>
</tr>
<tr>
<td>Guest Room</td>
<td>13.3</td>
<td>34.3</td>
<td>24.0</td>
<td>22.0</td>
<td>18.0</td>
<td></td>
</tr>
<tr>
<td>Mezzanine</td>
<td>-</td>
<td>4.3</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Balcony</td>
<td>2.8</td>
<td>5.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Corridor</td>
<td>10.0</td>
<td>22.8</td>
<td>12.0</td>
<td>16.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Open Plan</td>
<td>6.6</td>
<td>8.6</td>
<td>26.0</td>
<td>32.0</td>
<td>40.0</td>
<td></td>
</tr>
<tr>
<td>Shared Kitchen</td>
<td>-</td>
<td>8.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Praying Room</td>
<td>6.6</td>
<td>17.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Outside the Block</td>
<td>3.3</td>
<td>12.9</td>
<td>4.0</td>
<td>-</td>
<td>2.0</td>
<td></td>
</tr>
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</table>

### Table 11. Room Arrangement (%)

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
<th>A, B, C, D</th>
<th>E, F, G</th>
<th>H, I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- One Bed Room Open Plan</td>
<td>6.6</td>
<td>6.6</td>
<td>26.0</td>
<td>32.0</td>
<td>40.0</td>
<td></td>
</tr>
<tr>
<td>Core with Quest Room</td>
<td>10.0</td>
<td>18.6</td>
<td>2.0</td>
<td>6.0</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Core without Quest Room</td>
<td>-</td>
<td>-</td>
<td>2.0</td>
<td>-</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>- Additional Multipurpose Room</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Informal Settlements and Affordable Housing
Meeting and Conference, Surabaya 17-18 November 2005
Department of Architecture ITS and the International Council for Research and Innovation in Building and Construction (CIB)

| - Additional Bed Room | 6.6 | 14.3 | 6.0 | 22.0 | 2.0 |
| - With Room for Economic Act. | 3.3 | 5.7 | 4.0 | 10.0 | 18.0 |
| - Standard Type (Quest, Bad, Dining) Room | 73.5 | 52.8 | 60.0 | 30.0 | 26.0 |

<table>
<thead>
<tr>
<th>Table 12. Interchange of Space (%)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A, B, C, D</td>
</tr>
<tr>
<td>Quest Room – Bed Room</td>
<td>6.7</td>
<td>20.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Quest Room – Dining Room</td>
<td>23.3</td>
<td>44.2</td>
<td>26.0</td>
</tr>
<tr>
<td>Bed Room – Dining Room</td>
<td>26.7</td>
<td>37.1</td>
<td>12.0</td>
</tr>
<tr>
<td>Stall – Bad Room</td>
<td>3.3</td>
<td>-</td>
<td>6.0</td>
</tr>
<tr>
<td>Bed Room - Workshop</td>
<td>3.3</td>
<td>4.2</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 13. Extension of Space (%)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A, B, C, D</td>
</tr>
<tr>
<td>Balcony for :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bed Room</td>
<td>2.8</td>
<td>5.7</td>
<td>-</td>
</tr>
<tr>
<td>- Kitchen</td>
<td>20.0</td>
<td>38.0</td>
<td>-</td>
</tr>
<tr>
<td>- Storage</td>
<td>6.7</td>
<td>22.9</td>
<td>8.0</td>
</tr>
<tr>
<td>- Workshop</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Dining Room</td>
<td>3.0</td>
<td>2.8</td>
<td>-</td>
</tr>
<tr>
<td>- Sitting Room</td>
<td>7.6</td>
<td>11.4</td>
<td>-</td>
</tr>
<tr>
<td>Corridor for :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bed Room</td>
<td>10.0</td>
<td>22.0</td>
<td>12.0</td>
</tr>
<tr>
<td>- Quest Room</td>
<td>16.7</td>
<td>12.8</td>
<td>-</td>
</tr>
<tr>
<td>- Stall</td>
<td>10.0</td>
<td>15.7</td>
<td>14.0</td>
</tr>
<tr>
<td>- Storage</td>
<td>3.3</td>
<td>8.6</td>
<td>12.0</td>
</tr>
<tr>
<td>- Kitchen</td>
<td>6.7</td>
<td>17.1</td>
<td>-</td>
</tr>
<tr>
<td>- Workshop</td>
<td>3.3</td>
<td>1.4</td>
<td>-</td>
</tr>
<tr>
<td>- Dining Room</td>
<td>-</td>
<td>4.2</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 14. Modes of Change (%)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A, B, C, D</td>
</tr>
<tr>
<td>Sleeping Equipment</td>
<td>6.7</td>
<td>20.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Devider</td>
<td>-</td>
<td>-</td>
<td>4.0</td>
</tr>
<tr>
<td>Additional Furniture</td>
<td>16.7</td>
<td>12.9</td>
<td>-</td>
</tr>
<tr>
<td>Anclosing Balcony</td>
<td>3.3</td>
<td>2.9</td>
<td>-</td>
</tr>
<tr>
<td>Mezzanine</td>
<td>-</td>
<td>4.3</td>
<td>-</td>
</tr>
<tr>
<td>Kichen Equipment</td>
<td>26.7</td>
<td>55.7</td>
<td>-</td>
</tr>
<tr>
<td>Change Used Furniture</td>
<td>3.3</td>
<td>5.7</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Table 15. Preference for Using Shared Facility (%)  

<table>
<thead>
<tr>
<th>Facility</th>
<th>Dupak</th>
<th>Sombo</th>
<th>Penjaringan (Block)</th>
<th>A, B, C, D</th>
<th>E, F, G</th>
<th>H, I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathroom and Toilet :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Available</td>
<td>32.0</td>
<td>38.0</td>
<td>32.0</td>
<td>40.0</td>
<td>48.6</td>
<td></td>
</tr>
<tr>
<td>- Not Available</td>
<td>62.0</td>
<td>48.0</td>
<td>60.0</td>
<td>53.3</td>
<td>48.6</td>
<td></td>
</tr>
<tr>
<td>- Don’t Know</td>
<td>6.0</td>
<td>14.0</td>
<td>18.0</td>
<td>6.7</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Kitchen :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Available</td>
<td>26.0</td>
<td>20.0</td>
<td>10.0</td>
<td>23.3</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>- Not Available</td>
<td>60.0</td>
<td>58.0</td>
<td>76.0</td>
<td>56.7</td>
<td>52.8</td>
<td></td>
</tr>
<tr>
<td>- Don’t Know</td>
<td>14.0</td>
<td>22.0</td>
<td>14.0</td>
<td>20.0</td>
<td>24.3</td>
<td></td>
</tr>
<tr>
<td>Laundry :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Available</td>
<td>56.0</td>
<td>74.0</td>
<td>50.0</td>
<td>63.3</td>
<td>74.3</td>
<td></td>
</tr>
<tr>
<td>- Not Available</td>
<td>28.0</td>
<td>18.0</td>
<td>36.0</td>
<td>26.7</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td>- Don’t Know</td>
<td>16.0</td>
<td>8.0</td>
<td>14.0</td>
<td>10.0</td>
<td>7.1</td>
<td></td>
</tr>
</tbody>
</table>

Through the observation, the pattern of space use in shared kitchen can be categorized into the following: 1) unusud at all, 2) just for washing, cooking in the dwelling unit, 3) just for cooking, preparing in dwelling unit, 4) storage for domestic wares, except kitchen wares, 5) used for kitchen both cooking and preparing, 6) used for sleeping in the night(unusud kitchen), 7) storage for kitchen wares.
Space Use for Small Business Activity

This observation on typology of informal economic activity in kampung multistory housing in the study area led to the suggestion that there are four main types (as shown in Table 16): a) food stall, b) daily-items kiosk, c) service, d) workshop. All of these above activities can be cataloged in the following figures and diagram (Fig.4). These shows that the dwelling units, the shared spaces in flats, and the common space in housing estates is used not only for living, but also for small business activities.

Considering all the circumstances mentioned above, it is obvious that living activities will extend from dwelling unit level to block level and neighborhood between kampung lifestyle and flat housing lifestyle, and, in other words, the habitants will secure the settlement just like traditional kampung especially in innovative flats.
Conclusion
After evaluation of planning issues and investigation of the case study areas, the recommendation notes could be concluded as follows:

1. The ‘rent’ type is more appropriate than the ‘purchased to own’ type for low income group especially for ‘pondok’ living system, because they have very low affordability for purchasing the house and just using the house as dormitory or lodging purposes in the inner city as working place.

2. The subsidy in the form of ‘rent’ type is more appropriate not only because the income affordability must be assured for low income level, but also because the ‘purchased to own’ houses have the high possibility for changing the function into commodity goods and causing the gentrification of local kampung community to move out toward cheaper areas, and changing hands to become residential area owned by new households from outer area who mostly have middle and upper income level.

3. The living types in rental flat could be grouped into four types: living place system, living and working place system, working place system and lodging place system. This is very similar to the traditional kampung which have two types of setting: ‘pondok’ (lodging) and ‘tinggal’ (living), and sometimes accompany with the setting for working.

4. The kampung flat inhabitants do the consolidation activities dealt with their living and small business activities with the room arrangement, space extension and interchange of space use.

After detail examination of the study area on a sample method basis, some evaluation notes of consolidation behavior are obvious and be concluded as follow:

1. A corridor and small hall either in ground floor or in upper floor are shared spaces in kampung multistory housing instead of alleys and pocked open spaces in traditional kampung.
2. The concept of corridor is redefined not just for ‘go’ space, but also for ‘do, sit, place and occur’ space.

3. The shared spaces as ‘go, do, sit, place and occur’ space showed that the different types of design accommodate the various behavior which double up as both social and economical function concurrently giving the sense of kampung community.

The community-based approach is needed for exploring and developing a working mechanism which provides the community not only to solve their housing problems, but also to improve their social and economic condition by mobilizing the already existing efforts and skills. In this paper, we could make sure that the rental flat housing for low income people is appropriate, and that it is important to consider location and subsidy affordability for rental flat housing. And through the case study, we could suggest the approach point of the planning and designing with concerning to that the community can identify their specific needs or problems in designing their neighborly shared space.

These conclusion are some preliminary notes for the planning and designing of low cost flat development for low income level. After this, we need suggest more concrete methodology to develop, plan and design.

Notes:
This paper is based on the author’s research under the guidance of Professor DR. Eng Toniguchi Mamoru (Kyoto University) and Instructor Seiyo Hashimoto M.Eng (Kyoto University).

References


THE DESIGN OF BUILDING CONSTRUCTION FOR LOW INCOME PEOPLE WITH USED OF LOCAL MATERIALS
A Case Study of Solid Clay Block

V. Totok Noerwasito
Departement of Architecture
Institut Teknologi Sepuluh Nopember Surabaya
totoknoerwasito@yahoo.com

Abstract

One of the application from the sustainable of architecture is efficiency of material using and construction method, the material related to the using the material volume, material source, energy for the production of material and nontoxic material. Construction method covers, how the construction is made for architecture, so it must be more efficient the energy, also the cost of construction can be cheaper. Both the things relates the embodied energy material, namely energy utilized to the production of material, transportation of material and maintenance of material.

Local material is material which is produced near to the construction site of building. effect of the short distance to the site construction, it can be to minimize the energy for transportation. The Energy efficient also relates to utilize petroleum in production of material.

The Solid Clay block is local materials, it does not need fire wood and petroleum to produce the blocks.

The design of building construction for low income people is using the low embodied energy material and the combination of construction between the ancient construction and the present construction.

Keywords: embodied energy, local material, solid clay block, construction method.
1. Introduction

Problems

One of housing problems for the low income people is how to make the low cost of building construction, its mean the house have to be efficient in used of materials, efficient energy of construction, and does not damage environment. One of the concepts of sustainable architecture is efficient in material selection and efficient in construction method, material usage related to the usage the material volume, material source, energy for the production process of material and nontoxic material.

Efficient Material selections are to utilize the material which do not destroy the environment, included of its raw material source, utilize material which can recycle or reuse, material which need low energy in production process, and transportation.

Construction method covers how the construction can be applied for buildings, so it does not yield many waste, and easy to maintain after construction building. Construction has to be applied with low energy for the maintenance. It is important to learn from traditional construction is important, because the traditional construction is not utilizing much energy, especially the energy coming from fuel fossil, and it is optimally using local materials, but not all traditional materials can be utilized at present, because material which is utilized in traditional construction in this time is very expensive environmentally, for example the usage of forestry wood dominantly, and now it is difficult to get it.

Solution Methode:

The solution methode is by using local materials, Solid Clay Block, and use in design of building construction which less concrete usage. The design of building construction is combination between ancient constructions with modern construction.
2. Discussion

Local Materials:
Local materials are materials which exist in around area; and have the efficient energy, because these are only requiring low energy, mainly for transportation.

Solid Clay Block:
A block of wall material which uses Clay as raw material and cement as additional material. The block is compacted, and dried without using a combustion process, it is dried by wind.

The block can be produced in the site by utilizing clay which exists in around site. Compression strength of block is designed to reach more than 30 kg / cm$^2$ (standard minimum of the block) and can be designed stranger than the standard value. The density of block is 1.8 -2.0 g/cm$^3$; minimal dimension is 9 x 19 x 6 cm, block has some type block. Block surface is very smooth; therefore wall of Solid Clay and Block needn't be plastered

Operational Energy
Operational energy is energy which utilized to reduce the heat energy into room. That is related with the usage of electrical energy electrics, Operational energy building will be lower if the building utilize the local climate potential optimally.

In Indonesia there are many regions which have high temperature in the day, in such location material selection is very important, because the characteristic of such material will influence to indoor temperature condition in nighttime, in which the temperature will be higher than outdoor. That condition, will make the user difficult to take rest, but in the morning the temperature decreases equally with outdoor temperature, where in that time the room is empty. Fig.1 shows the condition temperature in Surabaya.
the temperature difference in nighttime between outdoor and indoor in nighttime, cause a time lag temperature which represent thermal properties material. Tabel 1 shows time lag of common use material, in that table the thickness material influences to time lag, the thin walls have shorter time lag than thick material. Solid clay blocks have time lag nearly the same with red bricks.

\[
\begin{array}{|c|c|c|c|c|c|c|c|}
\hline
\text{Material} & \text{Thickness} & \text{Time Lag (jam)} \\
\hline
\text{Stone} & 20 cm & 5.5 \\
\text{Stone} & 30 cm & 8 \\
\text{Stone} & 40 cm & 10.6 \\
\text{Concrete} & 5 cm & 1.1 \\
\text{Concrete} & 10 cm & 2.5 \\
\text{Concrete} & 15 cm & 3.8 \\
\text{Concrete} & 20 cm & 5.1 \\
\text{Concrete} & 30 cm & 7.8 \\
\text{Common Brick} & 10 cm & 2.3 \\
\text{Common Brick} & 20 cm & 5.5 \\
\text{Common Brick} & 30 cm & 8.5 \\
\text{Face brick} & 10 cm & 0.17 \\
\text{wood} & 1,2 cm & 0.45 \\
\text{wood} & 2,5 cm & 1.3 \\
\text{wood} & 5 cm & 0.45 \\
\hline
\end{array}
\]

Source: Victor Olgay 1973

fig. 1 Temperature Condition of daytime and nighttime into a house in Surabaya
Embodied Energy Material

Embodied energy material is energy which used material for production; transportation; construction and maintenance materials. High embodied energy of material is material which use much fuel fossil for its production process, and also produced material far from site of construction. Table 2 shows that each material has different value of embodied energy, and Solid Clay Block has a lower embodied energy than brick.

<table>
<thead>
<tr>
<th>Material</th>
<th>Primary energy requirement (MJ/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Energy</strong></td>
<td></td>
</tr>
<tr>
<td>Aluminium</td>
<td>130 – 270</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>&gt; 100</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>&gt; 60</td>
</tr>
<tr>
<td>Steel</td>
<td>20 - 60</td>
</tr>
<tr>
<td>Glass</td>
<td>12 - 75</td>
</tr>
<tr>
<td><strong>Medium Energy</strong></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>4 – 8</td>
</tr>
<tr>
<td><strong>Ceramics, bricks and tiles</strong></td>
<td>1.5 - 8</td>
</tr>
<tr>
<td>Concrete, blocks and tile</td>
<td>0.9 - 1.6</td>
</tr>
<tr>
<td>Concrete-in-situ</td>
<td>0.6 – 2</td>
</tr>
<tr>
<td>Lime/cement mortar</td>
<td>0.5 – 1</td>
</tr>
<tr>
<td><strong>Cement-stabilized earth blocks</strong></td>
<td>0.3 – 0.8</td>
</tr>
<tr>
<td>Timber</td>
<td>0.1 - 5</td>
</tr>
<tr>
<td>Natural, stone, sand, aggregate, soil</td>
<td>&lt;0.3</td>
</tr>
</tbody>
</table>

*Source: UNCHS 1991a, b.*

Concept Construction for House of Low Embodied Energy

- Use material produced without utilizing fuel fossil.
• Use minimal volume of material.
• Use minimal volume of concrete material, cause concrete is high embodied energy material.
• Avoid to use material that damage environment, especially for material from forest
• Avoid to use toxic material, for example asbestos.

Building Construction Design

![Solid Clay Brick type "Talijuk"](image)

Fig. 2 Solid Clay Brick type”Talijuk”

The size of block is 9 x 19 x 4 cm, the strength of compression is 40 – 50 kg/cm², and density is 1.7 – 1.8 kg/cm³.

It has smooth surface and the surface of block can be nailed. Its color of block depends on the color of natural soil. The Block has an ability of resistance to water, and it has a weight up to 1.2 kg/perblock. The Construction of block is not plated, because it has an natural color and natural texture.

Fig 3 shows that house design utilizes Solid Clay block wall with size 9 x 19 x 4 cm (minimal size). Coloum of building is a pilaster of block non concrete with iron into the
coloum and it placed each 3 m with other. Gevel is used to reduce utilizing of wood and also to avoid insect like termite. Wall house is an exposed wall, but up to 1m in height from soil wall must be plastered, to avoid water infiltration from rain or from earth (fig.4)

![Diagram of a house plan](image)

**fig.3 example plan of house for low income**

Fig 4 shows that there is an iron into wall. The iron is placed each 1 m for vertical layer and 1.5 m for horizontal layer. The function of the iron is to anticipate the horizontal force, for example earthquake.

Fig 5 shows that above frame of window is placed a beam from wood or “rollage” to bear weight forces from above wall.
Informal Settlements and Affordable Housing
Meeting and Conference, Surabaya 17-18 November 2005
Department of Architecture ITS and the International Council for
Research and Innovation in Building and Construction (CIB)

fig 4 isometrie of wall

fig 5 detail of window construction

fig 6 detail of window frame
Common use for frame window or door is wood with size 5/15, but in this construction the frame uses wood with size 5/7. For more detail see fig. 6

**fig. 7 detail of pilaster column**

Fig 7 shows that pilaster column use vertical layers which is different between above and below layer. The wall use full size, and half size

**fig 8 standard section of building**
Conclusions

- Using combination between ancient construction and the modern construction is not only for esthetic architecture but also it is especially for minimizing cost of building.
- Reduce volume concrete in house construction, is also to reduce embodied energy building.
- Using efficient material energy and construction method, will influence to the cost of house building. In this case, using Solid Clay block Material and mixed construction system.
- House building for low cost housing is building which is efficient in embodied material energy.

Bibliography
