International Journal of Engineering & Technology, 8 (1.9) (2019) 640-644

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Integrated Arrangement in Mass and Self-help Housing's Infrastructure Based on Land Consolidation Approach

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Abstract

Horizontal housing development creates conflict between local communities and developers. The conflict leads to ineffective in land-uses and separated infrastructure networks. This paper focus on 1) analysing the arrangement of land parcels pattern among the local community, real-estate developers and their housings infrastructure network; 2) Composing the integrated infrastructure arrangement criteria for self-help and mass housing neighbourhood development based on land consolidations. The study location is Makassar suburban Area (South Sulawesi-Indonesia). Data was obtained from direct observation of each housing site arrangement. Method of analysis uses a qualitative method and spatial analysis. The results show: arrangements of housing parcel between the local communities and the real-estate developers show a different pattern. The land parcels belong to the community show irregular plots in a small range of land while the housings parcels belong to the real-estate developers are built in a wide-range area and regular parcels pattern. The infrastructure network for both types of housing is not integrated into the neighbourhood scale and further influences the urban infrastructure system. The integrated infrastructure arrangement for self-help and mass housing neighbourhood development based on land consolidations can be achieved by considering these criteria: a)Identify the land ownership; b) Measure the plots dimension as a start to land-banking process; 3) Expose the benefit of land consolidation; 4) Plan the blocks/plots and infrastructure network in participative ways with win-win solutions

Keywords: *Housing development, ineffective land-uses, land consolidations*

1. Introduction

Housings development in a horizontal way is the main spatial structure of the urban sprawl. The high number of population and their needs in shelter lets the housings and settlements overgrow in suburban areas where low-priced land remains available.
Nowadays, the housing demands grow strong together with the population growth. The backlog remains unsuccessful in achieving and continuing to rise to extend the gap at this present time. This situation becomes an opportunity for the businessmen to provide the residents' needs in housings. They start to develop a mass housing, some of them in a wide range area while others in limited space. The developers offer a closed-housing estate which is constructed around the local community's dwelling units and surrounded by walls. Due to the developers' actions, there are occurrences of problems related to ineffective land-uses and separated infrastructure networks (Table 1).

Table 1: Discussion Backgrounds

Developing Actors, Product and Types	Dwellers	Problem		Solution
		Land Ownership	Infrastructure	
Developers: Mass Housing Cluster Housing	New Community	Private Company: Closed, well-arranged plots pattern	Closed Infrastructure Network	Repairing Approach
Community Self-help, Individual housing	Local Community	Individual Belonging: Conventional, Individual & Irregular plots	No yet infrastructure Services	

Ideally, the housing infrastructure network should be integrated from a small neighbourhood to a large area as a city. The network in either the whole area of housing and settlement a self-help housing or the mass housing should be connected. However, things are going differently in Makassar suburban area. This reason takes this discussion to two aims which are: 1)analysing the arrangement of land parcels pattern between the local community and real-estate developer and their housings infrastructure network; 2)composing the integrated infrastructure arrangement criteria for self-help and mass housing neighbourhood development based on land consolidations.

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2. Literatures Review

Sprawl can be explained as the uncontrolled urban expansion into suburban areas with some typical features such as low-density, single-use, and car-dependent communities (Saunders, 2005). Sprawl is mostly formed by the development of housings and settlements which vigorously grow in the suburban areas (Wunas, 2011).
According to Tachieva (2010), the form of sprawl ignores the neighbourhood structure and creates car-dependent behaviour. The shapes of sprawl are not compact and consume valuable farmland and natural areas. The leapfrog's form can be seen in the land use segregations, single-use facilities and the emerge of gated communities.
In order to overcome sprawl in suburban areas, Tachieva (2010) suggests a repair method. The main idea of this method is the infill development approach which inserts the required elements in the sprawl neighbourhoods. However, some challenges arise on the application of this method. Expensive land acquisition and overhaul of the regulatory framework have to be solved for successful implementation.
Committee of subdivision layout in Southworth & Ben-Joseph, (1995) show that the classical pattern in a residential area (Fig. 1) become the essential aspects to be considered in formulating policy in street pattern. The aspect consists of the relation of new planned street to adjoining street systems; street alignment; street intersection; street width; roadway width;

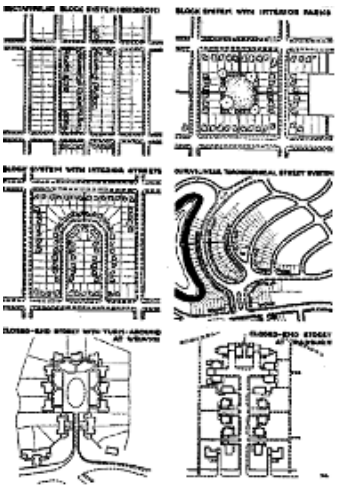


Fig.1:Street Planning in the residential neigbourhood (Southworth & Ben-Joseph, (1995)

Wunas (2001) describes sprawl shows as the separated arrangement in land-use and urban transportation system. Ideally, the housing arrangement should apply the ecological housing concept which promotes a compact land-use planning and connects to the transport network (Fig.2).

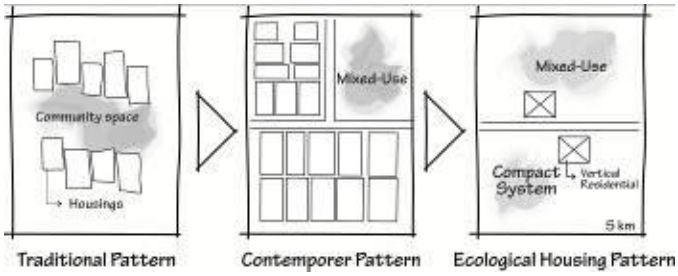


Fig. 2: Housing neighbourhood changes and their dwellers' social pattern (Wunas, 2011)

Jones & Williamson, (2009) explain the separating uses and separating people that occur in suburban development. They suggest a solution named suburban retrofitting which installs not available features in the neigbourhood. Suburban housing as the product of suburbanisation process arises some problems that can be described the research framework (Fig. 3).

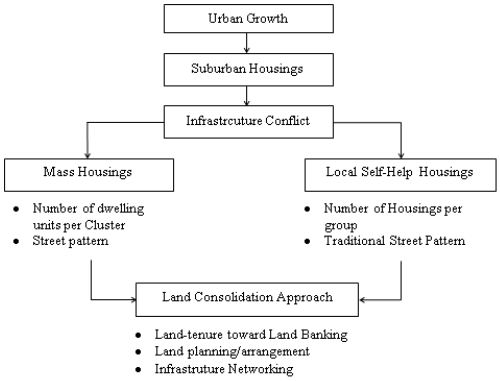


Fig. 3: Research Framework

3. Method

This research takes place in Makassar Suburban areas (Fig 4). The areas show an excessive growth in mass housing development and continue beyond the city boundaries. Data were collected from direct observation of each housing site arrangement. The objects of this research are the housings and settlements in Makassar suburban areas. The units of analysis are the blocks scale housing and settlement in suburban neighbourhoods. They were chosen with the following criteria: year of construction, their location along the main road and local Self-Help Housings, number of dwelling units of each block.

Blocks were chosen the criteria by year of construction criteria. Data were collected by direct survey and were completed by local database. The descriptive quantitative method and spatial analysis are used for research analysis.

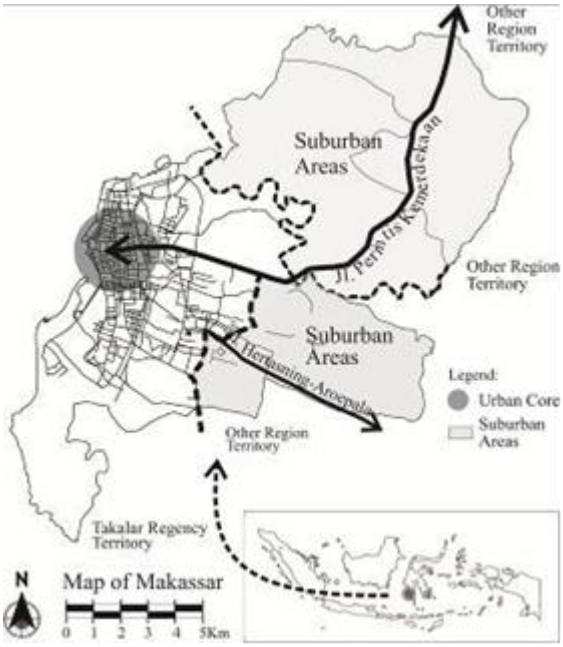


Fig. 4: Location of The Study

3. Results and Discussion

This section describes the two aims of this discussion.

3.1. The Arrangement of Land Parcels Pattern among Local Community, Real-Estate Developers and Their Housings Infrastructure Network;

Makassar's suburbanisation process emerges in the last fifteen years. The emergence of the process can be seen in the increasing of housings and settlements range areas reaching 77% from the year of 2000 to 2015 (Table 2). The growth of housings and settlements goes simultaneously with the rise of population number in Makassar's suburban areas. Consequently, the symptoms of sporadic housing neighbourhood are inevitable. In, addition, the constructions of inter-regional road network make the sprawl worse.

Table 2: Housing and settlement growth in Makassar suburban areas

No	**Year**	**Numbers of added Building** (Units)	Total B**uilding** (Units)	**Additional land width** (**sqm**)	**Total Area Width** (**sqm**)	%
1	2000	4291	4,291	432,257	432,257	56
2	2005	375	4,666	33,027	465,284	4
3	2010	1667	6,333	188,888	654,172	25
4	2015	1013	7,346	111,595	765,767	15

The housing development trends in Makassar suburban areas show in the form of sprawl, low density and most of them consist of various types of gated communities. Mainly, these housings and settlements are provided by two types of development actors, the developers and the local communities. The developers' products are known as mass housing or gated communities and the local communities' products are known as self-help housings. Both of the development actors play their act in very different ways and show their role features in housing and settlements developments but the developers are more "aggressive" than the local communities.

There are a lot of reasons for the aggressive movement of developers in providing housing for the urban residents but the higher demand in affordable housing market becomes the main motivation. Low-priced land in the suburban areas and convenient service from the bank credits are the other factors. Even small or low capital companies can perform this kind of business. Moreover, the government policy in subsidised housings promotes more businessmen to get involved and enlarge the mass housing expansion.

Nowadays, mass housings expand over the Makassar boundaries in their various kinds of range. Starting from small areas with <50 dwelling units to >500 dwelling units of gated communities can be seen in the east and south of Makassar suburban areas. The housing types in the gated communities show a modern and complex construction, well arranged plots and equipped with good infrastructure but found only inside their walls.

In general, types of the street pattern in Makassar's gated communities are grid, loop and cul-de-sac. Streets form and plots arrangement are well managed inside the housings border. The developers focus only on land under their legal belonging, but outside other neighbourhood becomes other land-owners' business or government issues. In many cases, the mass housing constructions ignore their surrounding neighbourhood including their infrastructure systems.

On the other hand, the local communities do their housing construction less aggressively than do the developers. The local communities' housings form irregular shapes and consist of a small number of housing (5-10 dwelling units) or a single house with a quite long distance to other housings while some housings are not yet equipped with the urban infrastructure networks. Even though most of the local communities can work together as part of participatory approach but this approach cannot be conducted because of the form of irregular plots and the less competence in infrastructure planning and construction make the local communities unable to build their own infrastructure system. Eventually, they can only rely on the government programs.

The street pattern of the self-help housing communities is formed by the leapfrog's shape of the plots which consist of house and the yard. In some cases, the housing plots are located around the farmland areas/undeveloped land and served by discontinued footpath.

Nowadays, the expansion of mass housings development exists side by side with the locations of the self-help housing of local communities in the suburban areas (Fig. 5). In the process of land ownership, developers purchase the strategic land from the local people. Some of them gain the land in small range area while others gain the small range in several phases from different land owners before they weld together the area as a wide range housings-estate. In opposite way, the local communities get their land from generations, some in small range and others in wide range land used for farmland or plantation.

A separated housing development between developers and local communities cause some infrastructure problems. First: the different land elevation. In order to do the construction of the mass housing, the developers have to prepare the land in a proper way. In many cases, the mass housings are built in a converted land which is from farmland/plantation areas into housings neighbourhood. Hence, the wet farmlands areas need to be "buried" and ready for the housings constructions. As a consequence, the land elevation become higher than its surroundings, distract ground water and drainage's flow system, causing flood/puddle.

Second: discontinuity of the street network. The gated communities live parted beyond their walls. The idea of closed housing neighbourhood creates dead-end types of street network on both sides, inside and outside the walls. The exclusive development demotes the walk-able neighbourhood concept. The disconnected access makes a longer distance to reach the facilities in the area and blocks the short-cut access opportunities. Furthermore, the street hierarchy becomes irregular.

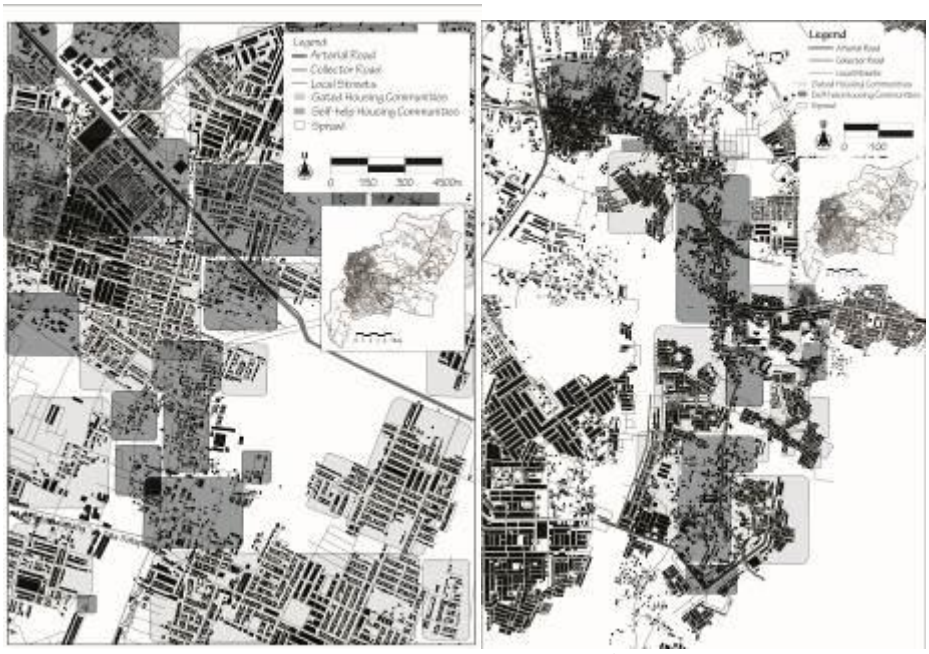


Fig.5: Self-help housings location exists side by side with the gated communities (Left: Southern suburban and Right: Eastern suburban)

Third: low-density neighbourhoods, housings development in the suburban areas are the main contributor in the form of sprawl. Scatter and low-density areas create limited undeveloped land which show land-use inefficiency. The parted development between developers and local communities makes the sprawl worse. Both of the actors focus only on providing horizontal types of housing development. The developers play a significant role in this condition because they have abilities to manage a wider range of areas than do the local communities. The government policies need to manage these actions to avoid the severe environmental damage and population loss.

3.2. Composing the integrated infrastructure arrangement criteria for self-help and mass housing neighbourhood development based on land consolidations

Regarding the housings and sprawl problems, Tachieva, (2010) suggests an idea to combat sprawl by creating complete communities. The approach uses infill development concept which fills the undeveloped land in sprawl with various types of facilities as communities' need.

This bright idea can bind the housings in the surroundings facilities and gradually creates complete communities. However, the idea has to deal with land ownership and social conflicts. Even though the infill development uses a range of undeveloped areas but it has to be done in comprehensive method and to solve the problems in the neigbourhoods. Not every reseident will agree with this idea.

Tachieva (2010), suggests a land aquisition approach for the problems. It means the blocks/areas for the infill development become one person/company's belonging. For some cases it could work but for Makassar local communities who represent the developing countries

it shows a different state. Most of the coomunities remain to own their land/houses and live in the neighbourhood. The sprawl physical condition for Makassar suburban areas which shows in low-density scatter housings and discontinued infrastrcuture network becomes difficult to apply.

In order to apply the idea of repairing sprawl with infill development especially in Makassar with such unique communities, new approaches related to land owning or legal right are important for the idea. A land consolidation approach can be fitted to solve the problems because this approach can make it possible for the land owner to stand their rights and the idea to repair the sprawl can be implemented.

The land consolidation approach in this discussion focuses on composing the integrated land arrangement criteria which bridge the development in mass and self-help ways. The approach can be implemented together with the participatory approach. This should be done because it is related to land ownership. In Indonesia residents or companies own their land legally completed with a legal document (certificate).

Arranging an area or one block based on land consolidation approach involves various kinds of land owners. They can participate by making a group with a leader that can help deliver the group's need. The group leader can come from a variety of backgrounds: entrepreneur, non-government organization, chairman of the community and so on.

Indonesia, especially Makassar does not have the land-banking. The map of land owner and plots are not documented well. The land board service can provide database in type of boundary description and plots sketch that show in the land owner's certificate. In order to apply the land consolidation approach, land banking is needed but most of the societies have little information about the benefit. Land banking can help land owners improve their land quality and prices because it manages land properly.

4. Conclusion

The arrangement of land tenure pattern between the local communities and the real-estate developers shows a different pattern. The Communities land tenure shows irregular plots pattern but in a small range of land while the housings from real-estate developers are built in wide range areas and well arranged in their plots pattern and create gated communities. The infrastructure network for both types of housing appears in not-integrated patterns in the neighbourhood scale and further influences the urban infrastructure system.

The integrated land arrangement for self-help and mass housing neighbourhood development based on land consolidations can be achieved by considering the following criteria:

1. Record the land ownership
2. Measure the plots dimension as a start to land-banking process
3. Expose the benefit of land consolidation
4. Make planning in blocks/plots and infrastructure network in participative ways with win-win solutions.

Table 3: Integrated Arrangement of Mass and Self-help Housing in suburban areas

Development Actors	Approach	Solution
Mass housing Developers	Participatory	Land consolidation supporting criteria: Land ownership Plots dimension Benefit Presentation Block and Infrastructure Planning
Self-help housing communities		
	Non Goverment Organisation,Government	

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