Socio-Impacts in the Formation of Organic Settlement

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Abstract
This research is a study of the theory to a reality of socio - impacts in the formation of organic settlement in Indonesia. In the past, rural community in Indonesia tend to move to new areas and established residential area. The residential area developed into a settlement that grew based on their thinking. Literature review in this research, based on observations of many communities occupy new areas in the Medan city Indonesia, which was originally a forest area. Along with time, groups of people who occupy these new areas may have different social systems or equalled their home rural origin. Process and components of the creation of the new settlement area was integrated with the resident social circumstances. Social conditions of rural communities occupying new areas in the city of Medan Indonesia offers a challenge study of social influences on the formation of the physical manifestations of unplanned settlements. The physical manifestations are studied theoretically as residential typology and morphology organically formed settlements in Medan city. The study of social impact to the shape of the settlement that grew organically will produce a theoretical concept. The concept is the theory of the formation of settlements which have characteristic physical manifestations, the evolution of the concept of the formation of residential areas and the concept formation and morphological typology of settlements that occur organically.

Keywords: Social, settlement, organic pattern, typology, morphology.

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Introduction

The formation process of a settlement as a living space is inseparable from the social factors. That condition could possibly happen when human occupied a new area. This phenomenon is the reality that was found in areas dominated by particular community. As the time flows, that area forms a settlement. Author did some literature reviews which are related with the social factors and the changing of unplanned settlement formation. Then, the unplanned settlement will develop into an organic settlement (irregular).

Background of Study

Unplanned settlement pattern in Medan City Indonesia has been implicated since the Dutch colonial era. Settlements grew without infrastructure planning and economic networks based on the city government planners. This unplanned settlement pattern shows physical manifestations of social organization of its inhabitants. This study analyzes the theory generated by previous writers and connects it to the settlement forms in the Medan City, Indonesia. According to the observation on unplanned settlement pattern in Medan Indonesia, the author develops a theoretical concept of the formation of a settlement, settlement patterns, and the concept of social influences on the formation of unplanned settlements. The concept of the theory is an effort to enrich the existing theory based on the fact that unplanned settlements exist in Medan Indonesia.

The Design of Study

In this study, the author used qualitative methods in order to comprehend the research area. In the research area, the author looked at the social circumstances that affect the occurrence of unplanned settlement formed irregular (organic). The author obtained the data by physically observing the settlement condition and interviewing based on the residents' perception. Observations and interviews are physically linked by researcher with preconceived theories. The result of this analysis is the fact that nature enriches existing theories. The theories that based upon the reality of unplanned settlement in the Medan city, Indonesia are the forms of vigorous social influence.

Settlement Formation

Factors that could cause the formation of a settlement are: (a) evolution; (b) environmental circumstances; and (c) value. Men in modern times and prehistoric times have a different meaning toward these factors. A settlement can be formed because of evolution. The evolution of rural settlement can be divided into three stages: colonization, spread and competition (Hudson, 1969 in Sarkar, 2010). In the first stage, the occupation, happened because of the growing population of the occupied territory is no longer able to accommodate the number of people who want to inhabit. As a result, they have to find a new place that have no occupants and declare it as their own. The second stage is the spread. At this second stage, there is population displacement process from the origin to the new colonized area and gradually the area became a settlement. The increasing number of the inhabitants, then on the third stage, there was a competition for space. This process will produce regularity in settlement pattern that was made in groups or clusters.

A settlement can also be formed by the initiation of the very first settler of the territory and gain authority over it. Newcomers who came later had to ask permission to previous dwellers in order to settle and establish residence (Taschner, 2001 in Fernandez, 2011). Then asserted by Matos (1977) in Fernandes (2011) that the settlement will ultimately lead to more compact and requires a leader who is responsible for collecting taxes, developing a better settlement and divide the greater land from the old settlers to the new settlers.

Murray (2008) identifies that the form of settlement tends to grow in four phases. The four phases are: (1) phase to get land; (2) phase to occupy the newly acquired land; (3) phase to process the land to become plantation; and (4) phase to enhance residential areas and the circulation system of farm produce to take home. Spiro Kostof (Smith, 2007) identifies the spatial models of urban planning into four, which are: (1) organic, is a city development that occurs without visible overall direction and coordination; (2) grid, is a reference to the development of orthogonal planning; (3) The diagram cities, is the development of inflexible city planning; and (4) the grand manner, is the planning with buildings and spaces that are designed to convey visual messages of pride and coherence. Environmental circumstances that can lead to the formation of settlement are the availability of natural resources, water, flora and fauna, as well as land. Since ancient times, men had made use of the natural resources such as wood and soil which are available in the surrounding area to build their homes. For example, the ancient settlement that is found in Bylany, Czech Republic (Kvetina and Koncelová, 2013) has longhouses with pole structures of wood and walls of wattle and daub. Many of the traditional houses in Indonesia are built on stilts and they are made by using the ideal materials that are easy to be obtained from the natural surroundings. One of the traditional houses in Indonesia that is built on stilts is traditional Batak Toba house (Figure 1).

Figure 1. Traditional Batak Toba house is one of the traditional houses in Indonesia that is built on stilts.
Photo by: Yuly E. Aryatnie (2012)

Since ancient times, man had had a way of thinking to solve the disposal problems. This can be seen from the prehistoric settlement in Bylany, Czech Republic (Kvetina and Koncelová, 2013). In this prehistoric settlement, adjacent pits were found along the houses' walls of the residential area which are assumed to be the result of excavation used to build houses. Later, these pits will be covered with settlement wastes or natural runoffs (Figure 2).
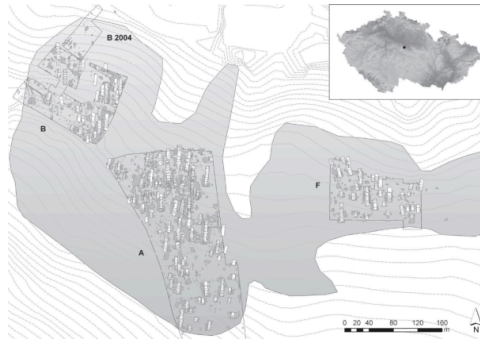
Figure 2. Condition of archaeological excavations in Bylany, Czech Republic.
Source: Kvetina and Koncelová, 2013

In modern times, the pits are formed as ditches around the house. The ditches are drainage canals that are used to drain the sewage from household and rainwater. For example, these can be seen from organic settlements in Kelurahan Sei Agul, Medan Barat Sub-District (Figure 3) and in Kelurahan Lalang, Medan Sunggal Sub-District (Figure 4).
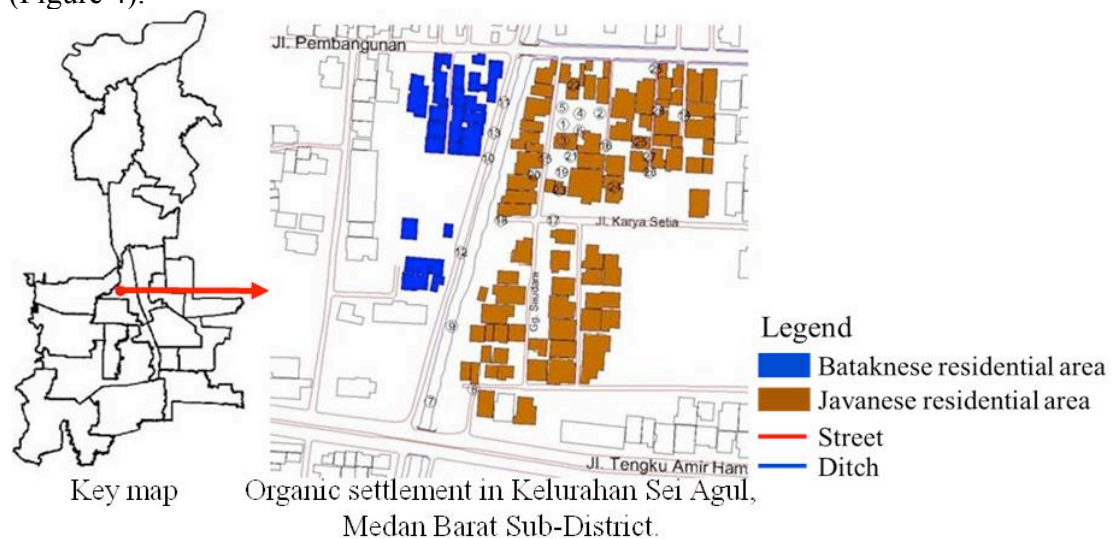
Figure 3. Organic settlement in Kelurahan Sei Agul, Medan Barat Sub-District which has ditches around the residential area.
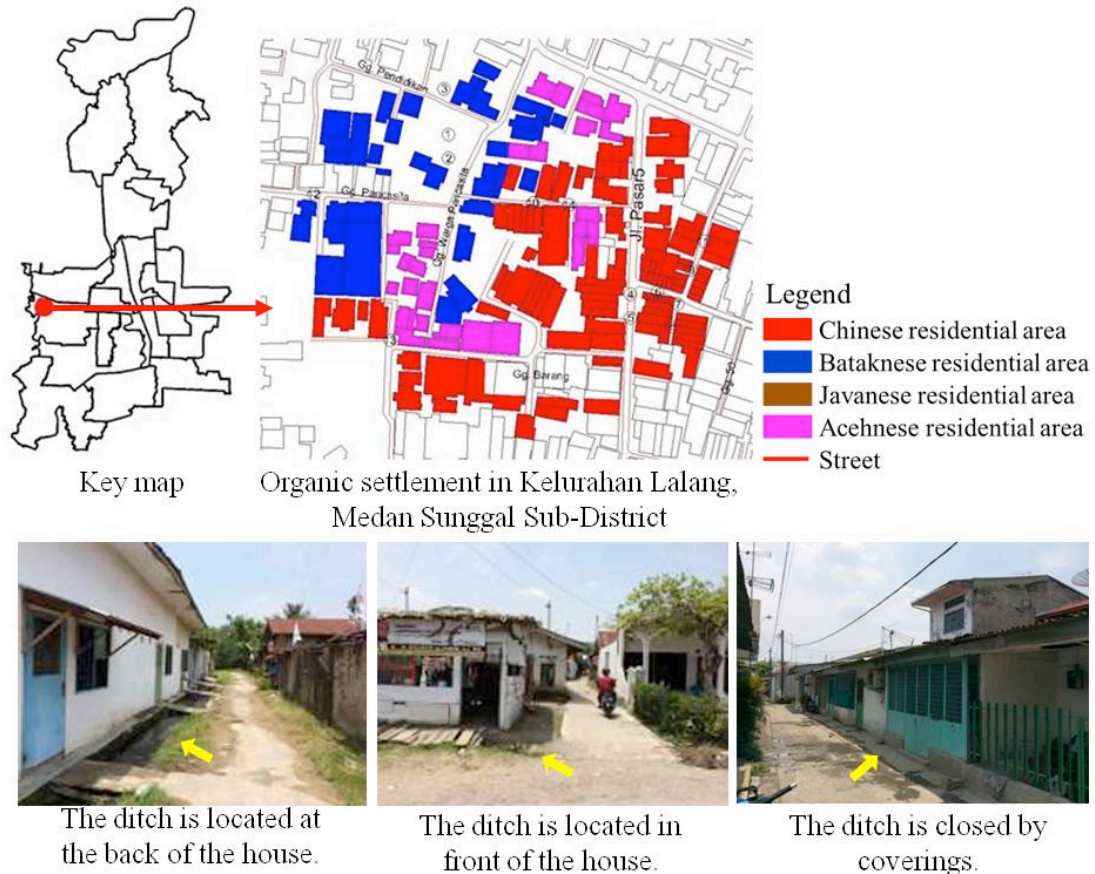
Figure 4. Organic settlement in Kelurahan Lalang, Medan Sunggal Sub-District which has ditches around the residential area.

Value can be a factor to form a settlement. Since ancient times, men have recognized the value of the economic, social and cultural. On the economy aspect, men have recognized medium of exchange with metal and gold. While in the social aspect, men have recognized the social strata. This condition is shown by having a leader. In aspect of culture, men have been able to make pottery, sculpture and painting. Settlements' existence since ancient times can be identified by the existing hints. Indicators used by Katsamudanga (2007) to identify ancient settlements in the Eastern Highlands of Zimbabwe are: the wall construction, the remains of grain bins, rock painting, the remains pit structures and pottery (Figure 5).


Figure 5. Hints of prehistoric settlements' existence.
Source: Katsamudanga (2007)

Settlement

According to Declaration of Vancouver (Sarkar,2010), settlement can be formed based on some supporting elements which are physical, social, spiritual, organization, and culture. Settlement is divided into two categories which are large-scale settlement

called urban and small-scale settlement called rural. The basic difference between rural and urban settlement lies on the economic activity and the social interaction (Sarkar,2010). Rural people gain their economy resources from the ground, as the majority of the citizen farm for a living. In the other hand, urban people gain their economy resources from cultivating raw material to a fine, ready-for-sale material as the majority of the citizen works in factories and industries. Regarding the social interaction and their way of living, rural people have some sort of differences with the urban people. Rural people tend to have an intimate - familiar relationship and a simple way of living while urban people tend to have a formal relationship and a complex way of living. This case can be seen in Medan Polonia Sub-District and Medan Labuhan Sub-District. The majority of citizen in Medan Polonia Sub-District (Figure 6) are entrepreneur and employee which means the economic activities in this sub-district are entrepreneurship and office complex. Whereas the majority of citizen in Medan Labuhan Sub-District (Figure 7) are fisherman, driver and labor.
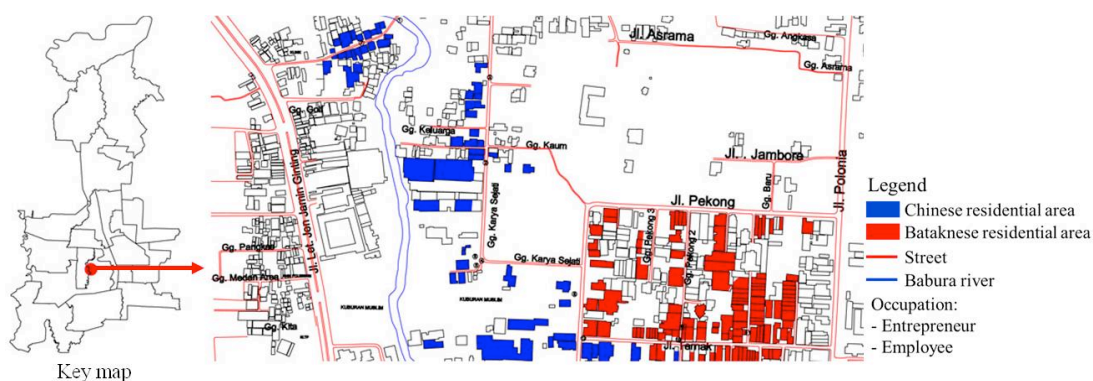

Figure 6. Settlement in Kelurahan Polonia, Medan Polonia Sub-District which the majority of the settlers are entrepreneur and employee.

Figure 7. Settlement in Kelurahan Pekan Labuhan Deli, Medan Labuhan Sub-District which the majority of the settlers are fisherman, driver and labor.

The immigration of rural citizen to the city tends to cause some urban-problems, one of which is building an unplanned residential area in downtown. This residential area sooner or later will grow into an organic settlement. According to Fernandez (2011), the easier an unplanned resident could be found, the easier for the government to take over that resident. The example of unplanned residents can be found in Kelurahan

Silalas, Medan Barat Sub-District (Figure 8). This settlement is placed in a narrow alley, border to the Deli River. The citizens purposively build their settlement in a small alley beside the river so that their slums will not be evicted by the government and they will not disturb the downtown constructions.
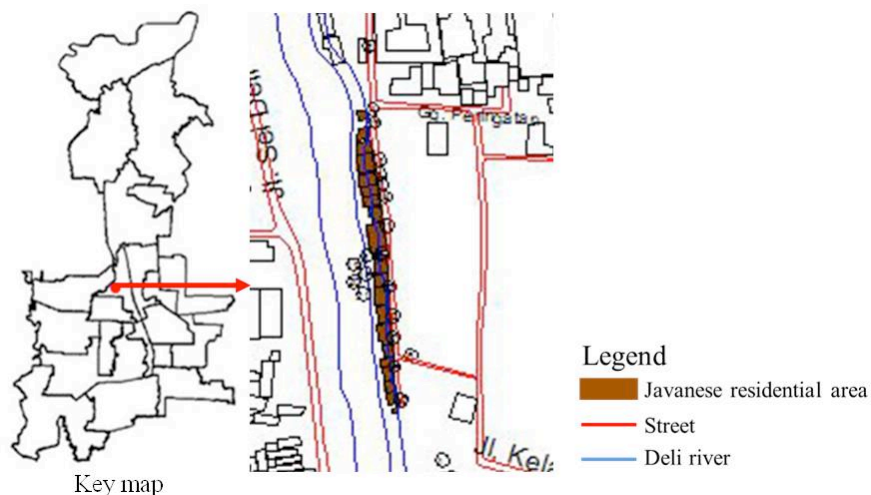
Figure 8. Settlement in a narrow alley, border to the Deli River in Kelurahan Silalas, Medan Barat Sub-District.

In Drolet, Robertson and Robinson (2010) studies, it is stated that the settlement is a process that continuously grow and cannot be set in a certain time as a form of individual adaptation to the environment. This case can be seen in Medan Johor Sub-District (Figure 9) where a lot of wasteland can be found and that wasteland will continue to experience the growing process.
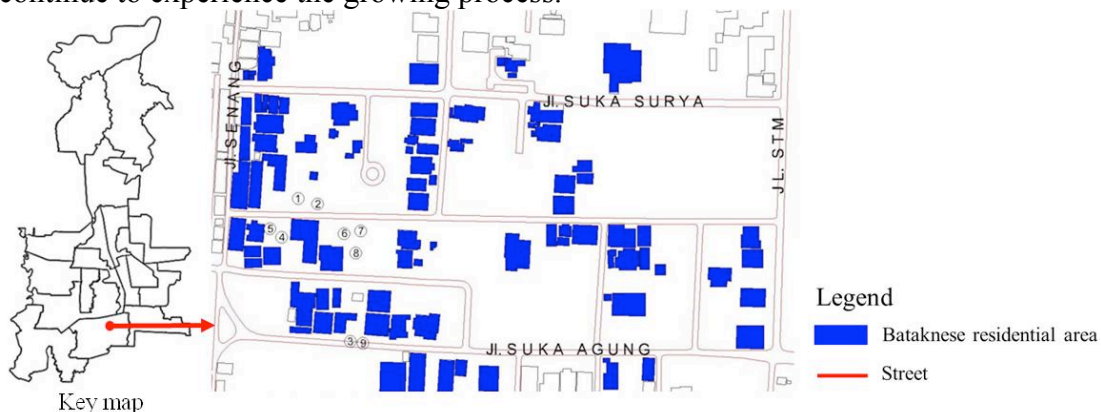

Figure 9. A lot of wasteland in Kelurahan Sukamaju, Medan Johor Sub-District.

Settlement Pattern

According to Katsamudanga (2007), prehistoric men built their settlement by choosing land that was suitable for farming and ranching. The adaptation of the land will cause a different settlement pattern over. There are two types of settlement, the first one is planned settlement (built by architect, consultant, government, and the authorities) and the second one is unplanned settlement that is a form of human adjustment with the surroundings (Kubat, 1999). According to Fernandez (2011), there are seven types of unplanned settlement pattern: (a) regular grid pattern (Figure 10a and 10b); (b) irregular grid pattern (Figure 11a and 11b); (c) the adaptive form towards topography (Figure 12a and 12b); (d) the main corridor pattern (Figure 13a

and 13b); (e) radial pattern (Figure 14a and 14b); (f) platform occupation pattern (Figure 15a and 15b); and (g) hill flat heads occupation pattern. The settlement pattern according to Fernandez can be seen from the figure below.
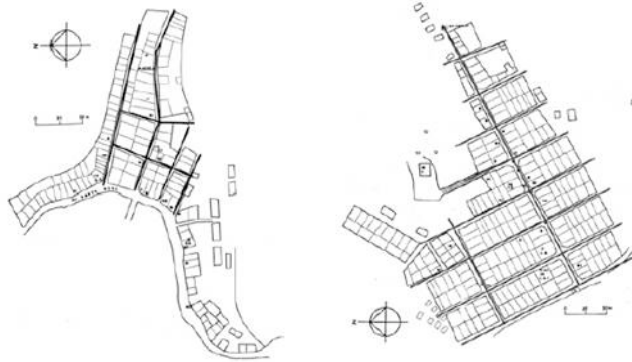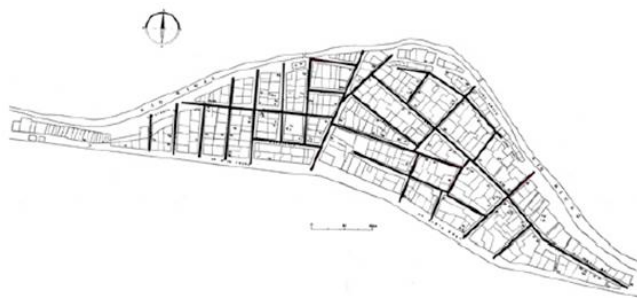

Figure 10a. Regular grid pattern.
Source: Fernandez (2011)

Key map

Figure 10b. The example of regular grid pattern in Medan Petisah Sub-District.

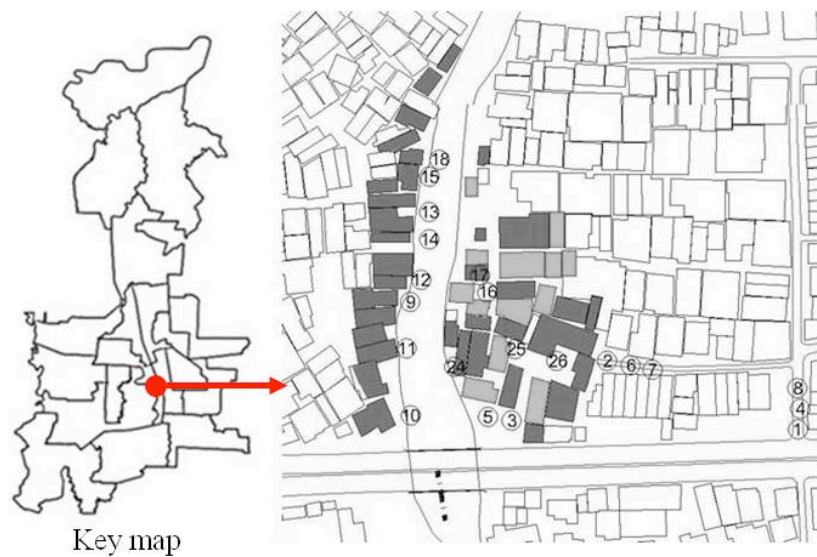**Figure 11a. Irregular grid pattern.**
Source: Fernandez (2011)

Figure 11b. The example of irregular grid pattern in Medan Labuhan Sub-District.

Figure 12a. The adaptive form towards topography.
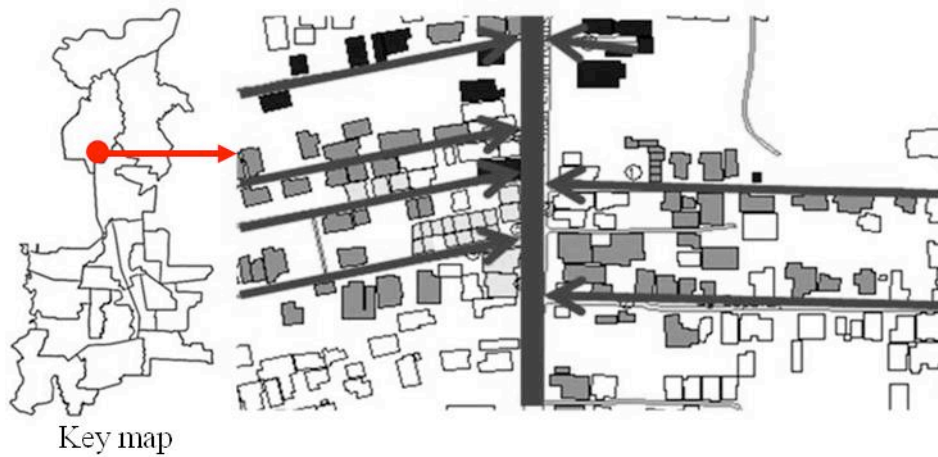Source: Fernandez (2011)

Figure 12b. The example of the adaptive form towards topography in Medan Maimun Sub-District.

Figure 13a. The main corridor pattern.
Source: Fernandez (2011)

Key map

Figure 13b. The example of the main corridor pattern in Medan Marelan Sub-District.
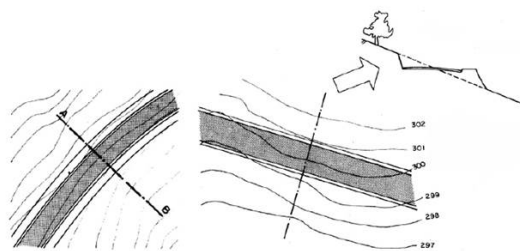

Figure 14a. The radial pattern.
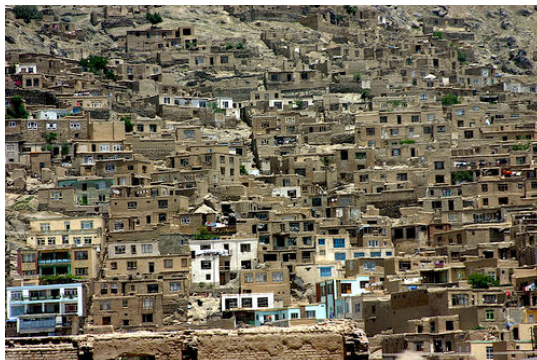Source: Fernandez (2011)

Figure 14b. The example of radial pattern in Vila natal Salvador de Bahia, Brazil.
Source: Fernandez (2011)


Figure 15a. Platform occupation pattern.
Source: Fernandez (2011)

Figure 15b. The example of platform occupation pattern in Kabul, Afghanistan.
Source: http://www.happytellus.com/kabul/afghanistan

According to Galster et al. (2001) in Besussi et al. (2010), there are five types of settlement pattern: (a) a settlement pattern that dominates a certain single area or compact development (Figure 16a and 16b); (b) a settlement pattern that is scattered around a certain area or scattered development (Figure 17a and 17b); (c) a settlement pattern that is scattered around a certain area with some of it dominates a single region or leapfrogging development (Figure 18a and 18b); (d) a settlement pattern that dominates the main transport infrastructure or linear strip development (Figure 19a and 19b); and (e) a settlement pattern that dominates some certain region or polynucleated development (Figure 20a and 20b). The settlement pattern according to Galster et al. in Bessusi et al. can be seen from the figure below.
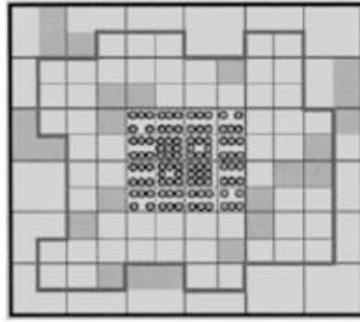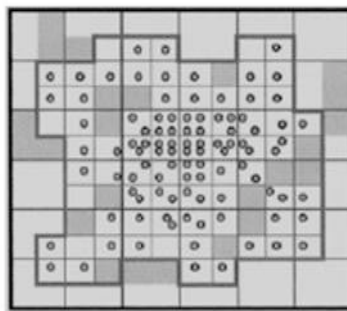
Figure 16a. Compact development.
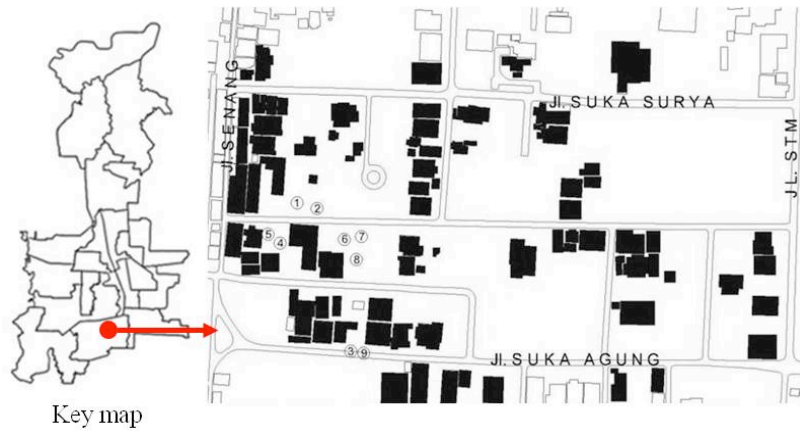Source: Galster et al. (2001) in Besussi et al. (2010)
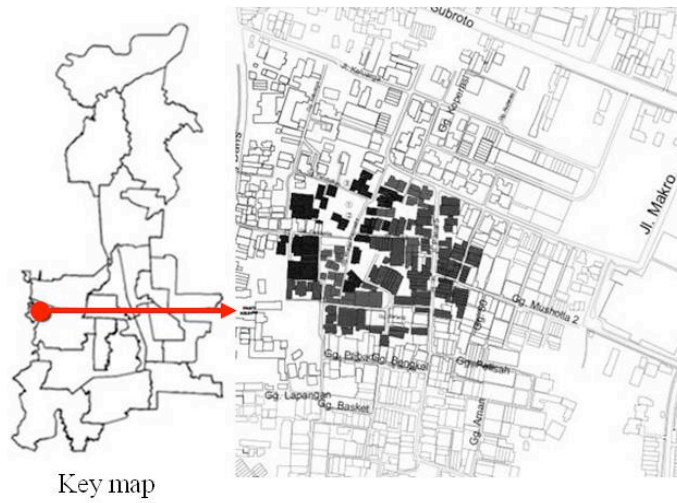
Figure 16b. The example of compact development in Medan Sunggal Sub-District.

Figure 17a. Scattered development.
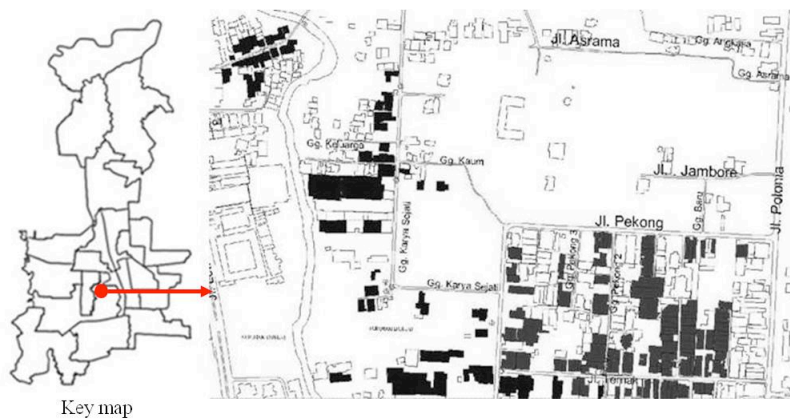Source: Galster et al. (2001) in Besussi et al. (2010)

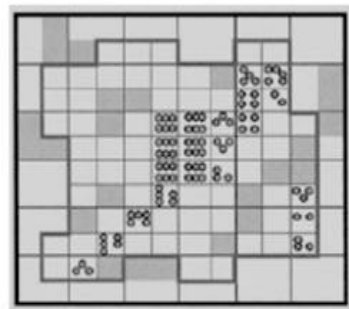**Figure 17b. The example of scattered development in Medan Johor Sub-District.**

Figure 18a. Leapfrogging development.
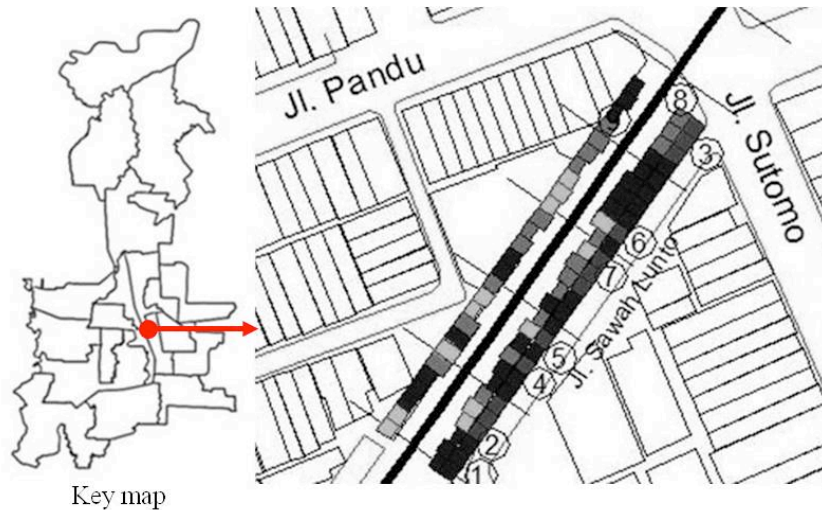Source: Galster et al. (2001) in Besussi et al. (2010)

**Figure 18b. The example of leapfrogging development
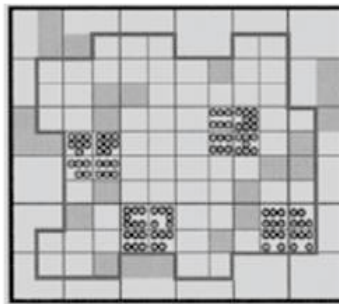in Medan Polonia Sub-District.**

Figure 19a. Linear strip development.
Source: Galster et al. (2001) in Besussi et al. (2010)

**Figure 19b. The example of linear strip development
in Medan Kota Sub-District.**

Figure 20a. Polynucleated development.
Source: Galster et al. (2001) in Besussi et al. (2010)
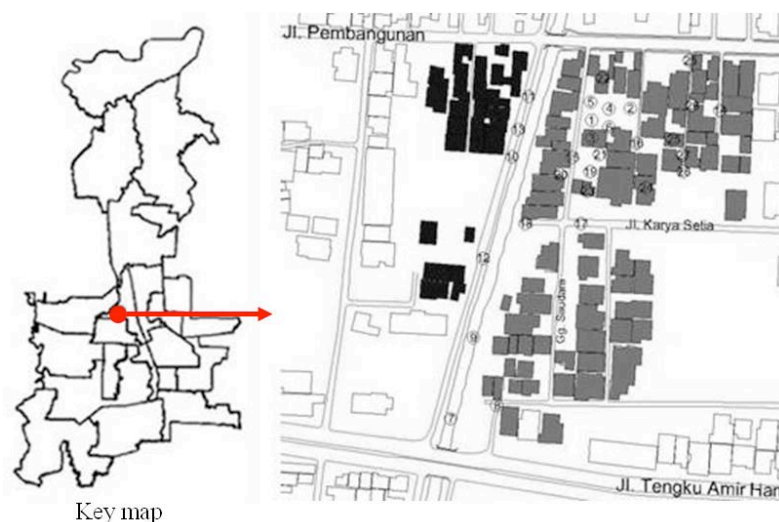
**Figure 20b. The example of polynucleated development
in Medan Barat Sub-District.**

According to Camagni et al. (2002), there are five types of suburban development: (a) construction is sited on an empty field which the previous settlement was built; (b) the widen of settlement on the border site of the settlement; (c) linear construction along side of main transportation infrastructure; (d) new construction which are spread equally on all region; and (e) large scale construction which is independent against the

existing settlements. These types of suburban development will impact on unplanned settlement. This unplanned settlement usually tends to become organic settlement pattern.

Social Impact in Settlement Formation

Social impact has important role in settlement formation. These social impact factors are: (a) social factor; (b) cultural factor; (c) economical factor; (d) political factor; (e) environmental factor; and (f) safety factor. These factors will affect the settlement formation. In terms of social factor, for instance, can be seen from population growth which affects human settlement (Scott, 1996). This especially happens in urban settlement. According to Neuman (2005), increased population growth in the city cause increased population density. This increased population density led to decreasing of urban land which can be used as settlement area. With the limited land in the city, cheap open land outside the city became a magnet which is very appealing to most people, so people tend to expand or build settlement in area outside the city. This can be seen from the number of settlement formed in Medan Johor Sub-District, which is an area outside the city. One of the unplanned settlement in Medan Johor Sub-District is located in Kelurahan Sukamaju (Figure 21).
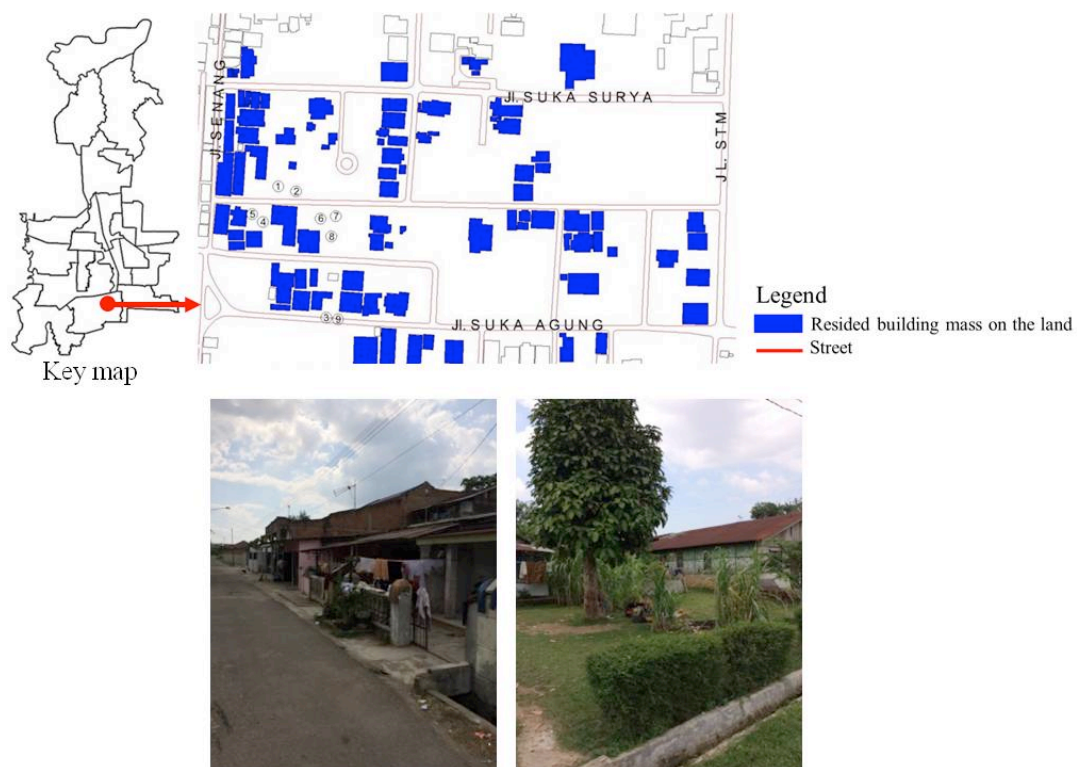
**Figure 21. Unplanned settlement in Kelurahan Sukamaju,
Medan Johor Sub-District.**

As seen in Figure 21, unplanned settlement in Medan Johor Sub-District is located at Jalan Senang, Jalan Suka Surya, and Jalan Suka Agung. Part of the settlement in this Sub-District is quite dense, but another is rather distant. This is possibly because the land in this Medan Johor Sub-District, which is located outside the city, is still quite vast, so people are free to build anywhere. The fact that people build in Medan Johor Sub-District affect to formation of organic mass. Besides, this settlement in Medan

Johor settlement is occupied by Bataknese, who work as carpenter, bus driver, and policeman.

Settlement pattern is also influenced by human culture (Mookodi, 2001). In settlement formation, either in the village or in the city, there are always factors that affect the type or condition of the settlement. These factors are vary in the village and in the city due to different conditions. The settlement in the village is more influenced by cultural factor, such as ethnics, caste, and religion (Sarkar, 2010). On the other hand, settlement in the city is more influenced by needs, lifestyle, and perspective. Neighbourhoods provide residents social needs according to their lifestyle (Oktay, 1998). Besides, man also formed settlement using existing materials. This mostly happens in uncontrolled development (de Bustillos, 2003).

Settlement in Kelurahan Silalas, Medan Barat Sub-District, is one example of settlement which materials' using improvised materials. This settlement is occupied by Javanese, who work as vendor, parking attendant, beggar, entrepreneur, and employee. In this settlement, the house's wall using bamboo plait or wooden plank, roof using zinc, and foundation using wooden poles structure (Figure 22a and 22b).
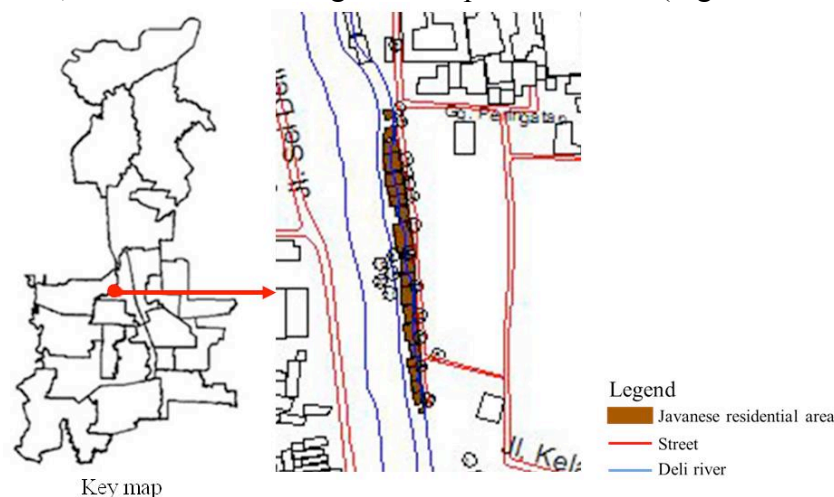
Figure 22a. Settlement in Kelurahan Silalas, Medan Barat Sub-District has houses that made from improvised materials.
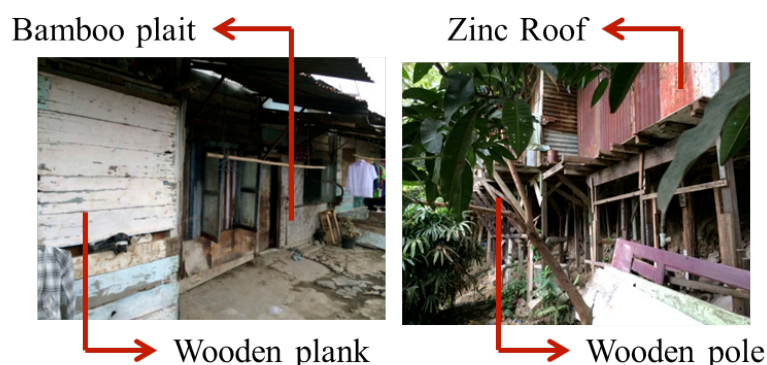
Figure 22b. Buildings are made from materials that are easily found, such as bamboo, wood and zinc.

In Limanarkasi, the old city of Girne (Kyrenia), which still retains its space quality and local identity, there is a small port that creates high economic attractiveness. This

is because the port associated with the transport of goods (export-import) and human resource requirements are high, so many people come and form settlement in the vicinity (Oktay, 1998). On the other hand, in India, precisely in Tamilnadu and Andhra Pradesh, most of the water area had been made shrimp farming area. The shrimp farming creates jobs for the local population with a sizable salary and benefits of shrimp farming is also quite high. This encourages people to form settlement in the area (Kagoo, 2002).

Besides Limanarkasi, this also happens in Indonesia, precisely in Medan Belawan Sub-District, Medan, North Sumatera. In this Medan Belawan Sub-District, there is Belawan city which is a port city in Medan. Belawan city is the only water transport facility in Medan, where the transport of goods (export-import) happens, so many people came and formed settlement around it (Figure 23).

Figure 23. Belawan city is a port city which is located in Medan Belawan Sub-District.
Source: https://maps.google.co.id/?hl=id

In Figure 23, can be seen a very dense settlement in area around Belawan port. Belawan port city is the center of local economic activity, so that triggers the formation of local settlement. Political factor, such as social organization also has a role, either positive or negative, in a settlement (Katsamudanga, 2007: 68). Besides, people in a settlement, in this case slum, can survive because they are empowered by local community and political system that shelter it. As happens in Tehran, Iran, where people are empowered by local community. This community may come from the closest social relationships, even by people of different ethnics, but with the same social status. Besides, people of higher social status and the government also take role in empowering the people in this slum (Babaei, 2012).

This can be seen from settlement in Kelurahan Mabar, Medan Deli Sub-District, which is located near downtown. People in this settlement tend to be empowered by the citizen or local community. This can be seen from the people's occupation. People in this settlement work as builder, labourer, public transportation driver, maid, and employee. This shows that these people chose to live in this area because the location of this settlement which is near to their work location, which is downtown (Figure 24a and 24b).

Figure 24a. Organic settlement in Kelurahan Mabar, Medan Deli Sub-District is formed near the residents' working areas.

Figure 24b. Settlement's atmophere in Kelurahan Mabar, Medan Deli Sub-District which is unplanned and located near downtown.

Environment determines the location of the settlement because it can determine the survival of society (Katsamudanga, 2007). In countryside, people survive by cultivating the surrounding natural resources, such as farming, fishing, hunting, and cattling. In choosing settlement location, people consider the land condition with the existing natural resources, because the people's livelihood largely depends on the land condition. For example, if the land around the settlement is potential as land for farming, then most people in this area work as farmers; whereas if the settlement is located near the sea, then most people in this area work as fishermen, and so on (Kitula, 2006).

In Indonesia, this can also be seen in Belawan fishing village in Medan, Medan Belawan Sub-District. This village is located in the riverside, so the natural resources which have the potential to be processed are all available resources in the river. That's why most of the people in this village work as fishermen (Figure 25).
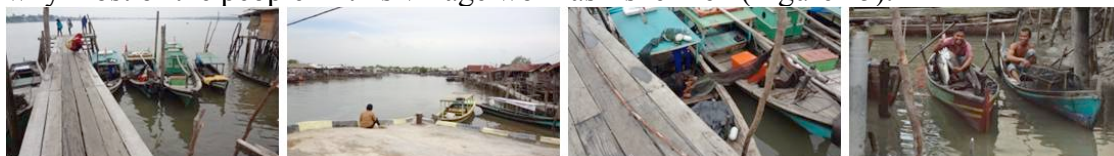

Figure 25. Fisherman Village in Belawan Medan.

An area has a strategic value for a country. This is because the control of area will benefit military (Hensel, 2000, in Weidmann, 2009). Settlement form is influenced by the need for defence against attacks from the outside. This causes many found

settlement built on the side of a mountain or forest (McKay, 1968). Settlement in Bylany, Czech Republic, in 5500-5000 BC also formed because of the element of defence. Residential buildings in Bylany are not all uninhabited, because of the motivation behind the residential development. The motivation is to trap the enemy (Kvetina and Koncelova, 2013: 5). Besides, the type of animal that occupies a location also determines the settlement location. If a site was inhabited by large animal, then this animal can be dangerous to the public, so settlement can't be found in this location (Katsamudanga, 2007). As in settlement in the period before, settlement was formed by considering the safety factor, such as defence from large animals and defence from enemies. Now, safety factor is still one important factor for the settlement formation. In Newfoundland and Labrador, for example, people tend to form settlement in the city because of the low crime rates and a safe and quiet environment (Gien and Law, 2010). At present, the safety factor remains a consideration in forming a settlement. However, the safety factor is not defence of large animals or enemies, but the safety factor against crime. The safety factor against crime is applied in gated community housing type. Cemara Asri Housing in the Percut Sei Tuan Sub-District is one example of gated community in suburban of Medan city. This can be seen from the entrance guarded by security and walls which is boundary to the housing. (Figure 26a and 26b).
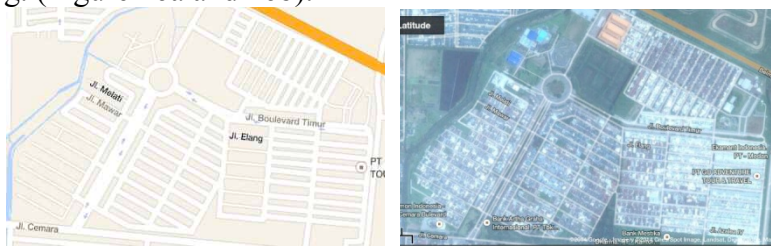
**Figure 26a. Cemara Asri Housing in Percut Sei Tuan Sub-District, Kabupaten Deli Serdang.**
Source: Google Map (2014)
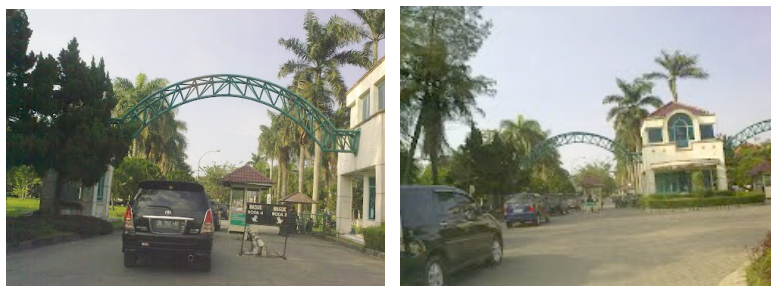
Figure 26b. Gates control entry for the sense of security.
Photo by: Jenny (2014)

Theoretical Concept

The settlement formation is because of evolution, environmental circumstances, and value. There are also phases and forms which are form and development of a settlement (Figure 27).
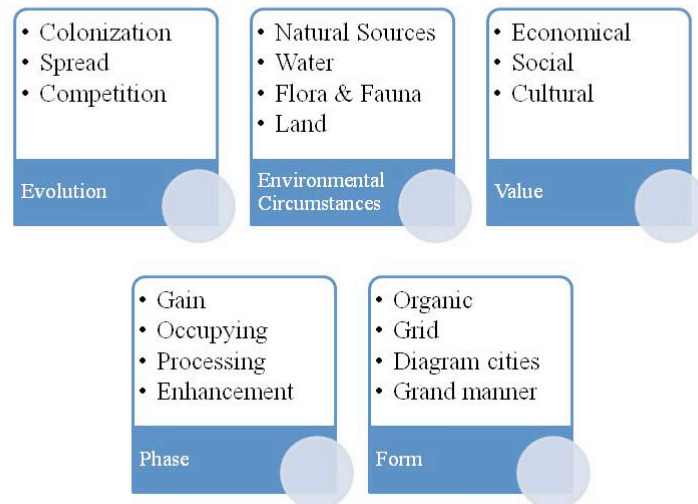
Figure 27. Theoretical concept of settlement formation.

Settlement is divided into 3 types, such as: (a) urban settlement; (b) rural settlement; (c) slum. Settlement can be valued based on certain criteria. Besides that, settlement also has physical elements which are the most important element in settlement formation (Figure 28).
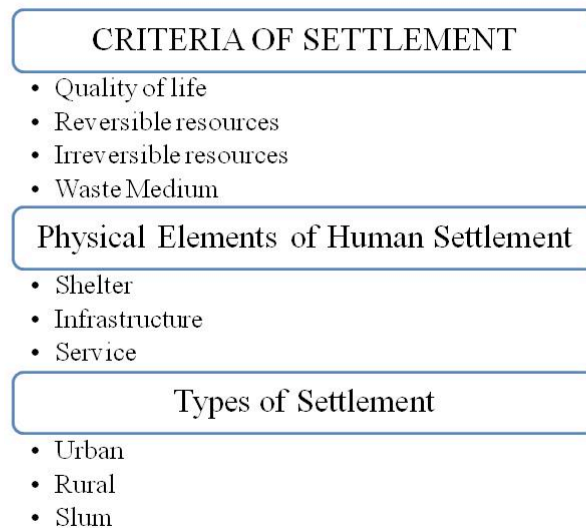
Figure 28. Theoretical concept of settlement.

Settlement pattern can be formed by 2 ways, which are by planned and by unplanned. The planned settlement is built by architect, consultant, government, and the authorities. Otherwise, the unplanned settlement is a form of human adjustment with the surroundings (Figure 29).
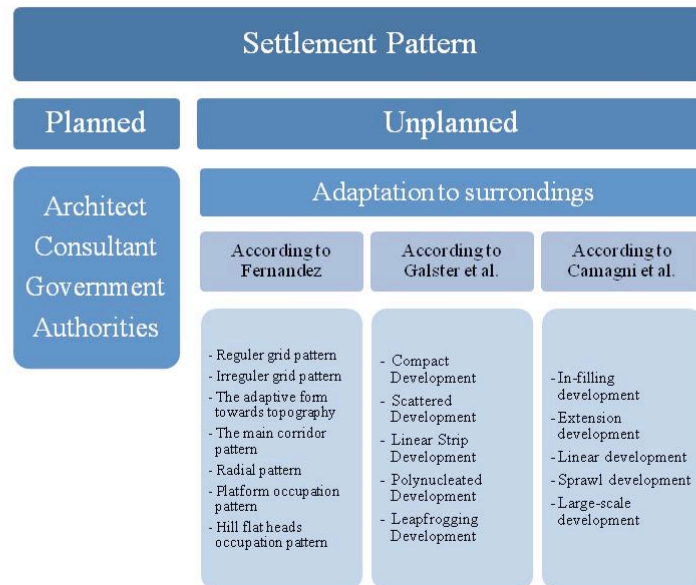
Figure 29. Theoretical concept of settlement pattern.

Social impact take role in settlement formation. Social impact which influence settlement formation, such as social factor, cultural factor, economical factor, political factor, environmental factor, and safety factor (Figure 30).

Figure 30. Theoretical concept of social impact in settlement formation.

Conclusion

The theory concept built by the author provides a clear relationship to the facts about the relationship between the forms of unplanned settlement with the social condition of resident's community. The author has made a theoretical concept about the formation of settlement and settlement forms. In theory, the author states that basically the human have social values that affect the ability to create form and space within a settlement. Social values that affect an individual's personality will determine

the orientation of life. The orientation of life gives an idea that affect the form of unplanned settlement. The idea enriches the theoretical concepts of the social influences on the formation of settlement, especially irregular settlement (organic).

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