Morphological Study of Planned Human Settlement Affected by Service Trade Activities

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Abstract. A planned human settlement is a settlement which is planned and controlled by government. In its development, this human settlement needs support from other areas, for example trade and service areas. However, this service trading area will give effect to residential areas if it's not controlled, especially in its morphological aspects. There are many residential areas which are close to the service trade area and affected by this activity, for example in this case is Tanjung Duren Selatan, West Jakarta. This paper aims to study morphological aspect of planned human settlement affected by service and trading activities. This paper used qualitative method with mapping and parameter assessment based on aspects in human settlement morphology. The study shows that the trade and service sector in Tanjung Duren Selatan give the impact for housing morphology, such as increasing of land use for housing, solid formation dominates more than the formation of voids, morphological formation of figure ground theory, linkage and place that adjusts the impact.

Keywords: settlement; trade service; morphology, study

1. Introduction
A dynamic developing city cannot be separated from the development of the service trade sector. The service trade sector that grows in a region reflects the development of the region itself. On the other hand, a city that is developing dynamically will lead to increased demand for space, especially the need for residential area[1].

In urban areas, service trade areas are often seen alongside residential areas. The existence of this service trade area, more or less, have an impact on settlements, both from the physical aspects of the environment and the impact in the form of socio-economic. Furthermore, this raises social changes and these changes are manifested in the physical form of the region. Products of social change in the physical area are known as morphology[2].

Morphology is the physical appearance of the area in terms of the structure that forms the shape of a particular appearance. Physical appearance of morphology is not only a form but also the existence of relations between areas.

Tanjung Duren Selatan is an urban village located in Grogol Petamburan District, West Jakarta. In this region there are service trade superblocks, namely Podomoro City and Taman Anggrek Mall. The existence of the service trade area in Tanjung Duren Selatan is adjacent to the residential area that has been there before.
Existing land use in this location study is mixed land use which consists of settlements and trade services. This service trade is also supported for the existence of the Podomoro City superblock area and Taman Anggrek Mall. This area has an activity character which is a mix used development [3]. Many land use functions have sprung up, for example the emergence of eating places, houses that have turned function into kiosks / stalls and varied land uses in this area. Retail presence is also seen in this region. Therefore, this random land use will affect the growth and development of the region in the future.

Morphology is defined as knowledge to study the physical form of a city. Morphology is a form of science or approach to understanding the development of a city that continues to experience changes during its development process through the form and pattern of urban spatial structure [4].

The physical appearance of residential areas in Tanjung Duren Selatan developed with the function of settlements. Continuous development without control results in random shapes, making it difficult to predict future needs. The existence of the existing service trade area also has an impact on the physical appearance of the existing area. Thus, research will be carried out to examine the physical appearance of the Tanjung Duren Selatan residential area due to existing trade services.

1.1. Planned Human Settlement

In the physical form of cities, there are several types of settlements which can be classified as planned and unplanned settlements [5]. Planned settlements are settlements whose overall planned development includes road facilities, drainage, open space, mass management patterns, and so forth. Unplanned settlements or spontaneous settlements built in stages from units by each owner with unplanned environmental conditions such as roads and drainage. According to Yunus [6], continuously uncontrolled settlement development will become a building-dense settlement, unregulated and a trigger for taudification or the process of forming slums.

1.2. Morphology

In designing a city, Trancik in Yunus [7] assumed that cities can be approached from 3 approaches / theories, namely Figure Ground Theory, Linkage Theory and Place Theory. These three theories will give an idea of the morphological characteristics of a city. Furthermore, these three theories will be useful for analysing potential problems that exist in the study location.

1.2.1. Figure Ground Theory. This theory emphasizes the relationship between the form that is built (building mass) and open space (open space) from an area / urban environment. In theory, what is meant by Figure is mass that is built in an area. Usually the map is shown in black. Meanwhile, the Ground is an open space in an area or all the space outside the built mass. Usually in maps it is shown in white. This theory can be used to analyse the texture and patterns of urban spatial planning and identify problems related to the mass / urban space.

1.2.2. Linkage Theory. Linkage means a pseudo line that connects between one element with another element, node one with another node or district one with another district. This line can be in the form of road networks, pedestrian lines, open spaces in the form of lines and so on. Linkage theory is an analysis that is used to pay attention to and confirm the relationships and movements of an urban fabric. This theory sees cities as dynamic and urban dynamics can be used as generators / generators of urban activities.

The most important thing about Linkage Theory is the integration of 2 regions visually and connecting two regions with priority to one area. An example is a linkage to see the relationship between the core city and its satellite city. The relationship of a place with others can be seen through a visual, structural or collective form of acceleration.

1.2.3. Place Theory. This theory is related to space / space which lies in understanding or understanding of culture and human characteristics of physical space. Space is a void that lives and has a physical
connection. This space will be a place if given a contextual meaning from the cultural content or local content potential. Place Theory sees the design of cities approached from how big the interests of urban places are open to history, culture and socialization. Place analysis is a tool for giving understanding of urban space through signs of urban life and giving understanding of urban space. The nature of place theory in spatial design lies in understanding culture and human characteristics in its place. An architect in designing a city / region based on the place theory approach, must pay attention to the history of society and the location, culture and historical monuments that may exist as a basis for design so that the direction of the development of the city can be determined.

2. Research Method
This study is used mapping analysis and qualitative descriptive analysis to gain potential and problems that exist in the study location. In this study, observations of existing settlement morphology were carried out by referring to the three previously mentioned theories, namely Figure Ground Theory, Linkage Theory and Place Theory. The morphological formation observed was changed in land function and physical formation of the area. The results of the observations are then transformed into regional maps and analysed based on the theory.

3. Discussion and Result
Tanjung Duren Selatan is located in Grogol Petamburan District, West Jakarta. The study location has an area of 1.77 km$^2$, with residential land use of 1.66 km$^2$ and the use of service trade 0.11 km$^2$(8). The study location can be seen on figure 1.

![Figure 1. Study Location Boundaries in Tanjung Duren Selatan](image)

Land Use Conversion
The development of trade and service activities in a region spatially has had an effect, such as the addition of a wide area to the built due to similar activities and supporting activities that arise. Expansion of built-up areas such as commercial land use, trade in services, and public facilities occurs by occupying areas not built so as to reduce the area of vacant land [9].

The existence of Central Park mall, which was established around 2009 - 2010, also had an impact on land changing in Tanjung Duren Selatan Village, especially for residential land use and service trade. The percentage of land changes that occur is presented in the following charts as seen on chart 1 and 2.
Chart 1 shows that the percentage of land use for housing in 2009 - 2010 was 75.69% of the total land area or 1.34 km$^2$ and increased to 93.79% of the total land area in 2011 or 1.66 km$^2$. In graph 2 it also shows that the percentage of land use for services trade in 2009 - 2010 was 1.48% of the total land area or an area of 0.026 km$^2$ and increased to 6.77% of the total land area in 2011 or an area of 0.11 km$^2$.

The increasing of land use for housing was affected by increasing the service trade activities in the Podomoro City area. Apartments that are part of housing contribute to this increase. The market share for vertical and landed house housing in Tanjung Duren Selatan is increasing due to the ease of access to Podomoro City as a one stop living center. People who want to work in the Podomoro City area can choose to live in Tanjung Duren Selatan. The community does not need long time to arrive at the Podomoro City service trade area or in the Central Park mall, and both daily and secondary needs can be easily found in this region. This trend is a factor in the increase in land use for housing in Tanjung Duren Selatan.

**Housing Morphology**

Tanjung Duren Selatan has 2 types of building mass typology (solid), blocks seen from several areas such as the Podomoro City superblock area and solid formed from residential settlements that are parallel to road formations. For void typology (space) is seen with a linear open system because it follows the shape of the residential environment which is a main road. There are also a number of closed systems that focus on several points in the residential area as well as in the superblock area. The solid void typology of study location can be seen on figure 2.

**Figure 2. Solid Void Typology in Tanjung Duren Selatan**

From this solid void it is also seen that solid formation dominates more than the formation of voids that exist. This is happened as the impact of the high intensity of land use in Tanjung Duren Selatan.

While in terms of urban texture, overall urban textures in Tanjung Duren Selatan region are heterogeneous, visible from several scattered masses and different shapes and heights so that they look
like unregulated areas and can adversely affect the city's image. The urban texture in Tanjung Duren Selatan can be seen on figure 3.

Figure 3. Urban Texture in Tanjung Duren Selatan

For the linkage aspect, the linkage that appears is a visual linkage. The visual linkage in the area is marked by the axis of the road, namely Tanjung Duren Timur Raya road which is neutral or serves as the main lane connecting between regions and is characterized by rows of trees and buildings around the road so as to form line elements. The linkage in study location can be seen on figure 4 as follows.

Figure 4. Linkage in Tanjung Duren Selatan Appears as Visual Linkage

Next element is path. As a connector for human and vehicle mobility, path also can make urban structure. There are 2 main path in this area. First, Jalan Tanjung Duren Selatan which is connecting settlement in Tanjung Duren Selatan and Jl. Letjend S. Parman (beyond area). Secondly, Boulevard Podomoro City which is connecting superblock Podomoro City with Jl. Letjend S. Parman. As a connector for 2 district/area, these 2 paths are always crowd by vehicle. Beside, retails are seen alongside Jalan Tanjung Duren Selatan. Figure 5 shows path element in location study.
Figure 5. Path Element in Tanjung Duren Selatan

Edges are terminations of a particular district or region. Formation of building masses forms and limits a particular functional area with other functional areas within the city. Grogol River is a very clear edge to the east of the area, but in the north, east and west it still does not stand out because it is a building with less clear mass.

District is an integration of various functional activities which generally focus on certain areas in the city. This concentration is based on the main orientation, interests and role within a city. Figure 5 as follow, shows the district element in study location.

Figure 6. District Element in Tanjung Duren Selatan

As a result of trade in service activities in Podomoro City superblock, it has resulted in 2 dominant district formations, namely districts in the form of residential areas that dominate the region and districts in the form of markets and retails spread in several points in Tanjung Duren Selatan.
Nodes are a meeting between several roads / aisles in the city, thus forming a space that is usually the center of certain functional activities. Each node has different characteristics, both the formation of space and the pattern of general activities that occur. Buildings located at these nodes are often specifically designed to provide a certain image or space identity.

The increasing trade service activities in Tanjung Duren Selatan makes Kopro Market as regional nodes. It is no longer a settlement that has become nodes in Tanjung Duren Selatan.

Landmark is one of the elements that also enriches urban space. Landmark is buildings that provide certain images so that they are easily known and remembered and can also provide orientation for people and vehicles to circulate. A good landmark is a physical structure that stands out from the surrounding environment but is still a harmonious part of the whole environment.

The increasing of service trade activities in TDS make Podomoro City a landmark for the region. It is no longer a settlement but is a landmark in TDS.

From this discussion on settlement morphology in Tanjung Duren Selatan, the typical formations of existing settlements are less prominent. The existing form of housing has no difference with other regions. The influence of the trade and service area indirectly took over the formation of morphology in Tanjung Duren Selatan settlement. If there is no appropriate utilization control, the existing settlement will lose its identity.
4. Conclusion
Regarding the analysis, the study shows that the trade and service sector in Tanjung Duren Selatan give the impact for housing morphology such as increasing of land use for housing, solid formation dominates more than the formation of voids, morphological formation of figure ground theory, linkage and place that adjusts the impact.

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