

MORPHOLOGY OF URBAN SPACE: Model of Configuration using Logic of Space (LoS) Theory in densely populated of Bandung City

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Abstract - A city through the years is always growing and developing along with the development of a variety of urban activities. One of the triggers of the development is the city residents. The increase in population resulted in increasingly high demand for settlement. Moreover, the surge in population also occurred in Bandung city, where one of the changes in the use of space is visible in Taman Hewan Balubur-Tamansari. This area is growing and changing from being a compact place to a solid kampong with an extensive use of space. The purpose of this research basically was to reveal the configuration and the visibility of the changes that occurred as well as examine what factors that caused the occurrence of a change in the use of space function in Taman Hewan Balubur-Tamansari in Bandung. Research used a descriptive approach. As for data collection, this study used questionnaire and analysis with LoS (Logic of Space) theory.

This study addressed the thought (value system) of the community based on empirical phenomena in the education area of the settlements that are located in the major cities of Indonesia, which was then analyzed in inductive and qualitative ways. Through a qualitative research method using grounded theory, the study was expected to contribute to the vocabulary knowledge of space theory in addressing the urban density of the urban space as the impact of urbanization and student migration. Moreover, research aimed to enrich the theory about the local cultural values settled in the area of education in major cities of Indonesia, where the findings of the local theory eventually provide the realization that the value spaces for people living in the neighborhoods of the city is not only for quantitative aspects, but also for the concept of the basis theory of spaces in the city. All this time, the architectural space theory is always used to the idea of space based on the theory from the West.

Keyword : Open space, Community participation, Sustainable city

1. Introduction

The living condition in Indonesia is generally in a favorable position as well as the opposite since the country is located in the Equator with the climate of tropical wet. This is caused by high temperature, solar radiation, precipitation, and humidity as well as the characteristics of different wind with other regions. In a matter of years some shift patterns and prominent change in the order life occurred in a number of developing countries including Indonesia from an agricultural life-traditional shifts into a modern industrial life (Karyono, 2014). These conditions change the behavior and human way of looking at the environment. The shift in the traditional agrarian-life in harmony with nature and not subject to modern technology as a form of maintaining sustainability of nature has shifted. In the process, shifting order of life from an agricultural-traditional order into

modern technology not rarely brings up a number of problems for the life of the community. The issue is growing in all sectors, including sectors of housing and neighborhoods.

Regional development is an attempt to encourage the development of social economy in order to grow well and keep the continuity of life through conservation and environmental balance well against a region or between regions. It is in line with Bratakusumah opinion which states that development is basically inseparable from growth, this means that a regional development can lead to the growth of both physical and non-physical (Hairudin, 2008). Growth can be a development/distribution or increased activity undertaken by individuals or by community. The progress of a civilization on the environment the community is testament to the history of the development of a city. According to Soetomo (2012) the city as a whole covers two aspects, namely: the physical aspect as a manifestation of the space elements and the human aspect of development as the subject and the user space of the city. The community development to urban life historically has been shown as an activity that led to a better life than before. An increasing number of inhabitants can result in improved living space requirements which will trigger the growth and development of urban areas. The development of an urban area basically contains two consequences, namely the existence of the intensification of land use in city and the extensification of land use towards the outskirts of the city (Sujarto, 1992; Daldjoeni, 1996; Permana, Soetomo, Hardiman, and Buchori, 2013; Permana, 2014; Permana, Sumarna, and Wijaya, 2017).

Implementation of housing developments and settlements both in rural and in urban areas must always pay attention to the arrangement of space in the area concerned so that there is conformity between development or synchronization of the housing construction and settlements with spatial territory itself. Housing is one of the basic human needs, in addition to the need for food and clothing. In the daily life of human, housing has a strategic function as the place where social interaction in terms of culture, fostering the younger generation, the search for identity, and at the same time the housing serves as economic assets. Therefore, the residential development is a strategic sector and is one of the indicators of success that need attention in order to create the well-being of society. The function of the land always changes over time as the increasing needs of human space. This change in space caused by changes in the demand for land for settlement is likely to continue to increase. This is in line with the growth and development of an urban area, resulting in mastery and uncontrolled land use. In addition, changes in function of the use of space usually occur with symptoms of "penetration" (Umar, Sela, and Tarore, 2016) and the new function of tunneling into a homogeneous function. In the process, symptoms of changes in the utilization of space, thus became a natural symptom in an evolution of the city. The form of this change does not happen uniformly in each location, because every land has different strategy level depends highly on the potential. Land use allocation in urban areas will lead to a site that can provide the highest profits (Umar et al., 2016), so lands that have strategy level depends highly on the greater potential will have more chance to experience the process of changing land use. These symptoms generally occur in major roads or areas in particular that has its own characteristics and uniqueness. The activity of the economy of trade and services (commercial) is the easiest sector grow in strategic places.

Functional change of the use of space in the city of Bandung is visible in almost all of its territory. One of the areas that is experiencing changes in the use of space is Taman Hewan Balubur-Tamansari. One of the causes of the occurrence of a change of function space utilization is the migration of students. Activities that occur with marked changes in the function of private residence became the lodge as well as the presence of the development of empty land (of open green space and boundary river).

1.1 Research Question

With the rate of population growth higher, Bandung from year to year is becoming an increasingly dense residential area especially in the city center. It is characterized by the construction of the settlement in different parts of the region. Unfortunately, the development of this sector is often put aside so that the function of land in other sectors can change. Land-use change is actually very favorable to the residents due to the changes that occur to accommodate the activity transpiring. This can further enhance the economy of the population. However, sometimes the changes that occur are not coupled with policies set by the Government of Bandung city, giving rise to irregularity of the area. Therefore, the development of residential areas and settlements of current and future use of space planning required should be mature, so that all the potential of the region in relation to the growth in the residential and Settlements can be optimally harnessed. Thus, in this

study the authors formulate problem, namely: "What is the spatial patterns of the growth area of the settlements in Taman Hewan Balubur-Tamansari Bandung?"

2. Literature Review

2.1 Logic of Space (LoS) Theory

City is a form of expression of human life as an acculturation of cultural, economic, and social contained in a physical form. The development of the city is affected by some aspects such as: population development, progress in the field of economic, social, cultural, and technology in urban areas that will drive an increase in standard of living and level of mobility. [Kostoff \(1991\)](#) explains that the morphology of the city can be seen as the result of the evolution of life history that is specified by two decisions, namely, by planning and by the process of the development of the city ([Soetomo, 2012](#); [Permana, 2014](#); [Permana and Wijaya, 2017](#)).

The growth of the settlement in an effort to meet the demand of a dwelling, that is affected by the increasing number of population density and economic growth of the community, puts an impact on many things such as increasing accessibility to the area itself as well as between different regions, the increasing needs of a wide range of services, including infrastructure and means of settlement, transport, social facilities as well as public facilities. As a result of the fulfillment of the needs of that land, in reality, some infringement rules against specified spatial occurred, such as illegal land use using the border rivers as well as aggravated trespass public space becomes land residence. The condition is triggered by a number of factors including lack of understanding of the spatial functions, the function of institutional authorities haven't run with maximum capacity. If neglected, it will negatively affect continuity of the life of a neighborhood area.

The spatial system is composed of two main components ([Carmona, M., Heath, T., Oc, T., and Tiesdell, 2003](#)) namely the layout and configuration. Physically, this spatial system manifests in morphology. The second component is very important because it is the defining human movement and can be used as a parameter in the development of the region ([Siregar, 2014](#)). Configuration ([Darjosanjoto, 2006](#)) can be defined as a set of relationships in which there are objects which are interdependent with one another in a structure ([Hillier and Hanson, 1984](#); [Hillier, Burdett, Peponis, and Penn, 1987](#); [Hillier, 2007](#)). In the context of urban space, this relationship is embodied in the interaction space that can be identified from the movements from one space onto another space. With the object in the form of spaces, the strength of this interaction is influenced by the properties of the space system morphology, among others:

- Land use, building structures, pattern plots and pattern-road network ([Carmona, M. et al., 2003](#))
- Buildings, open spaces, pattern plots and road network ([Moudon, 1997](#)).

Among the properties of the morphology, pattern network becomes an important component in the design of the city as it affects aspects of the quality of the space in the form of permeability and accessibility ([Carmona, M. et al., 2003](#)). Permeability is a parameter that measures the extent to which the space configuration provides options in travel and accessibility is a parameter that is measured from the interaction between individuals with the spatial system. Hillier and Hanson, (1984) explains that the pattern and intensity of movement of individuals is affected by the configuration of the space, even the structure of the space can be considered as the sole determinant of the most influencing in the movement of space ([Carmona, M. et al., 2003](#)). To measure interaction in configuration space, space syntax uses several dimensions as measured by applying the concept of topological distance called the depth.

2.2 Dynamics of Regional Growth, Increased Land Needs and Use

Related to the issue of land and urban land use, the determination of housing and settlements location according to ([Budihardjo, 2009](#)) shows the division in space and the role of the city, such as the residential area of work, the shops, and also recreation area ([Jayadinata, 1992](#)). While the land use relating the aspect of accessibility for facilities service of the city tend to approach the access of goods and people to be close to the transport links and accessible for the settlements and places of work as well as other facilities.

The growth dynamics of urban area and increasing land needs is a set of interplay which connected to one another. According to [Zahnd \(1999\)](#) the life of the city has been more identified with the ecology of the city that involves three basic relationships very closely i.e. the dynamics of

economic, political, and cultural city. While planning a city can not be separated from its spatial layout aspect, space is the form of structural and space utilization patterns, whether planned or not (Kostoff, 1991; Soetomo, 2012; Permana, 2014; Permana and Wijaya, 2017).

Land use in a city is generally shaped in a certain pattern and its development can be estimated. The city's development decisions are usually free while still considering the land use planning. Economic motives are a primary in the establishment of land use structure of a city with the incidence of business centers. There are also economic motives other than political motives, the physical form of the city, such as topography and drainage. Although the structure of the city looks irregular, the structure still has a particular pattern of regularity. Physical buildings form an internal charm of the city. The theories of the structure of the existing city used examines land use forms which usually consists of the use of land for settlements, housing, business, industry, agricultural, and services. Jayadinata (1992) explains that the land is of the existing allocation and generally there are owners (individuals or institutions). While according to Sugandhy (1999), it is a land surface of the Earth as the place of the human activity. Land is a finite natural resource, where in their use requires the Setup, provisioning, and purpose formulated in plans for the welfare of society (Kostoff, 1991; Santoso, 1994; Kostoff, 1999). Malingreau, Chriatiani, and Rosalia (1981) describes the land use is a work of collective human hands either permanently or periodically for the land with the aim to meet the needs, both spiritual as well as material needs (Permana, 2012; Soetomo, 2012; Permana, 2014).

The increasingly rapid population growth, particularly in urban areas, as well as the increasing number of demands in community needs of the land, often resulting in the onset of a conflict of interest for the use of land for various uses. Sometimes it is found that the land use is not in accordance with the allocation. If not immediately addressed, at some point, it will lead to the occurrence of land degradation. Theoretically, the extent to which land resources allocation is efficient can be achieved through market mechanisms. Moreover, the allocation depends on whether the rights of possession (ownership) can control the set of characteristics of land resources (Budihardjo, 2009; Widjaja, 2013). The set of these characteristics among others are: external things, incompatibility between the alternative usage, transaction expenses, economies of scale, the aspect of equity and justice (Rapoport, 1990; Santoso, 1994; Setioko, 2010).

In practice, Governments in most countries in the world hold a key role in the allocation of land. Since the land has a significant function and role in the public life (economic, political, social, and cultural), the government holds strong legitimacy to govern land ownership. The role of Government in the allocation of land resources can be an indirect land policy such as taxes, zoning, as well as direct policies such as the construction of reservoirs and land tenure such as forests, mines, and so on. Thus the role of Government through a system of planning region is intended to: (1) provide land resources for public interest, (2) enhance the harmony between different types of land use, and (3) protect the property rights through restrictions on harmful activities (Budihardjo, 2009; Setioko, 2010; Permana, 2012a).

Home and housing should be seen as part of the settlement and settlement environment environment is part of the environment. Expansion for settlements and housing led to changes in the natural environment which all function as water absorption area into an artificial environment that rejects the water absorption. Contradiction between the necessity of housing and settlements in order to improve the welfare of society with efforts in environmental conservation as the two sides of a coin which cannot be separated from each other (Budihardjo, 2009; Rachman, 2010). According to Catanese and Snyder, (1989), that the planning of land use was strongly influenced by human, activities, and location where relationships between the three of them are very tight, so that it can be seen as a cycle change of land use. This can be seen in Figure 1.

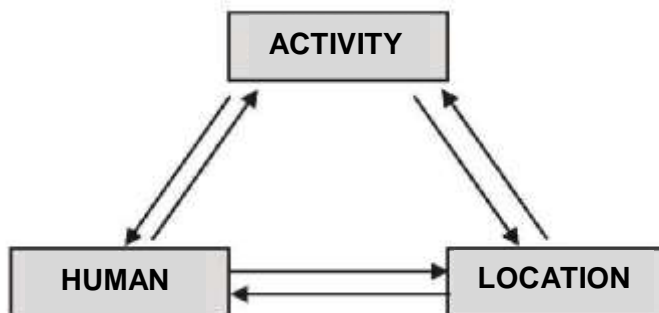


Figure 1. Cycle of Change in Land Use
Source: Catanese and Snyder, 1989; Rachman, 2010

Based on Figure 1, it can be understood that by referring to the growth of urban areas that are interpreted as cities as a process, this shows that the dynamics of urban growth cannot be separated from 3 (three) main elements namely economic dynamics, political dynamics and cultural dynamics, which can be explained as follows:

- Economic dynamics can be in the form of; (a) land status related to topography and human intervention situations, (b) hierarchy of values related to use value and exchange value, (c) level of structure related to global and local.
- Political dynamics or management system, is the role of parties involved in a dimension of urban or regional life. Politics in this case can also be formulated in a simpler scope with the meaning of policy. A policy becomes a very necessary thing in the city development process because the process is the implementation of a number of decisions by individuals and groups for the benefit of many people.
- Cultural dynamics, is an element of culture as a form of city physical space that is more to the nature and character of the community both in rural and urban areas. Usually life that interacts between certain communities will form a residential environment where there are various ethnic cultures that blend.

2.3 Spatial Patterns, Patterns of Land Use and Regions, and Changes in the Function of Utilizing Urban Spaces

Spatial use is an effort to realize the spatial structure and spatial pattern in accordance with spatial plans through the preparation and implementation of programs and their financing. Changes in spatial use can be in the form of utilization of land that has not yet been built into built-up land or in the form of conversion from one type of utilization to another. One of the main objectives and uses of land is to get the highest added value from activities held on land. [Soegijoko, Tjahjati, and Kusbiantoro \(1997\)](#) explains that the notion of land use change is function transfer or land mutation in general concerning transformation in allocating land resources from one use to another.

Land Use Patterns is an arrangement of land use that includes the use of the earth both on land and the designation of the earth in the ocean. Meanwhile, land use is a sustainable process for construction purposes to be optimal and efficient. Land use is a reflection of the relationship between circulation and activity / function density in the region. Each region has different land use characteristics, according to its capacity, ease of access, physical conditions of nature, transportation systems and individual land use needs ([Jayadinata, 1992](#)).

When viewed from the physical form of urban space or also called the city morphology is a result of the formation of social, economic, cultural and political life ([Soetomo, 2012](#)). This can be interpreted that the physical form of urban space describes the arrangement of space which is influenced by various constituent elements such as socio-cultural community, economic growth and political decisions of a region. This will form a directed systematic structure and functionally related as a spatial reflection of the development or growth of a region. The existence of two key bases in forming the spatial elements of the city, namely the physical basis of a city is the embodiment of appearance in the form of buildings, pathways, and other objects that affect the shape of the city, and the economic basis ([Catanese and Snyder, 1989; Hairudin, 2008](#)). This indicates that the basic physical and economic basis is a spatial element that also influences the growth of a city or region where there is interaction between regions as part of a process of forming the character of the region. Theories regarding the growth and development of the structure of urban areas with patterns of land use are stated by: a). Concentric Theory, b). Sectoral Theory, c). the Multiple Nuclei Theory.

Meanwhile according to Von Thunen, the value of land rent is not only determined by its fertility but also by function of its location. Von Thunen's approach to liken the center of the economy is a city surrounded by land which is of a homogeneous quality. The land use produced can be presented as circle rings which are concentric in shape surrounding the city ([Darmawan, 2009](#)). This Model Zone can be seen in Figure 2.

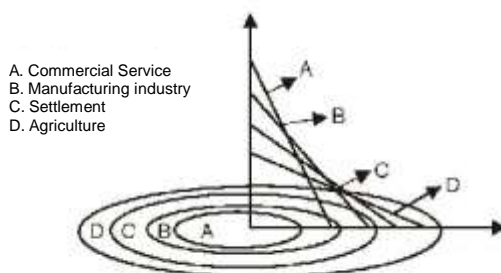


Figure 1. Zone Model (von Thunen)

Source: [Catanese and Snyder, 1989](#); [Rachman, 2010](#)

It can be seen from Figure 2 that ring A represents land use activities for commercial services (downtown). In this region, land rent reaches the highest value. B, C, and D rings each represents land use for industry, housing, and agriculture. The relative increase in land rent will increase the terms of trade of commercial services, thereby shifting the land rent A curve to the right and a portion of the ring B area (industrial area) converted to A, and so on. In addition, conversion of agricultural land (ring D) to settlement allocation (ring C) also occurs. In a market system, land conversion takes place from activities that produce lower land rent to activities that produce higher land rent.

2.4 Factors of Changes in Land Use, Regional Patterns, and Urban Spatial Expressions

[Sugandhy \(1999\)](#) explains that land change is a substitute for land use for other land uses. Since the area of land does not change, the addition of certain land uses will result in a reduction in other land uses. The factors that influence changes in land use in urban areas are: (1) topography; (2) residents; (3) land value; (4) accessibility; (5) infrastructure and facilities; and (6) carrying capacity of land .

[Yoelianto \(2005\)](#) suggests that on a broader scale, the overall shape of the city reflects its geographical position and the characteristics of its place. Based on this theory, it can be interpreted that the development of a city can be determined by the geographical position and characteristics of the place where an activity process takes place to form patterns that follow the conditions of the region.

A pattern can help deal with problems regarding constancy and change in city design and help determine basic guidelines for determining a concrete urban environment design according to the texture of the context. The theory of ground figure in urban planning is a textural relationship between the building mass and open space. This method can identify a texture and patterns of an urban spatial (urban fabric), as well as identify the problem of regularity of mass / urban space ([Zahnd, 1999](#)). Based on the terminology, a figure is a term of mass that is constructed (usually shown in black) and ground is the term for all space that is outside the mass (usually indicated by white). But sometimes a ground figure is also described in the opposite color so that it can express certain effects. From the ground figure, it can be seen the state of texture of the city / region. Texture patterns of urban areas can be very different because the texture differences of these patterns reveal architectural differences in life and urban activities. By analyzing the texture patterns of urban areas and finding differences in data on these patterns, information will be obtained that shows the characteristics of the order of the region and its environment ([Zahnd, 1999](#)). Regional patterns in texture can be classified into three groups, including:

- a. Homogeneous Area Patterns (clear homogeneous region arrangement, where there is only one pattern of arrangement. In this pattern, the solid and void elements that make up the area consist of forms that tend to be the same, and usually show a high density level).
- b. Heterogeneous Region Patterns (Arrangement of heterogeneous regions, where there are two or more colliding patterns. This pattern usually has more forms of solid and void elements, thus forming a quite varied composition).
- c. Spread Area Patterns (spread area arrangement with chaotic tendencies. This area is usually formed on certain causes. It is seen that this area is not integrated between one function with another, so that it looks like an unplanned area).

Three (3) patterns of this region can be illustrated as follows:




Figure 3. Urban Area Patterns

Source: [Catanese and Snyder, 1989](#); [Rachman, 2010](#)

The system of relations in the texture of ground figures recognizes two groups of elements, namely solid, which are blocks of building masses and voids which are the outer spaces formed between these blocks. There are three basic elements ([Zahnd, 1999](#)) that are solid and four elements that are void, namely:

Table 1. Figure Ground Element

ELEMENT	BASIC ELEMENT	DESCRIPTION	ILLUSTRATION
Solid	Single Block	Single elements are somewhat individual. This element can be seen as part of a larger unit, which usually has important properties, for example as a determinant of angles, hierarchies, or connectors	
	Side defining block	This element can function as a linear barrier formed by these elements from one, two or three sides.	
	Terrain block	This block has a variety of masses and shapes but each of them is not seen as individuals but is seen only as a whole mass.	
Void	Linear closed system	This element is paying attention to the linear space, but somehow seems closed. This system element is the most often found in cities	
	Centered closed system	This element has a space pattern that seems to be concentrated and closed. This space can be observed in the city center and in various regions.	
	Central open system	This element gives an impression of an open space, but still looks concentrated. This element appears on a large square, a city park and so on.	

ELEMENT	BASIC ELEMENT	DESCRIPTION	ILLUSTRATION
	Linier open system	This element has a linear pattern of open space. For instance, this element appears in the river area.	

Sumber: Zahnd, 1999; Rachman, 2010

According to Yunus (1999) the city's morphological approach is one approach that is directly related to aspects of urban and rural land use that highlight the spatial existence of manifestations of their characteristics. Yunus (1999) further stated that some experts tried to show variations of spatial expressions of the morphology of the city namely square shapes, rectangular shapes, fan shapes, round shapes, ribbon shapes, octopus shapes, and non-patterned form.

One of the forming elements of the city's morphology is the pattern of the road, where there are 3 (three) types of road pattern system known as: (1) irregular road pattern system; (2) a concentric radial system; (3) a system of rectangular or grid systems (Yunus, 1999).

2.5 Driving Factors of the Growth of Settlements

In relation to population distribution with the growth of housing and settlements in both urban and rural areas, which are relatively flat, they will form separate patterns which are influenced by their geographical position and characteristics of the place (Yoelianto, 2005). This reflects that the relatively flat topographic conditions in the study area are the basic capital of housing and settlement growth. Furthermore, the things that must be considered in the development of housing are zoning; utilities; technical factors; locations; aesthetics; community; city services; and costs (Catanese and Snyder, 1989).

In general, the housing and settlement environment is inseparable from the support of the availability of environmental infrastructure and facilities. Infrastructure systems can be defined as physical facilities or basic structures, equipment, installations that are built and needed to support the social system and economic system of society (Grigg, 1988). According to the Housing and Settlement Hanson (1998), environmental facilities are supporting facilities that function for the implementation and development of social, economic and cultural life. Today, the potential for urban development is more influenced by the attractiveness of the city due to the accumulation of economic business activities in the industrial sector and services.

The development of cities and towns often broadens at the same time as these industrial and service activities make the city a labor market that provides agglomeration benefits and leads to high levels of productivity and efficiency. On the other hand, the ability of the city to provide infrastructure and facilities in accordance with the level of community needs is an important part of maintaining the momentum of the city's development. Therefore, the continuity and sustainability of a city must be supported by adequate facilities and infrastructure in accordance with the needs of the community. Planning means that the pattern of spatial use is a form that describes the size, function, and character of human activities and / or natural activities. The manifestation of spatial use patterns includes location patterns, distribution of settlements, workplaces, industries and agriculture, as well as patterns of rural and urban land use. One of the goals in spatial planning is the achievement of quality space utilization for:

1. Realizing an intelligent, virtuous and prosperous nation's life;
2. Realizing integration in the use of natural resources and artificial resources by paying attention to human resources;
3. Increasing the use of natural resources and artificial resources in an efficient and effective manner to improve the quality of human resources;
4. Realizing protection of space functions and preventing and overcoming negative impacts on the environment;
5. Realizing a balance of welfare and security interests.

Karyoedi (1993), describes that the criteria for assessing the ability of a city can be seen from the perspective of its potential. The strategic geographical location will greatly support the acceleration of development compared to its isolated rear areas. On the other hand, urban development is highly dependent on the ability to create and attract productive resources from outside that are needed by the market. Factors that influence the development of a city, namely:

- Factors which are basic capital, namely city land, sources of funds and residents.

- Supporting factors which are the primary functions, namely industrial activities and commercial services that are attractive to the workforce.
- Supporting factors which are secondary functions or factors forming the internal structure of the city in the form of a residential environment, public service facilities, urban infrastructure and labor.

2.6 Space Configuration

Hanson (1998) states that a house is not only a collection of individuals but is a complex pattern of space that it creates, governed by rules and conventions about space size and configuration, which domestic activities go together. How should the interior be decorated and furnished; What types of household objects are in accordance with their respective arrangements; How family members relate to each other in different spaces; and how and where guests must be accepted and entertained at home. Hanson (1998) introduces computer-based techniques designed to take and interpret social wealth and symbolic information. Various representations and actions show that how domestic space provides a common framework for everyday life, how the social meanings are built at home and how various sub-groups in society distinguish themselves through patterns of domestic space and lifestyle. Basically, homes everywhere are the same to serve the same basic necessities of life, cooking and eating, entertaining, bathing, sleeping, storing and the like, but seeing architectural records reveals that there are a variety of activities accommodated in homes according to historical and cultural periods different. The most important thing about a house is not because of the list of activities or space but in the pattern that is arranged by conventions about what space is there, how they are connected together and how the sequences, activities carried out together and activities separated, how the interior, and even what types of household objects must be displayed in different parts of the house.

Space is a network, norms, activities and artifacts that are able to facilitate, accommodate and shape people's lives. In this case, space is a media of behavior transformation. A good space is one that is adaptive and dynamic and has cultural strength so that behavior can adapt to maintain that space. In the process of socio-cultural transformation "cultural space capital" is very necessary. This is because what happens is not only dualism (based on theory, that one party works) but there is a process of "fading out of socio-cultural capital". Putnam (1995) defines social capital as "the feature of a social organization such as networks, norms, and social trusts that coordination and cooperation for mutual benefit facilities (Putnam, 2013). In this case Putnam emphasizes that social capital is an understanding and knowledge shared by the community, as well as a pattern of relationships that allows groups of individuals to carry out one productive activity. Whereas the capital of the socio-cultural space (citizens) is a form of ecology of living space which consists of networks, neighbors, norms or rules and the belief to get a mutual benefit in fostering a decent life.

3. Research Methodology

3.1 Case study area

Based on the results of the initial recordings, five cases of student lodgings were chosen as the first step as well as the entry point for the next case. The selection of these five cases was obtained based on the openness and response of the owner of the boarding house encountered during the first round of exploration. The sampling technique as the focus of observation is done by snow ball (Setioko, Endrianto, and Woro, 2013), it is intended to expand information and get new themes in it. As explained by Moleong (2006) the purpose of the snowball sampling technique is to obtain new information and themes through deepening during the research, if there is a repetition of information as an indication that the sampling has saturated, the sample search is stopped.

In conducting the induction process, it is carried out through in-depth interviews aimed at getting physical data on the pattern of space and its use; and non-physical in the form of thoughts in the form of existing value systems in accordance with the conditions of the selected case. The factors observed include: humans both owners and students as actors in carrying out activities both as individuals and groups, and space as a place to carry out activities as well as that of the users'.

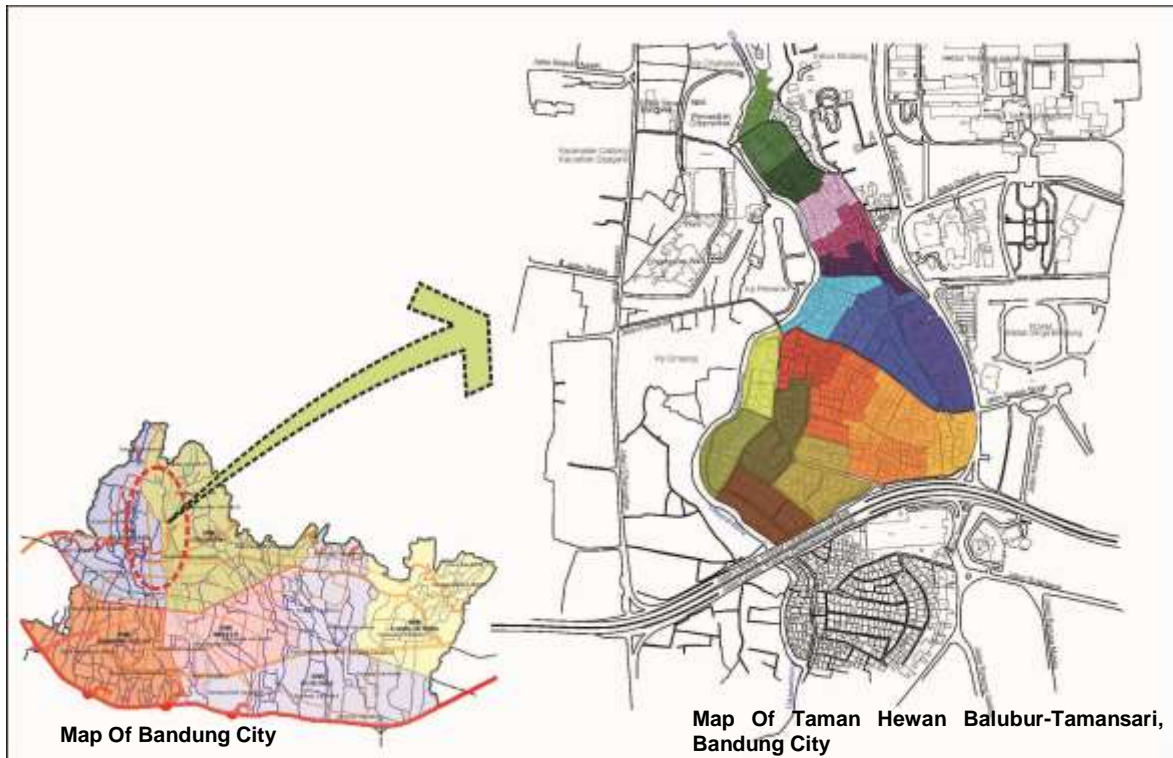


Figure 4. Map of the research area
Source: Personal archive

Based on the interpretation of the data that has been obtained from the results of mapping the case as shown in Figure 4 as well as the results of in-depth interviews, then the depiction of the map and layout of the furnishings for each space is done based on the categorization found during the previous grand tour. Rethinking plans and lay outs of furniture placement for each case is intended to facilitate the process of analysis and the process of induction to determine the existing themes and conceptions of local theory.

4. Results and Discussion

Space as a human need, besides being seen as a physical need such as sleep and eating, the need for space can also be seen as a psychological need. These needs usually have four dimensions, namely ownership of the space, personalization of space, level of privacy of space, and control of space. These dimensions will affect the spatial arrangement of the space from a value point of view. Altman (1980) explains that in the Western concept, privacy is something that wants to be achieved if someone does not want to be disturbed in solitude (personal space and private space). As in personal space (Laurens, 2004; Permana, 2003), provocation is a very important process in human life, and if someone's privacy is disturbed it can lead to "stressful" conditions.

Altman (1980) further explained that privacy is the central concept of all space management processes. Trancik (1986) in looking at city space can be done in 3 ways theoretical approaches, namely: (1) 'ground figure theory'; (2) 'Linkage Theory'; and (3) 'Place Theory'. While Krier (1979) groups space into 2 (two) large groups of spaces, namely: (1) Linear space / street (longitudinal pattern). Where this space has a supportive and expressive value from the visual space of the city that is closely related to access and linkage between one place to another. It is possible that this space is elongated on both sides which is then analogous to linear space (path); and (2) Square / cluster space, namely space showing access (access) and linkage, but these two factors are not placed in the main function of space. Cluster space emphasizes the storage container for human interaction with all activities that occur in it.

4.1 Macro Space based on Social Logic

Urban space as a collection of space cells that are divided into 2 (two) cells, namely the main cell (in the form of buildings or houses) and buffer cells (in the form of facilities that make the settlement in its position).

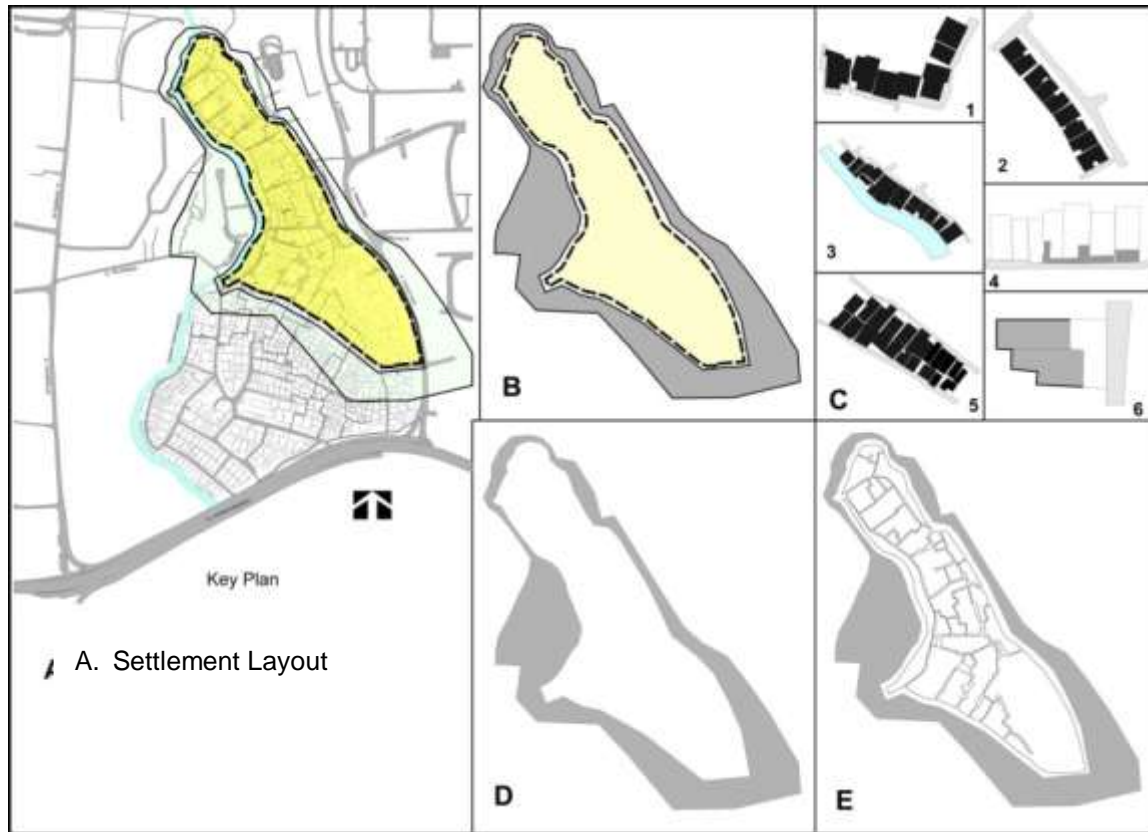


Figure 5. Space Analysis Based on Social Logic
Source: Research findings, 2018

In the case of the Taman Hewan Balubur-Tamansari area as one of the urban kampong in Bandung City, the campus is a buffer zone to meet the needs of student lodges. In Figure 5.A, the boundaries of this area are clearly visible, where in the east it is bordered by Jalan Tamansari as one of the accesses to this area, the western part is limited by the flow of the Cikapundung River, the northern part is limited by the Zoo complex.

The position of the river, the road as seen in Figure 5.A is the boundary between the Balubur Tamansari Region and the area outside the kampong. The structure between the surrounding areas as a buffer zone Balubur Tamansari can be interpreted as a place to meet and interact among fellow citizens in a residential system and the relationship between people occupying the area with outsiders.

Figure 5.B is the space boundary of the Taman Hewan Balubur-Tamansari area as a city village with boundaries by Jalan Tamansari on the east and Pelesiran Road on the south, and the Cikapundung River on the west and the Zoo on the north. Figure 5.C is a space typology that exists in this area. Figure 5.C.1 and 5.C.2 are types of houses lined up in accordance with the contours and textures of spaces formed organically following paths or alley paths that have irregular road conditions or alleyways with varying widths of aisle between 80 cm - 120 cm. The area of the plot is very varied according to the effective width of the existing land. Figure 5.C.3 is a group of lodges that are located along the river with zero river markers. This cabin lined up according to the contour and texture of the organically formed space following the river path. The status of the land includes illegal land, which is on the river border. Figure 5.C.4 is a series of groups of houses with front and back boundaries, the area of the plot still varies. Land status consists of 3 types of status, namely government-owned land, owned by PT. KAI, and individuals (private). Figure 5.C.5 is a series from one group of houses to another directly adjacent to the plot. In the case of Figure 5.C.5,

environmental drainage is in front of the house. Figure 5.C.6 is a series of houses surrounded by fences.

Figure 5.D is the area of parcels as a form of region supported by buffer zones of various systems of interest in the region. In the picture clearly the boundary of the area with the buffer zone. The buffer zone is a facility that surrounds the area. Figure 5.E is another boundary of several building blocks or houses in a settlement. This boundary bridges buildings with free spaces within the area, where the shape and structure of the area can only be seen from the results of a series of building blocks or houses that are connected by roads or alleyways within the area.

4.2 Space based on the Structure

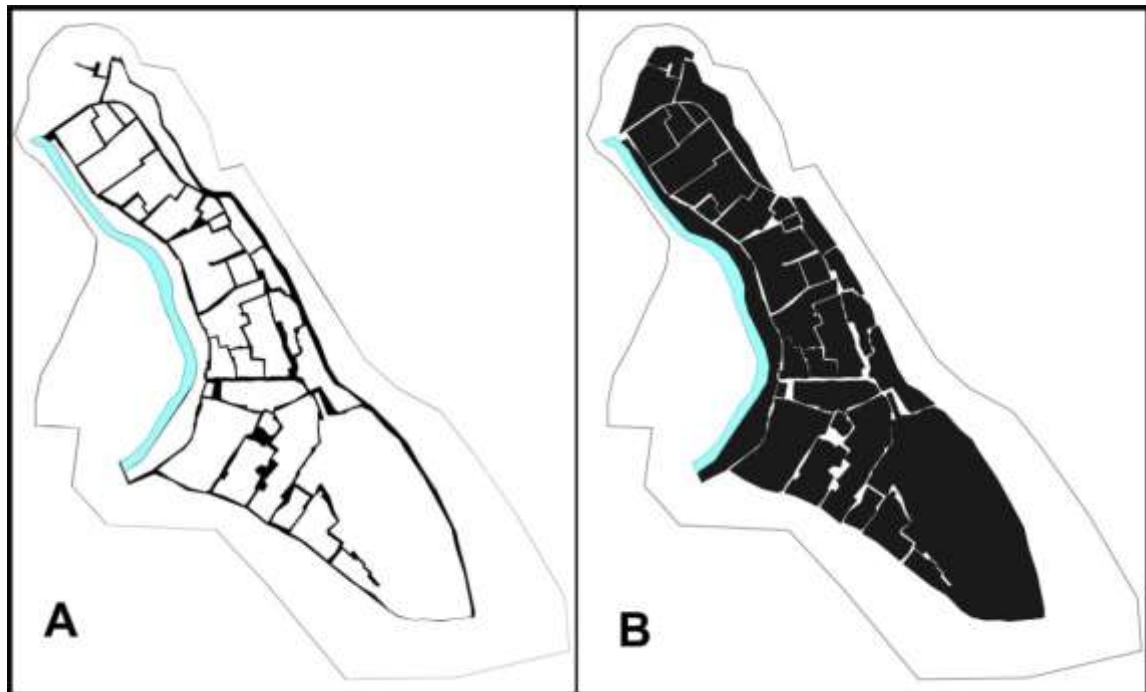


Figure 6. Space Analysis Based on Space Structure

Source: Research findings, 2018

In the analysis of space based on the spatial structure, a map of unused space structures is produced with buildings in the form of aisles or roads and built spaces, as shown in the following data:

- A. In figure 6.A an image of the outer structure of an alley is made. To show parts of a region or environment that are not built in the sense that parts outside the building's lines are displayed in dark colors. The part shown indicates that the outer space is continuous, while the white block indicates a group or cluster of buildings commonly referred to as building blocks.
- B. In figure 6.B a picture of a building block is made with dark colors, this shows the level of density of this area or environment. The percentage of comparison between land built and non-built is $\pm 98\%$ of this area built.

From figure 1, it is clear that the density of the Taman Hewan Balubur-Tamansari area is included in a densely populated area, where the ratio of open space to land is very high $\pm 98\%$.

4.3 City Space based on Region Integration Map

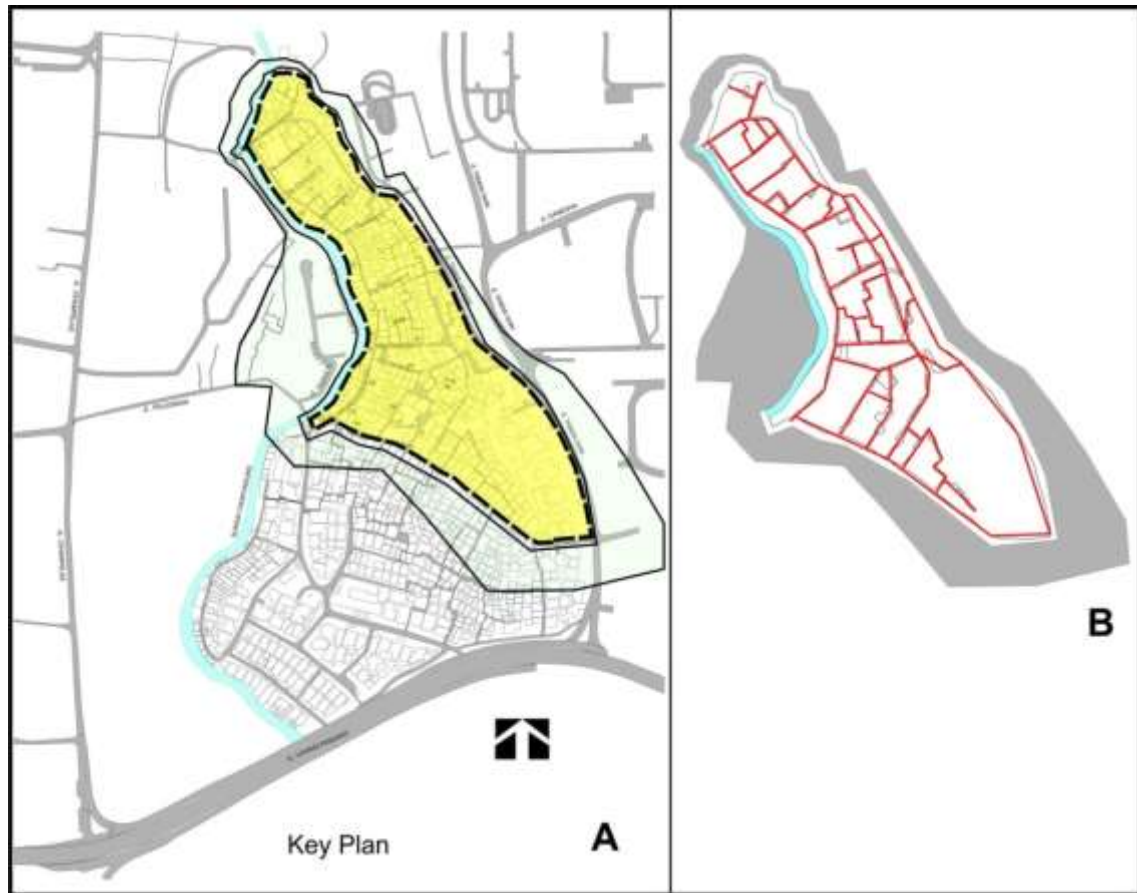


Figure 7. Basic Map and Map of Integration of the Balubur Tamansari Region
Source: Research findings, 2018

In conducting research, a redrawn analysis is carried out as an analysis of city space based on the integration map in this Taman Hewan Balubur-Tamansari area. The purpose of this re-drawing is a line map for the analysis process, in Figure 7.A it shows the appearance of a base map and a line map that shows how deep the alley position is and how high the integration of the alley with other aisles is in the whole alley network and residential road.

In Figure 7.B, it shows the entire line appearance in the area or the overall settlement environment. The lines intended in the picture can represent or describe the distance a person has in one environment / region. The relationship between lines depicted above an alley in a region or neighborhood with an alley that is on the outside does not rule out the possibility of having an unlimited range. This indicates the shallowness or proximity of the alley with the outside world and the number of alleys that cut it off so that the alley has high integration in the alley network and roads in the settlement as a whole. There is one main alley that covers the aisles in it.

4.4 Figure Ground of Balubur Tamansari Region of Bandung City

Figure ground analysis can be seen from the aspects of mass and space functions and how they are functionally related. Analysis of this figure ground can be seen in Figure 8.A and Figure 8.B.



Figure 8.A *Figure Ground* between Developed Area and Open Space; 8.B *Figure Ground* between Open Space and Developed Area in Balubur-Tamansari of Bandung city
Source: Research findings, 2018

4.5 Comparison of Space and Mass as well as *Enclosure*

Based on solid void analysis as seen in Figure 9, how is the textural comparison of the building area with open space. In Figure 9.A, it is shown how the configuration of figures in mass and blocks are seen massively and figuratively, in the sense that attention is given to the mass figure. While in Figure 9.B, it can be seen how the open space configuration is seen massively and figuratively, in the sense that attention is given to space ground.

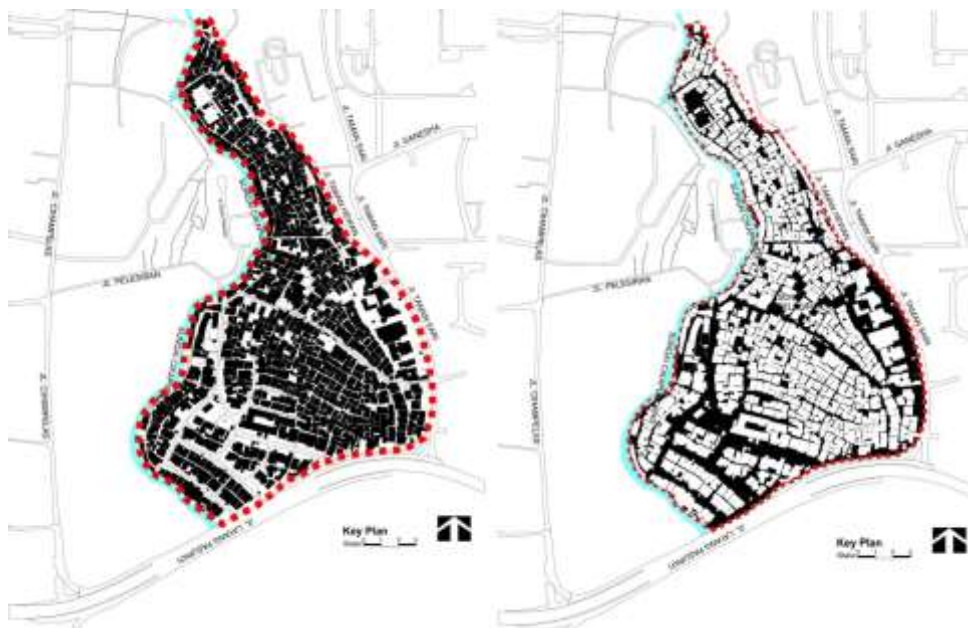


Figure 9.A The Comparison of Space, Mass, and *Enclosure*
Figurative Mass and Building Blocks in Balubur Tamansari Area
Figure 9.B Figurative space of *Figure Ground* in Balubur Tamansari Area
Source: Research findings, 2018

4.6 Solid and Void as Space Elements

In connection with the solid and void elements, there are three solid elements found in the Balubur Tamansari area, namely single blocks, side defining blocks (edge defining blocks), and field blocks. Whereas the void elements found in the Balubur Tamansari area are linear open systems, linear closed systems, central closed systems. As shown in figure 10.

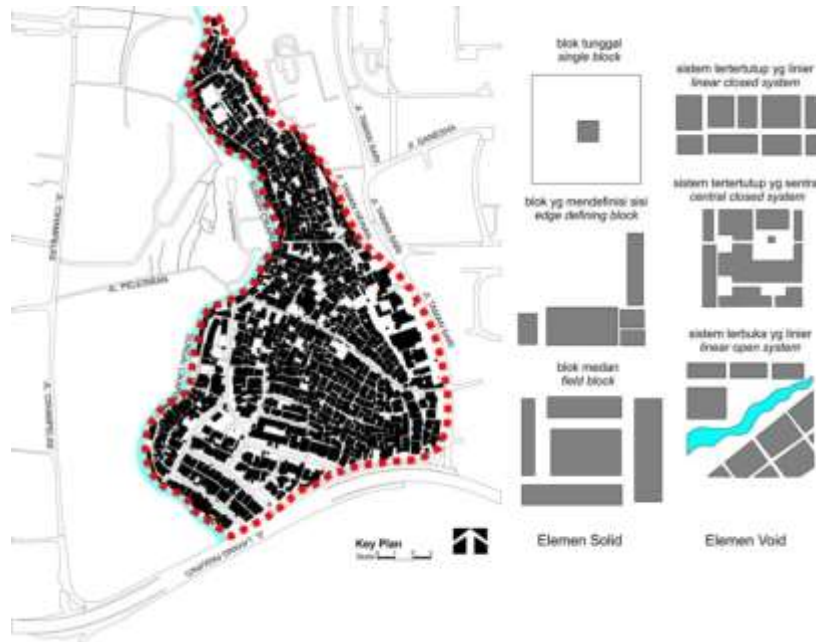


Figure 10. *Solid and Void as Space Element in Balubur Tamansari Area*
 Source: Research findings, 2013-2018; [Trancik, 1986](#)

4.7 Void and Solid as Space Unit

Analysis of urban space is not only related to solid and void elements, because elements in urban textures rarely stand alone, but are collected in one group as a unit of urban space. In urban areas, the existence of units is important, because the units function as a group of buildings together with open spaces which emphasize the existence of textural mass unity. The pattern and dimensions of units in the Taman Hewan Balubur-Tamansari area can be seen in figure 11.



Figure 11. *Void and Solid as Space Unit in Balubur Tamansari Area*
 Source: Personal archive, 2014-2018; [Trancik, 1986](#)

5. Conclusion

Based on the analysis of morphological changes in the Balubur Tamansari area of Bandung City, it can be concluded that:

- In visual linkage, the Balubur Tamansari area is dominated by building mass blocks with unplanned fragments, in which the building mass fragments found in this area follow the pattern of buildings that grow gradually, so that the existing relationships are not focused on any of the blocks in the area. Basically the resulting building block fragments follow an organic form and a neutral functional relationship pattern.
- Structural relations between elements of space and building mass that occur in the Balubur Tamansari area are gradually growing, in accordance with the development of the city of Bandung. Structurally related relations with the development of the region as settlements with village structures, basically there is no extreme change when viewed from the existing spatial structure.
- The Balubur Tamansari area belongs to one of the oldest areas in the city of Bandung with a spatial structure formed as a city settlement, following the pattern of the development of the collective form form of group forms (group forms). The form of this group is formed in the linkage (relationship) that is organic and informal in a structure of urban village settlement space.

The image and aesthetics of the Balubur Tamansari area which was formed by elements of the path (path) in the situation since the growth and development of this region, shows the identity of the Balubur Tamansari area. From the results of the analysis of regional image elements, are explained as follows: (1) The function of the alley as a path for circulation routes of the user community to carry out movements in general; (2) The existence of the Cikapundung River as the edge of the Balubur Tamansari area in the west and Tamansari road in the east of the region; (3) The function of meetings between alleyway in this area as a node (node) for communication meetings between residents. At several point nodes that have a wide enough width occur communication space, such as used for regional community space, gathering space, etc.; and (4) Landmark (perch) as the identity of the region is the easiest reference point to recognize in a prominent visual form.

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