Ekistics in planned and unplanned settlement

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Abstract. Doxiadis (1969) in ekistics states that settlements are where people life and existence. Ekistics is one of the efforts that must be made to address the increasingly complex problems due to the increasing population growth and increasing land use. Therefore, a settlement consists of the content (the content) that is human and where the physical human lives that include natural and man-made elements (the container). The formation of settlement morphology consists of planned and unplanned settlements, the method used in ekistics research in planned and unplanned settlements is the study of literature with descriptive analysis. Sampling used in this study is a planned settlement Kelurahan Baluwarti in Solo and an unplanned settlement that is a Kelurahan Gentan in kabupaten Sukoharjo. The result of this study is (1) The Concept of Ekistics exists in planned or unplanned settlements (2) The very noticeable difference between planned and unplanned settlements is the social condition of the community.

1. Introduction

Ekistics is the science of settlements written by Constantinos A. Doxiadis Ekistics as an approach to explain the happening or to analyze what happens in a settlement is a neutral approach that can be used to analyze what happens in settlements. Ekistics is one of the efforts that must be made to address the increasingly complex problems due to the high population growth. In this regard, ekistics theory is still relevant used as one of the tools to explain and guide planning in Indonesia in the future along with other earlier theories. Doxiadis (1969) states that settlements are where people life and existence. Therefore, a settlement consists of the content (the content) and the physical place of a man living which includes elements of nature and man-made (the container). Furthermore, the contents and places can be further divided into five main elements referred to as Ekistics elements: (1) Nature, providing the foundation on which settlements are formed or formed and the framework in which a settlement can function; (2) Man; (3) Society (Society); (4) Building / Structure of Space (Shells), a structure in which man can live and live according to his function; (5) Networks, both natural and artificial that facilitate the functioning of a settlement (e.g. Roads, electricity, water).

The formation of morphology of settlements in addition to planned settlements also occurred unplanned, Kostof in Soetomo (2018) explained that the result of a city space is formed by two processes: the planning results are referred to as planned settlements then urban process results in unplanned planning. Individual forces move into communal forces, this is an unplanned process, which is formed organism, growing and evolving according to urban processes. Kostof said that whatever the city's initial planned time in its planning could always be fixed and driven to change because the urban processes that formed the planned.
In planned settlements, the rules of the default space order have been theoretically applied in the planning. In contrast to unplanned dense settlements, the pattern of space or space order can sometimes occur by itself due to the principles of rules as a result of agreement and interaction between the people. Although unplanned and difficult to explain, it can be seen that the order is a planned development process that basically has an architecturally understandable nature.

Constantinos A Doxiadis, who wrote the book Ekistics, An Introduction to the Science of Human Settlements, explains that human settlement is a place or space for life and life for human groups. There are two basic elements of human settlement, namely the contents and containers that can be described in more detail in five elements.

1. *Shells* or building spaces building buildings up to groups that reach the scale of settlements, villages, cities, and physical agglomeration of areas, where people live.
2. *Networks* that include infrastructure where humans communicate, and utility networks where materials flow (transportation, water, electricity, etc.).
3. *Nature* or nature consists of non-biotic and biotic elements: the physical environment of nature, climatologists, and habitats of living beings. Mini-style elements are also in natural processing conditions such as landscape, agriculture, forestry, therefore the processing is in its nature and ecological nature.
4. *Man*, a human being as an individual being with all his personality and identity, as a complex little Anthropos universe
5. *Society*, society or group of people from families, neighborhoods, to citizens of the world. With all its complex relationships in social, economic, political life.

![Ekistics Theory by Doxiadis](image)

**Figure 1.** Ekistics Theory by Doxiadis
Source: Doxiadis, 1968

1.1. Planned Settlement

Planned settlements are human works that govern people's lives in small spaces and regulate human relationships, and regulate human relationships with nature. Therefore planned settlements are an attempt to modernize their lives.
1.1.1. Grid pattern
The first form of planned settlement is a grid pattern, as a form of the first business pattern of humans arranging the dwelling. The first form in dividing the area, setting the human location to live in is in the form of a grid that is the shape of a square space done with a straight line intersection. The nature of grid patterns is very effective clearly and practically in dividing space because grid patterns are very good at regulating not only the autocratic hierarchy of city space but also the pricing hierarchy of a residential block.

The pattern of cities with grid systems can be found in almost all cultures and is one of the forms of the old town. This grid pattern is a fairly universal mechanism in regulating the environment and this pattern is formed because of the need for a gridiron system to provide a geometric shape in urban spaces. The residential blocks were designed to allow the house to be connected to buildings and public spaces (Kostof, 1991).

1.1.2. Diagram pattern
Royal cities, militarily, are formed as regional centers (economic as well as political). especially in political, religious, and military centers in the form of planning. The structure of the city is a form of city diagram where the city pattern is created to organize or diagram the desired order of life. Diagram city is the most complex group of planned settlements, is the culmination of the role of a planner that translates the will of the ruler to form a pattern of space for the life of his community. The pattern diagram is explained by the form of functional diagrams, among others, the transport pattern (radial concentric pattern) of the modern city.

City patterns with this diagram system are usually depicted in symbols or hierarchies that reflect the current form of social system and power. In contrast to the grid system that prioritizes efficiency and economic value, the basic motivation of the city pattern with this diagram system is (Kostof, 1991): • Legitimation, a city system formed based on symbols of power and in terms of politics serves
to oversee/organize the system of its people. Such as the form of empire or monarchy (Versailles) and democracy (Washington DC). • Holy City, a city built on its community belief system like the city of Jerusalem. The shape of the city that is often found and used in part, in whole, or combined is in the form of lines, centering, branching, circular, grouping, geometric patterns, and living organisms.

![Diagram of social cities form](image1)

**Figure 4.** Diagram of social cities form

Ebenezer Howard To-Morrow

Source: Soetomo, 2018

![Nahalah Israel](image2)

**Figure 5.** Nahalah Israel

Source: Soetomo, 2018

1.2. Unplanned Settlement

Organic pattern type is the settlement of life and natural forms, here the passage of time that determines not man order. Organic forms attach importance to the process rather than the product, how these settlements are formed attached to the process of community formation, the unity between individual need and common will. The organic settlement as a form of the biological process puts the process of building city space as a living being that never at rest. The form of organic settlements occurs in trading cities formed due to the process of supply-demand interaction.

Organic patterns are organisms that develop according to cultural and social values in their society and usually develop over time without planning. This organic pattern changes spontaneously and the shape follows the condition of the existing topography. The nature of this organic pattern is flexible, it's not about the physical, it’s usually in the form of curved lines, and in the development of society has a large role in determining the shape of the city. In contrast to the grid shapes and diagrams, usually determined by the ruler of the city (Kostof, 1991).

Characteristics of an unplanned settlement can be reviewed by observing several factors, including: (1) Land ownership, (2) Structure and social facilities, (3) Infrastructure, (4) Economic and financial, and (5) Socio-cultural (Onyekachi, 2014)
From the theoretical about ekistics above, This research aims to find out Does ekistics exist in planned and unplanned settlements of Kelurahan Baluwarti in Kota Surakarta and Kelurahan Gentan in Kabupaten Sukoharjo?

2. Method
The method used in ekistics research in planned and unplanned settlements is a case study with sampling techniques purposes.

Sampling used in this study is a planned settlement namely Kelurahan Baluwarti in Solo and an unplanned settlement that is a Kelurahan Gentan in kabupaten Sukoharjo. The analysis used in this study is qualitative descriptive, which explains whether in planned and unplanned settlements there is an ekistics theory or nothing at all.

3. Result
3.1. Kelurahan Baluwarti
Kelurahan Baluwarti is one of the villages located in Surakarta City, this village is special because it is within the scope of Surakarta Palace and all its inhabitants occupy the land owned by the palace it called magersari.
Baluwarti is an area inhabited only by the royal family and abdi dalem (abdi dalem is a person who dedicated their life for the palace, royal family and the King). To know the status of the occupants of the house in Baluwarti, it can be seen by the form of the house and its equipment. Based on the social status of Kelurahan Baluwarti, the form of houses in Kelurahan Baluwarti divided into 3 (three): joglo house, Limasan house, and village house.

Settlements in Baluwarti Area are not fully used as residences, some areas in this settlement are used for the benefit of palaces such as palace guards, mosques and king's car storage, Duchy Paseban (Duchy Paseban is a person who lead a region), houses for royal soldiers, and Ksatriyan School.

Kelurahan Baluwarti itself has 10 (ten) villages where in each village there is its own social strata, for example in the village that has the name Gondorasan inhabited by abdi dalem keraton, tamtaman village inhabited by abdi dalem prajurit. The residence of abdi dalem is in the second circle in the palace, this is intended to be the event of the invasion of kartosuro palace.
3.2. Kelurahan Gentan,
Kelurahan Gentan is bordered by Surakarta city so it becomes the urban fairy area of Surakarta City. Kelurahan Gentan becomes an area that provides housing for commuters located in Surakarta City, because it has land that can still be developed as a residential area. This can be proven by the rapid population growth from year to year as well as the reduction of rice fields in Kelurahan Gentan.

Figure 12. Map of Kelurahan Gentan

Figure 13. Settlement pattern of Kelurahan Gentan

| KELURAHAN | Years | Population | Paddy Field Area (HA) | Non Paddy Field Area (HA) | Total of area |
|-----------|-------|------------|------------------------|---------------------------|--------------|
| Gentan    | 2013  | 6334       | 20                     | 118                       | 138          |
|           | 2014  | 6313       | 20                     | 118                       | 138          |
|           | 2015  | 6322       | 20                     | 118                       | 138          |
|           | 2016  | 8936       | 17                     | 121                       | 138          |
|           | 2017  | 9544       | 17                     | 121                       | 138          |
|           | 2018  | 9554       | 17                     | 121                       | 138          |

As the fulfillment of the needs in the settlement of gentan has several facilities and infrastructure, Kelurahan Gentan only available 2 elementary schools, 31 mosques, 1 church, 1 traditional market, and 1 minimarket.
4. Discussion
This discussion, matched between empirical data and theories about ecistics in Kelurahan Baluwarti and Kelurahan Gentan.

Table 2. Ekistics between planned and unplanned settlement

| Ekistics | Planned Settlement | Unplanned Settlement |
|----------|--------------------|----------------------|
| shells   | in the diagram pattern, it created by the people who have order to organized the settlement. As we saw in Kelurahan Baluwarti, the government is in the middle while in the second circle is occupied by guards and abdi dalem. | Planned patterns are formed through the process of people's social life, there is no autocratic hierarchy in settlements so that existing settlements grow spontaneously. |
| network  | In planned settlements, the entire infrastructure network was well planned before the settlement was built. | In the pattern of unplanned settlements, settlements instead follow the location of the existing network of infrastructure facilities. For example, linear settlements are settlements that grow following the flow of river n or the main road. |
| nature   | In planned settlements, the topography of an area does not affect the location of the settlement. | To topography, unplanned settlements are usually located in strategic locations that are around transportation nodes such as in river flows or in main road line and it made a linear form of settlement |
| man      | generally, planned settlements are lived by elites. Where they have better socio economic and culturally. | Unplanned settlements were set up by traders from several corners of the world as well as ethnicities. So it has a different |
Ekistics | Planned Settlement | Unplanned Settlement
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| | socio-cultural and economic. However, this difference makes them adhere to plurality so that they are accustomed to differences.

**society**

Planned settlements are mostly influenced by elite groups such as noble groups, merchants, religious groups, the military as the dominant group that encourages the formation of city communities and elite groups. This group governs social, political and cultural order as a form of residential law.

Unplanned settlements are formed due to supply demand, from strategic locations such as trading cities. The social life of these unplanned settlements is also shaped by a plurality composed of various ethnicities and cultures without the establishment of an autocratic hierarchy.

5. **Conclusion**

Conclusion of Ekistics in the planned and unplanned settlement are:

- Ekistics does exist even in planned or unplanned settlement
- The very striking difference between planned and unplanned settlement is society. Those who have authority about urban design, laws, and culture
- in planned settlement the infrastructure network is build before the settlement, so we can reduce the problem about infrastructure
- in planned settlement, it has no problem with the nature because the can adjust the settlement by the topography. in unplanned settlements they following the nature because they aren’t built the infrastructure first, the build the settlements usually located in strategic location.
- Planned settlement has hierarchy of a settlement block depend, but in unplanned settlement has no hierarchy so the settlement grows spontaneously.
- Planned settlements are lived by elites, so the settlements are planned with any regulation. In unplanned settlement mostly formed by traders.
- Unplanned settlement has so many differences of socio-culture but in unplanned settlement it influenced by the elites
- Planned settlements influenced by elite group there are governs social, political, and cultural order. In unplanned settlement are formed due to supply and demand, from a strategic location such as trading cities.

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