

# Arrangement of Settlements and Infrastructures: Notes for the Urban Fringe Areas Development in the Eastern Part of Indonesia

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*Abstract-* The settlements can be interpreted as a residential area with all supporting of infrastructures such as public facilities and social amenities. An urban fringe areas or area behind the town is part of the unplanned settlements so that the distribution of these facilities is relatively less supportive. This paper aims at trying to assess the efforts of settlements and infrastructures in the urban fringe areas of the city as the concept of urban development, especially in the Eastern part of Indonesia. The reason is simply because of the various previous experiences showed that many development of urban areas in Indonesia have less attention towards the development of rural areas. As a result, this leads to the urban bias development. In principle, if the settlement and regional infrastructures in urban fringe areas are better laid out accordingly to the needs of the daily activities of the residents including business supporting the economic and social facilities, it is expected that movement of population from rural to urban will indeed decline. Therefore, the efforts of urban fringe areas development should be planned and coordinated with specific regional units and other stakeholders, so that any potential frictions between the regions do not occur on one hand, and many people in the islands and rural areas will not be interested in moving to urban areas on the other hands.

**Index terms-** settlements, infrastructure, urban fringe areas, urban development.

## I. INTRODUCTION

Why rural areas are lagging behind the urban areas? Some research can be used as a reference for the formulation of strategic steps to develop a residential area in this region. Starting from the premise that, if a urban fringe areas (hinterland area) as the circumference of the center as well as rural areas as an outer ring are arranged by providing such as infrastructure settlement planning with a complete approach the completeness of the infrastructure of settlements in urban areas, the population of the region will be minimized and the countryside will be more comfortable and improves their achievement in environmental infrastructure and facilities such as health facilities, education, information, communications, credit, markets and so forth (Wanmali, 1983).

If you look at the empirical situation of infrastructures in rural areas, there are some worrying conditions. These include : (1) the amount of infrastructures and facilities for the settlement are less than the standard requirements, (2) while the amount of infrastructures and facilities for the settlement may be sufficient, but the location of placement is often not evenly distributed in accordance with the number of people on serve, and (3) the type of infrastructures and facilities that are available usually do not suit with the people needs.

Theoretically, the availability of infrastructures settlement planning can improve the function both the urban fringe areas (hinterland area) and remote rural areas. Another thing that can be expected due to the increase in the quality of infrastructures and means of settlements in rural areas is the decline in the urbanization process. In other words, the development of urban fringe areas settlement should be balance or equal between urban settlements with rural settlement. Also, by having well management of urban fringe areas development, many opportunities in both urban and rural areas can be optimized.

To have well management of the development of residential of urban fringe areas, programs such as Urban Function for Rural Development (UFRD), Development of Urban Integrated Infrastructures (P3KT), and some other development programs in urban areas can be taken as references. According to The World Bank (1978), a successful settlement is where employment opportunities are created and the efficiency and productivity of the system is assured of one side, while on the other side the use of land wisely.

For that reasons, specific understanding particularly in the field of engineering science that examines the physical settlement is needed. Saliya (1991) emphasized that the settlement infrastructures concerns more to the process of settling or subject resides, while the settlement is a place for living. This means that the process of settling is much to do with socio-economic and socio-cultural well being, while infrastructures are more associated with the physical aspects of a building and infrastructural environment. Note that, the latter tend to be widely used and agreed especially for y planners and construction managers.

## II. INFRASTRUCTURE

The development of infrastructures in the region is generally provided by the government while the small portion of the development is often provided by the private sector and the public (Wanmali, 1982). The aim of the infrastructures development is likely to be in term economic performance settlers. This means that the development of the infrastructure and facilities in the region are expected to empower economically.

Infrastructure in a residential area is a vital part, because it is directly related to the lives of residents in the region itself. There is a tendency in some locations that although the amount of infrastructures and facilities meet the terms of the settlement areas of architecture standards, but its distribution is not in accordance with the service area boundary. Several studies have found another tendency that due to lack of infrastructure in rural areas cause mobilization of the population in the form of urbanization. This condition can cause a decline in the quality of the environment that in turn lowers the quality of life of urban residents. Thus, the purpose of planning and regional development is to improve the level of living condition of residents at the area and their full participation in the development process of the entire community. This suggests that to achieve this goal, the development of urban fringe areas settlement and infrastructures must be as a continuance process independently or self-sustaining process. It does not only bring together the various strata of society, but the whole sector and the whole region (Manig, 1979).

The above views have been supported, for instance, by the study undertaken by Rostam (1972). He found that the closer to the infrastructures and socio-economic facilities, the population in Perak, Malaysia is likely to further increase their income (Rostam, 1992). Manig (1979) further suggested the same thing from the point of view of the regional science perspective in that he argued that the distance between the workplace or center field with facilities such as extension office and so on need to be considered as it can provide a better access to the activities of the population as well as increased their economic success. Thus, it is no doubt that there is a direct relationship between the distance and the economic success. This is because the distance factor in settlement associated with the costs, including the transportation costs and transaction costs as well as travel time which further lead to expenditure minimization (Wanmali, 1992).

Apart from the above distance factor, concerns on the time dimension, the human dimension and the dimension of the region are a must. The importance of these multi-dimensional consideration is to avoid any potential friction of the development process (Sugandi, 1994). Dimensional space in this case involves aspects of spatial infrastructure in settlements which is a responsibility spatial planners and local governments. This suggests that spatial plan is an embodiment of the direction of development goals and the implementation of development. The linkages between sectors needs to be clear. Spatial plan is the initial part of a process of development, therefore, the spatial plan should be used as a reference, while the development of the city itself is a dynamic and ongoing process (Abhimanyu and Sujarto, 1994).

### III SETTLEMENT

According to Sujarto (1991), urban and rural settlements generally may be limited to some of the following characteristics:

#### 1) Urban Settlements:

- Demographically, the population with a high population density compared to the surrounding area,
- Sociologically, associated with the restrictions their heterogeneous nature of the population and the dominance of urban culture,
- Economically, characterized by the proportion of employment dominated industry, sector, services, transport, trade and others non-agricultural sectors.
- Physically, can be recognized by the dominance of the region woke up (built-up areas) and the physical structure of the building,
- Geographically, defined by a center of activity linked to the strategic location,
- Administratively, it is a jurisdiction which is limited by jurisdiction established by regulations.

#### 2) Rural Settlement:

- Demographically, the population density is lower than that of urban settlements,
- Sociologically, a living environment where there is a homogeneous social patterns,
- Economically, reflected by the dominance of employment in agriculture and traditional carpentry,
- Physically, can be recognized by the dominance of the natural structure of the region (natural structures),
- Administratively, the village limits cannot be ascertained clearly,

Based on the above characteristics, it is important to undertake an in-depth study on the establishment and a clear distinction between urban and rural residential areas. Note that, among the two regions, there is an area called the urban-rural areas or suburban areas (urban fringe areas). While in rural areas, there are rural areas outside the city that is what we are familiar with the urban fringe areas of the city.

Value differences due to the burden of the urban fringe areas are something that must be of particular concern us. One reason is because an attraction for the settlers in urban fringe areas that may be provided may become a threat to the urban fringe areas. The movement of agricultural workers from rural areas to the city, for instance, becomes the loss of skilled labor for the urban fringe areas. These events continue until functioning urban fringe areas have increasingly shifted and then a process of impoverishment of the region.

From various studies, it was found that the sparkling city and hedonistic lifestyle are the main attraction of the urbanism. The physical facilities of the city is a strong magnet that drew rural people migrated to the city. This is certainly because the availability of infrastructures and facilities attracted people from rural areas migrated to the urban areas. The other thing is the promise of increased revenue (income), employment opportunities and relatively high wages in the urban areas.

There is the thought that, if a urban fringe areas is well managed such as structuring settlement patterns with complete facilities similar to the city then residents of urban fringe areas would be more at home in the area and then improve their achievement in environmental infrastructure and facilities such as health facilities, education, information, communications, credit, markets and so forth (Wanmali, 1983).

According to Nasendi (1985), regional development is the effort to develop and enhance the relationships of interdependence and interaction in the sense of mutual needs and mutual supports between the human system (social system) with the system environment in the ecosystem.

Some studies support this, for example, Wanmali (1983). He found that by improving the pattern of structuring infrastructures placements and facilities, it will be able to support the improvement of people's living standard as a whole in terms of demographic, functional and spatial region.

#### IV. LOCATION THEORY

In theory, there are two concepts of empowerment urban fringe areas of the city and also rural-urban area that may be considered for development, namely Location Theory and Central Place Theory.

For urban fringe areas and certain rural-urban areas, agricultural activities still dominate people's economy compared with other economic activities. In conjunction with efforts to increase the income of the population, then the theory of locations needs to be specifically examined.

Basically, the location theory has been introduced by the German economist, Johann Heinrich von Thünen (1895). His theory was based on his research on two different locations, namely, locations where there is an economic effects of the free market and the latter is isolated from the influence of the market. This theory is grouped as the supply oriented theory. The availability of supply here is intended for the sake of a population to fulfill both the production process as well as their everyday needs.

In the process of the transfer of goods from the market to the consumer, infrastructure environment are very influential, such as a network and highway conditions. In the area of remote villages, infrastructure is lacking, so the selling price of goods is very high because a high cost of transport, both due to the long distances and the condition of roads (asphalt, gravel or soil pavement) which can be a determining factor the length of the transport process (Abdullah, 2000).

Apart from the above factor, the land value plays important role in as it determines the level of productivity. This productivity level is associated with the amount of income. The mathematical formula for this is introduced by Dunn cited in Dean (1970) as follows:

$$R = E(p - a) - Efk \quad (1)$$

#### V. CENTRAL SERVICE THEORY

This central service theory is introduced by Walter Christaller (1933). The essence of this theory is the central service with a service area with a hexagon shape (hexagonal). The service centers are arranged in a hierarchy depicted particular, from the main center in a big city to the environment in rural centers.

This theory was later developed by Lösh (1940). Then in 1956 by Isard, Hagget (1965). The availability and utilization of services, the size of the settlement and the distance between the facilities and service centers are an important part of this theory. For elaboration, Sen and Wanmali (1971) outlines six aspects to service areas in this theory, among others:

- (1) According to Christaller that the ministry needs to concentrate on a specific area and its surroundings, where the region is an area that is more important than the surrounding,
- (2) The Service Center is the center of the region. The most basic and most important is the settlement that supply services and basic commodities to the broader region of the service center itself. Service function is the key word and the most important of the population from service centers,
- (3) Each region has an important function that is usually difficult to accurately described through the size of the population and the region itself,
- (4) The function of the service center according to Christaller is trade, commerce, banking, administration, education, and transportation. The functions are oriented to consumers (consumer-oriented functions) solely owned by the

- service center. According Rostham (1992), however, a small service center on the development of rural areas, not only the size, number and spatial arrangement, but also how these functions interact with rural areas as a whole,
- (5) The relationship between the region and the region complement each other in terms of functional,
- (6) In classical theory, supply and demand based on the layout for basic goods and services are determined by the cargo (freight), guarantees (insurance), warehousing costs, the time factor and lose weight in the process or journey. There are two notes to explain the spatial movement of basic goods and services; the maximum distance of commodity demand called the upper limit and the minimum distance where the minimum volume of commodities that ensures normal profit to the seller as the lower limit.

Regional planning is considered as a problem in spatial integration and functional co-ordination of settlement (Wanmali, 1970). Because these service centers serving the region on such a scale. While Baskin (1966) limits the distance and the most important is the upper limit and lower limit (upper and lower level). Further, Christaller explains the hexagon pattern of the services market and the hierarchy of service centers. The upper limit is set as the farthest distance dispersion of the population that can be served, sell or buy staples or get service. The price level depends on the materials mileage away from production fields to the market, it is this which determines the upper limit, which is at the optimum condition of the price level. Then the service limit below which the optimum distance from the nearest land to the production market. Both of these conditions are called the service area ideal (the ideal range). That is, there is an optimum distance where each type of commodity has the greatest profit. It is determined based on the research the relationship between the market price (market price), transportation costs and transaction costs (transaction cost).

Due to the operational purposes in the field, then Isard (1956) and Hagget (1965) showed that the hexagonal pattern proposed by Christaller and Losch, is somewhat difficult to apply in practice. This is because of the fact that a high population density in the central area will lead the size of the market becomes smaller, while the distance from the market will lead to traffic congestion. Therefore, the hexagonal shape of an equilateral was further developed by not following the shape of the area bounded by geographical conditions and the interests of administrative areas.

As an illustration service centers, a description can refer to Dickenson (Pacione, 1984) which is divided into five levels as follows:

- Central region, with 100000-250000 inhabitants
- Central sub-region, with 60000-100000 inhabitants
- The district center, with 5000-60000 inhabitants,
- Sub-district center, with 1,000-5,000 inhabitants,
- The village center, with 300-1000 inhabitants,

The concept of central service of course requires adjustments to the conditions of local settlements. Most important is an understanding of these concepts in a multi-sector approach through participatory planning (Poerbo, 1990).

## VI. URBAN FRINGE AREAS

At the beginning of the XXI century, an estimated 60% of the world population live in urban. This is a challenge of planning and regional development, especially in terms of settlement planning and functions of urban areas and the urban fringe areas of the city.

Urban fringe areas, also called the hinterland areas is a region which support the functional urban areas. This area should be of particular concern given the burden to the people by an urban area is very heavy. To give a clear understanding on the urban fringe areas, the need for boundary area between urban settlements and rural settlement based on its characteristics.

The urban fringe areas is a highly influential part in a development area. This is the region that continuously supply the needs of the service center by Christaller denoted as G-center, while the urban fringe areas of these areas as B-center. This urban fringe areas at the same time can be a problem for the service center. For some large cities, the urban fringe areas is composed of:

- 1) Some areas that supply the food needs (A)

- 2) Some regions which supplies human resources settled in the center (B)
- 3) Most of the territories that are dwelling urban workers commonly called commuters (*panglayu*), (C)
- 4) Most of the territories that are urban residents looking for fresh air (D)

## VI. CONCLUDING REMARKS

There are two things that can be significantly noted as conclusions in this paper. The first is the important of a well managed urban fringe areas development in order to decrease urbanization. The second is the important of the concern toward the implementation of urban development concept. These remarks particularly important the eastern part of Indonesia as this parts are still relatively lag behind in comparison to the Western part of Indonesia. Thus, much remain to be done by the Government of Indonesia.

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