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# The Utilization Characteristics of Social Facilities in the Border Area of Semarang City

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**Abstract.** The rapid growth of settlement in border areas is often considered as a problem of big cities in Indonesia, where people from rural areas prefer to move out and settle in the border areas of big cities due to the provision of better social facilities. Border areas generally do not receive adequate attention and are often overlooked by the local government. It is a common phenomenon in Indonesian cities, including in Semarang City. Increased number of settlements in the border areas in Semarang City is in linear with spontaneous urbanization processes which indicate the heterogeneity emerging of settlement areas. In the early stages of Semarang City spatial planning, the need for social facilities in border areas is included based on the regular standard which is commonly applied to the urban core. In a very short period, the numbers and types of existing social facilities are insufficient to fulfill the needs of the community. Nowadays, in the context of rapid urbanization, the growth of social facilities in border areas is very high. The intense growth of settlements in border areas is very high due to the low price of land in Demak Regency in compared to those of other areas in Semarang City. However, only a few developers involved social facilities as a part of housing estate construction. Consequently, most of the occupants utilize a limited number of social facilities provided by the municipal government, which are actually intended to serve the citizens of Semarang City. This research was conducted at Sendang Mulyo Village which is located in the border of Semarang municipal administrative area and included in Demak Regency. This paper discusses the utilization characteristics of social facilities in the border area of Semarang City, with the aim to get the trigger factors. The method analysis consisted of a statistical test and descriptive analysis. The utilization characteristics were formulated based on the relationship between neighborhood and human behavior. The settlements in the border area of Semarang City have different characteristics. The differences led to a gap of the utilization of facilities between people who live in the planned and unplanned settlement. Therefore, the social spatial concept is required to address the issue.

## INTRODUCTION

Cities always grow and develop through sustainable urbanization [1]. This process causes urban sprawl spreads to the outer part of the city, known as the border area. The city is the venue for a human with all of their life as a part of a human settlement that consists of "contents and container". Content consists of individual and society, while container consists of shells, networks, and nature [2]. The relationship between man and space in regional physical element consists of content and container. Content is the population of the city while the container is a region that consists of nodal, path, natural resources, and the administrative boundaries [3]. Those factors affect the emergence of new sub-service facilities that influences the use of social facilities in the border area. The emergence of new sub-service facilities occurs because there are some areas with an absence of facilities due to their low accessibility. Therefore, sub-service facilities are provided to reach some areas which are not well served to make accessibility easily. In addition, the service center hierarchy is influenced by threshold population and range of goods [4]. The emergence of the subservice center is triggered by some factors, such as, 1). location factor, 2). natural resources availability factor, 3). agglomeration factor, 4). government investment factor [5]. In the early stages of Semarang

City spatial planning, the provision of social facilities in border areas was assessed based on a basic standard that is commonly used for the development of urban settlements. However, a few years later, the number and types of existing social facilities are inadequate to fulfill the needs of the community, particularly due to the intense growth of settlements in border areas.

The rapid growth of settlements in border areas is often considered as a problem for Indonesian cities where people from rural areas prefer to move out and settle in the border areas of big cities to obtain better social facilities. Border areas generally do not receive adequate attention and are frequently overlooked by the local government. It is a common phenomenon in Indonesia, including in Semarang City. Increased number of settlements at the border areas in Semarang City is in linear with spontaneous urbanization processes which indicate the heterogeneity of settlement areas. The intense growth of settlements in border areas is very high due to the low price of land in Demak Regency in compared to those of other areas in Semarang City. However, merely a few developers involved social facilities as a part of housing estate construction. Consequently, most of the occupants utilize a limited number of social facilities provided by the municipal government, which are actually intended to serve the citizens of Semarang City. The absence of sufficient social facilities at a neighborhood center in the border areas, however, has an adverse impact.

The utilization of social facilities in the border areas of Semarang City is not only influenced by the flourish of settlement and sub-service center, but also by the local people behavior. Nevertheless, it shapes specific characteristics. The utilization characteristics are formed based on the relationship between neighborhood and human behavior. In addition, human behavior will influence and shape the behavior setting of their neighborhood [6]. The settlements in border areas of Semarang City have particular characteristics. The differences trigger the gap between people who live in a planned and unplanned settlement in pertaining to the facilities utilization. Therefore, a social spatial concept that consists of spatial practice, representations of space, and representational space, is required to bridge the gap [7]. Sendang Mulyo Village is a village that is located in the border area of Semarang municipal city and Demak Regency, as the study area of this research.

## STUDY AREA

This study was conducted in the capital of the Central Java Province, Semarang City. It is located in the North Coast of Java Island. Data in 2010 to 2015 recorded an average of 0.97% population growth with the total population of Semarang of 1,723,988 inhabitants.



**FIGURE 1.** Map of Semarang Municipal Area  
(Source: Semarang Local Planning Development Agency).

The percentage of population growth in Semarang is considered low in compared to other metropolitan cities, for instance, Bandung, Medan and Palembang. In addition, the most populous sub-district is Pedurungan whereas the least populated sub-district is Tugu. In 1986, 62% of Semarang population was still concentrated in the city center, but in 1995, the population concentration was shifted to sub-district fringe by 64%. The population data indicated that there was a population shift from the city center to the border areas. It is predicted that this tendency will continue due to the density level of population and building in fringe areas is relatively low. The increasing interest

of people to live in the border areas is motivated by several factors, including the increasing number of real estates in the form of various types of new settlements, various social strata, and the easiness of house ownership process by the availability of many housing credit scenarios (Fig. 1).

Sendang Mulyo Village is the locus of this research which located in the border area of Semarang municipal area and included in Demak Regency. The settlements in Sendang Mulyo Village can be categorized into three characteristics of: 1. Planned settlement, 2. The unplanned settlement, and 3. Autonomous settlement. The differences among those categories led to a gap among the residents who live in the planned and unplanned settlement, in pertaining to the characteristics in utilizing the social facilities (Fig. 2 and Fig. 3).

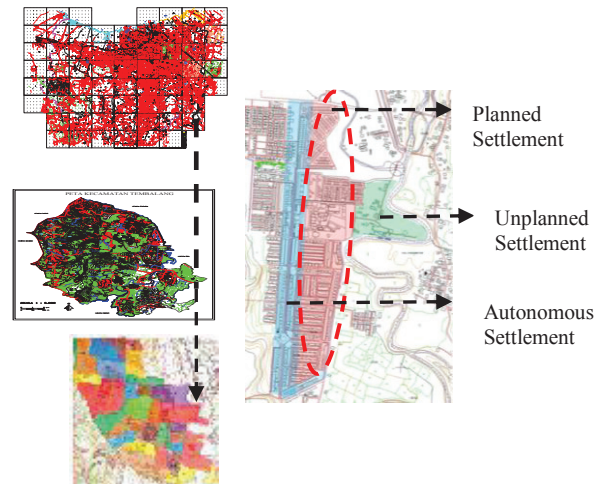


FIGURE 2. Map of Sendang Mulyo Settlements.

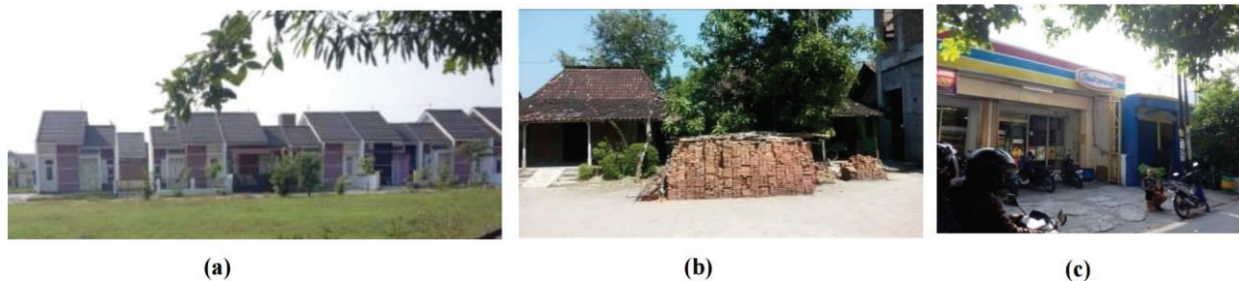


FIGURE 3. Settlement Characteristics in Sendang Mulyo Village: (a) Planned, (b) Unplanned, and (c) Autonomous settlement.

## STATISTICAL ANALYSIS

### Research Population and Respondent (Sampling)

The number of respondents was 100 residents (a 95% confidence interval).

### Validity and Reliability Test

The process of validity and reliability test was performed by using Pearson's correlation to determine the variable reliability, which can be seen from the generated variable that has signification value of  $<0.05$ . Meanwhile, Pearson correlation value for valid data is  $>0.3$ .

Subsequently, then reliability level was examined through Corrected item-Total Correlation with SPSS software (Table 1 and 2).

**TABLE 1.** Cronbach's Alpha Variable X

| Case Processing Summary |     |       |
|-------------------------|-----|-------|
|                         | N   | %     |
| Cases Valid             | 100 | 100.0 |
| Excluded <sup>a</sup>   | 0   | .0    |
| Total                   | 100 | 100.0 |

<sup>a</sup>Leastwise deletion based on all variables in the procedure

| Reliability Statistics |  |            |
|------------------------|--|------------|
|                        | Cronbach's Alpha Based on Standardized Items | N of Items |
| Cronbach's Alpha       | .764   | 30         |

**TABLE 2.** Cronbach's Alpha Variable Y

| Case Processing Summary |     |       |
|-------------------------|-----|-------|
|                         | N   | %     |
| Cases Valid             | 100 | 100.0 |
| Excluded <sup>a</sup>   | 0   | .0    |
| Total                   | 100 | 100.0 |

<sup>a</sup>Leastwise deletion based on all variables in the procedure

| Reliability Statistics |  |            |
|------------------------|--|------------|
|                        | Cronbach's Alpha Based on Standardized Items | N of Items |
| Cronbach's Alpha       | .625   | 40         |

Based on the table of Cronbach's Alpha variable X and Y, it can be seen that Cronbach's Alpha on variable X was 0.764 and on variable Y was 0.625, therefore, variable X and variable Y were included in 0.60 to 0.80 category with the reliable predicate.

### Mean Factor Analysis

#### *Mean Factor Variable Analysis of Utilization Characteristics of Social Facilities (Variable X)*

The lowest mean factor in the variables of the characteristics of social facilities utilization was obtained by the accessibility to settlement facilities with a value of 2.31. This value was included in the range of 1.5-2.5 with low interpretation. It can be interpreted that the accessibility to settlement facilities significantly affects the utilization characteristics of social facilities in the border areas of Semarang City.

#### *Mean Factor Variable Analysis of Human Settlements (Variable Y)*

The lowest mean factor in the variable of human settlements was obtained by an individual with a value of 2.46. This value was included in the range of 1.5-2.5 with low interpretation. It can be interpreted that individual significantly affects the utilization characteristics of social facilities in the border areas of Semarang City.

#### *Mean Factor Correlation Analysis on Variable of Utilization Characteristics of Social Facilities and Human Settlements*

The average mean factor of variable Y was 2.82. It was determined from the median calculation of factors in the utilization characteristics of social facilities variable. Subsequently, the value was converted into a semantic differential element or opposing adjectives in the scale of 1, 2, 3, 4, 5, that refers to agreement and disagreement statement. The result was the value of 2.82 included in the range of 2.5-3.5, which can be classified as neutral/ordinary.

Furthermore, the average value of mean factor of human settlements variable was 2.63. This value was also classified as a neutral/ordinary category. Hence, the gap between the variables of the utilization characteristics of social facilities and the human settlements was 0.19. The respondents' response to the utilization characteristics of social facilities variable was less than 0.19 toward human settlements variable.

## Factor Analysis

In the factor analysis, not all variables are involved in the analysis process since merely valid variables that are included in the process. To determine whether the collection of factors is significant to be included in the analysis, KMO and Bartlett's Tests were performed. In case the KMO value is  $>0.5$ , it can be assumed that the factors are significant (Table 3 and 4).

**TABLE 3. KMO and Bartlett's Test Variable X in the Initial Step**

| <b>KMO and Bartlett's Test</b>                  |                   |         |
|---|-------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                   | .622    |
| Barlett's Test of Sphericity                    | Approx Chi-Square | 1.317E3 |
|   | Df                | 435     |
|   | Sig.              | .000    |

**TABLE 4. KMO and Bartlett's Test Variable Y in Initial Step**

| <b>KMO and Bartlett's Test</b>                  |                   |         |
|---|-------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                   | .631    |
| Barlett's Test of Sphericity                    | Approx Chi-Square | 2.076E3 |
|   | df                | 703     |
|   | Sig.              | .000    |

Based on the factor analysis, there were some variables that obtained MSA of  $<0.5$ . There were variables X of X2.1 (0.381a), X5.5 (0.392a), and X3.11 (0.493a). While for variable Y were Y3.8 (0.445a) and Y3.9 (0.492a). In accordance with the determination of MSA value of  $<0.5$ , thus, one factor with the smallest value was eliminated. The eliminated variables were X2.1 with MSA value of 0.381 and Y3.9 with MSA value of 0.445a.

After the elimination of variables with MSA value of  $<0.5$ , KMO value by the end of the analysis can be determined, which were 0.665 for variable X and 0.643 for variable Y (Table 5 and 6).

**TABLE 5. The Final Output of KMO Value and Bartlett's Test of Variable X**

| <b>KMO and Bartlett's Test</b>                  |                   |         |
|---|-------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                   | .665    |
| Barlett's Test of Sphericity                    | Approx Chi-Square | 1.189E3 |
|   | Df                | 378     |
|   | Sig.              | .000    |

**TABLE 6. The Final Output of KMO Value and Bartlett's Test of Variable Y**

| <b>KMO and Bartlett's Test</b>                  |                   |         |
|---|-------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                   | .643    |
| Barlett's Test of Sphericity                    | Approx Chi-Square | 2.030E3 |
|   | Df                | 636     |
|   | Sig.              | .000    |

After identifying the correlation value and KMO value, the next step was to assess the factor components that were formed. Based on the factor analysis, there were 28 components of factor X and 37 components of factor Y. Furthermore, the factor components with significant effect were determined as components with an eigenvalue of  $>1$ , hence, components with eigenvalue of  $>1$  would be included. Finally, there would be only 8 (eight) factor X and 11 factor Y that obtained the eigenvalue of  $>1$ .

### *Factor X*

**Factor 1.** Accessibility to market facilities (shopping complex, stall) (X3.1) with a loading factor of 0.793. Accessibility to college/academy (X3.6) with a loading factor of 0.611. Accessibility to government facilities (citizen association, neighborhood association, village, sub-district) (X3.7) with a loading factor of 0.733. Accessibility to public health center and maternity care facilities (X3.11) with a loading factor of 0.622. Accessibility to the hospital (X3.12) with a loading factor of 0.538.

**Factor 2.** Accessibility to kindergarten education facilities (X3.2) with a loading factor of 0.444. Accessibility to elementary school education facilities with a loading factor of 0.768. Accessibility to Junior High School education facilities (X3.4) with a loading factor of 0.832.

**Factor 3.** Accessibility of road infrastructure (highway, street) (X1.1) with a loading factor of 0.712. Accessibility to water network infrastructure (X1.2) with a loading factor of 0.633. Accessibility to water channel infrastructure (X1.3) with a loading factor of 0.684.

**Factor 4.** Electricity network services (X1.7) with a loading factor of 0.704. Telecommunication network services (X1.8) with a loading factor of 0.754.

**Factor 5.** Waste management system services (X1.4) with a loading factor of 0.431. Transportation network services (X1.10) with the loading of 0.606. Accessibility to security facilities (police office) (X3.10) with a loading factor of 0.630. Homogeneous topography (X4.1) with a loading factor of 0.821.

**Factor 6.** Accessibility to open space (X3.9) with a loading factor of 0.787. Homogeneous land in fertility, productivity, and cost of transport (X5.2) with a loading factor of 0.344.

**Factor 7.** Homogeneous economic life and does not allow for primary production (X4.2) with a loading factor of 0.602. Systems in an isolated condition (X5.1) with a loading factor of 0.388. There are a large number of producers who want to maximize the benefits and a large number of the land statue who intend to maximize the rental fee (X5.4) with a loading factor of 0.759.

**Factor 8.** General lighting service (X1.5) with a loading factor of 0.846. Fire engine infrastructure service (X1.6) with a loading factor of 0.395. Services of sewerage and drainage systems (X1.9) with a loading factor of 0.386.

### *Factor Y*

**Factor 1.** Socio-Culture (Y2.3) with a loading factor of 0.697. Law and administration in the neighborhood (Y2.7) with a loading factor of 0.481. Distributed by water channel system (Y4.3) with a loading factor of 0.779. Distributed waste management network (Y4.4) with a loading factor of 0.810. Distributed sewerage and drainage (Y4.9) with a loading factor of 0.817.

**Factor 2.** Health and welfare conditions (Y2.6) with a loading factor of 0.617. Distributed road network (highway, street) (Y4.1) with a loading factor of 0.751. Distributed water channel (Y4.2) with a loading factor of 0.561. Distributed electricity network (Y4.7) with a loading factor of 0.809. Distributed telecommunication network (Y4.8) with a loading factor of 0.603.

**Factor 3.** The relationship between social interaction and others in the neighborhood (Y1.3) with a loading factor of 0.681. Moral values in the neighborhood (Y1.4) with a loading factor of 0.571.

**Factor 4.** The condition of settlements spatial enclosure (Y1.1) with a loading factor of 0.679. Sensation and perception (Y1.2) with a loading factor of 0.643. Social stratification (Y2.2) with a loading factor of 0,749. Social education (Y2.5) with a loading factor of 0.536.

**Factor 5.** Social economic development (Y2.4) with a loading factor of 0.741. Land use (Y5.3) with a loading factor of 0.660.

## **Statistical Analysis Results**

After performing statistical tests on the factor analysis, factors that formed the utilization characteristics of social facilities in the border areas of Semarang City were determined. In overall, there were 16 factors in the utilization characteristics of social facilities, which consisted of 8 (eight) variable X and 5 (five) variable Y.

Variable X comprised of: Factor 1 (18.395%), factor 2 (13.045%), factor 3 (10.498%), factor 4 (7.783%), factor 5 (5.142%), factor 6 (4.842%), factor 7 (4.303%), factor 8 (3.910%). These factors of the utilization characteristic of social facilities had a significance value of 67.918%, while the other 32.082% was influenced by other factors outside the research model.

Furthermore, the factors of variable Y comprised of: Factor 1 (15.389%), factor 2 (12.626%), factor 3 (6.235%), factor 4 (4.379%), and factor 5 (3.095%). These factors of human settlements in the utilization characteristics of social facilities had a significance value of 73.869%, while the other 26.131% was influenced by other factors outside this research model.

## **RESULTS AND DISCUSSION**

By using statistical test, the utilization characteristics of social facilities in the border areas of Semarang City were categorized based on two dominant aspects as follows:

### **Physical aspects**

Based on physical aspects point of view, the characteristics consisted of several factors as follows:

- Factor 1. Accessibility to trading facilities, college, government facilities, public health center, and maternity care facilities.
- Factor 2. Accessibility to education facilities.
- Factor 3. Accessibility to water channel infrastructure.
- Factor 4. Electricity network services.
- Factor 5. Waste management system services.
- Factor 6. Accessibility to security facilities.
- Factor 7. Homogeneous topography.
- Factor 8. Accessibility to open space.
- Factor 9. Homogeneous economic life and the absence of primary production.
- Factor 10. General lighting service Fire engine infrastructure service Services of sewerage and drainage systems.

### **Non Physical Aspects**

Based on non-physical aspects point of view, the characteristics consisted of several factors as follows:

- Factor1. Socio-culture, law and administration in the neighborhood.
- Factor2. Health and welfare conditions.
- Factor3. The relationship between social interaction and others in the moral values in the neighborhood.
- Factor4. The condition of settlements spatial enclosure.
- Factor5. Social economic development.

## **CONCLUSIONS**

Based on the analysis, the results can be summarized as follows:

1. Characteristics of the utilization of social facilities in the border areas of Semarang city are affected by the physical aspects such as accessibility, electricity network services, waste management system services, homogeneous topography, homogeneous economic life, general lighting service, fire engine infrastructure service, sewerage system, and drainage systems. Meanwhile, non-physical aspects such as socio-culture, law and administration in the neighborhood, health and welfare conditions, and the relationship between social interaction and others in the moral values in the neighborhood, the condition of settlements spatial enclosure, and social economic development, also have a significant contribution.

2. There is a close relationship between the physical layout of an environment and human behavior. Hence, several groups were formed in accordance with their diverse behaviors in utilizing social facilities among people who live in the border areas. This condition leads to social inequality.



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