Evaluation and study of minimarket potential locations in BWK I, Semarang City

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Abstract. Nowadays the population in Semarang City is increasing rapidly, this is also followed by the development of economic activities in the trade and services sectors. The minimization of the Minimarket to the lower middle trade sector can be seen from the increase in quantity. In 2010 the number of minimarkets in Semarang City had 244 buildings and continued to increase every year. This has an impact on land use change and will affect the existence of traditional markets. This research uses descriptive quantitative method with emphasis on spatial perspective. Aims to identify the needs, distribution patterns, service coverage (trade area), and suitability of the existing minimarkets. This study shows that the number of existing minimarkets exceeds the limits of what they should be. Based on the analysis of the suitability of the location of the existing minimarkets, as many as 11 minimarket buildings are included in the appropriate category from a total of 92 buildings.

Keywords: Minimarkets, Trade area, Service area

1. Introduction

The growth of the city is marked by an increase in population, usually followed by the development of economic activities in the trade and services sector. It is also characterized by changes in the use of agricultural land to more profitable and productive sectors such as trade and services. Semarang City is one of them, in 2010 the number of minimarkets reached 244 buildings and continues to increase every year [1]. In line with the increasing focus on customer value offered by minimarkets, especially in services, food safety guarantees, convenience, information, variety and comfort [2]. This is reinforced by Indonesia's gross domestic product (GDP) per capita of US $ 3,500 with an annual household budget of around US $ 5,000-US $ 15,000 expected to expand from 36% at present to 58% in 2020 [3]. Going Over 60 million low-income residents are projected to join the middle class population and drive higher consumer demand [3].

In determining the modern retail location in this study, especially the minimarket has a tendency to be located in the city center, this is often referred to as a symptom of the centralization of retail locations [4]. Richardson (1969) suggested that economic or corporate activity tends to be located at the center of activity in an effort to reduce uncertainty in decisions taken to minimize risk [5]. As a research location BWK I Semarang City is a city center that has offices, trade and services.
research suggests that in determining retail locations using demographic data as potential consumers. Berman & Evans explained that the importance of identifying consumers according to their demographics, lifestyles, needs and desires, attitudes and shopping behavior, their perceptions of retailer actions and the environment. Site selection is very important because a minimarket can succeed or fail based only on its location.

Location analysis is very important for retail. Some previous studies related to minimarkets in general are still focused on the determinants of minimarket locations, such as the most dominant geographical factors in determining new locations. The distribution pattern of minimarkets and the reach of minimarket services to consumers and the impact on traditional markets. This study bases on the saturation of minimarkets which has an impact on consumer reach. Both between minimarkets and traditional markets. The importance of structuring business space in urban areas (especially minimarket), this condition requires a structured problem solving through control and evaluation. In the future so that the development of minimarkets does not cause problems, this research will discuss the needs of minimarkets, the pattern of distribution of service areas (trade areas) and focus on evaluating the suitability of existing minimarket locations. So the results of this study are expected to be able to provide an overview and recommendations on the challenges of sustainable minimarket.

2. Data and Methods

2.1. Research data

Data requirements in this study use secondary and primary data. These data are grouped based on objectives and variables or attributes used in research. Primary data sources in this study were conducted by questionnaire and field observations. As for secondary data, it is conducted through literature review and document review from books, laws, journals, previous studies, articles, internet, archives and data from government or private agencies. Secondary data in this study include population, number and location points of trade facilities (minimarkets and traditional markets) as well as spatial data such as land use maps, road networks and disaster-prone maps.

2.2. Research analysis method

This research uses descriptive quantitative method with emphasis on spatial perspective. Church states that the success of many future applications of the location of retail outlet sites may be closely linked to Geographical Information Systems (GIS) due to the fact that these systems are responsible for working with spatial information. The analysis in this study mostly uses GIS software including the needs analysis and distribution patterns of the minimarket (nearest neighbor analysis), the trade areas analysis (services range) of existing minimarkets and traditional markets, and the suitability analysis of the location of the existing minimarkets. Sampling in this study using the technique of Probability sampling. This sampling is to provide equal opportunities for each member of the population to be chosen as a sample. With stratified random sampling the classification is distinguished through the street level of the minimarket location. Then the number of samples is determined by a random selection system. By using the formula from Slovin the number of samples in the study obtained 100 respondents. then each sub-district in BWK I Semarang City has 33 respondents and subdivided into 3 road classes namely arterial roads, collector roads and local roads.

3. Results and discussion

3.1. Analysis of Minimarket Needs and Distribution Patterns

This minimarket needs analysis refers to the Indonesian national standard each minimarket building can serve up to 6000 consumers Table 1. Overall in BWK I Semarang City, the total needs of suitable minimarkets are 36 minimarkets, while the existing minimarkets are 92 buildings, resulting in
an excess of 56 minimarkets. So that the total number of existing minimarkets is over capacity or more than the needs of minimarkets.

| No | District                  | Total population (2018) | Existing minimarket | Minimarket needs | Add new minimarket | Over capacity |
|----|--------------------------|-------------------------|---------------------|-----------------|-------------------|--------------|
| 1  | Central Semarang         | 69,711                  | 40                  | 11              | -                 | 29           |
| 2  | South Semarang           | 79,162                  | 28                  | 13              | -                 | 15           |
| 3  | East Semarang            | 76,608                  | 24                  | 12              | -                 | 12           |
|    | **Total**                | **225,481**             | **92**              | **36**          | -                 | **56**       |

But it is known from the results of research questionnaire data that there are several minimarkets that have consumers who live outside the city of Semarang. Minimarkets with consumers outside the study area are located along arterial roads, collector roads and minimarkets which are located around areas adjacent to other districts such as Kendal Regency and Demak Regency Figure 1. So this is in accordance with the theory developed by Losch [17] based on the landscape model, in this case the trade location (minimarket) is located in the city center and is related to the consumer movement sector. This is also reinforced by the land value theory by R.V. Retcliff [5] that the retail zone (minimarket) is located in the city center because business continuity requires the greatest degree of accessibility in order to obtain maximum benefits when viewed from an entrepreneur's perspective.

Figure 1. Map of existing minimarket locations distribution and analysis diagram of average nearest neighbors in BWK I Semarang City

It can be seen that in 2019 almost all parts of the research area have been covered by Alfamart and Indomart minimarkets. The distribution points of minimarkets are located in each class of roads, arterial roads, collector roads and local roads. Based on the analysis of the average nearest neighbor, the result of the minimarket distribution patterns found in the study area is to form an irregular random or random pattern. The Observed mean number values indicate that the average distance between the nearest minimarket is 203 meters. This shows that the distance between the existing minimarkets in the study area is closer than the service coverage limit if viewed from SNI No. 03-1733-2004 as far as 500 meters.
3.2. Analysis of minimarket and traditional market reach services (trade area)

Minimarkets with a distance of less than 500 meters with other minimarket locations produce a range of services that overlap with one another Table 2. So that it can be said the density between the locations of the minimarket results in competition in getting consumers. Consumers will usually use more than one place to shop, especially in densely populated urban areas where shopping options are greater [18]. Whereas traditional markets are divided between services that overlap and some do not. When viewed from the perspective of consumers this has a positive impact on the variety of choices in meeting shopping needs.

Table 2. Distance, transportation and shopping frequency of minimarket consumers

| No | Location distance | Distance | Respondents | Modes of transportation | Respondents | Shopping frequency | Respondents |
|----|-------------------|----------|-------------|-------------------------|-------------|--------------------|-------------|
| 1  | <500 Meter        | 16       | Walk        | 8                       | Daily       | 35                 |
| 2  | <1 Km             | 23       | Motorcycle  | 82                      | Weekly      | 10                 |
| 3  | >1 Km             | 61       | Car         | 8                       | Monthly     | 2                  |
| 4  | Other             | 2        | Uncertain   | 53                      |             |                    |
| Total |                   | 100    | Total       | 100                     | Total       | 100                |

The diversity of the reach of minimarket consumers in the study area shows that the reach of minimarket services is not limited to the surrounding population Figure 2. This can be shown from the number of respondents between the location of residence and the destination minimarket which is more than 1 Km as many as 61 people. The most frequently used mode of transportation to the minimarket is a motorcycle with 82 respondents with an average answer that is more flexible and comfortable.

Figure 2. Map of the reach of minimarket and traditional market services at BWK I Semarang City
3.3. Analysis suitability of the existing minimarkets

The criteria chosen as a reference for selecting the suitability of minimarkets are minimarkets located in residential and commercial areas, minimarkets are located in every road network system, not located in the area or range of traditional market services, finally the existing minimarkets are not in disaster prone areas. By using the model builder in the Spatial Analysis, each geographic information system is realized in a spatial map [19]. The process of scaling and weighting of land use variables, road networks, the distance between existing minimarkets and traditional markets and to disaster prone locations.

The total locations of the existing minimarkets according to the category correspond to the total value of the value between 17-21 in BWK I Semarang City of 11 buildings. Average minimarkets are in land use in trade and service areas, arterial roads, located outside the area or range of services of other existing minimarkets and traditional markets and located outside flood-prone areas. Furthermore, more than half of the total minimarkets in the Semarang City BWK I are dominated by existing minimarkets with a category that is quite in accordance with the total value of between 13-16 as many as 65 buildings. While the location of the existing minimarkets in the category does not match the total value of the range between 7-12 as many as 16 buildings with an average land use in residential areas, located along the collector road and local roads, located within the area or range of other existing minimarket services and traditional markets and located in flood prone areas Figure 3.

![Figure 3. Map of the suitability analysis of the existing minimarket in BWK I Semarang City](image)

4. Conclusion

The city of Semarang especially BWK I is a growth center for the surrounding area. This region is a strategic location for investment, especially in the trade sector, especially minimarkets. Based on the results of minimarket needs analysis that the number of existing minimarket buildings is disproportionate or more than their needs. Over capacity of up to 56 minimarkets out of a total of 92 existing buildings. This certainly affects the income of traders in traditional markets and grocery stores in the study area. But it is known from the results of questionnaire data that there are several minimarkets that have consumers or visitors residing outside the study area. Minimarkets with consumers outside the study area are located along arterial roads, collector roads and minimarkets...
which are located around areas adjacent to other districts such as Kendal Regency and Demak Regency. This shows that the minimarket is not only to meet the needs of residents in the Semarang City BWK I region, but also includes consumers outside the study area. Through analysis of the distribution patterns of minimarkets it is known that in 2019 almost all parts of the research area have been covered by minimarkets (Alfamart and Indomart) and form irregular random or random patterns. Based on the analysis of the nearest nearest average or average nearest neighbor, the average distance between the nearest minimarket is 203 meters.

In the analysis of the reach of minimarket services, it is known that all minimarkets in the study area overlap with one another. In accordance with the analysis of the nearest nearest neighbor, the average nearest neighbor shows that the average distance between the nearest minimarket is 203 meters. Even at some point the location of the minimarket is next to each other and facing a distance of less than 50 meters. So that it can be said the density between the locations of the minimarket results in competition in getting consumers. But based on the results of the questionnaire showed the diversity of consumers marked by as many as 61 respondents the distance of the location of their residence with a minimarket of more than 1 km. The average consumer minimarket is a private employee with the most commonly used mode of transportation is a motorcycle. Based on the analysis of the suitability of the location of the existing minimarkets, it is known that as many as 11 minimarket buildings are included in the appropriate category, as many as 65 buildings in the category are quite appropriate and with the category of incompatible as many as 16 buildings.

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