

ANALYSIS OF DEVELOPMENT AND SPATIAL PATTERN OF MINIMARKET DISTRIBUTION IN KALIURANG ROAD CORRIDOR

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ABSTRACT

Minimarket is the most expansive retail because the growth in number is much larger than other retail such as supermarkets and hypermarkets. In addition, the existence of minimarkets can not only be found in big cities but can also be found on the suburban and even rural areas. The spatial distribution of minimarkets in regional space is not random but forms a certain pattern that can be analyzed and mapped. Technological developments in the geospatial field, especially Geographic Information System (GIS) technology provide convenience in analyzing data on objects on the earth's surface, especially the development and spatial pattern of minimarket distribution in the Kaliurang road corridor. The analysis used in this study is trend analysis, which is to explain the direction and trend of minimarket development; and nearest neighbor analysis, which is to find out the spatial pattern of minimarket distribution that is formed in the Kaliurang road corridor. The results show that the direction of minimarket development is in line with the physical development of the city. In other words, the more developed an area, the higher the development of existing minimarkets, namely towards the southern part (urban area appearance) of the Kaliurang road corridor. Meanwhile, the physical development of the area also affects the distribution pattern formed. A clustered pattern is formed in urban areas appearance ($T=0.83$), a random pattern in suburban areas ($T=1.22$), and a spreading pattern in rural areas ($T=2.78$).

Keywords: spatial pattern, development, minimarket, gis, nearest neighbor, trend analysis, kaliurang road



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INTRODUCTION

Each region on earth will experience changes or dynamics with different intensities depending on the geographical, social, and economic conditions of the people in the region. Modern retail, especially mini-markets as an element in the regional space, is also experiencing dynamics and developments marked by an increase in the number of outlets from year to year. In a period of four (4) years, namely 2004-2008, the development of minimarkets in Indonesia has almost reached 100%, namely, from 5,604 units in 2004 to 10,289 in 2008 (Pandian, 2009).

Another fact shows that the growth of minimarkets is faster than large-format retails such as hypermarkets and supermarkets. This is because minimarkets are easier to obtain permits, both location permits, and business permits so that the existence of minimarket outlets can not only be found in urban areas, but also in suburban areas and even in rural areas (KPPU, 2009).

Growth in the number of outlets minimarkets in Sleman Regency, especially in the Kaliurang road corridor has also increased every year. Data from the Department of Industry, Trade, and Cooperatives (Disperindagkop) of Sleman Regency as of February 2013 shows a total of 161 minimarket outlets spread over 13 sub-districts. Meanwhile, the

number of Alfamart and Indomaret minimarkets (objects of research) spread across the Kaliurang road corridor is 64 units. It is estimated that this number will continue to grow in line with the physical development of the city and population growth.

Table 1. Retail Development in Indonesia

Years	Minimarket	Supermarket	Hypermarket	Total
2004	5604	956	34	6594
2005	6465	1141	50	7656
2006	7356	1311	83	8750
2007	8889	1379	99	10367
2008	10289	1447	130	11866
Total	38603	6234	396	45233

Source: (Pandin, 2009)

Table. 2 Minimarekt Data in Sleman District, February 2013

No	Sub-districts	Data Minimarket	
		Total (n)	%
1	Berbah	5	3.11
2	Depok	69	42.86
3	Gamping	13	8.07
4	Godean	9	5.59
5	Kalasan	12	7.45
6	Minggir	1	0.62
7	Mlati	16	9.94
8	Ngaglik	22	13.66
9	Ngemplak	7	4.35
10	Pakem	1	0.62
11	Seyegan	1	0.62
12	Sleman	4	2.48
13	Paste	1	0.62
Total		161	100

Source: Disperindagkop of Sleman Regency (2013)

Table 3. Number of Retail Alfamart and Indomaret in Kaliurang road corridor

No	Villages	Name Minimarket		Total (n)
		Indomaret	Alfamart	
1	Single Chess	15	8	23
2	Condong Chess	10	7	17
3	Sardonoharjo	2	3	5
4	Sinduadi	6	3	9
5	Sinduharjo	4	2	6
6	Sukoharjo	0	1	1
7	Umbulmartani	2	1	3
Total		39	25	64

Source: Field survey data in 2013.

This road corridor is a very strategic location for various economic activities, especially services and services. The existence of large and well-known hotels and campuses such as Gadjah Mada University (UGM), Yogyakarta State University (UNY), Atma Jaya, Indonesian Islamic University (UII), Yogyakarta National Development University (UPN), and Sanata Dharma encourage population growth, settlements, and other economic service activities. Rachmawati (1999) found that the Indonesian Islamic University (UII) Campus located in the northern part of the Kaliurang Km 16 Corridor, precisely in Umbulmartani Village, has made a major contribution to land-use change and suburban development.

The development and spatial distribution pattern of minimarkets in the Kaliurang road corridor are interesting to study because the location of the outlets shows a certain trend. This is in line with the theory expressed by Tarigan (2005) that the location of various activities, both socio-cultural and economic, is not random, but shows measurable patterns and trends. In this case, distance is the main factor in choosing the location of business activities. Adisasmita (2005) expressed different variables or considerations in determining the location of the most strategic economic activity, namely approaching places that have complete convenience facilities. Shops selling food, medicines tend to be spread according to the distribution of the population. Another scientist, namely Morill (1970) revealed that there are three (3) ways that decision-makers in the retail business usually do in selecting and placing their business locations, namely: good transportation accessibility, grouping (especially for complimentary items such as clothing stores, jewelry, and shoes), and choosing a location far enough from competitors that sell the same goods to ensure a secure market continuity. Meanwhile, according to Djojodipuro (1992) in his book entitled *Location Theory* states that there are six (6) factors that are usually taken into consideration by a company in placing its US location, namely 1) factors endowment, 2) market and price, 3) raw materials and energy, 4) agglomeration, 5) government policies, and 6) transportation costs.

Technological developments in the geospatial field, especially GIS have made it easier to display and analyze the direction of development and distribution patterns formed as well as preferences for choosing minimarket business locations in the Kaliurang road corridor. Coordinate data and other supporting data, namely the year of operation of the minimarket, urban level, accessibility, population, and distance are the main data in this study. The development and spatial distribution pattern of minimarkets that are formed are presented in a map that shows each time the outlets start operating so that the process, direction, and pattern of developments that occur can be seen.

Seven (7) villages administration are the research locations, namely villages that are attached to Jalan Kaliurang from Km 0 to Km 16.5. The reason for choosing these Seven (7) villages administration units is because of variations in the physical development of the area (accessibility, population, and distance), namely the representation of the urban area appearance (the southern region includes Caturtunggal, Condongcatur, and Sinduadi villages), representation of the suburban area appearance (the central region, covering the Sardonoharjo and Sinduharjo villages), and the representation of rural features (northern region, including Umbulmartani and Sukoharjo villages) so that it is interesting to study its relation to the development and spatial distribution pattern of minimarkets in location preferences.

METHODS

2.1 Types of research and sampling

This research uses quantitative research with a full/saturated sample. The saturated sample is a sampling technique that uses all members of the population as a sample (Sugiyono, 2011). The reason for choosing this sampling method is to provide the most accurate and reliable analysis results. The more the number of samples used or the closer to the population, the higher the level of confidence from the results of generalizing the object under study (Sugiyono, 2010). There are 64 units of minimarket outlets that are the object of research.

2.2 Technical data analysis

There are two analytical techniques used in this study, namely trend analysis, and nearest neighbor analysis.

1. Analysis of Spatial Trends (Spatial Trends): This trend analysis is one of the analytical themes of the 9 (nine) themes contained in the spatial approach. Trend analysis in this study is used to identify and explain trends in the growth and development of minimarkets in the Kaliurang road corridor, namely by showing the initial location of minimarket development and trends in the direction of development that occurs based on time series (Yunus, 2010). The main key of this trend analysis is the time factor, so data on the start time of each minimarket outlet is needed.
2. Analysis of Nearest Neighbors (Average): Nearest neighbor analysis or better known as nearest neighbor analysis introduced by Clark and Evans is a geographical quantitative analysis method used to determine the distribution pattern of object location points using calculations that consider distance, number of points, and area (Haggett, 1975). The final result is an index calculation that has a range between 0 – 2.15. The nearest neighbor analysis in this study is used to analyze and measure the pattern of the minimarket point distribution that is formed.

According to Bintarto & Hadisumarno (1978), the spatial distribution pattern that is formed can be grouped into three (3), namely the clumped pattern (Clustered), the random pattern (random), and the pattern of spread/uniform (dispersed). A distribution is said to be clustered if the calculation shows that the mean value of the nearest neighbor is less than 1 ($T < 1$). In contrast to the clustered pattern, a pattern is said to be dispersed if the ratio of the closest neighbors is equal to 1 ($T=1$), while a pattern is random or random if the ratio of the nearest neighbors is greater than 1 ($T>1$). The three (3) distribution patterns can be described as follows.



Figure 1. Three (3) distribution patterns

The description of the spatial distribution pattern of minimarkets formed in this study is grouped into four (4) types of discussion, namely the distribution pattern for the period 2003-2012 (minimarkets as a whole), the distribution pattern in the southern region (urban area appearance), the distribution pattern in the central region (suburban area appearance), and the distribution in the northern region (rural area appearance).

2.3 Data Collection Techniques Data

The collection is the most important stage in the research process so that appropriate data collection techniques are needed (Sugiyono, 2011). Data collection techniques in this study were carried out in two ways, namely, primary and secondary data collection, regional administrative boundary data, and road network maps are secondary data obtained from the Agency of Regional Development Planning Agency (BAPPEDA) of Sleman Regency, meanwhile, plotting the coordinates of minimarkets using a GPS handheld, and data on the year when minimarkets started operating through interviews are primary data

obtained from direct surveys to The plotting of minimarket locations aims to obtain absolute locations which are then abstracted into point features on the map. Meanwhile, data from the start of operation is used to see trends or trends in the development of minimarkets.

RESULTS

3.1 Distribution and development of minimarkets in Kaliurang road corridor

The beginning of the development of minimarkets in the Kaliurang road corridor was in 2003 (Fig 2), with one unit of minimarket outlets starting to operate in Sinduharjo Village (suburban area appearance). Temporarily, the spatial development trend of minimarkets in the first five years, namely the 2003-2007 period, was still low. This is indicated by data on the growth in the number of minimarkets, which were only 6 units. In other words, the average growth of minimarkets in this period was 1 unit (1.6% per year) compared to the total existing outlets until 2012. This condition was due to the initial development of a trading service facility, namely minimarkets, which was a period of exploration so that the number of adapt to the needs of the community. The distribution points of minimarket locations in this period are spread out in the southern region (urban area appearance, namely Caturtunggal, Condongcatu, and Sinduadi villages) and the central area (the suburban area appearance) namely in the village of Sinduharjo. Meanwhile, in the northern part (rural area appearance) there are no minimarkets that have started operating during this period. The peak development of minimarket outlets in the Kaliurang road corridor was in the period 2008-2012, which increased by 58 (91%) new outlet units from the total number of outlets. The largest increase was in Caturtunggal Village, which was 21 units, followed by Condongcatu Village as many as 15 units. Meanwhile, the direction of development that occurs is still dominated by the southern part of Sleman Regency, while the least is in the northern part.

Overall, the number of minimarket outlets in the Kaliurang road corridor from the beginning of its development, namely 2003 to 2012 was sixty-four (64) units. The spatial trend in the direction of development of the distribution of these minimarket outlets is towards the southern region (urban area appearance), followed by the central region. Meanwhile, the direction of development to the northern region is still very limited. This is by Morill's (1970) activity site selection theory; Adisasmita (2005); Tarigan (2005). The village with the most minimarkets is Caturtunggal Village, which is 23 units and followed by Condongcatu Village with 17 units of outlets. Meanwhile, the village that has the least number of minimarket outlets is Sukoharjo Village, which only has 1 outlet unit.

The striking difference in the trend towards the development of the spatial distribution of minimarkets in the Kaliurang road corridor shows an imbalance in the development of the city between the northern, central, and southern parts. Development in the southern part is faster due to various factors such as good accessibility, large population, and higher urban levels. Meanwhile, the existing road network in the northern part is very limited and land use is still dominated by non-residential areas. Another thing that affects this situation is the distance factor between the southern region which is closer to Yogyakarta city so that the influence of seepage of the development of Yogyakarta city is greater in the southern region than in the central and northern parts.

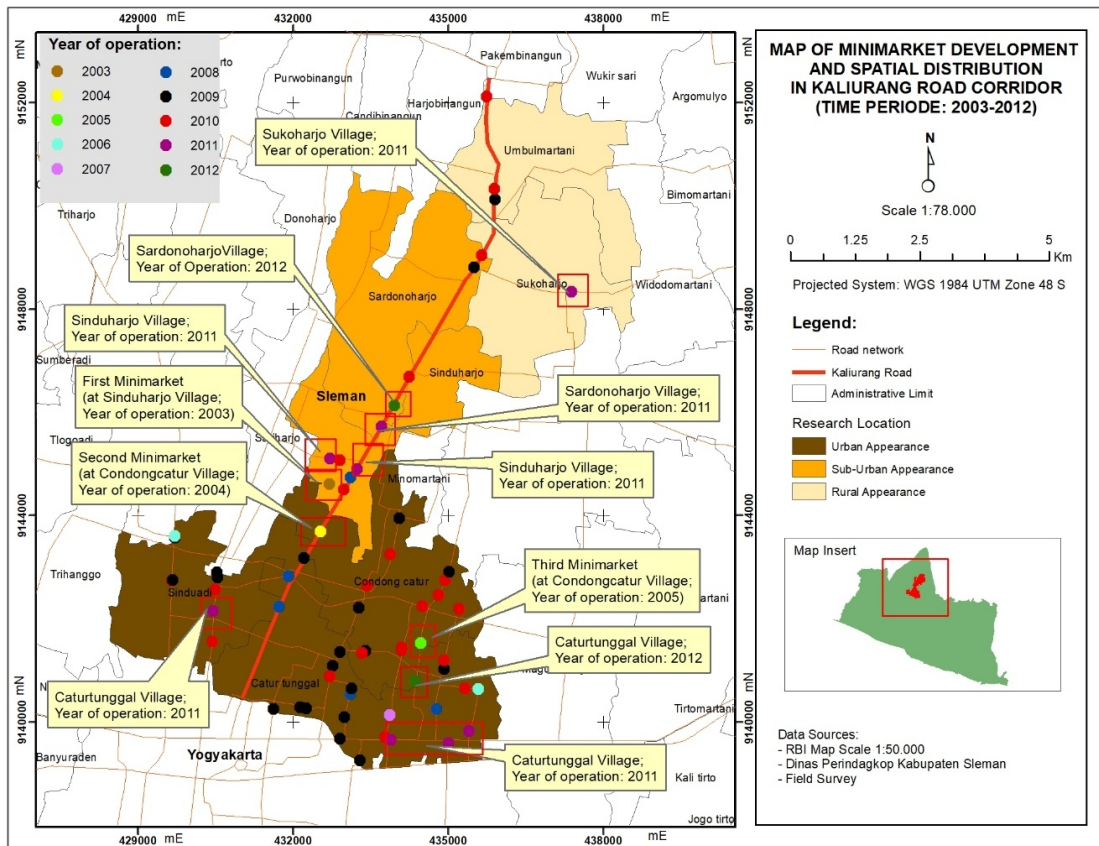


Figure 2. Map of minimarkets in Kaliurang Road Corridor

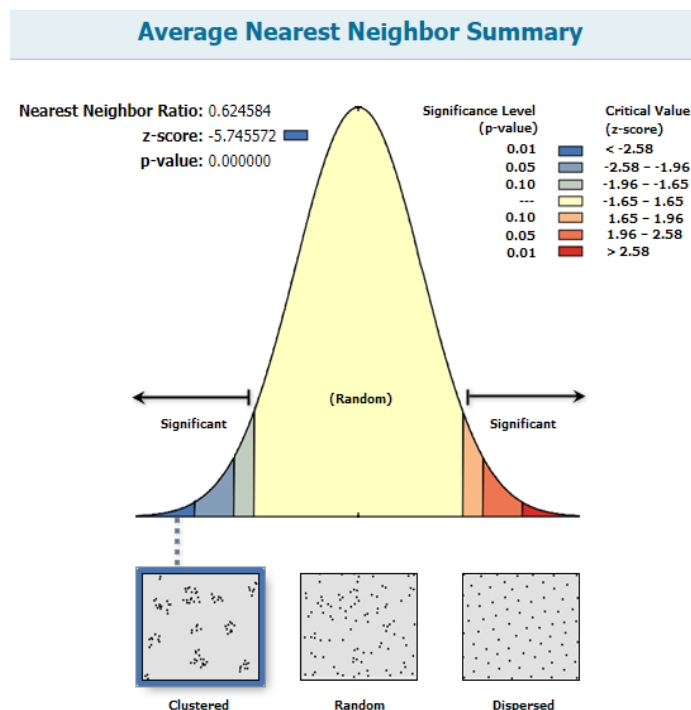


Figure 3. Nearest neighbor analysis of minimarket distribution patterns in Kaliurang road corridor

Spatially, the spatial distribution pattern of minimarkets formed in the Kaliurang road corridor is clustered. This is indicated by the average value of the nearest neighbor which

is less than one ($T=0.62$) (Fig 3). The concentration of grouping is in the southern region, especially in Caturtunggal and Condongcatur villages by following transportation routes and also settlements (population). The tendency of grouping minimarkets in the Southern region (urban area appearance) is due to the higher level of development than the central and northern areas, so developers prefer to place outlets in this area as a strategy to approach existing settlements (market potential). The higher the level of regional development, the greater the intensity of various population activities which become a very strategic market potential.

3.2 Southern region (Urban area appearance)

The initial development of minimarkets in the Southern region was in 2004, namely in Condongcatur Village as many as 1 outlet unit which then continued to grow until 2012. The total existing market was 49 units. Spatially, the pattern of distribution formed is clustered with a value of $T = 0.83$ (Fig 4). The tendency of grouping minimarkets in the southern part of the Kaliurang road corridor is due to the higher (urban) level of development compared to the central and northern areas, so developers prefer to place outlets in this area as a strategy to approach existing settlements. The higher the level of regional development, the greater the intensity of the various activities of the population in that location and this becomes a very strategic market potential.

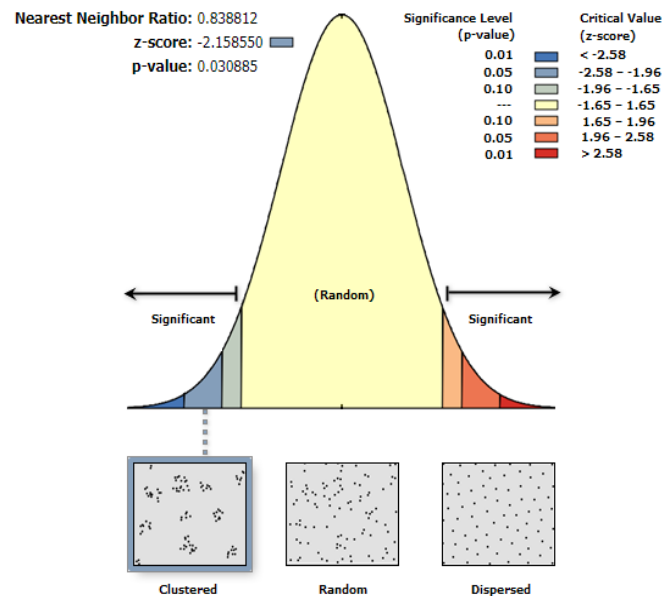


Figure 4. Nearest neighbor analysis of distribution patterns in urban features

3.3 Central region (Suburban area appearance)

The initial development of minimarkets in this central area was in 2003, with 1 unit of outlets located in Sinduharjo Village (close to residential areas). Until 2012 there were 11 units of minimarket outlets in this area. Meanwhile, the spatial pattern of minimarket distribution formed is random. This is indicated by the average value of the nearest neighbor T approaching 1, namely $T = 1.22$ (Fig 5).

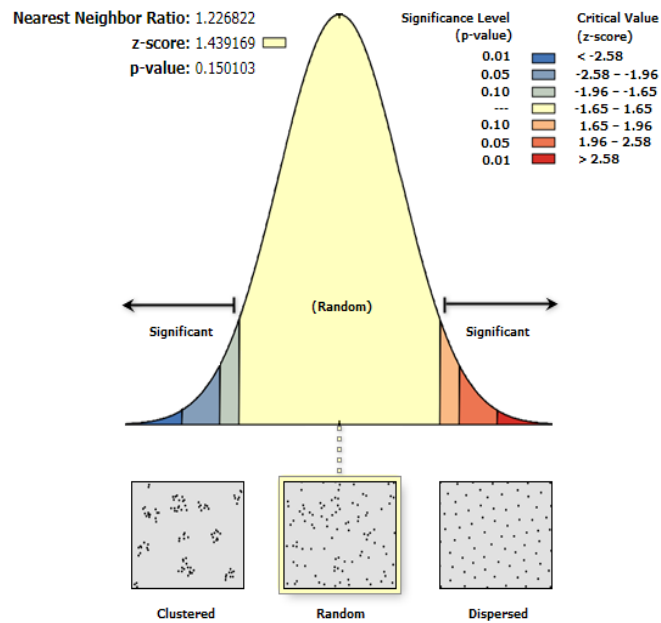


Figure 5. Nearest neighbor analysis of distribution patterns in suburban features

3.4 Northern region (Rural area appearance)

This northern area is a rural feature with the dominant land use being undeveloped land. The initial existence of minimarket outlets in this part of the region was in 2009 or six years since the initial development of minimarkets in the Kaliurang road corridor. The total number of existing minimarkets until 2012 was four (4) units of outlets. The spatial distribution pattern formed is spread out, with the nearest neighbor value $T = 2.78$ (Fig 6). In this condition, because settlements and land use in the northern part are still dominated by non-built land (rural physical appearance).

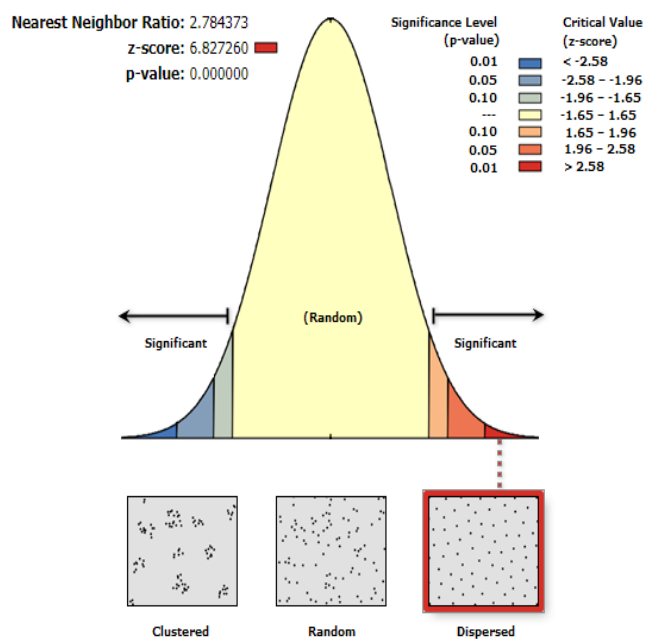


Figure 6. Nearest neighbor analysis of distribution patterns in rural features

CONCLUSION

The trend towards the development of minimarkets in the Kaliurang road corridor follows the level of physical development of the city (urban level: distance to the city center, population, accessibility). The more developed an area, namely the southern region (the urban appearance), the higher the level of development of minimarket outlets. This is because it provides a good market potential for business activities. Meanwhile, developments to the north tend to be limited, this is because this area is still dominated by non-built land, the distance from the city center is far and accessibility is low. Spatially, the pattern of distribution of minimarkets formed at each level of regional development is different. The distribution pattern formed in the area with the urban area appearance is a clustered pattern with the nearest neighbor value ($T = 0.83$). Meanwhile, on the suburban area, it forms a random pattern ($T=1.22$), and in the rural area, it forms a spreading pattern with the nearest neighbor value ($T=2.78$).

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