The physical factors affected settlement preferences in peri-urban area of Medan City

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Abstract. Preference settlement is a person's willingness to live or not in a place that influenced by various factors and variables. The policy of housing development in the suburban is an attempt to divert the population in Medan City to the peri-urban area. This causes more people to choose the peri-urban area as a residential location. Based on observations, the location in Medan City with the amount of housing that tends to increase is Namorambe District. This research is analyzed based on the following variables: accessibility, environmental conditions, and the completeness of facilities and infrastructure. This research aims to examine the physical factors that become settlement preferences in peri-urban areas. The method used in this research is quantitative descriptive by grouping data that have similarities with each other. The results of the research showed: in terms of accessibility, the large number of streets and the availability of many alternative routes; in terms of environmental factors, the condition of residential street frame, drainage systems, the vegetation, and the cleanliness of the; in terms of the condition of the facilities and infrastructure, the electricity facilities, garbage disposal, the sanitation network and worship facilities are the reasons respondents choose to live in Namorambe District.

1. Introduction

Amos Rapoport [1] stated the preference is one's taste in making choices, or making a choice among the available alternatives. Preference also applies in determining the location of residence or is interpreted as a preference for living. In general, location quality, such as security, accessibility, and social conditions, are taken into consideration when choosing a place to live. Amos Rapoport [1] states that decisions on location are often related to the characteristics of housing, status, prestige, social homogeneity, greening, topography, views, security, good schools, environmental conditions and social relationships which are closely related to levels and social status. Norman W. Heimstra and Leslie H. Mc. Farlins in Kurniasih [2] provides location criteria where a person will feel suitable to live in a place as follows: (a) The housing area becomes an extension of the house such as personal space, privacy, and territoriality. The location around the residential unit is seen as an integral part of the house (sense of localism). (b) The housing area represents an extension of the house and is linked to an arrangement of social ties that serve as a source of interest for comfort. (c) Pay attention to the five elements of...
residential environment comfort, namely: neighborhood density, accessibility of facilities, respondent's home, social compatibility, and neighborhood maintenance level.

Luhst [3] states that the quality of life in the form of comfort, security of a house is very much determined by its location, in the sense that the attractiveness of a location is determined by two things, namely the environment and accessibility. Environment by Luhst is defined as an area geographically bounded by real boundaries, and usually inhabited by population groups. The environment contains physical and social elements that give rise to activities and busyness in daily life. These elements are in the form of school buildings, shopping buildings, markets, open areas for recreation, driveways, and so on. Accessibility according to Luhst is the attractiveness of a location because it will gain ease in its achievement from various activity centers such as trade centers, education centers, industrial areas, banking services, recreation areas, government services, professional services and even a combination of all activities. The assessment of accessibility can be in the form of distance from the Central Business District or CBD, the ease of getting services from public transportation to the location concerned or it can also be seen from the width of the street, namely the narrower the street width of an area of land means that the accessibility of the place concerned is not good.

Koestor [4] emphasizes the accessibility factor as the main influence of choosing a place to live, namely the ease of transportation and proximity to distance. Koestor [4] states that there is a very close relationship between the availability of local public transportation and the growth of residential locations, the existence of public transportation services makes it easier to reach residential locations in suburban areas, so that better transportation services will affect the growth of a residential environment. According to Sidik [5] in terms of the market economy, settlement is a special type of commodity, where the characteristics of the settlement are unique, especially concerning things such as (a) its fixed location and almost impossible to move, (b) its use in the long term, (c) is heterogeneous in a multidimensional manner, especially in location, natural resources and preferences, (d) physically can be modified but spatially the location is fixed.

Urban housing development always faces land problems, especially in downtown areas due to limited land availability. The tendency for population growth to develop is towards suburban areas as a result of expanding urban activity. The city center is no longer able to accommodate the pressure from the population. The increasing of population growth indicates that population development is spreading towards the sub-urban areas so that as a consequence there is a change in land use in urban areas. The Peri-Urban Area (WPU) [6] is an area located between two areas with very different environmental conditions, namely between an area that has an urban appearance on the one hand and an area that has a rural appearance on the other.

The population growth in Medan City continues to increase from year to year. Based on data from the Badan Pusat Statistik Medan City in 2019, the population of Medan City is 2,279,894 people [7]. As the population increases, the need for housing also increases. The policy of housing development in the suburbs is an attempt to divert the population of Medan to the suburbs which are directly adjacent to the city of Medan. This causes more and more people to choose peri-urban areas as their residence locations. Based on observations, the area with the number of housing that tends to increase from year to year is Namorambe District, Deli Serdang. From this things, it is necessary to carry out a research to find out what factors that affect the settlement preferences of people living in this area.

2. Methods
The peri-urban area to be studied is the Namorambe District, Deli Serdang Regency. The reason this area was chosen as a research area is because the housing development in this location is quite developed and the physical characteristics of this area still have agricultural land in the form of cultivated land and empty land. Namorambe District is the area closest to and directly adjacent to the main constructed urban land, for example directly adjacent to Medan Johor District. So that Namorambe District can be said to be a peri-urban area within the zobikot zone. In this research, the method used is descriptive quantitative. The criteria for respondents used in this research are (a) The head of the family, (b) Residents who have lived in the research location for at least 5-10 years.
3. Results and discussions

3.1. Accessibility

Based on the results of the questionnaire, accessibility is one of the physical factors that affect residents' preferences to choose housing in Namorambe District as a residence location. In the research area, the quality of streets in residential area is considered to be quite good with a percentage of 52.3%, while the rest of respondents stated that the quality of streets in residential areas is inadequate, streets that are potholed and have streets that are waterlogged (Figure 1).

![Figure 1. Accessibility percentage chart.](image)

In the research area, some respondents stated that the quality of streets in residential areas is considered quite good, while other respondents stated that the quality of streets in residential areas is inadequate, the streets are potholes and there are streets that are flooded, such as in Citra Namorambe Asri Housing and Namorambe City Housing (Figure 2).

![Figure 2. Street points inside the inadequate housing of Citra Namorambe Asri Housing and Namorambe City Housing.](image)

The main access to Namorambe District is fairly good quality. 59.5% of respondents stated that the streets in Namorambe District were quite wide and could be passed by 2 four-wheeled vehicles, while the rest stated that the streets in Namorambe District were narrow (Figure 3). The quality of the main streets in Namorambe District is quite smooth, the street material is made from asphalt and has no holes. The main street in Namorambe District is also not congested. The congestion point to and out of Namorambe District occurs on Jalan Karya Jaya because some points on this street have holes (Figure 3). Residents who do not obey traffic, narrow lanes and low street material quality are the factors that cause congestion to occur on Jalan Karya Jaya.
The number of streets and alternative routes in Namorambe District is an attraction for residents in choosing housing, as seen from 100% of respondents who stated this. This is good enough to avoid congestion at certain hours. One of the accessibility obstacles faced by residents is the difficulty of public transportation and online transportation. To get public transportation, residents have to walk far enough to get to the main street in Namorambe District. In addition, the number of public transportation is small and not always available. Based on the results of the research that has been done, it can be concluded that the number of streets and the availability of alternative routes are the main attraction for residents in choosing housing in Namorambe District as a place to live.

3.2. Environmental conditions

Based on the research results, 96.4% of respondents stated that environmental factors had an affect on the choice of housing location, while the rest stated that it had no affect. The respondent's assessment of the environment can be seen from the following diagram (Figure 4).

![Environmental conditions percentage chart](image)

**Figure 4.** Environmental conditions percentage chart.

In the research area, the entire road frame in the residential area can be traversed by four-wheeled vehicles and is made of asphalt and paving block materials (Figure 5).

![Street conditions in the residential areas](image)

**Figure 5.** Street conditions in the residential areas.

As many as 76.1% of respondents stated that the drainage system in the residential area are made of permanent materials, while the rest said that the drainage system in the neighborhood do not yet exist, such as in the Labuhan Asri Housing and Grand Fajar Asri Housing (Figure 6).
The condition of some of the drainage systems is quite good and well-maintained like in the Pondok Mansion, while some of them look unkempt. This untreated drainage system causes the housing environment to flood. In the research area, most of the residential areas have vegetations, so that the air quality in the housing is generally cool. From the 5 residential areas studied, there was one residential area that did not or had no vegetation so that the air quality in the residential area felt arid (Figure 7).

The cleanliness of the residential area is quite important for residents. As many as 72.6% of respondents said the existence of trash cans is in every house, while the rest stated that the existence of trash cans was only available at several points in the housing. Based on observations, the waste disposal points managed by residential areas are not well maintained. Garbage is only piled up at certain points and left unattended. In the research area, most of the respondents stated that the security conditions of the residential areas were unsafe and there were no security posts. There is only one residential area that has security post, namely Pondok Mansion. This causes residential areas to be quite prone to crimes such as loss of property belonging to residents of the residential areas.

Based on the results of the research, it can be concluded that environmental factors have an affect on residents in choosing a place to live. Some of the environmental conditions that affect are the drainage systems made from permanent materials, construction of road frames in residential areas that can be passed by four-wheeled vehicles with materials from paving blocks or concrete.

3.3. The completeness of facilities and infrastructure
In the research area, the availability of electricity networks and landfills were the facilities that were considered the best by the respondents, even though there was one housing area whose garbage dumps could be said to be inadequate because they were only piled at certain points. Waste management in the research area is managed by the housing environment itself. The following is a tabulation of the completeness of facilities and infrastructure in a housing location (Figure 8).
The assessment of the sanitation network and worship facilities is considered quite good with a percentage of more than 80%. The obstacle faced by respondents regarding municipal waterworks is the difficulty in obtaining municipal waterworks (PDAM). Based on observations, only Namorambe City Housing is equipped with PDAM network. Even though it is equipped with PDAM network, residential residents still use water pump to get clean water because PDAM water sources are not smooth. Meanwhile, other houses still use water pump to get clean water. The assessment of the facilities of worship is also considered good enough. Most of the residential areas have a mosque/prayer room within the housing area itself, so the access to places of worship can be reached on foot or by two-wheeled vehicles. The cleanliness of places of worship is also quite good and well maintained (Figure 9).

The assessment of economic facilities, 58.3% of respondents stated that economic facilities exist in residential areas, such as in Namorambe City Housing. While the rest stated that to access economic facilities, respondents had to leave the residential area. Several stalls are available inside the residential area but they are not sufficient to meet daily needs (Figure 10).
The assessment of educational facilities in the housing area is considered poor. Of the five houses, only Namorambe City Housing has educational facilities and only Kindergarten. Meanwhile, education facilities for SD, SMP, and the rest must be reached from outside the housing area with a relatively long distance. The evaluation of entertainment facilities is considered poor, because the entire residential area does not have entertainment facilities. Residents must leave the residential area to get entertainment facilities. The assessment for sports facilities is considered inadequate, because only Pondok Mansion Housing has volleyball field sports facilities. The condition of the field is quite well maintained and is still used by residential residents (Figure 11). Based on observations, there is no open space in a residential area that can add to the beautiful impression of the area. More than 50% of respondents stated that public funeral facilities are already available outside residential areas.

![Figure 11. Volleyball field sports facilities.](image)

Based on the research results, it can be concluded that some of the facilities and infrastructure that affect respondents in choosing a place to live are the availability of electricity networks, garbage dumps, the sanitation networks and the worship facilities. As for the education facilities, entertainment and sports facilities, the residents think it is not good, because all houses do not have these facilities.

4. Conclusion

Based on the results of the analysis of the research that has been done, it can be concluded that the physical factors that influence the preference for living in the peri-urban area of Namorambe District. The results of the study concluded that of the three physical factors that have been described, each factor has its own analysis.

In terms of accessibility, the large number of roads in Namorambe District and the availability of many alternative routes are the reasons most respondents choose to live in. In terms of environmental factors, respondents stated that the environment greatly influences the decision in choosing a residential location. The condition of a residential road frame can be passed by four wheels with asphalt construction, paving blocks or concrete. Drains that have been made of permanent materials and are sufficiently maintained. The vegetation condition is considered good with the presence of shade trees in the housing area. The cleanliness of the housing environment is quite clean, although there are houses that do not manage waste properly so that there is accumulation of garbage at some point. In terms of the condition of the facilities and infrastructure is considered quite good. Respondents assessed that electricity facilities are good, all residential areas have electricity networks. Garbage disposal facilities are also good, all residential areas have garbage dumps, even though the waste management is inadequate. The sanitation network and worship facilities are considered good. Worship facilities are evenly distributed in every housing and outside the housing environment and are easily accessible.

From the results of the study, several suggestions were made regarding physical factors that affect residence preferences. One of them is the need to conduct similar research in other peri-urban areas in Medan City where the residential preferences are not yet known. Similar research can also be carried out with different analytical methods and techniques to produce new findings.
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