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The Development Pattern of The Gowa-Maros New City as an Edge City Based on GIS (Geographic Information System)

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Keywords

Edge City, new urban characteristics, Gowa-Maros New Town.

Abstract. The development of the new city of Gowa-Maros is one way to address the inability of th core city (Makassar City) to support the impact of urbanization experienced by the current Metropolitan Mamminisata. This study aims to identify the development trend of Gowa- Maros New Town as an edge city that impact on the sustainability of Metropolitan Mamminasata urbanization. This research includes descriptive research type using quantitative data. Characteristic of new town developments in this study focuses on the physical, social and demographic, and economic aspects of the region with references to the edge city indocators. Furthermore, related to the development impact of Gowa-Maros New Town, efforts to reduce the burden of the core city (Makassar City) in support of Metropolitan Mamminasata urbanization is identified based on the characteristics of the current development of the region. The result of this study indicate that the tendency of the Gowa-Maros New Town suitability with further edge city indicators has a positive direct impact on metropolitan development, particularly with regard to regional structure, increased employment opportunities, and regional economic structure growth.

1. INTRODUCTION

In various developed countries, the construction of new cities is one of the strategies in managing urbanization as a form of counter magnet for the direction of population movement orientation and is believed/seen as the only way to overcome the problem of rapid urbanization without needing to conflict with development and conservation of rural land. as well as agriculture (Saliheen 2006). The main principle in development is that it is based on meeting the service and housing needs of the community with better environmental quality, as well as avoiding small-scale and scattered development so that development efficiency can be increased wherever possible. Furthermore, one form of new city development that is often found today is satellite cities. This city form is understood as a concept with the main function as residential cities to address the problem of housing/residence needs, and the arrangement of settlements in urban areas. These satellite cities are usually located close to the core city in the metropolitan area and most of the residents' needs still depend on the core city (main city). Apart from that, this city is also often called a bedroom community or dormitory city because most of its residents work outside the satellite city during the day, and are only used to rest (sleep) at night.

Referring to the same phenomenon in developing countries such as Indonesia, the development of new satellite city areas is also an important part of metropolitan urban development planning. One of them is the effort to develop Mamminsata Metropolitan with Makssar City as the center, followed by planning a new satellite city area to the east of Makassar City (Gowa Regency and Maros Regency) with an area of ±3,500ha and known as Pattalassang-Moncongloe New City. The aim of developing this satellite city is to spread population and urban activities to the eastern area of Makassar City, thereby reducing current and future traffic and population density, increasing urban green areas, or to reducing urban chaos in the suburbs today. However, along with the rapid development of the Mamminasata Metropolitan area at this time, the development of this satellite city has begun to be directed towards its spatial concept by seeking to provide commercial areas within it to meet the needs of its population and as a first step in efforts to equalize development. This is what then attracted many investors so that the development of activity centers (around the intersection of the planned Mamminasata Bypass road network and the Jl Abdullah Dg. Sirua canal road) was directed towards the development of trade and service centers, industry, open space and recreation, as well as government and public service centers. which is also supported by the shift in the function of the capital of Gowa district, which was originally located in Sungguminasa District to Pattalassang

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District. Meanwhile, the sub-center activities are directed at serving clusters of residential areas with coverage of some development areas at sub-district level.

Further related to this phenomenon and existing conditions in the field, the development of this satellite city is then seen to show a tendency for regional patterns and characteristics that are similar to the concept of post(suburbia) new city growth which leads to new forms of settlement with different settings, which is further known as edge city. In its development, this concept is considered more suitable to be applied in an effort to reduce the burden of urbanization and overcome the complexity of current urban problems with economic independence without needing to be confronted with the problem of congestion due to heavy traffic by commuters. Therefore, to identify the extent to which the Gowa-Maros New City can reduce the burden on the core city (Makassar City), the direction of development of the new city needs special attention. In this case, it relates to the extent to which the satellite city development opportunities can shift towards the new edge city concept, by identifying its characteristics based on the criteria of related concepts and theories currently developing.

2. METHOD

The type of this research used is qualitative descriptive research which is understood to emphasize process, meaning and understanding which is then explained in the form of words and images. This is in line with the understanding of Cresswell (2003. Pg. 145) by defining descriptive research as: "Qualitative research is descriptive in that the researcher is interested in process, meaning, and understanding gained through words or pictures". The choice of this type of research was based on the author's desire to describe in detail and interpret the data or phenomena obtained during the research, especially regarding the details of the development of new cities in the Mamminasata Metropolitan area. Furthermore, in this analysis, researchers used a descriptive approach method based on spatial analysis using arcGIS 10.4.1 software to link previously identified characteristics to the spatial form of the area. The understanding regarding the methods and approaches used in this analysis can be described as follows: 1) Quantitative Descriptive Analysis. Descriptive analysis is a simple analysis method which aims to facilitate interpretation and explanation by analyzing tables, graphs or diagrams as a support to add to and sharpen the analysis carried out, help understand the problem being studied, and provide a general description of the phenomena that occur; and 2) Spatial Analysis. Spatial analysis in this research is basically used to describe the tendency of regional development patterns towards edge cities spatially using the ArcGIS 10.4.1 application, which is then adapted to the theories and concepts of new cities that have been described previously.

3. RESULTS AND DISCUSSION

Analysis of Spatial Pattern: Consists of a new urban urban center (CBD)

Edge city development which is intended as a new urban center in a metropolitan area, basically makes the main activity center the CBD. Meanwhile, if it is related to the development of the Gowa-Maros New City, this CBD area can be identified using two important PKU (Main Activity Center) criteria, including:

1. Social service activity center, which is generally intended for community and regional activity centers. This can be seen from the function of using existing built-up land, most of which is used as government facilities, education, health and other services to meet the needs of the community.
2. Economic activity center, generally intended as a regional economic center to meet community needs as well as to increase community employment opportunities and reduce the intensity of commuting activities to the city center (Makassar City). This area can be identified through the use of built-up land for trade functions such as large trade centers/markets, small trade facilities/independent businesses (shophouses/shops), etc

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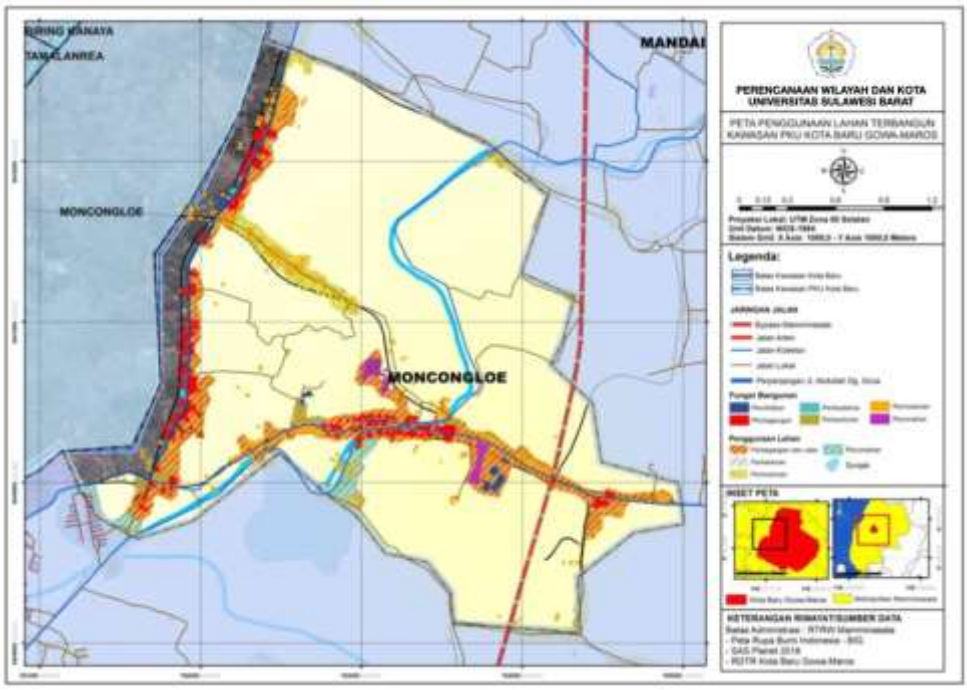

Figure 1. Spatial Pattern of Gowa-Maros Edge City

Analysis Spatial Structure Pattern: Develops around existing or planned main infrastructure in suburban areas

During its development, the Gowa-Maros New City was generally supported by a hierarchical and planned transportation system. This can be proven by the existence of several main regional roads which are functionally part of the classification of primary arterial, secondary arterial, primary collector, secondary collector, primary local and secondary local roads. The existence of each of these road networks is structurally integrated with each other and is connected by movement nodes, both in the internal transportation system structure of the Gowa-Maros New City Area and externally in the Mamminasata Metropolitan Urban Area which was developed to support regional development goals to east direction. The development of the Gowa-Maros New City Area basically plays an important role in the external transportation structure of the Mamminasata Metropolitan City in general. As explained in the previous overview section, the Gowa-Maros New City area is administratively developing at the main urban transportation system node located in the sub-urban area (around 15km from the center of Makassar City as shown in figure V.7 below) , so that it has the opportunity to attract the direction of development and development to the eastern metropolitan area. This is also supported by the construction of a freeway (Mamminasata bypass) and the extension of Jl. Abdullah Dg. Sirua is a mega project for the development of Metropolitan Mamminasata in accordance with the existing spatial plan.

Based on these conditions, if linked to the theory of the new independent city concept, the Gowa-Maros New City area generally meets the edge city criteria. Where, the basic principle of the development location is that it is located and/or develops around the main infrastructure that exists or is planned in the sub-urban area. Based on existing conditions, the main infrastructure intended for the development of the Gowa-Maros New City is the existence of the Abdullah Dg arterial road network. Sirua and planning of the Mamminasata Bypass road network, as well as support for the main movement node on Jalan Poros Daya which directly connects 3 (three) regional centers within the scope of the Gowa-Maros New Urban Area as previously described. The development pattern of the existing road network in the Gowa-Maros New Town area in several previous periods can be seen in the following picture

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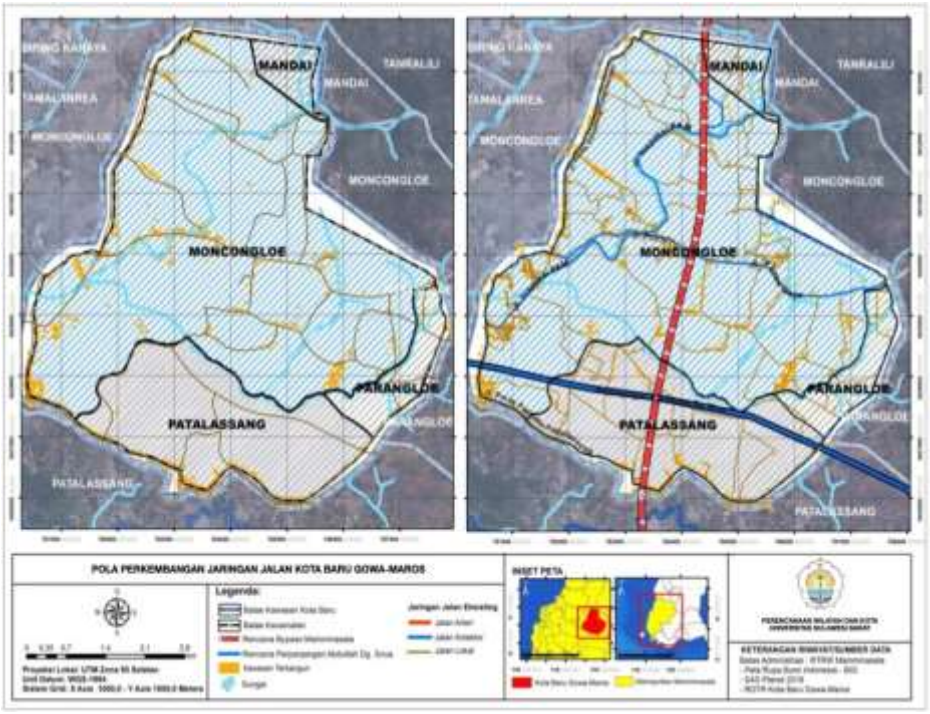

Figure 2. Spatial Infrastruktur Pattern of Gowa-Maros Edge City

Functional Physical Analysis: Initially an area with the function of open space/empty land and/or 'bedroom' (sometimes satellite cities)

The development of the New City of Gowa-Maros within the scope of the Mamminasata Metropolitan area generally influences the internal and external economic conditions and structure of the urban area. As explained previously regarding the characteristics of regional economic activity in the previous section, the economic structure of Gowa-Maros New City has generally experienced a shift from the agricultural sector to the non-agricultural sector which further influences the rate of economic growth. The condition where the non-agricultural sector takes over the priority sector in the regional economic structure proves that this sector shift actually helps increase regional income at this time. This can be proven by looking at the growth in the contribution value of the total GRDP of Gowa-Maros Regency. Thus, it can be concluded that the development of the Gowa-Maros New City in the economic context of the Mamminasata Metropolitan urban area generally has a positive impact on opportunities for growth in the regional economic structure without having to be confronted with the problem of decreasing agricultural quality and productivity (due to the previously dominant proportion of agricultural land use being only in the form of non-productive agricultural land with the function of non-irrigated rice fields) as well as reducing the population's livelihood.

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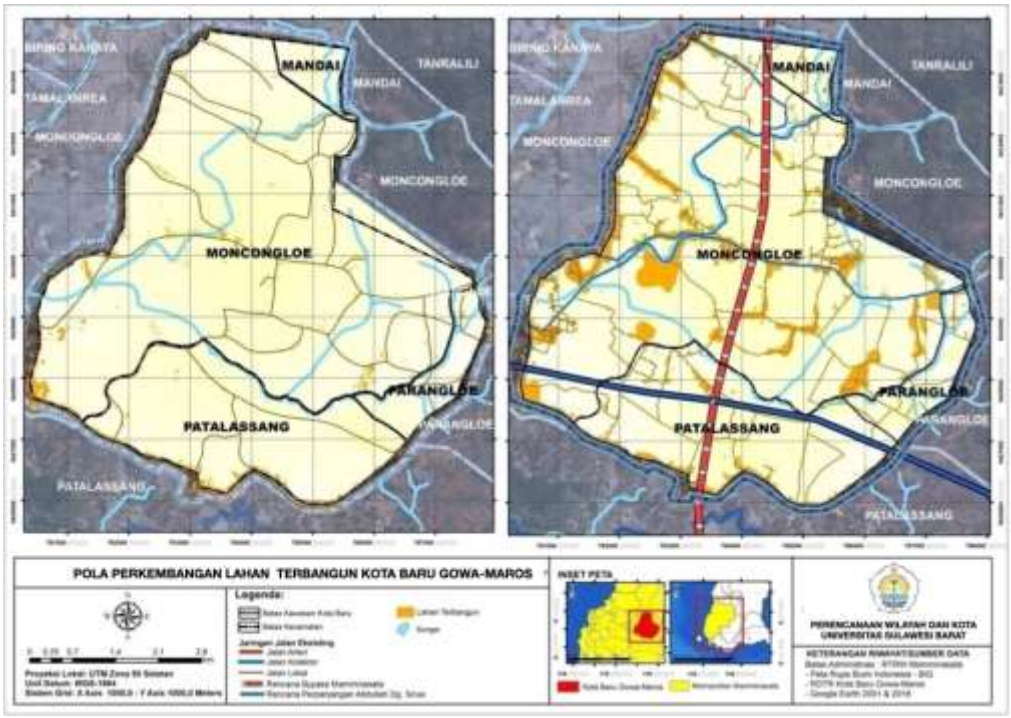

Figure 3. Spatial Land Use Pattern of Gowa-Maros Edge City

In 2005, most of the land use was dominated by the use of dry land agricultural areas, namely around 83.3% of the total land use of Gowa-Maros New City, while the smallest land use area was the built-up land area (around 1.93% of the total land use area). land). Even though in 2022 the land use pattern of the Gowa-Maros New Town area was still dominated by dry land farming, if you look at the interval, land use for built-up land areas has increased quite significantly compared to other uses, namely around 11.08% of the total bar city land use. Developments in land use have developed over the years 2005 to 2022 largely focuses on the function of space along the main roads which are currently included in the collector road network classification. In this way, it can be said that one of the factors pulling growth that influences the level of urban land development is the road network infrastructure system. Furthermore, if linked to the characteristics of the edge city theory and concept, the development of this new city area has the opportunity to become a new urban growth center that takes advantage of its strategic location to attract various developers in an effort to provide land for efforts to improve the economy by taking advantage of the availability of supporting factors. others such as a hierarchical and planned road network system and other non-productive land.

With this opportunity, the development of this new city no longer needs to be confronted with the shortcomings of the satellite city concept, such as the possibility of the emergence of marginal city spaces and the decline in environmental quality due to chaotic city development which is also influenced by the disintegration of city infrastructure if it is only used as land to provide new residential space. urban.

Morphological Pattern Analysis: Homogeneous landscape form with low-rise buildings surrounded by open spaces and a hierarchical and winding road network

The landscape shape of the Gowa-Maros New Town Area generally has the same characteristics from various points of view. Where in this case, the current buildings which function as housing/settlements, shophouses, mosques, schools, offices, etc. mostly have similar characters such as the building level being relatively low (one/two floors) and most of them are equipped with space. open to function as a home page, parking space or sports field, and tend to develop around the area's main road network.

The shape and layout of buildings for residential/housing functions in the New City of Gowa-Maros basically have the same characteristics, namely on average low-rise (one or two floors) with brick building materials and tend to be clustered. The physical characteristics of buildings for office

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functions are generally low-rise, equipped with open space as a parking area or open field, each of which is made of concrete and/or cement. Furthermore, the landscape for areas with shopping and worship functions basically develops on the outskirts of the main road network with parking lots that complement each building. Thus, it can be concluded that in general the landscape of the Baru Gowa-Maros city area has homogeneous physical characteristics with low-rise buildings (one or two floors) and made of brick which are always equipped with parking spaces for each building regardless of form or function.

4. CONCLUSION

The Gowa-Maros New City area is one of the new urban development areas in the Mamminasata Metropolitan area to overcome the problems of the city center (Makassar City) which occur as a result of the urbanization phenomenon. In general, the development of this area is planned in the concept of a new city to support providing residential land for the overflow of urban population, as well as as a counter magnet for the development of large cities and service centers for rural areas. In general, the characteristics of this new urban area can be reviewed based on physical and non-physical aspects (social, population and economic activity) of the existing area. Based on the physical development conditions of the Gowa-Maros New City area, there are several important points that differentiate this area from other sub-urban areas, including firstly, the concentration of social and economic activities (CBD) which tends to make this area a new growth center. Second, the availability of a hierarchical and planned transportation system in this new urban area supports the connectivity of the external spatial structure of the Mamminasata Metroopolitan urban centers and increases the interconnection of activity centers within the internal scope of the Gowa-Maros New City. Kegita, the fairly rapid change in built land use patterns in a period of less than 20 years illustrates the rapid growth of this area. And fourthly, in terms of its physical form, this area is generally inhabited by low-rise buildings (1 or 2 floors) with various functions and each of them is equipped with open space (both for RTH and RTNH functions), which tend to develop along road network and clustered. The existence and development of this new urban area basically has several direct impacts related to opportunities for developing the external spatial planning of the Mamminasata Metropolitan area, such as: (1) development of the spatial structure of the urban area with the existence of a new economic activity center in the new city which also acts as a sub-center of activity. major metropolitan areas; (2) spreading traffic distribution in the Mamminasata Metropolitan area by utilizing the existing road network of the new city as an alternative route to and/or from one city center to another, or from one important area to another; (3) providing employment opportunities for surrounding communities, especially rural communities to reduce the percentage of opportunities for urbanization and increased urban unemployment; and (4) development of the external economic structure of the Mamminasata Metropolitan urban area through the development of the non- agricultural sector. Thus, it can be concluded that the development of the Gowa-Maros New City Area in general has the opportunity to reduce the burden on the core city (Makassar City) and support the urbanization of the Mamminasata Metropolitan area to a certain extent in accordance with the main objectives of developing the new city. Apart from that, the development of this new urban area as a center of activity is also one of the supporting factors in this area which can attract population growth and distribution towards the east as an effort to equalize development.

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