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Contribution of Economic Development to The Development of The Mamminasata Region

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Abstract

Mamminasata (Makassar, Maros, Gowa, Takalar) is one of the urban or metropolitan areas in Eastern Indonesia. Mamminasata as a strategic area with economic interests has an important role in the development of its city and surrounding areas. Meanwhile, the dynamic development of the city causes demands for space needs to increase, especially the need for residential land. The objectives of this study are to 1) know economic development in the Mamminasata district/city in 2001-2021 2) know the development of built-up land in the Mamminasata district/city in 2001-2021 and 3) know the influence and contribution of economic growth to the development of the Mamminasata region. The research location is Makassar City, Maros Regency, Gowa Regency and Takalar Regency. This type of research is descriptive quantitative qualitative. The required data is collected through literature studies in the form of secondary data, namely Gross Regional Domestic Product (GRDP) at constant prices 2010, and google earth images 2001-2021. The analysis used in the research is literature study analysis, qualitative quantitative descriptive, basic statistics, LQ-DLQ, Shift Share, and multiple linear regression analysis. The result of this study is that during 2001-2021 the real income of the Mamminasata Region continued to increase. With the highest growth rate in Gowa Regency. Makassar City only has one leading sector, Maros Regency has two leading sectors, Gowa Regency has three leading sectors, and Takalar Regency has two leading sectors. Only Kabupaten Maros experienced a shift in economic structure from the tertiary sector to the primary sector in 2021 due to a significant economic decline. Spatially, sub-districts that are adjacent or directly adjacent to Makassar City have the most significant built-up land growth with developments following the main road network pattern. Based on the results of multiple linear regression analysis, it shows that there is no significant influence between the independent variables on the dependent variable either jointly or partially individually. Then the t-test was conducted again between tertiary variables and built-up land and showed a significant influence with a contribution of 33% to built-up land.

Keywords:
Leading Sectors; Economic Structure; Mamminasata; Built Up Area; Contribution

1. INTRODUCTION

Indonesia's economic growth during 2023 grew by 5.05% which was lower than the previous year, 2022 with 5.31%. Spatially, Indonesia's economy continues to grow, with the largest contribution contributed by Java Island with 57.05%; followed by Sumatra 22.01%; Kalimantan 8.49%; Sulawesi 7.10%; Bali and Nusa Tenggara 2.77%; and Maluku and Papua 2.58% (Badan Pusat Statistik, 2024).

According to Wahyudi et al. (2022), regional development or the development of new urban areas can be carried out with the establishment of National Strategic Areas (KSN) which function to accelerate national economic development. One of the urban or metropolitan areas in Eastern Indonesia is Mamminasata (Makassar, Maros, Sungguminasa, Takalar). The Mamminasata area has been organically formed since the 1980s due to the rapid population growth in Makassar City and the expansion of urbanization around it (Sulmiah et al., 2019).

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The economic development of the Mamminasata region will certainly affect how the physical development of the region. Based on Firman (1996), said that the actual development of the city is a physical manifestation of economic development. The continuous development of the city causes demands for space needs to increase, especially the need for residential land. In addition, Makassar City is one of the largest cities in Indonesia, especially in the East. Making Makassar City as a hub in connecting Eastern Indonesia with other regions.

By knowing whether there is an influence between economic growth and the development of the Mamminasata region, it can provide information on how the contribution of economic sectors to land development, so that it can provide input for the government and stakeholders in focusing the direction of development for each district / city in Mamminasata according to the characteristics of the region.

This study aims to 1) determine economic development in the Mamminasata district / city in 2006-2021 2) determine the development of built-up land in the Mamminasata district / city in 2006-2021 and 3) determine the influence and contribution of economic growth to the development of the Mamminasata region.

2. METHODS

2.1 Research Method

The type of research used by the author in this research is descriptive research with a qualitative quantitative approach. This research was conducted in the Mamminasata Region which consists of 46 sub-districts, consisting of 14 sub-districts in Makassar City, 9 sub-districts in Takalar Regency, 11 sub-districts in Gowa Regency, and 12 sub-districts in Maros Regency. This research was conducted in the Mamminasata Region because Mamminasata is the only metropolitan as well as national strategic area located in Eastern Indonesia. Thus, it has the potential and important role to drive the Indonesian economy, especially in the east. The spatial research area can be seen in Figure 1.

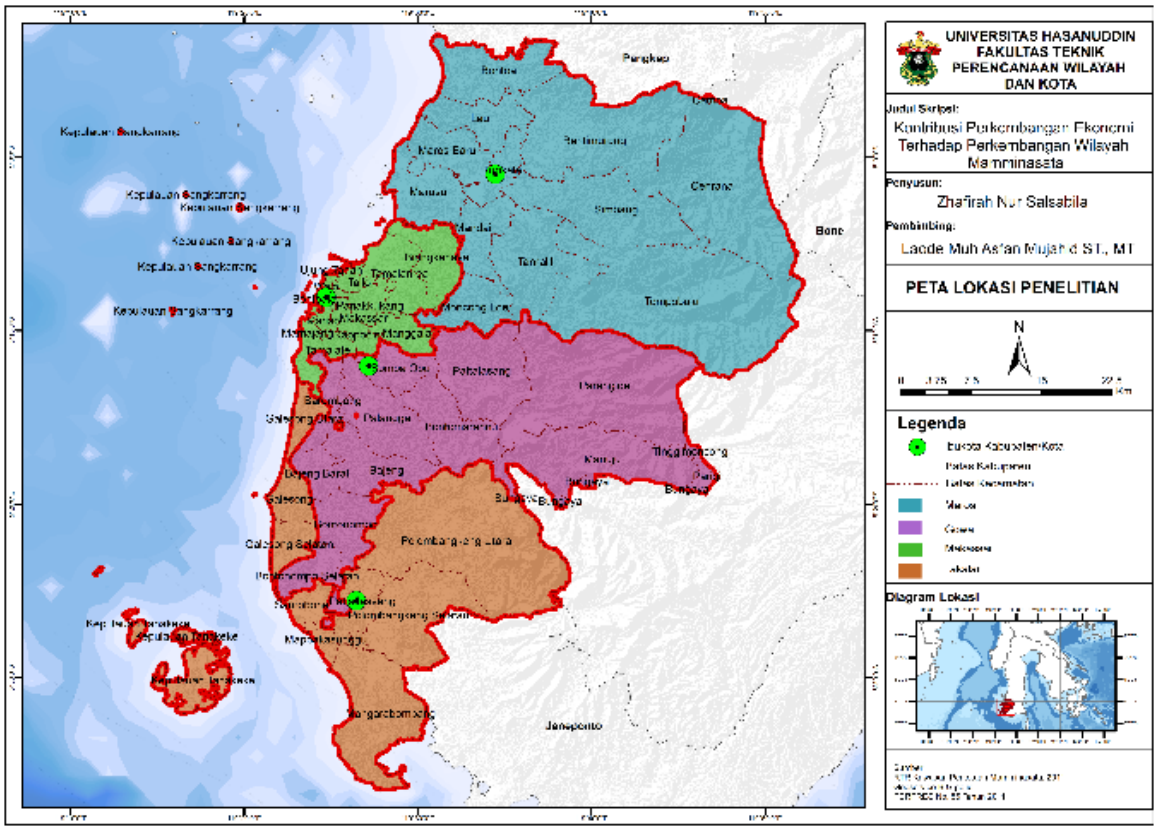


Figure 1. research location

The population in this study are districts / cities that are part of the Mamminasata KSN. The technique in determining the sample in this study is purposive sampling technique or deliberate sampling based on certain

considerations (Sugiyono, 2019). The samples in this study are sub-districts that are part of the Mamminasata Region from four districts/cities in South Sulawesi, namely Makassar City, Maros Regency, Gowa Regency, and Takalar Regency.

2.2 Data Analysis Technique

The analysis techniques to achieve the first research objective are described as follows:

1. Real income is obtained from GRDP data based on 2010 constant prices obtained through the BPS website.
2. The economic growth rate in this study uses GRDP data with the following exponential equation (Duko et al., 2018).

$r = anti\ log \frac{PDRB_t - PDRB_0}{t} - 1$.....(1)

with,
r = economic growth rate
t = period of observation
GRDPt = GRDP in year t
GRDP0 = GRDP in the initial year

3. Sektor basis dan non basis diperoleh dengan analisis LQ-DLQ. Berikut merupakan formula perhitungan LQ berdasarkan Sarwo dkk., (2019).

$$LQ = \frac{Si/_S}{Ni/_N} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Description:
LQ = Location Quotient
Si = GRDP of sector i of the city/district
S = Total GDP of district/city sector
Ni = GRDP of sector i of province/national
N = Total GRDP of provincial/national sector

If the LQ value ≥ 1 indicates that the sector is basic, while if the LQ value < 1 then the sector is categorized as non-basic (Sarwo et al., 2019). A base sector indicates a sector where goods and services can be exported outside the region, after meeting the needs within the region. Meanwhile, non-base sectors are sectors that provide goods and services needed by people within the region and cannot export.

The DLQ method emerged to overcome the weakness of the LQ method which only calculates the leading sector at one time (Nugraha, 2019). With DLQ, it can be seen whether there are changes in the basic and non-basic sectors in the future. The DLQ method formula is as follows (Pribadi & Nurbiyanto, 2021).

$$DLQ = \frac{(1 + gij)/(1 + gj)}{(1 + gip)/(1 + gp)} \dots\dots\dots\dots\dots\dots\dots (3)$$

where:

DLQ = Dynamic Location Quotient
gij = average GRDP growth of sector i of district j
gj = average growth of total GRDP of district j
gip = average GDP growth of sector i at province level p
gi = average growth of total GRDP at province level p

If the DLQ value > 1, it indicates that the development potential of sector i of Regency/city j is faster than the sector in the reference region, while if the DLQ value < 1, it is the opposite (Saputri & Boedi, 2018). The next step is to combine the LQ and DLQ analysis to determine whether there is a shift and repositioning and to see the prospects for the existence of regional economic sectors in the future, which can be seen in Table 1 below.

Table 1. Economic sector typology based on LQ and DLQ

Kriteria	LQ > 1	LQ < 1
DLQ > 1	Featured	Reliable
DLQ < 1	Prospective	Lagging

Sumber: Saputri dan Boedi (2018)

The results of the cross-table resulted in 4 classifications, namely:

a. Leading sectors, having LQ and DLQ values > 1 indicate that the sector remains basic both now and in the future;
b. Mainstay sector, having DLQ > 1 and LQ < 1 means that the sector is not currently basic but has the potential to excel in the future;
c. Prospective sector, having a value of LQ > 1 and DLQ < 1 indicates the sector is currently basic but has no potential to excel in the future; and
d. Lagging sectors, having LQ and DLQ values < 1 indicates that the sector is not currently basic and has no potential to excel in the future.

4. Analisis struktur ekonomi digunakan untuk melihat bagaimana struktur perekonomian di suatu wilayah dan apakah telah terjadi pergeseran struktur ekonomi selama periode waktu penelitian yang dilakukan dengan analisis shift share. Formula shift share dirumuskan sebagai berikut (Pribadi & Nurbiyanto, 2021):

Shift Share = PNij + PPij + PPWij……(4)

$PN_{ij} = (Ra)Y_{ij}$……(5)

$PP_{ij} = (Ri - Ra)Y_{ij}$……(6)

$PPW_{ij} = (ri - Ri)Y_{ij}$……(7)

$Ra = \frac{Y'-Y}{Y}$……..(8)

$Ri = \frac{Y'_i-Y_i}{Y_i}$……..(9)

$rij = \frac{Y'_{ij}-Y_{ij}}{Y_{ij}}$……(10)

Notes:

PN_{ij} = economic growth of the province in sector i in district j

PP_{ij} = proportional growth of sector i in district j

PPW_{ij} = regional share growth of sector i in district j

PB_{ij} = net shift of sector i in district j

Ra = ratio of GRDP in the province (reference)

Ri = ratio of GRDP of sector i in the province (reference)

rij = ratio of GRDP of sector i in district j

Y' = GDP of the province in the final year of observation

Y = GRDP of the province in the base year of observation

Y'ij = GRDP of sector i in district j in the final year of observation observation

Yij = GRDP of sector i in district j in the base year of observation base year of observation

Y'i = GRDP of sector i in the province in the final year of observation observations

Yi = GRDP of sector i in the base year province observation

The analysis technique to achieve the second research objective, namely to obtain the building area and its number by interpreting Google Earth images of Makassar City, Maros Regency, Gowa Regency and Takalar Regency in 2001, 2006, 2011, 2016, and 2021 was carried out by manual digitization.

The analysis technique used to achieve the third research objective related to the influence and contribution of economic development to the development of the Mamminasata region uses multiple linear regression analysis. Before conducting multiple linear regression analysis, a classical assumption test was previously carried out, which included four, namely.

1. Normality test, conducted to see if the data is normally distributed. If the Sig value. ≥ 0.05 then the data is concluded to be normally distributed (Putra et al., 2019).
2. Multicollinearity test, a good regression model does not occur multicollinearity. If the VIF value < 10 and the Tolerance value> 0.1, the level of collinearity can be tolerated (Raharjo, 2008).
3. Heteroscedasticity test, conducted through the Glejser test. A good model is a model that does not occur heteroscedasticity or homoscedasticity which is indicated by the significance value must be more than 0.05 (Novianingtyas & Bagana, 2022).
4. Autocorrelation test, conducted through the Run Test. Where a good model is that there are no autocorrelation symptoms indicated by the Asymp. Sig (2-tailed) ≥ 0.05 (Mokoginta et al., 2021).

After the data has passed the classical assumption test, a multiple linear regression model can be made. To find out whether there is an influence of the independent variable on the dependent, the following test is carried out.

1. Simultaneous Test (F Test), used to see and measure whether the independent variables together have an effect on the dependent variable, which is indicated by the Sig value. ≤ 0.05 (Mokoginta et al., 2021).
2. Partial Test (t test), used to see whether the independent variable partially or individually affects the dependent variable. If the Sig value. ≤ 0.05, it shows that there is an influence between the independent variable and the dependent variable (Mokoginta et al., 2021).

   $Y = \alpha + b_1 X_1 + b_2 X_2 + b_3 X_3 + e$……...…(11)

   with,

   Y = Dividend Payout Ratio

   α = constant

   $b_1\ b_2\ b_3$ = coefficient value

   X1 = primary sector

   X2 = secondary sector

   X3 = tertiary sector

   E = Error Term

3. RESULT AND DISCUSSION

The Mamminasata region includes all sub-districts in Makassar City and Takalar Regency, except 2 out of 14 sub-districts in Maros Regency and 7 out of 18 sub-districts in Gowa Regency. These sub-districts are excluded due to their distance from the metropolitan area (Integrated RTR for Mamminasata Metropolitan Area, 2006). The area of Mamminasata is approximately 2,666.63 km2 or 5.7% of the total area of South Sulawesi. The total population of Mamminasata in 2023 is about 2.7 million people with population concentration occurring in Makassar City. The total area and population in Mamminasata Region can be seen in the following table

Table 2. Mamminasata population, percentage, area and population density

Kabupaten/Kota	Jumlah Penduduk (jiwa)	Luas wilayah (Km^2)	Kepadatan Penduduk (jiwa/Km^2)
Kota Makassar	1,432,189	175.77	8,148
Kabupaten Gowa	627031	1237.84	507
Kabupaten Maros	332,245	686.51	484
Kabupaten Takalar	305,077	566.51	539
Total	**2,696,542**	**2666.63**	**1,011**

Source: BPS in figures, 2023 (data processed)

The Mamminasata region is considered to have a very high density, with the largest number in Makassar City at 8,388 people/km2. The population density in Maros Regency is 484 people/km2, the density in Gowa Regency is 510.6 people/km2, and the population density in Takalar Regency is 575.5 people/km^2.

3.1 Mamminasata Economic Development

In this study, it only discusses four of the various factors that mark economic growth in the Mamminasata Region, namely regional real income, economic growth rate, basic sectors and shifts in economic structure.

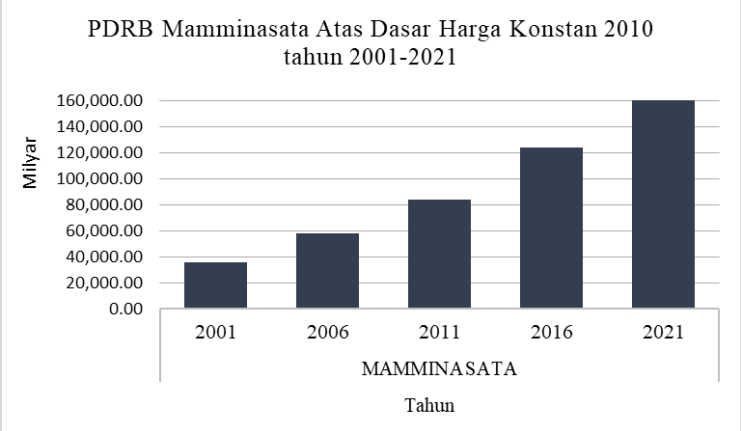


Figure 2. PDRB atas dasar harga konstan 2010, tahun 2001-2021

Real regional income in the Mamminasata Region is seen from GRDP data at constant prices in 2010 in Makassar City, Maros Regency, Gowa Regency, and Takalar Regency. From 2001 to 2021, the real income of the Mamminasata Region continued to increase, which can be seen in Figure 2. The increase can be seen that in 2001, Mamminasata's real regional income was Rp. 35,941.77 billion and continued to increase until it reached Rp. 160,665.17 billion in 2021. This shows that the increase in Mamminasata's real regional income based on the increase in the production factors of the economic sector is not affected by the element of inflation.

The increase in 2010 ADHK GRDP in Mamminasata cannot be separated from the contribution of the districts/cities in it. A comparison of the percentage contribution of GRDP in 2001 and 2021 shows that the contribution of GRDP is uneven, as shown in Table 3.

Table 3. Percentage contribution of GRDP Mamminasata ADHK 2010 per district/city

Mamminasata	Persentase PDRB Mamminasata ADHK 2010 per kabupaten/kota			
	2001	Kontribusi (%)	2021	Kontribusi (%)
Kota Makassar	27,673.91	77.08	126,312.82	78.62
Kabupaten Maros	5,011.19	13.96	12,400.61	7.72
Kabupaten Gowa	2,425.21	6.76	15,043.70	9.36
Kabupaten Takalar	790.66	2.2	6,908.04	4.3
Mamminasata	35,900.97	100	160,665.17	100

In 2001 and 2021, Makassar City dominated the contribution with a percentage of 77.08% and 78.62% respectively. Meanwhile, the rest is the percentage of contributions from 3 other districts. In 2001, the percentage of Maros Regency was 13.96%, Gowa Regency was 6.76%, and Takalar Regency was only 2.20%. In 2021, the percentage contribution of Gowa Regency's GRDP was 9.36%, which was greater than that of Maros Regency, which was 7.72%, which was smaller than the percentage contribution of Maros Regency in 2001. Meanwhile, Takalar Regency still has the smallest contribution with 4.30% but has increased compared to 2001.

The rate of economic growth is one way to determine whether the economy has grown. In general, the economic growth rate of districts and cities in Mamminasata is positive although the growth is fluctuating, which can be seen in Figure 3.

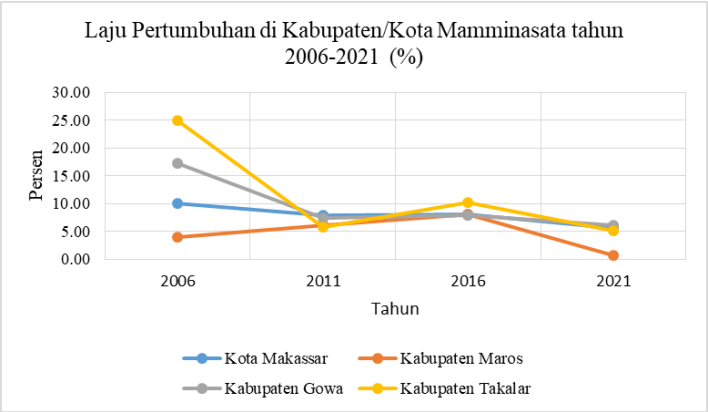


Figure 3. Economic growth rate of Mamminasata district/city in 2001-2021

The region with the highest average economic growth rate is Takalar Regency with 11.44%, followed by Gowa Regency with 9.64%, then Makassar City with 7.90%, and finally Maros Regency with 4.67%.

Table 4. The results of the average LQ value in Mamminasata Regency / City in 2001-2021

No	Sektor Ekonomi	Kabupaten/Kota			
		Makassar	Maros	Gowa	Takalar
1	Pertanian, Kehutanan, dan Perikanan	0.03	0.83	1.38	1.99
2	Pertambangan dan Penggalian	0.00	1.26	0.94	0.26
3	Industri Pengolahan	1.42	1.46	0.50	0.52
4	Listrik, Gas dan Air	1.33	0.91	1.73	1.02
5	Bangunan/konstruksi	1.41	0.56	0.85	0.75
6	Perdagangan Restoran dan Hotel	1.46	0.27	0.84	0.98
7	Angkutan dan Komunikasi	1.45	3.76	1.14	0.88
8	Keuangan, Real Estate dan Jasa perusahaan	1.45	0.39	1.19	1.23
9	Jasa-Jasa	1.48	0.49	0.95	0.52

Basic Sector

The results of the calculation of the average LQ for districts/cities in Mamminasata in 2001-2021 can be seen in Table 4. The results of the average LQ calculation in Makassar City show that there are 7 basic sectors. If sorted from highest to lowest value, they are 1) services sector 2) trade, restaurant and hotel sector 3) transportation and communication sector 4) finance, real estate and corporate services sector 5) manufacturing sector 6) building sector and 7) electricity, gas and water sector. There are three basic sectors in Maros Regency, ranked from highest to lowest value, namely 1) transportation and finance sector 2) manufacturing sector and 3) mining and quarrying sector. Gowa Regency has four basic sectors, in order from highest to lowest, namely 1) electricity, gas, and water sector 2) agriculture, forestry, and fisheries sector 3) finance, real estate, and corporate services sector and 4) transportation and communication sector. Meanwhile, Takalar Regency has three basic sectors in the highest to lowest order, namely 1) the agriculture, forestry and fisheries sector 2) the finance, real estate and corporate services sector.

Furthermore, to strengthen the results of the LQ analysis, the DLQ calculation was carried out, the results of which can be seen in Table 5.

Table 5. The results of the calculation of DLQ analysis in Mamminasata district/city in 2001-2021

No	Sektor Ekonomi	Kabupaten/Kota			
		Makassar	Maros	Gowa	Takalar
1	Pertanian, Kehutanan, dan Perikanan	0.80	1.07	1.17	1.13
2	Pertambangan dan Penggalian	0.42	1.33	0.94	1.00
3	Industri Pengolahan	1.06	1.04	0.95	0.84
4	Listrik, Gas dan Air	0.89	1.04	0.85	1.00
5	Bangunan/konstruksi	0.95	1.05	1.00	0.83
6	Perdagangan Restoran dan Hotel	0.94	0.96	1.13	0.91
7	Angkutan dan Komunikasi	0.98	0.83	1.05	0.88
8	Keuangan, Real Estate dan Jasa perusahaan	0.92	2.38	1.08	0.88
9	Jasa-Jasa	0.91	1.04	1.12	1.32

Basic Sector

Based on the results of the Makassar City DLQ calculation, there is only one basic sector in Makassar City, namely the manufacturing sector. This is due to the fact that the GDRP growth rate of Makassar City in 2021 has decreased in all sectors compared to the GDRP in 2016. For Maros Regency, there are seven basic sectors. Gowa Regency has six basic sectors. Meanwhile, Takalar Regency has four basic sectors based on DLQ analysis.

Furthermore, the LQ and DLQ analyses were combined to determine whether there was a shift and repositioning and to see the prospects for the existence of economic sectors in the future, which are described in Table 6.

Table 6. Combined results of LQ and DLQ in Mamminasata Regency/city

No	Sektor Ekonomi	Kabupaten/Kota			
		Makassar	Maros	Gowa	Takalar
1	Pertanian, Kehutanan, dan Perikanan	Tertinggal	Andalan	Unggulan	Unggulan
2	Pertambangan dan Penggalian	Tertinggal	Unggulan	Tertinggal	Andalan
3	Industri Pengolahan	Unggulan	Unggulan	Tertinggal	Tertinggal
4	Listrik, Gas dan Air	Prospektif	Andalan	Prospektif	Unggulan
5	Bangunan/konstruksi	Prospektif	Andalan	Andalan	Tertinggal
6	Perdagangan Restoran dan Hotel	Prospektif	Tertinggal	Andalan	Tertinggal
7	Angkutan dan Komunikasi	Prospektif	Prospektif	Unggulan	Tertinggal
8	Keuangan, Real Estate dan Jasa perusahaan	Prospektif	Andalan	Unggulan	Prosfektif
9	Jasa-Jasa	Prospektif	Andalan	Andalan	Andalan

Based on the LQ results, there are 7 basic sectors in Makassar City, while based on the DLQ results, only the processing industry sector is basic. Thus, for the final result, only the processing industry sector is the leading sector. Maros Regency has two leading sectors, namely the mining and quarrying sector and the manufacturing sector. Gowa Regency has three leading sectors, namely the agriculture, forestry, fisheries, transportation and communication sector, and the finance, real estate, and corporate services sector. Meanwhile, Takalar Regency has two leading sectors, namely the agriculture, forestry, fisheries, and electricity, gas, and water sectors.

Changes in economic structure are a prerequisite for economic growth that supports sustainable development (Rachamn, 2019). During the calculation year, the economic structure group that had the largest role in Makassar City was in the tertiary structure, which was dominated by the trade, restaurant and hotel sector. Based on this, there has been no shift in the economic structure of Makassar City during the 2001-2021 calculation period, the economic structure of Makassar City is still dominated by the tertiary group followed by the secondary sector then the primary sector. The economy of Maros Regency is dominated by tertiary sectors. However, in 2021 the tertiary and secondary sectors experienced a significant decline, which was caused by the covid-19 pandemic which made the economy of Maros Regency decline. Meanwhile, the primary sector shows a consistent increase until it surpasses the secondary and tertiary sectors in 2021. As a result, the economy of Maros Regency in 2021 is dominated by the primary sectors.

The economic structure in Gowa Regency according to the shift share calculation shows that from 2006-2021 it has been dominated by the tertiary sector. Where this tertiary group only experienced a decline in 2011. Meanwhile, the economy of Takalar Regency based on the results of the shift share analysis shows that throughout 2006-2021, its economic structure remains dominated by the primary sector. Although, the growth of this sector is slower than the agricultural sector in South Sulawesi, it consistently shows higher competitiveness.

3.2 Perkembangan Lahan Terbangun di Kabupaten/Kota Mamminasata tahun 2001-2021

The development of built-up land in the Mamminasata Region is seen from the growth of building area and the number of building units carried out by interpreting google earth imagery during 2001, 2006, 2011, 2016 and 2021. In general, the growth rate of districts/cities in the Mamminasata Region is positive, indicating that built-up land continues to grow. Based on Table 7, Gowa Regency has the fastest growth rate among other Mamminasata regions. Makassar City has a consistent growth rate of 2% except in 2021 where it only increased by 0.10%. Maros Regency has experienced an annual increase in growth from 1% to 3%. Meanwhile, Takalar Regency has a growth rate that fluctuates every year.

Table 7. The Growth Rate of Built-Up Land in Mamminasata Cities and Regencies from 2006 to 2021 (%)

No	**Kabupaten/ Kota**	**Tahun**			
		2006	**2011**	**2016**	**2021**
1	Kota Makassar	2.17	2.56	2.10	0.10
2	Kabupaten Maros	1.41	2.89	2.93	3.63
3	Kabupaten Gowa	4.34	4.13	5.33	3.99
4	Kabupaten Takalar	-	1.34	3.43	2.00

Sumber: Analisis penulis, 2024

1. Makassar City

The average development of built-up land in Makassar City is 3.02 km2 or 302 hectares per year, with the highest growth occurring in 2011. The largest land area is in Biringkanaya Sub-district with 809.26 hectares in 2021. The number of buildings generally increases along with the increase in building area with an average growth of 3,873 units per year.

Spatially, the development of built-up land in Makassar City is most visible in sub-districts on the outskirts of the city, such as Biringkanaya Sub-district, Tamalanrea Sub-district, Manggala Sub-district, Rappocini Sub-district, and Tamalate Sub-district, which is marked with a darker red color in Figure 4. This land growth fills the existing vacant spaces, so that the land becomes increasingly densely populated by buildings and development goes out to the suburban areas. As stated by Munawir et al. (2019) and Ashari and Maryana (2019) where the impact of high development intensity in Makassar City causes the physical development of the city to expand to other areas around it by following the road network pattern due to the ease of people to access the city center in and to Makassar City. So that it changes the function of land which was originally dominated by agricultural land or non-built land into urban land such as settlements, industry, commercial, and social culture.

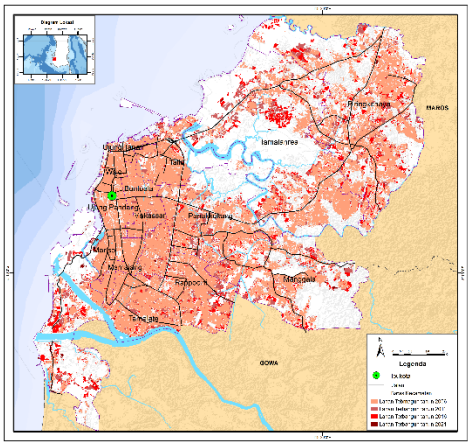
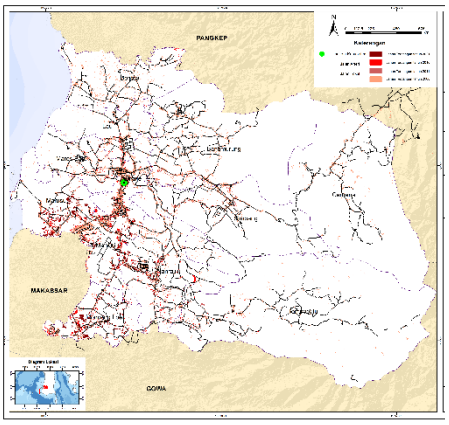


Figure 1. Map of Built-Up Land Development in Makassar City from 2006 to 2021

2. Maros Regency

The growth of built-up land in Maros Regency is considered quite slow with an average growth of 0.27 km2 or only 27 hectares per year. With peak growth in 2016. The sub-districts that have the most extensive built-up land include three sub-districts, namely Mandai, Turikale and Tanralili. As the area of built-up land increases the number of buildings also increases with an average increase of 1,146 units per year.

Figure 2. Map of Built-Up Land Development in Maros Regency from 2006 to 2021



When viewed spatially in Figure 5, sub-districts that are adjacent or directly adjacent to the City of Makassar have the fastest growth of built-up land, indicated by the darker red color. Mandai sub-district, which is located directly adjacent to Makassar City and is traversed by the Makassar-Maros Axis Road, had a growth of 4.13%. In addition, Sultan Hasanuddin International Airport is located in the sub-district. Making Mandai Sub-district the center of economic activity in Maros Regency. This is also as conveyed by Latief et al. (2021) in their research that high population growth in Mandai District has an impact on the activity of undeveloped land into built-up land. This growth mainly occurs following the pattern of the main road network, especially the Makassar-Maros Axis Road and the Maros-Pangkep Axis Road.

3. Sungguminasa Regency (Gowa)

The development of built-up land in Gowa Regency is said to be quite fast and even the highest compared to other districts/cities in Mamminasata. The average growth of built-up land area is 0.69 Km2 or 69 hectares per year. With the peak growth occurring from 2011 to 2016 with a growth of 4.49 Km2. The development of the number of building units in Gowa Regency also continues to increase along with the increase in built-up land area. The average development of the number of buildings in Gowa Regency is 5,594 units per year.

In general, the development of built-up land in the sub-districts of Kabupaten Gowa grew significantly. Barombong sub-district has a location directly adjacent to Makassar City where the land development is quite fast with 4.84%.

Pattallassang sub-district is conceptualized as a new city area based on Presidential Regulation No. 55 of 2011 concerning the RTR of Mamminasata urban area together with Moncongloe sub-district in Maros Regency. This area is directed as a new urbanization center to accommodate population growth in Makassar City. This causes the demand for space to increase, especially for settlements, resulting in changes in the function of non-built land into built-up land, especially housing. The growth of built-up land in Pattallassang Sub-district is the highest at 8.58% per 5 years of observation during 2001-2021. As stated by Haikal et al. (2023) in their research results show that during 2002-2022 the development of built-up land in Moncongloe District consistently increased, while forest areas and agricultural land consistently decreased.

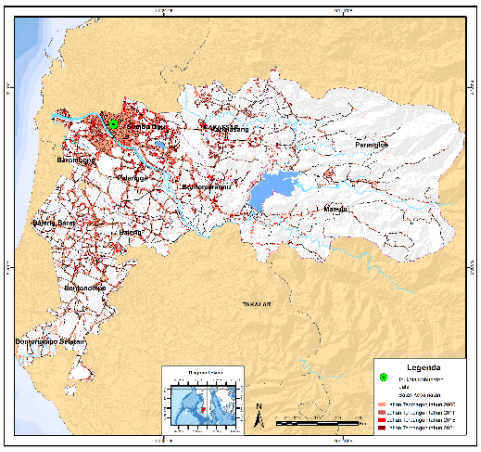


Figure 3. Map of Built-Up Land Development in Gowa Regency from 2006 to 2021

4. Takalar Regency

The development of built-up land in Takalar Regency in 2006-2021 can be said to be very slow as indicated by its average growth of 0.17 km2 or only 17 hectares per year. The sub-district with the highest built-up land area from year to year is Kecamatan Palombangkeng Utara followed by Kecamatan Pattallassang and the smallest area is owned by Kecamatan Kep. Tanakeke.

The number of buildings in Takalar Regency during the research time continued to increase as the built-up land expanded. If averaged, the growth in the number of buildings in Takalar Regency is 1,114 units per year with the highest growth occurring in 2016 with 2,040 units per year.

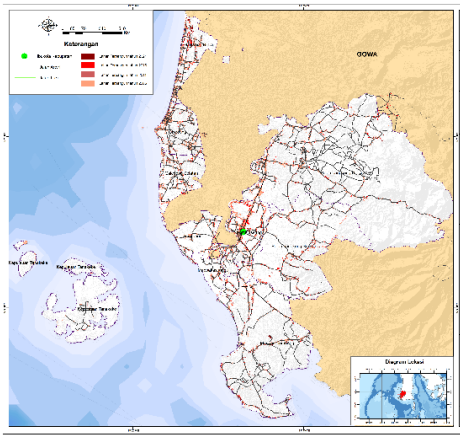


Figure 4. Map of Built-Up Land Development in Takalar Regency from 2006 to 2021

Similar to other regions in Mamminasata, the development of built-up land in Takalar Regency has transformed areas that were initially open spaces or water absorption areas into developed land (buildings). The built-up land in Takalar Regency has expanded following the road network, particularly along Jalan Diponegoro and Jalan Poros Takalar, with notable growth observed in Pattallassang and Mangara Bombang Subdistricts. Additionally, the growth of built-up land in Takalar Regency has also occurred around coastal areas, especially in Galesong Utara, Galesong, and Galesong Selatan Subdistricts. Overall, this expansion of

built-up land primarily involves the construction of factories or industrial facilities and the establishment of new residential areas on previously vacant land.

3.3 Pengaruh dan Kontribusi Perkembangan Ekonomi terhadap Perkembangan Wilayah Mamminasata

In examining the influence of various economic growth factors on regional development, a multiple linear regression analysis was employed. The results regarding the impact and contribution of economic factors to the development of built-up land are presented as follows.

1. Correlation Analysis

Correlation analysis is utilized to examine whether there is a relationship or correlation between independent and dependent variables. The results of the Pearson correlation between the variables are as follows.

Table 8**.** Pearson Correlation Results

	Variabel	**Primer**	**Sekunder**	**Tersier**	**Luas Bangunan**
Pearson Correlation	Primer	1.000	-0.158	0.182	0.433
	Sekunder	-0.158	1.000	0.492	0.382
	Tersier	0.182	0.492	1.000	0.577
	Luas Lahan	0.433	0.382	0.577	1.000
Sig. (1-tailed)	Primer	.	0.303	0.275	0.070
	Sekunder	0.303	.	0.044	0.099
	Tersier	0.275	0.044	.	0.019
	Luas Lahan	0.070	0.099	0.019	.

Source: Author's analysis, 2024

Based on Table 8 above, there is potential evidence of a relationship or correlation between the tertiary variables and the area variable, as indicated by a significance value (1-tailed) of 0.019, which is less than 0.05.

2. Simultaneous Test (F Test)

The simultaneous test, or F test, is conducted to determine whether the independent variables have a simultaneous effect on the dependent variable.

Table 9**.** F test results

Variabel	**F**	**Sig.**	**Keterangan**
Regression	2.906	0.094	Tidak berpengaruh
Residual			
Total			
a. Dependent variable: Luas lahan			
b. Predictors: (constant), Primer, Sekunder, Tersier			

Source: Author's analysis, 2024

Based on Table 9, the significance value of 0.94 is greater than 0.05, indicating that the independent variables do not collectively have an effect on the dependent variable. In other words, the development of built-up land is not influenced by the growth of economic sectors.

3. Partial Test (t Test)

The partial test, or t test, is conducted to determine whether the independent variables have a partial (individual) effect on the dependent variable.

Table 10. T test results

Variabel	**t**	**Sig.**	**Keterangan**
Primer	1.608	0.223	Tidak berpengaruh
Sekunder	0.918	0.142	Tidak berpengaruh
Tersier	1.308	0.383	Tidak berpengaruh
a. Dependent variable: Luas lahan			

Source: Author's analysis, 2024

Based on Table 10, the significance values for the tertiary sector (0.223), primary sector (0.142), and secondary sector (0.383) are all greater than 0.05, indicating that the independent variables do not have a partial (individual) effect on the dependent variable. In other words, the development of built-up land area is not influenced by the primary, secondary, or tertiary sectors.

Since the correlation analysis indicates a relationship between the tertiary variable and the land area variable, a simple linear regression analysis was conducted for these two variables, resulting in the following outcomes.

Table 11. Hasil uji t variabel tersier terhadap variabel luas lahan

Variabel	**Unstandardized Coefficients**		**t**	**Sig.**	**Keterangan**
	B	Std. Error			
(Constant)	-4.039	2.868	-1.408	0.187	
Tersier	7.617	3.247	.577	0.039	Signifikan
a. Dependent variable: Luas lahan					

Source: Author's analysis, 2024

Based on Table 11, the significance value for the tertiary sector is 0.039, which is less than 0.05, indicating that the tertiary variable has a significant effect on the land area variable.

Tabel 12. Koefisien dan determinasi

Model	**R**	**R Square**	**Adjust R Square**	**Std. Error of the Estimate**
1	0.577	0.333	0.273	1.17110
a. Predictors: (Constant), Tersier				
b. Dependent Variable: Luas lahan				

Source: Author's analysis, 2024

The R value in the model indicates a correlation coefficient of 0.577, reflecting a positive correlation between land area and the tertiary sector. The R Square value represents the coefficient of determination, which indicates the independent variable's ability to explain the variation in the dependent variable. The R Square result shows a value of 0.333, meaning that the tertiary variable accounts for 33% of the variation in land area, while the remaining 67% is explained by other unexamined variables.

The linear regression equation that can be formulated is Y = -4.039 + 7.617 X3. The regression coefficient of 7.617 indicates that each 1% increase in the tertiary sector will raise the built-up land area by 7.61%. The regression results demonstrate a significant influence of the tertiary sector on the development of built-up land in the Mamminasata area. The tertiary sector in the Mamminasata cities and regencies predominantly manifests in Makassar City, Maros Regency, and Gowa Regency, where the development of built-up land is particularly rapid, especially in Makassar City and Gowa Regency. Additionally, the tertiary sector continues to strengthen in Takalar Regency.

One rapidly developing tertiary sector in Makassar City is transportation and communication. This is evidenced by the conversion of land in the northern part of Makassar City into warehousing areas along Insinyur Sutami Toll Road and the Western Ring Road in Tamalanrea Subdistrict. The development of warehousing areas has accelerated with the construction of Insinyur Sutami Toll Road, which connects Makassar City to the Makassar-Maros border, linking the city with Sultan Hasanuddin Airport.

The development of the tertiary sector in Maros Regency is significantly influenced by the transportation and communication sector. This underscores the importance of Sultan Hasanuddin Airport for the economic development of Maros Regency. According to research conducted by Gusrianda and Wibowo (2024), the area of Sultan Hasanuddin Airport increased by 5.81 hectares from 2003 to 2010 and 2023. However, in 2020-2021, the transportation sector in Maros Regency experienced a significant decline in revenue due to the Covid-

19 pandemic, which restricted outdoor activities. This limitation severely affected Sultan Hasanuddin Airport's operations, resulting in decreased revenue.

Gowa Regency has experienced the fastest growth of built-up land compared to other regions in Mamminasata. The conversion of land primarily consists of residential and settlement developments. According to the Financial Services Authority (OJK), the real estate sector encompasses land and physical buildings, including all assets on the land, such as buildings and fences, used for various purposes. Somba Opu and Palangga Subdistricts exemplify areas in Gowa Regency where land development is significant. This growth is dominated by the construction of new residential units, which, based on imagery, display similar architectural designs and are developing in clusters.

Takalar Regency features several attractive tourist sites that, if developed, could enhance growth in various economic sectors, particularly trade, restaurants, and hotels. The influx of tourists contributes to local income through expenditures on services and local products. Currently, the development of built-up land in Takalar Regency remains relatively slow compared to other regions in Mamminasata.

4 CONCLUSIONS

Based on the analysis and descriptions provided earlier, the following conclusions can be drawn:

a. Regional Real Income: The regional real income in the Mamminasata cities and regencies, as measured by the Gross Regional Domestic Product (GRDP) at constant 2010 prices from 2001 to 2021, has shown a continuous increase. The analysis indicates that in Makassar City, the processing industry is the only leading sector. Maros Regency has two leading sectors: mining and the processing industry. Gowa Regency has four basic sectors, two of which are leading sectors. Takalar Regency has three basic sectors, with two being leading sectors: agriculture, and electricity, gas, and water. The shift-share analysis for the Mamminasata regions reveals no significant structural economic shifts during the assessment period, except for Maros Regency, which experienced a change in sector dominance from the tertiary sector to the primary sector.
b. Built-Up Land Growth: The built-up land in the Mamminasata cities and regencies has consistently grown from 2001 to 2021. Makassar City experienced a built-up land growth of 1.73%, Maros Regency 2.72%, Gowa Regency 4.45%, and Takalar Regency 2.26%. Spatially, the sub-districts adjacent to or directly bordering Makassar City exhibit the most significant growth in built-up land. This phenomenon is attributed to intense urban development in Makassar City, leading to the expansion of built-up areas into the surrounding regions, following road network patterns. This development represents the conversion of previously undeveloped land into built-up areas.
c. Multiple Linear Regression Analysis: The results from the multiple linear regression analysis indicate that there is no effect of the independent variables on the dependent variable, either simultaneously (jointly) or partially (individually). However, the results from the simple linear regression between the tertiary sector and built-up land area demonstrate a significant influence, with the tertiary sector contributing 33% to the land area. The regression equation indicates that for every 1% increase in the tertiary sector, there is a corresponding 7.61% increase in built-up land area in the Mamminasata region.

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