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Submission of Manuscript

1 message

Sobirin Hamid <sobirinhamid@gmail.com>

Fri, Apr 12, 2024 at 10:05 AM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear Editor-in-Chief
Nanotechnology Perceptions

Here we submit our article manuscript entitled "Analysis of The Potential of The Agricultural Sector In Mallawa District, Maros Regency In Development As an Agropolitan Area". We hope that it can be published in the Journal of Nanotechnology Perceptions. Thanks.

Best Regards
Sobirin

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Sobirin Hamid <sobirinhamid@gmail.com>

Submission Acknowledgement

2 messages

Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Fri, Apr 12, 2024 at 2:22 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Author

Thank you for submitting the manuscript "Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area" to the International Journal of Nanotechnology Perceptions. With our online journal management system, you can track the progress of the editorial process by logging in to the journal website:

Manuscript URL: <https://nano-ntp.com/index.php/nano/login>

Username: sobirin_212

Editorial Team,

Nanotechnology Perceptions

Website: <https://nano-ntp.com/>

ISSN: 1660-6795, E-ISSN: 2235-2074

Sobirin Hamid <sobirinhamid@gmail.com>

Fri, Apr 12, 2024 at 2:30 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear editor

Thank you for responding to our manuscript submission, we are waiting for further information.

Regard

Sobirin

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Sobirin Hamid <sobirinhamid@gmail.com>

Editor Decision

2 messages

Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Mon, May 27, 2024 at 2:32 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Authors,

We have reached a decision regarding your submission to the International Journal of Nanotechnology Perceptions, entitled: "Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area."

Our decision is to: Revision Required

General comments on this manuscript should follow the Nanotechnology Perceptions template format, which can be downloaded from the website. The following comments should be revised as needed:

1. The manuscript consists of four sections: Introduction, Methodology, Results and Discussion, and Conclusion. Please refer to the correct format.
2. We cannot accept submitted papers for publication if the similarity level is higher than 20% and the match between sources is higher than 3%.
3. The bibliography should contain at least 20 references, with 70% coming from recent publications in Scopus journals.

Editorial Team,
Nanotechnology Perceptions
Website: <https://nano-ntp.com/>
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Sobirin Hamid <sobirinhamid@gmail.com>

Mon, May 27, 2024 at 2:36 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear editor

Thank you for responding to our manuscript submission, we are waiting for further information.

Regard
Sobirin

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Sobirin Hamid <sobirinhamid@gmail.com>

Result Revision

2 messages

Sobirin Hamid <sobirinhamid@gmail.com>

Thu, May 30, 2024 at 2:43 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear Editor

We have revised our manuscript for the International Journal of Nanotechnology Perceptions, "Analysis of the Potential of the Agricultural Sector in Mallowa District, Maros Regency Under Development as an Agropolitan Area." The details of the revisions are as follows:

1. Our manuscript has been structured according to the rules applicable to the Nanotechnology Perceptions journal, which consists of four sections: Introduction, Methodology, Results and Discussion, and Conclusions, referring to the correct format.
2. We have proofread our paper for submission for publication in the Nanotechnology Perceptions journal, with similarity requirements exceeding the permitted threshold of less than 20% and matching sources less than 1% each.
3. We have revised the bibliography by including 33 references, 70% of which are from recent publications in Scopus journals.

Best Regards,
Sobirin

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519K

Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Thu, May 30, 2024 at 2:48 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Author

Thank you for your email and for submitting the revised version of article. Your revised file has been received and will now undergo another round of review to verify the suggested changes.

The academic editor will make the final decision based on the reviewers' recommendations. Reviewers usually have 15 days to complete their assessments. Once the review process is concluded, we will promptly notify you of the editorial decision.

We appreciate your patience and thank you for your continued cooperation.

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Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area

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Abstract

Development in developing countries is largely focused on the utilization of natural resources to attract investors and spur regional economic growth, where development is predominantly oriented toward natural resource exploitation and tends to neglect environmental issues. The utilization of natural resources towards the development of agropolitan areas impacts economic growth and increases farmer incomes in rural areas. This study uses a sequential explanatory research method, which is a combination of sequential quantitative and qualitative research methods. Qualitative methods serve to prove, deepen, expand, weaken, and invalidate quantitative data obtained at an initial stage and build research hypotheses. Meanwhile, the quantitative methods used are descriptive, comparative, and associative. The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and the relationship between the phenomena being investigated. The results of this study confirm that increasing the productivity of regional economic base sectors has an impact on the development of agropolitan areas based on rural agribusiness systems, leading to increased community income and regional economic growth. This article offers a system integration concept in the development of agropolitan areas based on ecosystem sustainability and regional economic growth in developing countries.

Keywords: Agropolitan, Economic growth, Rural agribusiness, Economic empowerment, Ecosystem sustainability.

1. Introduction

Economic growth is a major factor in the development of a region (Prasetya, 2014). There is a specific relationship between the level of economic growth and regional development where a good economy will improve the quality of infrastructure, improve public services, reduce unemployment, increase regional wealth, and improve the community's quality of life (Sobirin, et al., 2023). Urban and regional economic development is attempted to develop through the empowerment of human resources and utilizing natural resources in a planned and integrated manner. This is by Law No. 26 of 2007 concerning spatial planning, which directs integrated, environmentally friendly spatial planning. To create an integrated arrangement, it cannot be separated from efforts to develop good governance through multi-stakeholders, the government, private sector, and community must support each other and carry out their functions properly (Karim et al., 2023).

The gap between urban and rural areas causes poverty in rural areas (Mardjuni et al., 2022). The relationship between villages and cities in the perspective of agropolitan area development will include economic networks and the distribution of goods/services to support the regional economy's growth. Progress in the economic sector is usually considered a success in the development process. However, the development of rural areas is often separated from urban areas (Nawangsih, 2022). This results in the occurrence of an urban bias process, meaning that the development of rural areas was initially aimed at improving the welfare of rural communities, which had the opposite effect, namely the depletion of rural potential into urban areas, both in terms of human resources, nature, and even capital (Roidah, 2019).

The concept of agropolitan was first introduced by Friedman in 1975 by offering spatial planning for rural development based on the idea of rural development oriented towards human needs with fair distribution of economic benefits, direct movement of local communities in the development process, and growth based on rural community activities, agriculture, and resources (Saleh et al., 2017). Agropolitan is an agricultural-based city that grows and develops to support the development of agribusiness systems and commercial activities in the interior and surrounding rural areas. Agropolitan areas will become the main production areas that require support from marketing systems and infrastructure facilities that are integrated with the development of a wider regional infrastructure system (Hasniati et al., 2023). An agropolitan system based on superior commodities requires agropolitan development with the advancement of the competitiveness of superior agribusiness products developed in agribusiness activities (Farhanah, 2015). The agropolitan development process has three important issues, namely access to agricultural land and water, political and administrative authority at the local level, and a shift in national development policies in supporting the diversification of agricultural production.

Agropolitan development is aimed at building on the economic sector which is directed to form the basis for regional growth consistently in the long term. The hierarchical nature of the village, sub-district, regency, and province linkages will be able to encourage increased welfare of rural communities (Karim et al., 2021). This linkage must be followed by a decentralized bottom-up development policy and be able to empower rural communities. In a policy-making process, community participation greatly determines the failure or success of a policy to be implemented. Based on these conditions, to avoid the gap in the relationship between villages and cities in Mallawa Sub-district, Maros Regency, the development of agropolitan areas is an alternative solution to reduce urban bias in regional development.

The agropolitan area here is interpreted as a functional system of villages as indicated by the existence of a village spatial hierarchy. Maros Regency is one of the areas in South Sulawesi province that produces food crops. The economic structure of Maros Regency is still dominated by the agricultural sector, this shows that the majority of the population in Maros Regency until now still relies on agriculture to meet their daily economic needs (Berdegue et al., 2014). The agropolitan area development program is considered necessary to be implemented, especially in Mallawa Sub-district, Maros Regency, where the concentration of the pioneering pattern is by the application of the agropolitan area concept which is more focused on villages so that it will create development in Mallawa Sub-district, Maros Regency.

Therefore, it is important to develop agropolitan development and socialize it to the parties related to the development of agropolitan areas, which is absolutely necessary, so that a shared understanding arises about the importance of developing agropolitan areas to realize harmonious, harmonious, and balanced development. The Master Plan for the Development of Food Crops and Horticulture Areas in South Sulawesi is a blueprint for agricultural development in South Sulawesi. Therefore, gradual but continuous implementation is the key to success. Regional development planning is carried out through a top-down policy approach, which is in line with the direction of national agricultural development policies and bottom-up planning, in accordance with the needs of the community/farmers. The output of the planning is a regional design and a medium-term action plan in annual details.

Maros Regency has a very potential agricultural area to be developed into an agropolitan area. This is possible because it is supported by potential natural resources and optimally managed agricultural resources. High-commodity agricultural sectors in Maros Regency face obstacles in developing their areas. This impacts regional progress in Maros Regency. Upon further examination, this Regency has quite high potential, but is not supported by adequate infrastructure. The absence of these supporting facilities will certainly reduce the quality of agriculture in Maros Regency. In addition, the uncontrolled urbanization process also puts pressure on agricultural productivity in Maros Regency.

In the 2011-2031 Maros Regency Spatial Plan, it is stated that Mallawa District has been designated as an agropolitan area in Maros Regency. In the concentration of its pioneering pattern, the application of the agropolitan area concept is focused on Mallawa District which has an area of $\pm 235.92 \text{ km}^2$, which is divided into 11 villages/sub-districts with a population of 13,080 people with a population density of 55.44 people/ km^2 . In Mallawa District, several commodities are found that can be classified as mainstay commodities which are then designated as superior commodities, such as rice, corn and coffee. These superior commodities have not been able to be realized optimally because the supporting facilities and infrastructure to support the development of the agropolitan area in Mallawa District are inadequate.

The general problems that have arisen in agropolitan areas are human resources, including staff, facilities and infrastructure, and information about agribusiness. Efforts to solve these problems are being made through coordination between the province and district, providing guidance and evaluation.

2. Methodology

This study uses a sequential explanatory research method, which is a combination of sequential quantitative and qualitative research methods. Qualitative methods function to prove, deepen, expand, weaken, and invalidate quantitative data obtained at an early stage and build research hypotheses. While quantitative methods used are descriptive, comparative, and associative (Sobirin, 2023). The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and their relationship between the phenomena being investigated. This research was conducted in Malawa Sub-district, Maros Regency, South Sulawesi Province (Figure 1).

The research site was selected by considering: (1) The reality that develops in the field in general, (2) the agropolitan area of Malawa Sub-district has not developed as an integrated rural agribusiness system, (3) the production of food crops and horticulture tends to increase but has not been integrated with the market area system, (4) the increasing productivity of agribusiness businesses in Malawa Sub-district has not been accompanied by sustainable environmental management, and (5) the productivity of economic businesses has not been optimal in the framework of encouraging increased income, community welfare, and regional economic growth.

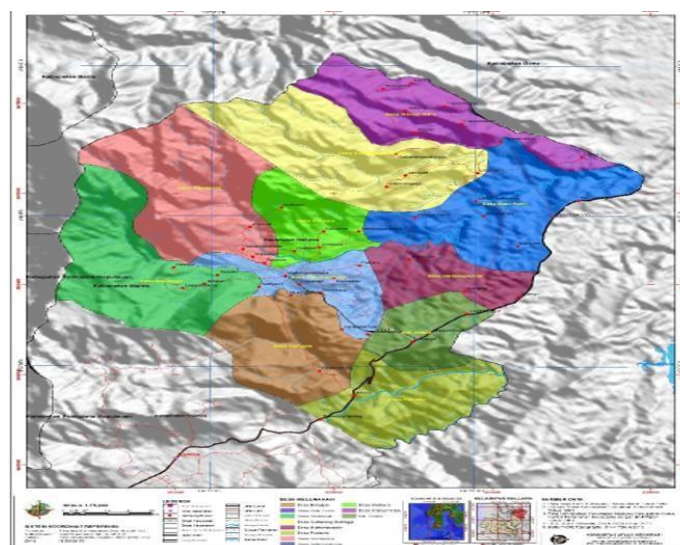


Figure 1: Administrative map of sub-districts in Maros Regency

The data collection method is divided into two categories, namely: (1) Qualitative data collection is obtained through; (a) participant observation, to observe the social and economic characteristics of the community, and (b) Focus group discussions are commonly conducted to explore the potential for productive economic enterprises and the involvement of community institutions in agribusiness in Malawa sub-district; and (2) quantitative data collection, carried out in three stages, namely (a) field observation, to observe the potential for economic enterprises managed by farmer groups and obstacles in the development of agropolitan areas, (b) surveys, to understand respondents' perceptions and efforts made to increase the productivity of economic enterprises, obstacles, and product marketing systems. The sample was determined using stratified random sampling. The research sample consisted of 100 respondents categorized based on the following characteristics: (i) type of economic enterprise, (ii) income level, and (iii) educational background. The survey was used to describe various types of productive economic enterprises, welfare and education. background based on respondents' perceptions. After that, the results of the observations and surveys were described using the results of the documentation study.

Qualitative analysis method is used to interpret the implementation of the agricultural sector potential of Mallawa sub-district, Maros district based on development as an agropolitan area. This aims to build a research hypothesis. Furthermore, quantitative analysis method is used to test the hypothesis of qualitative research results, namely: the relationship or correlation of X1 and X2 on Y, the influence of X2 and X3 on Y, the effect of X1, X2 on Y. The variables defined in this study include: (i) production economic enterprise (X1), (ii) commodity selling price (X2), (iii) promotion of economic enterprise (X3), (iv) infrastructure support (X4), and (v) market area (Y). Each answer to the question given by the respondent is given a score (score 5 is the highest). The second step is to divide the research results score by the ideal score. The correlation coefficient between variables uses the regression method. The equation used is $Y = a + b_1 X_1 + b_2 X_2 + b_n X_n$.

Sustainability of the implementation of the potential of the agricultural sector in Mallawa District, Maros Regency based on development as an agropolitan area using path analysis. The path analysis used is called variables, including: (i) X1 independent exogenous variable (development of agropolitan areas), (ii) X2 exogenous independent variable (rural agribusiness system), (iii) X3 exogenous independent variable (productive economic enterprise), (iv) Y endogenous dependent variable (environmental management), and (v) Z endogenous dependent variable (ecosystem sustainability). Path diagram using structural equation: $Y = PYX_1 + PYX_2 + PYX_3 + e_1$ Path analysis is used with several considerations including: (i) Research metric data is measured based on an interval scale, (ii) Exogenous and endogenous dependent variables are multiple regression models, while the intermediary variable refers to the mediation model and combined mediation and multiple regression models which are complex models, (iii) the relationship between variables is one-way, and (iv) cause and effect based on the theory that shows that there is a relationship or correlation between the development of the agropolitan area, rural agribusiness system, productive economic efforts, strengthening community capacity for environmental management and ecosystem sustainability.

The economic analysis of Malawa District, Maros Regency in this study is divided into two categories, namely (i) the location quotient (LQ) analysis is used to determine the extent of economic specialization of the Malawa District sector, Maros Regency as a base sector or leading sector. If the LQ result is > 1 then the sector is included in the base sector category, whereas if the $LQ < 1$ then it is not basic so that policies are needed to increase it. (ii) shift-share is used to analyze regional statistical data in the form of sectoral output to be compared with regional growth. It aims to determine the performance or productivity of the economic region. The formulation uses $LQ = S_i / N_i / S / N = S_i / S / N_i / N$, $PEK = KPN + KPP + KPK$. While the indicators assessed include: (i) changes in regional income, (ii) provincial growth components, (iii) proportional growth components, and (iv) district competitiveness growth components.

3. Result and Discussion

A development orientation that prioritizes accelerating high economic growth can, to some extent, influence development disparities between regions that tend to be urban biased and discriminatory against rural areas and the agricultural sector. The initially expected trickle-down effect, in part, results in an unbalanced transfer of resources from rural to urban areas. This can lead to income disparities between rural and urban communities, excessive population migration from rural to urban areas, and exploitation of rural areas that tends to ignore environmental aspects, resulting in ecosystem damage and triggering rural poverty. Over time, this situation and condition are feared to have a negative impact on the performance of the agricultural sector.

Furthermore, elasticity varies significantly depending on the affected sectors and regions, and is crucially determined by the spatial structure of the economy (Caliendo et al., 2017). The basic sector plays a crucial role in contributing to regional income and improving community income and the welfare of farmers in rural areas through government policy support. Initial support from the government and other partners for start-ups, including capital, subsidies, access to training and technical assistance, and navigating complex bureaucratic systems, is crucial. This positive impact can increase productivity over time, as economies of scale and access to markets influence potential poverty reduction (Humphries et al., 2020).

Table 1| Basic economic sectors in Maros Regency, South Sulawesi 2023-2024

Economic sector	The potential of economic sectors		LQ value
	Contribution to GDP	Business index	
	(IDR)		
Agriculture	4,024.28	105.10	1.71
Mining and quarrying	1,960.90	113.60	1.37
Processing industry	3,941.52	103.05	1.69
Electricity and gas supply	13.55	109.09	0.90
Water supply; waste management, sewage, and recycling	27.59	107.50	0.97
Construction	2,622.54	110.93	1.41
Wholesale and retail trade; car and motorcycle repair	789.66	108.80	0.82
Transportation and warehousing	10,366.06	111.90	7.45
Provision of accommodation and food and beverages	84.36	112.01	0.47
Information and communication and information	316.42	106.67	0.60
Financial services and insurance	350.73	103.76	0.40
Real estate	351.86	106.87	0.29
Corporate services	7.98	104.56	0.15
Government administration, defence, and mandatory social security	872.41	102.60	0.95
Education services	353.18	102.60	0.95
Health services and social activities	192.82	1.088.50	0.40
Other services	113.10	113.80	0.35

Source: Author's findings, 2024.

The economic base sectors in Maros Regency can be seen in the table above. The economic base sectors of Maros Regency (Table 1) tend to increase, including (1) Agriculture with a contribution of Rp. 4,024.28, a business index of 105.10, and a location quotient value of 1.71 or $LQ > 1$. (2) Mining and excavation with a contribution of Rp. 1,960.90, a business index of 113.60, and a location quotient value of 1.37 or $LQ > 1$. (3) Manufacturing industry with a contribution of Rp. 3,941.52, a business index value of 103.05, a location quotient value of 1.69 or $LQ > 1$. (4) Construction with a contribution of Rp. 2,622.54, a business index value of 110.93, a location

quotient value of 1.41 or $LQ > 1$. (5) Transportation and Warehousing with a contribution of Rp 10,366.06, a business index of 111.90 and a location quotient value of 7.45 or $LQ > 1$.

To increase regional competitiveness, efforts are needed to encourage the role of banking and non-banking finance, especially in developing infrastructure in leading sectors. Furthermore, the basic economic sectors that need to be improved in the future include: (1) agriculture, (2) mining and excavation (3) processing industry, (4) construction, and (v) transportation and warehousing. It can be concluded that agriculture, mining and excavation, processing industry, construction and transportation, and warehousing are strategic economic sectors that trigger economic growth in Maros Regency and South Sulawesi Province. Thus, harmonious innovation is needed so that all economic sectors can achieve these goals.

2. Regional economic growth

The shift in the economic structure of Maros Regency towards the GRDP of South Sulawesi Province for the 2019-2024 period shows that the potential for agriculture, mining, and quarrying, the manufacturing sector, the construction sector, the transportation and warehousing sector tends to increase with an average growth of 5.00 percent. This figure, after being confirmed in the field, illustrates that the growth of the sector is triggered by the existence of an agropolitan area in the Malawa Sub-district area and the existence of Maros Regency, which is part of the development of the Mamminasata metropolitan city in South Sulawesi Province (BPS, 2022). The current rapid economic growth is exclusively oriented towards resources. Moreover, the relationship between the following production programs leads to the responsiveness of larger PR factories needed for market needs: a reconfigurable SRS strategic system (RT reconfigurable technology supported by MS manufacturing and technology-TM management strategies), with an emphasis on the role of SCM intervention. The shift in the economic activity sector in Maros Regency can be seen in the following figure.

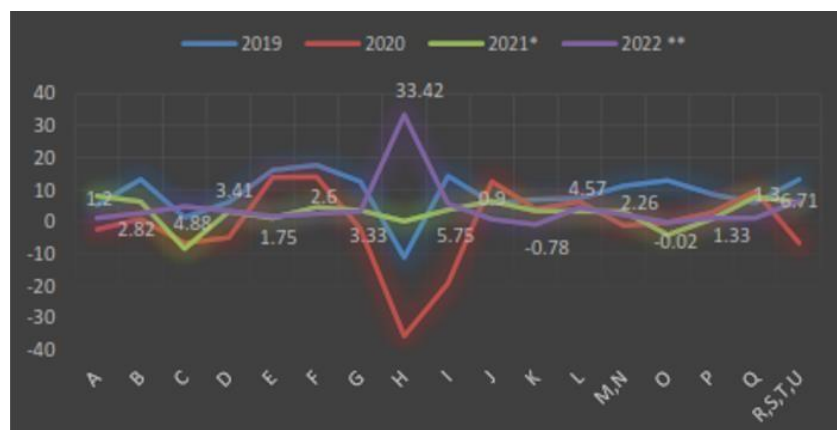


Figure 2. Economic growth rate of Maros Regency

Source: Author's findings, 2024.

The contribution of economic activity growth in the Maros Regency sector in Figure 2 shows a growth rate of 9.13%, higher than the national economic growth of 5.05 percent. Therefore, it could be concluded that the agricultural sector has a very strategic role in supporting the economic growth of South Sulawesi Province. This means that to increase the production of both food crops and horticulture, it is necessary to determine the area that is the center of production. In addition, agriculture contributes to MDG 1 through economic growth driven by agriculture and through improving nutrition.

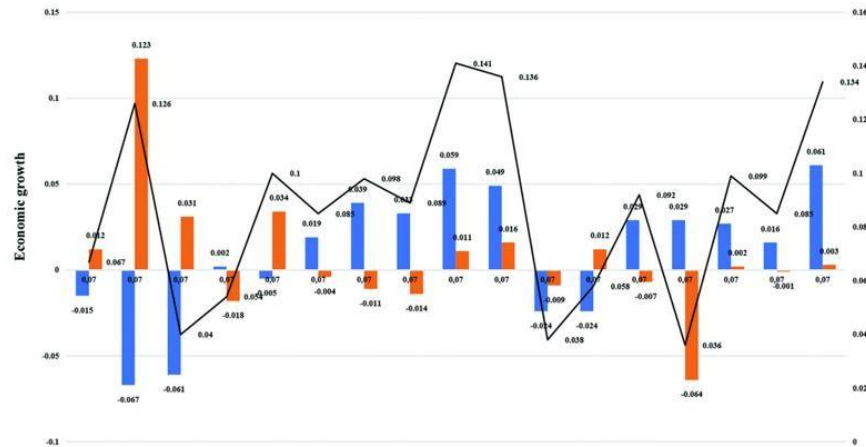


Figure 3. The competitiveness growth component of the regency.
Source: Author's findings, 2024.

The contribution of economic growth of Maros Regency based on the shift-share component is divided into four categories including: (1) Shifting of regional economic structure influenced by national with a value of 0.07, (2) proportional shift based on the gross value of each sector to the total of provincial economic activity sectors with a value of 0.169 or $PP > 0$. This means that the economic activity sector of Maros Regency shows rapid growth; whereas if $PP < 0$ then it does not have a specialization in the provincial economic activity sector, (3) differential shift or competitive position based on gross value added with the same sector with KPK of 0.117 or $PPK > 0$

Agriculture, mining and excavation, processing industry, Construction, Transportation, and Warehousing compared to other economic sectors activities. Furthermore, the PEK value is 2.5 percent. This means that the economic growth of Maros Regency has the potential to develop in the future. Therefore, it can be concluded that the economic sector has the potential for Maros Regency to experience significant growth through the development of agropolitan areas in the future. A national development approach that emphasizes macroeconomics Economic growth tends to ignore the magnitude of development between regions of existing disparities (Hashemianfar et al., 2014). Moreover, the transition from a traditional economy to a circular economy requires the realization of environmental innovation and sustainable engineering solutions.

Agropolitan Development Based on Regional Agribusiness in Rural Areas Agropolitan areas are created and developed basically to increase the productivity of agricultural businesses towards regional economic growth and overcome the gap between urban and rural areas. Efforts need to be continuously made in the development of agropolitan areas which are important for accelerating rural development in general and agriculture in particular (Karim & Syamsuddin, 2024). The economic system depends on various factors, such as producer and consumer behavior, technological change, resource availability and productivity, and population dynamics. Furthermore, the rural agribusiness system is a concrete manifestation of the business chain of the rural community economic system (Palisuri et al., 2024). The stronger role of market-related factors changing agricultural practices over time asks policymakers to design better market-based interventions and incentives to improve adaptation in agricultural communities. The results of the regression analysis can be seen in the following table.

Table 2. Summary of associative hypothesis testing results

Correlated variables	R-table	T-table	t-count	Sig.
Economic production efforts to market demand (ryx1)	0.116	1.960	5.409	0.003
Commodity selling price to market demand (ryx2)	0.116	1.960	8.326	0.002
Economic business promotion to market demand (ryx3)	0.116	1.960	2.587	0.036
Infrastructure support to market demand (ryx4)	0.116	1.960	2.980	0.014
Economic production efforts, selling price of merchandise, promotion of economic production efforts, and infrastructure support to market demand (R)				
F count=62,996 > F table=2.60				

Source: Author's findings, 2024.

The results of the regression on the tested variables (Table 2) obtained a picture: (1) the relationship between economic production of business and market demand is 5,409 with a coefficient of determination of the effect of 11.6. (2) the relationship between commodity selling prices and market demand is 8,326 with a coefficient of determination of influence of 11.6. (3) the relationship between economic business promotion and market demand is 2,587 with a coefficient of determination of influence of 11.6. (4) the relationship between infrastructure support and market demand is 2,980 with a coefficient of determination of influence of 11.6. It could be concluded that economic business production, commodity selling prices, economic business promotion, and infrastructure support together have a significant influence on market demand.

The results of the regression analysis confirm that remote rural areas that experience difficulties in marketing their products will experience significant changes with the existence of agropolitan areas developed in Malawa Sub-district, Maros Regency. Daily life in rural areas is often shaped by things that are different from urban life, especially in more remote rural areas; smaller labor markets, and access to social services such as schools, shops, and public transportation are often inadequate (Bahtiar et al., 2021). The agropolitan area will have a positive impact on economic growth in South Maros Regency, Sulawesi Province, and increase community economic efforts.

The role of the developed agropolitan area will encourage the creation of new jobs for rural communities because of the spatial interaction through the distribution of production marketing and support for regional transportation systems. Manufacturing, which replaced the agricultural and other natural resource sectors in the first half of the 20th century, has declined as the population sector has increased, and since the 1980s the service sector has become the largest segment of the growing employment sector. In this context, it is understood that the progress of a region or city contributes positively to the process of population mobility, transportation services, and the distribution of goods and services are fully influenced by the attractiveness of the city as a geographical unit. In addition, the service industry is also mentioned as an important part of trade and industry in big cities, and cities are described as playing an important role as drivers of growth in the region.

The agropolitan area of Malawa Sub-district, Maros Regency is oriented towards several components of activities in its development, namely; (1) development of transportation infrastructure to facilitate the transportation process from production locations to market locations; (2) agricultural production facilities; (3) warehousing to collect products before being marketed; and (4) other supporting facilities related to the industry for the needs of production processes and technological innovation. These components of agropolitan area activities have the potential for environmental pollution threats that cause a decrease in the quality of the living environment (Karim et al., 2023). This means that the need for food is quite high and increasing consumer needs are supported by the existence of potential centres for agricultural production that cause environmental degradation due to high pollution caused by various economic activities. Population growth and

increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important. The potential for environmental pollution in the agropolitan area in Malawa Sub-district, Maros Regency can be seen in the following image.

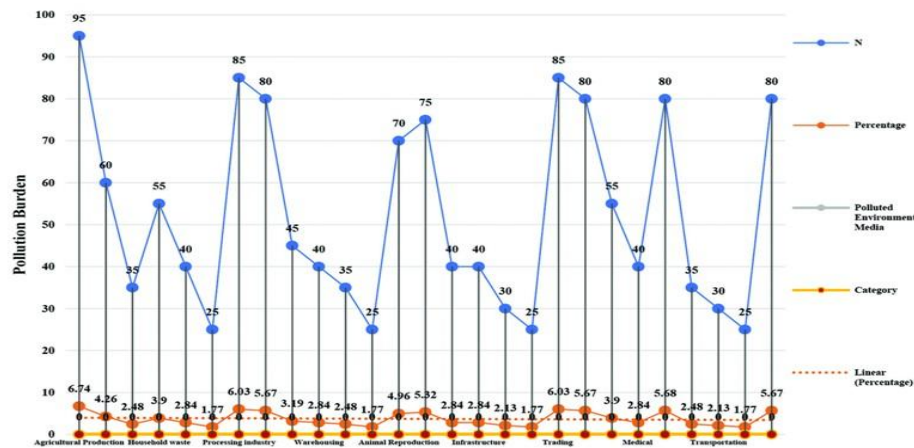


Figure 4. Sources of environmental pollution in the Agropolitan area, Malawa Sub-district
Source: Author's findings, 2024

Market location, (1) agricultural production facilities, (2) warehouses to collect products before being marketed, and (3) other supporting facilities related to industry for the needs of the production process and technological innovation. These components of agropolitan area activities have the potential threat of environmental pollution which causes a decrease in the quality of the living environment. This means that the need for food is quite high and increasing consumer needs and is supported by the existence of centres that have the potential for agricultural production which causes environmental degradation due to high pollution caused by various economic activities (Safariah et al., 2016). Population growth and increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important.

3. Integration of agropolitan area development system

Integration of agropolitan area development systems from the perspective of regional development is needed to synergize the productivity of economic efforts toward the production of marketing systems. Integration of agropolitan areas the development system is an effort to combine human resource capabilities and the utilization of natural resources to increase added value, artificial resources, and social capital that will increase regional capabilities in implementing development. Furthermore, the dominant trend in development and creation between regions is centered on economic growth and provides a positive contribution to spatial economic agglomeration. The regional transportation system plays an important role and is a driving factor in the distribution of the flow of goods and services towards economic agglomeration and spatial interaction between production centers and market areas.

Regardless of the relative importance of physical capital versus human resources, development cannot occur without both interacting as infrastructure cannot remain effective without proper operation and maintenance Economic activities cannot take place without an infrastructure base. Furthermore, the sustainability of agricultural production systems, rural economies, and the environment can be maintained and improved in an integrated agropolitan area development system. The pattern of marketing of regional spatial distribution and interaction can be seen in Figure 5 below.

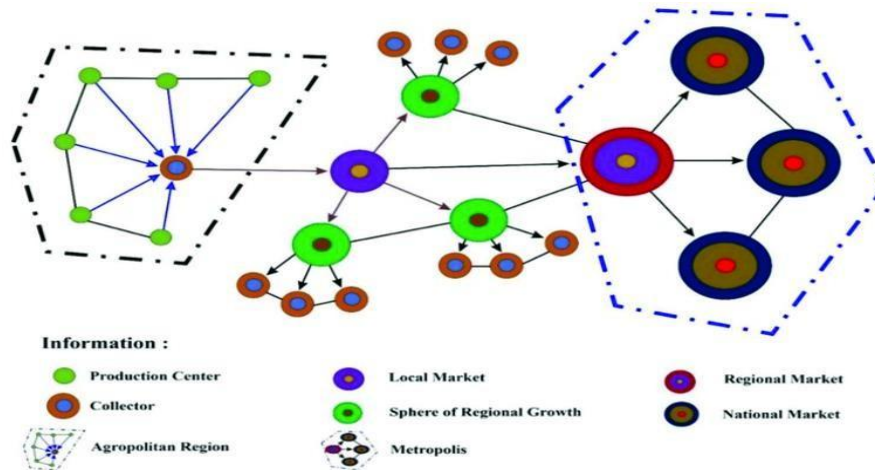


Figure 5. Agropolitan production marketing system in Maros Regency.
Source: Author's findings, 2024

The agropolitan production marketing system will be interrelated to the existence of regional growth centers, regional markets, and the existence of metropolitan cities as centers of national markets (Figure 6) that are globally oriented. Regional development policies and practices have undergone significant transformations in the last five decades. Its relevance has been challenged in recent years by the new economic geography that has emerged given globalization and because most countries are turning towards a more democratic and decentralized approach to planning and implementing their various development activities.

Moreover, many large cities have transformed into manufacturing centers supported by modern transportation systems, including highways, railways, and river routes, in a sense, every citizen of each of the 28 major cities in the world interacts with rural areas and villages has a dependence, on a production marketing system for urban communities as consumers.

Interpretations of the process that can be conveyed include: First, the integration of production centre areas into production centre areas, in this case, the role of Malawa District as the initial distribution centre, starting from the production process, product packaging, and finally to be forwarded to the district capital to meet regional needs. In this process, there is a high possibility of uncertainty, and will be very vulnerable to risks and obstacles. That is, in the local business world, its supply is limited, and the chain network becomes increasingly vulnerable to uncertainty and complexity.

Second, the product of the marketing process from the capital city of Maros Regency at that time continued to the growth centre of South Sulawesi Province about the provision of products, to meet consumer needs at the regional level. The organization of the strategic supply chain (or supply network) which aims to reterritorialize the agri-food system through the development of what is in the field of economic literature is defined as a value-based food supply chain.

Third, regional marketing of the agropolitan production of this area is intended to meet the needs of the urban population within the scope of the metropolitan city. Thus, it is expected to encourage economic growth by creating new business opportunities and jobs, saving material costs, reducing price volatility, and increasing security supplies while reducing environmental pressures and their impacts.

Furthermore, transportation services have a very important role and the available choices include land transportation, air transportation, and sea transportation. This process shows that the role of production centres in this agropolitan area is very strategic as a driver for regional economic growth through relations between rural and urban areas towards sustainable integration of the regional development system. Supporting government regulations that protect the needs of the most

vulnerable groups and formulating strategies related to provisions as a basis and requirement for sustainable economic growth. It can be concluded that the development of a well-managed agropolitan area has a positive impact on regional economic growth, integration of urban systems, and the relationship between local, regional, national, and global marketing toward sustainable regional development.

4. Discussion

The business economy that tends to increase through the rural agribusiness system pattern encourages economic growth and has had an impact on opening up employment opportunities and reducing poverty in rural areas (Amri et al., 2023). Strong economic growth advances human development, which in turn encourages economic growth. Furthermore, rural investment, pro-poor policies, social protection, and strengthening rural institutions create positive climates needed for family farmers, small-scale producers, and poor rural communities to invest in their businesses and build sustainable, income-generating activities (UN, 2015). Figure 5 shows the results of the path analysis showing the development of agropolitan areas, rural agribusiness systems, productive economic efforts, and strengthening community capacity for environmental management and ecosystem sustainability.

The development of agropolitan areas through rural agribusiness systems based on economic empowerment that is oriented towards increasing the productivity of the community's economy is then contextualized towards the environmental sustainability of the ecosystem. The results are supported by the triple-bottom-line approach, namely, integrating economic, environmental, and social factors. Moreover, a sustainable circular economy not only adopts an environmental perspective but also considers economic, social, and environmental performance (Gomez-Limon et al., 2009). The results of the analysis confirm that the economic cycle of the community and the distribution of production marketing through the rural agribusiness system in the agropolitan area will remain stable and sustainable by optimizing natural resources, strengthening production factors, and using environmentally friendly technology towards sustainable economic growth in the region.

Economic productivity that remains stable and the selling price of production that tends to increase due to high market and consumer demand simultaneously has a simultaneous impact on the economic growth of Maros Regency and the economic growth of South Sulawesi Province. Capital accumulation has an impact on economic growth and the fundamental factor that inhibits economic growth is the reduced return on capital in the production process. Furthermore, the argument is based on several considerations, namely: (1) government policy support and political stability, (2) production stability and ecosystem balance, and (3) environmental pollution control. The results of this study illustrate that production stability and market demand that tend to increase followed by market stability will have an impact on optimizing production and utilization of natural resources towards the sustainability of agropolitan areas based on rural agribusiness systems.

The implementation of a complex agroforestry system must be followed by the development of basic and advanced industries to handle it with superior commodities in the agropolitan area and the setting of a reasonable basic price level for local commodities at the level of local producers, building a transportation network system, developing markets, and empowering local communities (Retnowati, 2003). Furthermore, the health status of regional soil and ecosystems has important theoretical and practical meanings for maintaining regional ecological security and promoting of similar social and economic sustainable development (Schneider et al., 2007). Figure 6 shows the development of agropolitan areas in Malawa Sub- district, Maros Regency based on ecosystem sustainability.

The development of the Malawa Sub-district agropolitan area is based on increasing regional economic productivity and ecosystem sustainability (Figure 6), in the context of several important principles, namely: (1) Ensuring the existence of production processes through biodiversity and

food that are oriented globally towards long-term economic growth, (2) encouraging renewable energy based on sustainable agriculture followed by soil and air conservation, (3) government-directed policies on law enforcement and consistency in sustainable management of natural resources and ecosystems, (4) realizing rural agribusiness systems supported by investment and the business world capital towards increasing welfare and opening up employment opportunities, (5) developing agricultural-based technological innovation systems towards ecosystem management, and (6) rotation of agricultural commodities based on conservation of natural resources and the environment. Policies that lead to effective training for entrepreneurs, by providing incentive support and opportunities to start a business.

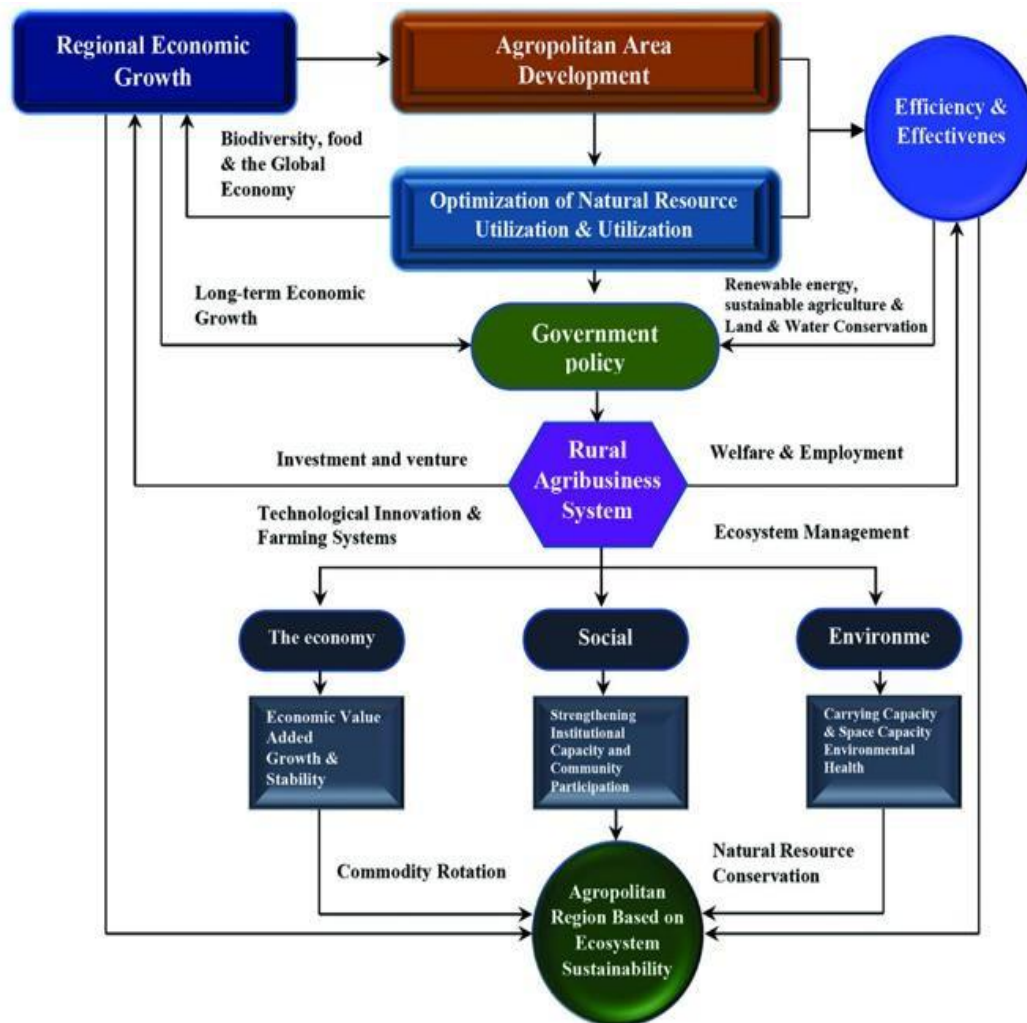


Figure 6. Development of agropolitan areas based on regional economic productivity and ecosystem sustainability
Source: Author's findings, 2024

4. Conclusion

Regional growth supported by the positive economic base sector is related to the development of agropolitan areas based on rural agribusiness systems. Agropolitan areas developed towards economic production efforts, increasing production quality and stability of commodity price sales followed by promotion of economic efforts, and supporting infrastructure have a significant influence on meeting market demand. Regional development followed by the acceleration of agropolitan area development through rural agribusiness systems and followed by community

empowerment and control of environmental pollution is positively correlated with the increase in economic business productivity and ecosystem sustainability.

Furthermore, agropolitan areas that are well and professionally managed are positively correlated with the integration of regional development systems. In addition, the relationship between local, regional, national, and global marketing to the stability of the economy of community circulation, stability of production marketing distribution, strengthening of production factors, and the use of environmentally friendly technology have an impact on increasing regional economic growth and ecosystem sustainability.

The direction of sustainability of agropolitan areas based on agribusiness will require government policy support in terms of political stability, production stability, product marketing, and environmental pollution control. The stability of production and market demand that tends to increase and is followed by market stability will have an impact on optimizing the use of natural resources towards sustainable development of agropolitan areas. Sustainability of the agropolitan area ecosystem to guarantee the existence of a production process through the development of biodiversity and food, the use of renewable energy based on sustainable agriculture followed by soil and water conservation and law enforcement.

Consistency in the management of natural resources and integrated rural agribusiness systems supported by investment and business capital actors and technology-based development of agricultural systems, ecosystem management, and commodity agricultural rotation based on natural resource and environmental conservation will encourage regional economic growth in an integrated system of independent agropolitan area development. The results of this study have implications for the development of regional planning science, built environment science, economic regions, and sociology of the Malawa sub-district area. This study explicitly has implications for the formulation of government policies and their implementation of the development of agropolitan areas based on the Malawa Sub-district agribusiness system in the future to maintain economic stability and sustainability of environmental management. The development gap in the context of cities and villages can be overcome and improved in the future by considering several indicators including the development of independent agropolitan areas, rural agribusiness systems, optimization and conservation of natural resources, strengthening the institutional capacity of government and community adaptation to global climate change based on data availability, spatial scale, regional scale, and period.

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Editor Decision

2 messages

Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Mon, Jun 17, 2024 at 2:37 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Author

We have reached a decision regarding your submission to the International Journal of Nanotechnology Perceptions, entitled "Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency Under Development as an Agropolitan Area." For this manuscript to be published, there are several issues that need to be resolved. We hope the following suggestions are helpful to the author.

Abstract: It is hoped that it can be refined and supplemented with a clarification of the research objectives and methods.

Introduction: It is necessary to refine the substance related to the urgency of the research being conducted (pp. 1-2) and to add supporting literature.

Materials and Methods: It is necessary to refine and serve as a basis for the use of research methods (p. 4).

Data Analysis: It is necessary to confirm the validity and reliability of the data and to present the data concretely (pp. 4-5).

Results and Discussion: The discussion will be refined by adapting previous findings to the research findings and their results (pp. 5-9).

Conclusion: This review confirms the conclusions drawn from the research conducted on "Accelerating Plastic Pollution Reduction through Sustainable Urban Infrastructure Development" (p. 9).

If you have any questions, please contact me. Thank you for using this journal as a platform for your work.

Editorial Team,
Nanotechnology Perceptions
Website: <https://nano-ntp.com/>
ISSN: 1660-6795, E-ISSN: 2235-2074

Sobirin Hamid <sobirinhamid@gmail.com>

Mon, Jun 17, 2024 at 3:00 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear editor

Thank you for responding to our manuscript submission, we are waiting for further information.

Regard

Sobirin

[Quoted text hidden]



Sobirin Hamid <sobirinhamid@gmail.com>

Author Response2

2 messages

Sobirin Hamid <sobirinhamid@gmail.com>

Wed, Jun 19, 2024 at 3:12 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear Editor and Reviewer

Hereby, I submit an article entitled: "Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area." This article has been revised based on input, suggestions, and corrections from reviewers.

Abstract:

This abstract has been revised to confirm the suggestions and input from reviewers. The abstract emphasizes the research findings, which emphasize that increasing the productivity of regional economic base sectors impacts the development of agropolitan areas based on rural agribusiness systems, leading to increased community income and regional economic growth. Furthermore, the method used is a sequential explanatory research method, a combination of sequential quantitative and qualitative research methods. The results emphasize the concept of systems integration in the development of agropolitan areas based on ecosystem sustainability and regional economic growth in developing countries. (page 1).

Introduction:

The urgency of this research focuses on three main points: (1) the importance of developing agropolitan areas to achieve harmonious, coherent, and balanced development; (2) Agropolitan areas are an alternative solution to reduce urban bias in regional development; and (3) Agropolitan development aims to build economic sectors that are directed towards forming the basis for consistent long-term regional growth. Overall, these three urgencies are supported by adequate and up-to-date literature sources (pp. 1-3).

Methods:

The urgency of the methods used includes: (1) Sampling and data collection oriented towards determining a minimal sample through accidental sampling. The reality on the ground is that the Malawa District agropolitan area has not yet developed as an integrated rural agribusiness system; (2) A survey using a questionnaire instrument, in this case conducted using two methods: first, qualitative data collection obtained through participant observation to observe the social and economic characteristics of the community; and second, quantitative data collection to observe the potential of economic enterprises managed by farmer groups and obstacles in developing agropolitan areas. Furthermore, to understand respondents' perceptions and efforts made to increase economic enterprise productivity, obstacles, and product marketing systems. (3) Determining the demographic profile of respondents refers to field facts, namely individual or group characteristics, and their relationships between the phenomena being investigated. The sample size consisted of 100 respondents categorized based on characteristics, type of economic enterprise, income level, and educational background; and (4) Path diagrams using structural equation path analysis were used with several considerations, including: (i) Research metric data were measured using an interval scale; (ii) Exogenous and endogenous dependent variables were multiple regression models, while intermediary variables were mediation models, combined mediation, and multiple regression models, which are complex models; (iii) The relationship between variables was one-way; and (iv) Causation based on theory demonstrated a relationship or correlation between the development of agropolitan areas, rural agribusiness systems, productive economic endeavors, strengthening community capacity for environmental management, and ecosystem sustainability. (pp.3-4)

Results:

Data validity was assessed using a correlation test method on the predetermined research sample. Furthermore, data validity was tested using a Cronbach number of 0.6 to ensure that the data obtained in the field were reliable for use in the structural equation path analysis. The clean data from this study are presented in tables and diagrams (pp. 4-12).

Discussion:

The discussion in this study was conducted to refine the field findings and then elaborate on previous research. The goal was to compare the findings, both in terms of similarities and differences, so that the research focus is more specific on the model of user convenience, usefulness, risks, user attitudes, and adoption intentions to use electric vehicle technology, as well as the impact, effects, and public attitudes toward electric vehicle use, leading to a renewable energy-based transportation system and urban environmental sustainability (pp. 4-12).

Conclusion:

The conclusion of this study emphasizes the significance and impact of the knowledge and public acceptance of regional development, followed by accelerated agropolitan development through a rural agribusiness system, followed by community empowerment and control of environmental pollution, which is positively correlated with increased economic business productivity and ecosystem sustainability (p. 12).

Best Regards,
Sobirin



Article_Sobirin-Author Response2 - Copy.docx

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Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Wed, Jun 19, 2024 at 3:23 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Author

Thank you for your email and for submitting the revised version of article. Your revised file has been received and will now undergo another round of review to verify the suggested changes.

The academic editor will make the final decision based on the reviewers' recommendations. Reviewers usually have 15 days to complete their assessments. Once the review process is concluded, we will promptly notify you of the editorial decision.

We appreciate your patience and thank you for your continued cooperation.

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[Quoted text hidden]

Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area

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Abstract

Development in developing countries is mostly focused on the utilization of natural resources to attract investors in spurring regional economic growth. Its development is oriented towards the exploitation of natural resources and tends to ignore environmental issues. The utilization of natural resources towards the development of agropolitan areas has an impact on economic growth and increasing farmer income in rural areas. This study uses a sequential explanatory research method, a combination of sequential quantitative and qualitative research methods. Qualitative methods function to prove, deepen, expand, weaken, and invalidate quantitative data obtained at an early stage and build research hypotheses. While the quantitative methods used are descriptive, comparative, and associative. The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and their relationship between the phenomena being investigated. The results of this study confirm that increasing the productivity of the regional economic base sector impacts the development of agropolitan areas based on rural agribusiness systems in the direction of increasing community income and the regional economy. This article offers a concept of system integration in the development of agropolitan areas based on ecosystem sustainability and regional economic growth in developing countries.

Keywords: Agropolitan, Economic growth, Rural agribusiness, Economic empowerment, Ecosystem sustainability.

1. Introduction

Economic growth is a major factor in the development of a region (Prasetya, 2014). There is a specific relationship between the level of economic growth and regional development where a good economy will improve the quality of infrastructure, improve public services, reduce unemployment, increase regional wealth, and improve the community's quality of life (Sobirin, et al., 2023). Urban and regional economic development is attempted to develop through the empowerment of human resources and utilizing natural resources in a planned and integrated manner. This is by Law No. 26 of 2007 concerning spatial planning, which directs integrated, environmentally friendly spatial planning. To create an integrated arrangement, it cannot be separated from efforts to develop good governance through multi-stakeholders, the government, private sector, and community must support each other and carry out their functions properly (Karim et al., 2023).

The gap between urban and rural areas causes poverty in rural areas (Mardjuni et al., 2022). The relationship between villages and cities in the perspective of agropolitan area development will include economic networks and the distribution of goods/services to support the regional economy's growth. Progress in the economic sector is usually considered a success in the development process. However, the development of rural areas is often separated from urban areas (Nawangsih, 2022). This results in the occurrence of an urban bias process, meaning that the development of rural areas was initially aimed at improving the welfare of rural communities, which had the opposite effect, namely the depletion of rural potential into urban areas, both in terms of human resources, nature, and even capital (Roidah, 2019).

The concept of agropolitan was first introduced by Friedman in 1975 by offering spatial planning for rural development based on the idea of rural development oriented towards human needs with

fair distribution of economic benefits, direct movement of local communities in the development process, and growth based on rural community activities, agriculture, and resources (Saleh et al., 2017). Agropolitan is an agricultural-based city that grows and develops to support the development of agribusiness systems and commercial activities in the interior and surrounding rural areas. Agropolitan areas will become the main production areas that require support from marketing systems and infrastructure facilities that are integrated with the development of a wider regional infrastructure system (Hasniati et al., 2023). An agropolitan system based on superior commodities requires agropolitan development with the advancement of the competitiveness of superior agribusiness products developed in agribusiness activities (Farhanah, 2015). The agropolitan development process has three important issues, namely access to agricultural land and water, political and administrative authority at the local level, and a shift in national development policies in supporting the diversification of agricultural production.

Agropolitan development is aimed at building on the economic sector which is directed to form the basis for regional growth consistently in the long term. The hierarchical nature of the village, sub-district, regency, and province linkages will be able to encourage increased welfare of rural communities (Karim et al., 2021). This linkage must be followed by a decentralized bottom-up development policy and be able to empower rural communities. In a policy-making process, community participation greatly determines the failure or success of a policy to be implemented. Based on these conditions, to avoid the gap in the relationship between villages and cities in Mallawa Sub-district, Maros Regency, the development of agropolitan areas is an alternative solution to reduce urban bias in regional development.

The agropolitan area here is interpreted as a functional system of villages as indicated by the existence of a village spatial hierarchy. Maros Regency is one of the areas in South Sulawesi province that produces food crops. The economic structure of Maros Regency is still dominated by the agricultural sector, this shows that the majority of the population in Maros Regency until now still relies on agriculture to meet their daily economic needs (Berdegue et al., 2014). The agropolitan area development program is considered necessary to be implemented, especially in Mallawa Sub-district, Maros Regency, where the concentration of the pioneering pattern is by the application of the agropolitan area concept which is more focused on villages so that it will create development in Mallawa Sub-district, Maros Regency.

Agropolitan development is important to develop and socialize parties related to the development of agropolitan areas that need to be done so that a common understanding arises about the importance of developing agropolitan areas to realize harmonious, harmonious, and balanced development (Hakim, 2016). The master plan for the development of food crops and horticulture areas in South Sulawesi as a design for agricultural development in South Sulawesi. Therefore, gradual but continuous implementation is the key to success. Planning for regional development through a top-down policy approach, which is in line with the direction of national agricultural development policy and bottom-up planning, according to the needs of the community/farmers (Karim et al., 2023). The output of the planning is the design of the area and the medium-term action plan in annual details.

Maros Regency has a very potential agricultural area to be used as an agropolitan area. This is possible because it is supported by the potential of natural resources and agricultural resources that are optimally managed, high-commodity agricultural sectors in Maros Regency experience obstacles in developing their areas (Abduh et al., 2024). This has an impact on regional progress in Maros Regency. If we look further, this regency has quite high potential, but it is not supported by adequate facilities and infrastructure, the absence of these supporting facilities will certainly reduce the quality of agriculture in Maros Regency, in addition, the uncontrolled urbanization process also suppresses agricultural productivity in Maros Regency. In the 2011-2031 Maros Regency spatial plan, it is stated that Mallawa Sub-district has been designated as an agropolitan area in Maros Regency.

In the concentration of its pioneering pattern, the application of the agropolitan area concept is focused on Mallawa Sub-district which has an area of $\pm 235.92 \text{ km}^2$ and is divided into 11 villages/sub-districts with a population of 13,080 people with a population density of 55.44 people/km². In Mallawa Sub-district, several commodities are found that can be classified as mainstay commodities which are then designated as superior commodities, such as rice, corn, and coffee. The superior commodities have not been able to be realized optimally because the supporting facilities and infrastructure to support the development of the agropolitan area in Mallawa Sub-district are inadequate. The general problems of the agropolitan area that have arisen so far are human resource factors including officers, facilities infrastructure, and information about agribusiness (Daga et al., 2024). Efforts to solve the problem are carried out by coordinating the province and district to carry out coaching and evaluation.

2. Methodology

This study uses a sequential explanatory research method, which is a combination of sequential quantitative and qualitative research methods. Qualitative methods function to prove, deepen, expand, weaken, and invalidate quantitative data obtained at an early stage and build research hypotheses. While quantitative methods used are descriptive, comparative, and associative (Sobirin, 2023). The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and their relationship between the phenomena being investigated. This research was conducted in Malawa Sub-district, Maros Regency, South Sulawesi Province (Figure 1).

The research site was selected by considering: (1) The reality that develops in the field in general, (2) the agropolitan area of Malawa Sub-district has not developed as an integrated rural agribusiness system, (3) the production of food crops and horticulture tends to increase but has not been integrated with the market area system, (4) the increasing productivity of agribusiness businesses in Malawa Sub-district has not been accompanied by sustainable environmental management, and (5) the productivity of economic businesses has not been optimal in the framework of encouraging increased income, community welfare, and regional economic growth.

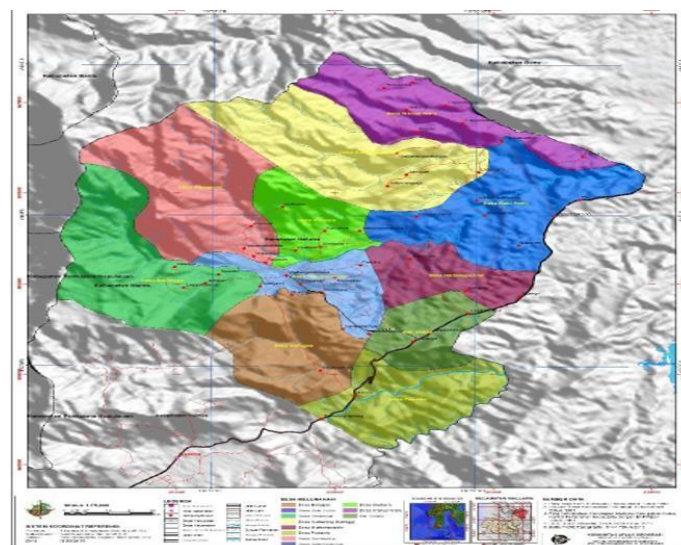


Figure 1: Administrative map of sub-districts in Maros Regency

Data collection methods are divided into two categories, namely: (1) Qualitative data collection is obtained through; (a) participant observation, to observe the social and economic characteristics of

the community, and (b) focus group discussions are commonly conducted to explore the potential for productive economic businesses and the involvement of community institutions in the Malawa District agribusiness; and (2) quantitative data collection, carried out in three stages, namely (a) field observation, to observe the potential for economic businesses managed by farmer groups and obstacles in the development of agropolitan areas, (b) surveys, to understand the perceptions of respondents and efforts made to increase the productivity of economic businesses, obstacles, and product marketing systems. The sample was determined using stratified random sampling (Wahyuni et al., 2022). The research sample consisted of 100 respondents who were categorized based on the following characteristics: (a) type of economic business, (b) income level, and (c) educational background. The survey was used to describe various types of productive economic businesses, welfare, and education. background based on the perceptions of respondents.

After that, the results of the observation and survey were described using the results of the documentation study. The qualitative analysis method was used to interpret the implementation of the potential of the agricultural sector in the Mallawa Sub-district, Maros Regency based on development as an agropolitan area. This aims to build a research hypothesis. Furthermore, quantitative analysis methods are used to test the hypothesis of qualitative research results, namely: the relationship or correlation of X^1 and X^2 on Y , the influence of X^2 and X^3 on Y , and the effects of X^1 , and X^2 on Y . The variables defined in this study include (a) economic production efforts (X^1), (b) commodity selling prices (X^2), (c) promotion of economic efforts (X^3), (d) infrastructure support (X^4), and (v) market areas (Y). Each answer to the question given by the respondent is given a score (a score of 5 is the highest). The second step is to divide the research results score by the ideal score. The correlation coefficient between variables uses the regression method. The equation used is $Y = a + b_1 X^1 + b_2 X^2 + b_n X_n$.

Sustainability of the implementation of the potential of the agricultural sector in Mallawa Sub-district, Maros Regency based on development as an agropolitan area using path analysis. Path analysis used is called variables including (a) X^1 exogenous independent variable (development of agropolitan areas), (b) X^2 exogenous independent variable (rural agribusiness system), (c) X^3 exogenous independent variable (productive economic efforts), (d) Y endogenous dependent variable (environmental management), and (e) Z endogenous dependent variable (ecosystem sustainability). Path diagrams use structural equations: $Y = PYX^1 + PYX^2 + PYX^3 + e^1$ Path analysis is used with several considerations including: (a) Research metric data is measured based on an interval scale, (b) Exogenous and endogenous dependent variables are multiple regression models, while intermediary variables refer to mediation models and combined mediation and multiple regression models which are complex, (c) the relationship between variables is one-way, and (d) cause and effect based on the theory that shows that there is a relationship or correlation between the development of agropolitan areas, rural agribusiness systems, productive economic efforts, strengthening community capacity for environmental management and ecosystem sustainability.

3. Result and Discussion

1. Description of research results

The development orientation that prioritizes high economic growth acceleration, more or less can affect the development inequality between regions that tend to be biased towards urban areas and discrimination against rural areas and the agricultural sector. The hatching effect that was originally expected to occur, in fact, partly causes an unbalanced transfer of resources from rural areas to urban areas. This can cause income disparities between rural and urban communities, excessive population migration from rural areas to urban areas, and exploitation of rural areas that tend to ignore environmental aspects, resulting in ecosystem damage and triggering poverty in rural communities (Aoki & Yoshikawa, 2002). Gradually, this situation and condition are feared to hurt the performance of the agricultural sector. In addition, elasticity varies greatly depending on the

affected sectors and regions and is very important to be determined by the structure of economic spatial planning.

The base sector has an important role in contributing to regional income and increasing community income and farmer welfare in rural areas through government policy support. The importance of early support from government and other partners for start-ups, capital, subsidies for access to training and technical assistance, and navigating complex bureaucratic systems, and the positive impacts can be increased productivity over time, economies of scale, and access to markets affect the potential for poverty reduction.

Table 1| Basic economic sectors in Maros Regency, South Sulawesi 2023-2024

Economic sector	The potential of economic sectors		LQ value
	Contribution to GDP	Business index	
	(IDR)		
Agriculture	4,024.28	105.10	1.71
Mining and quarrying	1,960.90	113.60	1.37
Processing industry	3,941.52	103.05	1.69
Electricity and gas supply	13.55	109.09	0.90
Water supply; waste management, sewage, and recycling	27.59	107.50	0.97
Construction	2,622.54	110.93	1.41
Wholesale and retail trade; car and motorcycle repair	789.66	108.80	0.82
Transportation and warehousing	10,366.06	111.90	7.45
Provision of accommodation and food and beverages	84.36	112.01	0.47
Information and communication and information	316.42	106.67	0.60
Financial services and insurance	350.73	103.76	0.40
Real estate	351.86	106.87	0.29
Corporate services	7.98	104.56	0.15
Government administration, defence, and mandatory social security	872.41	102.60	0.95
Education services	353.18	102.60	0.95
Health services and social activities	192.82	1.088.50	0.40
Other services	113.10	113.80	0.35

Source: Author's findings, 2024.

The economic base sectors in Maros Regency can be seen in the table above. The economic base sectors of Maros Regency (Table 1) tend to increase, including (1) Agriculture with a contribution of Rp. 4,024.28, a business index of 105.10, and a location quotient value of 1.71 or $LQ > 1$. (2) Mining and excavation with a contribution of Rp. 1,960.90, a business index of 113.60, and a location quotient value of 1.37 or $LQ > 1$. (3) Manufacturing industry with a contribution of Rp. 3,941.52, a business index value of 103.05, a location quotient value of 1.69 or $LQ > 1$. (4) Construction with a contribution of Rp. 2,622.54, a business index value of 110.93, a location quotient value of 1.41 or $LQ > 1$. (5) Transportation and Warehousing with a contribution of Rp 10,366.06, a business index of 111.90 and a location quotient value of 7.45 or $LQ > 1$.

To increase regional competitiveness, efforts are needed to encourage the role of banking and non-banking finance, especially in developing infrastructure in leading sectors. Furthermore, the basic economic sectors that need to be improved in the future include: (1) agriculture, (2) mining and excavation (3) processing industry, (4) construction, and (v) transportation and warehousing. It can be concluded that agriculture, mining and excavation, processing industry, construction and transportation, and warehousing are strategic economic sectors that trigger economic growth in

Maros Regency and South Sulawesi Province. Thus, harmonious innovation is needed so that all economic sectors can achieve these goals.

2. Regional economic growth

The shift in the economic structure of Maros Regency towards the GRDP of South Sulawesi Province for the 2019-2024 period shows that the potential for agriculture, mining, and quarrying, the manufacturing sector, the construction sector, the transportation and warehousing sector tends to increase with an average growth of 5.00 percent. This figure, after being confirmed in the field, illustrates that the growth of the sector is triggered by the existence of an agropolitan area in the Malawa Sub-district area and the existence of Maros Regency, which is part of the development of the Mamminasata metropolitan city in South Sulawesi Province (BPS, 2022). The current rapid economic growth is exclusively oriented towards resources. Moreover, the relationship between the following production programs leads to the responsiveness of larger PR factories needed for market needs: a reconfigurable SRS strategic system (RT reconfigurable technology supported by MS manufacturing and technology-TM management strategies), with an emphasis on the role of SCM intervention. The shift in the economic activity sector in Maros Regency can be seen in the following figure.

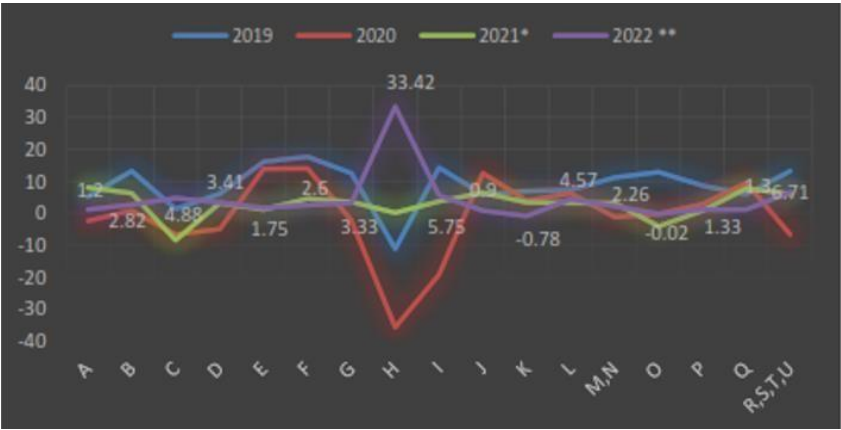


Figure 2. Economic growth rate of Maros Regency

Source: Author's findings, 2024.

The contribution of economic activity growth in the Maros Regency sector in Figure 2 shows a growth rate of 9.13%, higher than the national economic growth of 5.05 percent. Therefore, it could be concluded that the agricultural sector has a very strategic role in supporting the economic growth of South Sulawesi Province. This means that to increase the production of both food crops and horticulture, it is necessary to determine the area that is the center of production. In addition, agriculture contributes to MDG 1 through economic growth driven by agriculture and through improving nutrition.

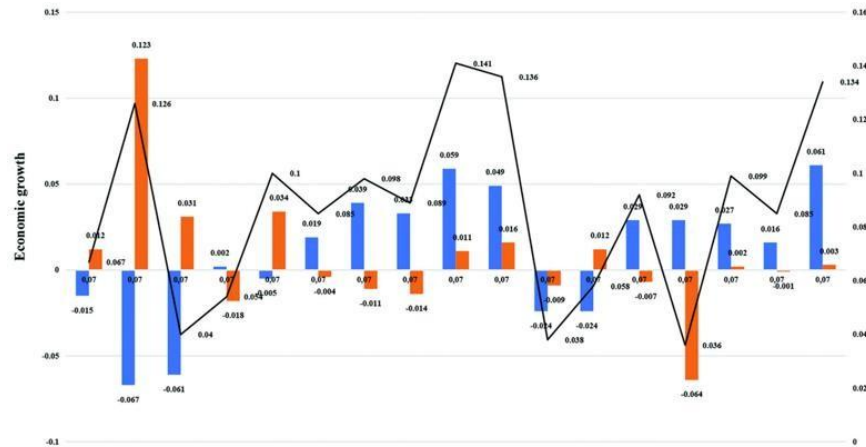


Figure 3. The competitiveness growth component of the regency.
Source: Author's findings, 2024.

The contribution of economic growth of Maros Regency based on the shift-share component is divided into four categories including: (1) Shifting of regional economic structure influenced by national with a value of 0.07, (2) proportional shift based on the gross value of each sector to the total of provincial economic activity sectors with a value of 0.169 or $PP > 0$. This means that the economic activity sector of Maros Regency shows rapid growth; whereas if $PP < 0$ then it does not have a specialization in the provincial economic activity sector, (3) differential shift or competitive position based on gross value added with the same sector with KPK of 0.117 or $PPK > 0$

Agriculture, mining and excavation, processing industry, Construction, Transportation, and Warehousing compared to other economic sectors activities. Furthermore, the PEK value is 2.5 percent. This means that the economic growth of Maros Regency has the potential to develop in the future. Therefore, it can be concluded that the economic sector has the potential for Maros Regency to experience significant growth through the development of agropolitan areas in the future. A national development approach that emphasizes macroeconomics Economic growth tends to ignore the magnitude of development between regions of existing disparities (Hashemianfar et al., 2014). Moreover, the transition from a traditional economy to a circular economy requires the realization of environmental innovation and sustainable engineering solutions.

Agropolitan Development Based on Regional Agribusiness in Rural Areas Agropolitan areas are created and developed basically to increase the productivity of agricultural businesses towards regional economic growth and overcome the gap between urban and rural areas. Efforts need to be continuously made in the development of agropolitan areas which are important for accelerating rural development in general and agriculture in particular (Karim & Syamsuddin, 2024). The economic system depends on various factors, such as producer and consumer behavior, technological change, resource availability and productivity, and population dynamics. Furthermore, the rural agribusiness system is a concrete manifestation of the business chain of the rural community economic system (Palisuri et al., 2024). The stronger role of market-related factors changing agricultural practices over time asks policymakers to design better market-based interventions and incentives to improve adaptation in agricultural communities. The results of the regression analysis can be seen in the following table.

Table 2. Summary of associative hypothesis testing results

Correlated variables	R-table	T-table	t-count	Sig.
Economic production efforts to market demand (ryx1)	0.116	1.960	5.409	0.003
Commodity selling price to market demand (ryx2)	0.116	1.960	8.326	0.002
Economic business promotion to market demand (ryx3)	0.116	1.960	2.587	0.036
Infrastructure support to market demand (ryx4)	0.116	1.960	2.980	0.014
Economic production efforts, selling price of merchandise, promotion of economic production efforts, and infrastructure support to market demand (R)				
F count=62,996 > F table=2.60				

Source: Author's findings, 2024.

The results of the regression on the tested variables (Table 2) obtained a picture: (1) the relationship between economic production of business and market demand is 5,409 with a coefficient of determination of the effect of 11.6. (2) the relationship between commodity selling prices and market demand is 8,326 with a coefficient of determination of influence of 11.6. (3) the relationship between economic business promotion and market demand is 2,587 with a coefficient of determination of influence of 11.6. (4) the relationship between infrastructure support and market demand is 2,980 with a coefficient of determination of influence of 11.6. It could be concluded that economic business production, commodity selling prices, economic business promotion, and infrastructure support together have a significant influence on market demand.

The results of the regression analysis confirm that remote rural areas that experience difficulties in marketing their products will experience significant changes with the existence of agropolitan areas developed in Malawa Sub-district, Maros Regency. Daily life in rural areas is often shaped by things that are different from urban life, especially in more remote rural areas; smaller labor markets, and access to social services such as schools, shops, and public transportation are often inadequate (Bahtiar et al., 2021). The agropolitan area will have a positive impact on economic growth in South Maros Regency, Sulawesi Province, and increase community economic efforts.

The role of the developed agropolitan area will encourage the creation of new jobs for rural communities because of the spatial interaction through the distribution of production marketing and support for regional transportation systems. Manufacturing, which replaced the agricultural and other natural resource sectors in the first half of the 20th century, has declined as the population sector has increased, and since the 1980s the service sector has become the largest segment of the growing employment sector. In this context, it is understood that the progress of a region or city contributes positively to the process of population mobility, transportation services, and the distribution of goods and services are fully influenced by the attractiveness of the city as a geographical unit. In addition, the service industry is also mentioned as an important part of trade and industry in big cities, and cities are described as playing an important role as drivers of growth in the region.

The agropolitan area of Malawa Sub-district, Maros Regency is oriented towards several components of activities in its development, namely; (1) development of transportation infrastructure to facilitate the transportation process from production locations to market locations; (2) agricultural production facilities; (3) warehousing to collect products before being marketed; and (4) other supporting facilities related to the industry for the needs of production processes and technological innovation. These components of agropolitan area activities have the potential for environmental pollution threats that cause a decrease in the quality of the living environment (Karim et al., 2023). This means that the need for food is quite high and increasing consumer needs are supported by the existence of potential centres for agricultural production that cause environmental degradation due to high pollution caused by various economic activities. Population growth and

increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important. The potential for environmental pollution in the agropolitan area in Malawa Sub-district, Maros Regency can be seen in the following image.

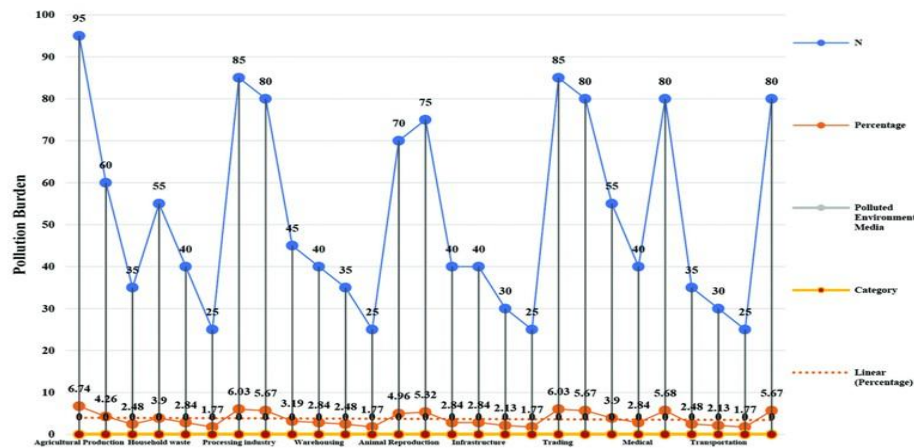


Figure 4. Sources of environmental pollution in the Agropolitan area, Malawa Sub-district
Source: Author's findings, 2024

Market location, (1) agricultural production facilities, (2) warehouses to collect products before being marketed, and (3) other supporting facilities related to industry for the needs of the production process and technological innovation. These components of agropolitan area activities have the potential threat of environmental pollution which causes a decrease in the quality of the living environment. This means that the need for food is quite high and increasing consumer needs and is supported by the existence of centres that have the potential for agricultural production which causes environmental degradation due to high pollution caused by various economic activities (Safariah et al., 2016). Population growth and increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important.

3. Integration of agropolitan area development system

Integration of agropolitan area development systems from the perspective of regional development is needed to synergize the productivity of economic efforts toward the production of marketing systems. Integration of agropolitan areas the development system is an effort to combine human resource capabilities and the utilization of natural resources to increase added value, artificial resources, and social capital that will increase regional capabilities in implementing development. Furthermore, the dominant trend in development and creation between regions is centered on economic growth and provides a positive contribution to spatial economic agglomeration. The regional transportation system plays an important role and is a driving factor in the distribution of the flow of goods and services towards economic agglomeration and spatial interaction between production centers and market areas.

Regardless of the relative importance of physical capital versus human resources, development cannot occur without both interacting as infrastructure cannot remain effective without proper operation and maintenance. Economic activities cannot take place without an infrastructure base. Furthermore, the sustainability of agricultural production systems, rural economies, and the environment can be maintained and improved in an integrated agropolitan area development system. The pattern of marketing of regional spatial distribution and interaction can be seen in Figure 5 below.

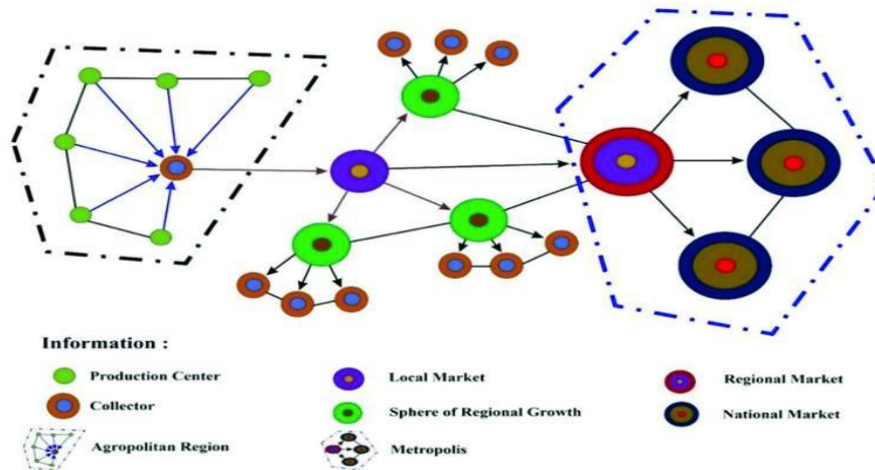


Figure 5. Agropolitan production marketing system in Maros Regency.
Source: Author's findings, 2024

The agropolitan production marketing system will be interrelated to the existence of regional growth centers, regional markets, and the existence of metropolitan cities as centers of national markets (Figure 6) that are globally oriented. Regional development policies and practices have undergone significant transformations in the last five decades. Its relevance has been challenged in recent years by the new economic geography that has emerged given globalization and because most countries are turning towards a more democratic and decentralized approach to planning and implementing their various development activities.

Moreover, many large cities have transformed into manufacturing centers supported by modern transportation systems, including highways, railways, and river routes, in a sense, every citizen of each of the 28 major cities in the world interacts with rural areas and villages has a dependence, on a production marketing system for urban communities as consumers.

Interpretations of the process that can be conveyed include: First, the integration of production centre areas into production centre areas, in this case, the role of Malawa District as the initial distribution centre, starting from the production process, product packaging, and finally to be forwarded to the district capital to meet regional needs. In this process, there is a high possibility of uncertainty, and will be very vulnerable to risks and obstacles. That is, in the local business world, its supply is limited, and the chain network becomes increasingly vulnerable to uncertainty and complexity.

Second, the product of the marketing process from the capital city of Maros Regency at that time continued to the growth centre of South Sulawesi Province about the provision of products, to meet consumer needs at the regional level. The organization of the strategic supply chain (or supply network) which aims to reterritorialize the agri-food system through the development of what is in the field of economic literature is defined as a value-based food supply chain.

Third, regional marketing of the agropolitan production of this area is intended to meet the needs of the urban population within the scope of the metropolitan city. Thus, it is expected to encourage economic growth by creating new business opportunities and jobs, saving material costs, reducing price volatility, and increasing security supplies while reducing environmental pressures and their impacts.

Furthermore, transportation services have a very important role and the available choices include land transportation, air transportation, and sea transportation. This process shows that the role of production centres in this agropolitan area is very strategic as a driver for regional economic growth through relations between rural and urban areas towards sustainable integration of the regional development system. Supporting government regulations that protect the needs of the most

vulnerable groups and formulating strategies related to provisions as a basis and requirement for sustainable economic growth. It can be concluded that the development of a well-managed agropolitan area has a positive impact on regional economic growth, integration of urban systems, and the relationship between local, regional, national, and global marketing toward sustainable regional development.

4. Discussion

The business economy that tends to increase through the rural agribusiness system pattern encourages economic growth and has had an impact on opening up employment opportunities and reducing poverty in rural areas (Amri et al., 2023). Strong economic growth advances human development, which in turn encourages economic growth. Furthermore, rural investment, pro-poor policies, social protection, and strengthening rural institutions create positive climates needed for family farmers, small-scale producers, and poor rural communities to invest in their businesses and build sustainable, income-generating activities (UN, 2015). Figure 5 shows the results of the path analysis showing the development of agropolitan areas, rural agribusiness systems, productive economic efforts, and strengthening community capacity for environmental management and ecosystem sustainability.

The development of agropolitan areas through rural agribusiness systems based on economic empowerment that is oriented towards increasing the productivity of the community's economy is then contextualized towards the environmental sustainability of the ecosystem. The results are supported by the triple-bottom-line approach, namely, integrating economic, environmental, and social factors. Moreover, a sustainable circular economy not only adopts an environmental perspective but also considers economic, social, and environmental performance (Gomez-Limon et al., 2009). The results of the analysis confirm that the economic cycle of the community and the distribution of production marketing through the rural agribusiness system in the agropolitan area will remain stable and sustainable by optimizing natural resources, strengthening production factors, and using environmentally friendly technology towards sustainable economic growth in the region.

Economic productivity that remains stable and the selling price of production that tends to increase due to high market and consumer demand simultaneously has a simultaneous impact on the economic growth of Maros Regency and the economic growth of South Sulawesi Province. Capital accumulation has an impact on economic growth and the fundamental factor that inhibits economic growth is the reduced return on capital in the production process. Furthermore, the argument is based on several considerations, namely: (1) government policy support and political stability, (2) production stability and ecosystem balance, and (3) environmental pollution control. The results of this study illustrate that production stability and market demand that tend to increase followed by market stability will have an impact on optimizing production and utilization of natural resources towards the sustainability of agropolitan areas based on rural agribusiness systems.

The implementation of a complex agroforestry system must be followed by the development of basic and advanced industries to handle it with superior commodities in the agropolitan area and the setting of a reasonable basic price level for local commodities at the level of local producers, building a transportation network system, developing markets, and empowering local communities (Retnowati, 2003). Furthermore, the health status of regional soil and ecosystems has important theoretical and practical meanings for maintaining regional ecological security and promoting of similar social and economic sustainable development (Schneider et al., 2007). Figure 6 shows the development of agropolitan areas in Malawa Sub- district, Maros Regency based on ecosystem sustainability.

The development of the Malawa Sub-district agropolitan area is based on increasing regional economic productivity and ecosystem sustainability (Figure 6), in the context of several important principles, namely: (1) Ensuring the existence of production processes through biodiversity and

food that are oriented globally towards long-term economic growth, (2) encouraging renewable energy based on sustainable agriculture followed by soil and air conservation, (3) government-directed policies on law enforcement and consistency in sustainable management of natural resources and ecosystems, (4) realizing rural agribusiness systems supported by investment and the business world capital towards increasing welfare and opening up employment opportunities, (5) developing agricultural-based technological innovation systems towards ecosystem management, and (6) rotation of agricultural commodities based on conservation of natural resources and the environment. Policies that lead to effective training for entrepreneurs, by providing incentive support and opportunities to start a business.

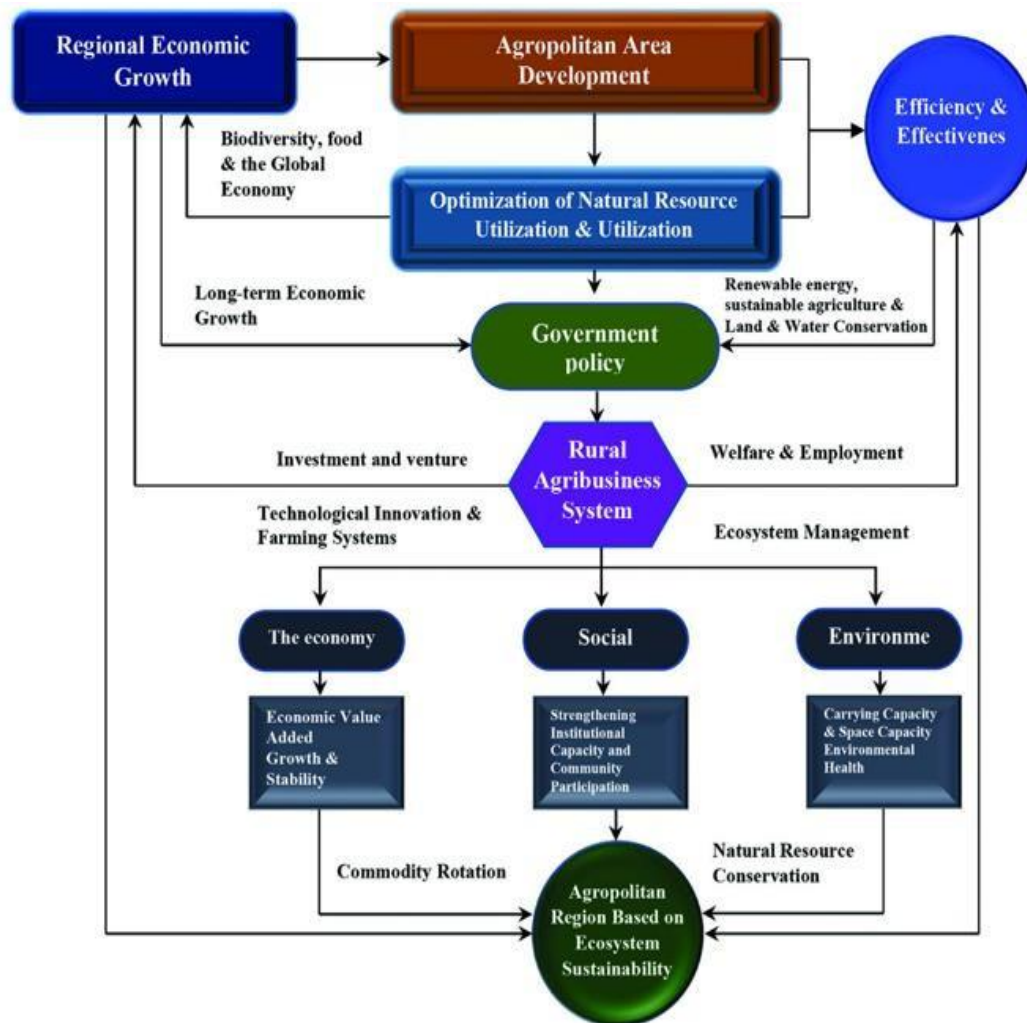


Figure 6. Development of agropolitan areas based on regional economic productivity and ecosystem sustainability
Source: Author's findings, 2024

4. Conclusion

Regional growth supported by the positive economic base sector is related to the development of agropolitan areas based on rural agribusiness systems. Agropolitan areas developed towards economic production efforts, increasing production quality and stability of commodity price sales followed by promotion of economic efforts, and supporting infrastructure have a significant influence on meeting market demand. Regional development followed by the acceleration of agropolitan area development through rural agribusiness systems and followed by community

empowerment and control of environmental pollution is positively correlated with the increase in economic business productivity and ecosystem sustainability.

Furthermore, agropolitan areas that are well and professionally managed are positively correlated with the integration of regional development systems. In addition, the relationship between local, regional, national, and global marketing to the stability of the economy of community circulation, stability of production marketing distribution, strengthening of production factors, and the use of environmentally friendly technology have an impact on increasing regional economic growth and ecosystem sustainability.

The direction of sustainability of agropolitan areas based on agribusiness will require government policy support in terms of political stability, production stability, product marketing, and environmental pollution control. The stability of production and market demand that tends to increase and is followed by market stability will have an impact on optimizing the use of natural resources towards sustainable development of agropolitan areas. Sustainability of the agropolitan area ecosystem to guarantee the existence of a production process through the development of biodiversity and food, the use of renewable energy based on sustainable agriculture followed by soil and water conservation and law enforcement.

Consistency in the management of natural resources and integrated rural agribusiness systems supported by investment and business capital actors and technology-based development of agricultural systems, ecosystem management, and commodity agricultural rotation based on natural resource and environmental conservation will encourage regional economic growth in an integrated system of independent agropolitan area development. The results of this study have implications for the development of regional planning science, built environment science, economic regions, and sociology of the Malawa sub-district area. This study explicitly has implications for the formulation of government policies and their implementation of the development of agropolitan areas based on the Malawa Sub-district agribusiness system in the future to maintain economic stability and sustainability of environmental management. The development gap in the context of cities and villages can be overcome and improved in the future by considering several indicators including the development of independent agropolitan areas, rural agribusiness systems, optimization and conservation of natural resources, strengthening the institutional capacity of government and community adaptation to global climate change based on data availability, spatial scale, regional scale, and period.

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Editor Decision

2 messages

Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Fri, Jul 5, 2024 at 3:16 PM

To: Sobirin Hamid <sobirinhamid@gmail.com>

Dear Author

We have reached a decision regarding your submission to the International Journal of Nanotechnology Perceptions, entitled "Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area."

Our decision is: Accepted Submission

Based on the review and revisions you have made, we are pleased to inform you that your paper has met our requirements. We will proceed to the final editing process.

Editorial Team,
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Sobirin Hamid <sobirinhamid@gmail.com>

Fri, Jul 5, 2024 at 3:21 PM

To: Editor Nanotechnology Perceptions <editornanotechnologyperception@gmail.com>

Dear Author

Thank you for responding to our manuscript submission, we are waiting for further information.

Regard
Sobirin

Analysis of the Potential of the Agricultural Sector in Mallawa District, Maros Regency in Development as an Agropolitan Area

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Development in developing countries is mostly focused on the utilization of natural resources to attract investors in spurring regional economic growth. Its development is oriented towards the exploitation of natural resources and tends to ignore environmental issues. The utilization of natural resources towards the development of agropolitan areas has an impact on economic growth and increasing farmer income in rural areas. This study uses a sequential explanatory research method, a combination of sequential quantitative and qualitative research methods. Qualitative methods function to prove, deepen, expand, weaken, and invalidate quantitative data obtained at an early stage and build research hypotheses. While the quantitative methods used are descriptive, comparative, and associative. The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and their relationship between the phenomena being investigated. The results of this study confirm that increasing the productivity of the regional economic base sector impacts the development of agropolitan areas based on rural agribusiness systems in the direction of increasing community income and the regional economy. This article offers a concept of system integration in the development of agropolitan areas based on ecosystem sustainability and regional economic growth in developing countries.

Keywords: Agropolitan, Economic growth, Rural agribusiness, Economic empowerment, Ecosystem sustainability.

1. Introduction

Economic growth is a major factor in the development of a region (Prasetya, 2014). There is a specific relationship between the level of economic growth and regional development where a good economy will improve the quality of infrastructure, improve public services, reduce unemployment, increase regional wealth, and improve the community's quality of life (Sobirin

et al., 2023). Urban and regional economic development is attempted to develop through the empowerment of human resources and utilizing natural resources in a planned and integrated manner. This is by Law No. 26 of 2007 concerning spatial planning, which directs integrated, environmentally friendly spatial planning. To create an integrated arrangement, it cannot be separated from efforts to develop good governance through multi-stakeholders, the government, private sector, and community must support each other and carry out their functions properly (Karim et al., 2023).

The gap between urban and rural areas causes poverty in rural areas (Mardjuni et al., 2022). The relationship between villages and cities in the perspective of agropolitan area development will include economic networks and the distribution of goods/services to support the regional economy's growth. Progress in the economic sector is usually considered a success in the development process. However, the development of rural areas is often separated from urban areas (Nawangsih, 2022). This results in the occurrence of an urban bias process, meaning that the development of rural areas was initially aimed at improving the welfare of rural communities, which had the opposite effect, namely the depletion of rural potential into urban areas, both in terms of human resources, nature, and even capital (Roidah, 2019).

The concept of agropolitan was first introduced by Friedman in 1975 by offering spatial planning for rural development based on the idea of rural development oriented towards human needs with fair distribution of economic benefits, direct movement of local communities in the development process, and growth based on rural community activities, agriculture, and resources (Saleh et al., 2017). Agropolitan is an agricultural-based city that grows and develops to support the development of agribusiness systems and commercial activities in the interior and surrounding rural areas. Agropolitan areas will become the main production areas that require support from marketing systems and infrastructure facilities that are integrated with the development of a wider regional infrastructure system (Hasniati et al., 2023). An agropolitan system based on superior commodities requires agropolitan development with the advancement of the competitiveness of superior agribusiness products developed in agribusiness activities (Farhanah, 2015). The agropolitan development process has three important issues, namely access to agricultural land and water, political and administrative authority at the local level, and a shift in national development policies in supporting the diversification of agricultural production.

Agropolitan development is aimed at building on the economic sector which is directed to form the basis for regional growth consistently in the long term. The hierarchical nature of the village, sub-district, regency, and province linkages will be able to encourage increased welfare of rural communities (Karim et al., 2021). This linkage must be followed by a decentralized bottom-up development policy and be able to empower rural communities. In a policy-making process, community participation greatly determines the failure or success of a policy to be implemented. Based on these conditions, to avoid the gap in the relationship between villages and cities in Mallawa Sub-district, Maros Regency, the development of agropolitan areas is an alternative solution to reduce urban bias in regional development.

Agropolitan Development in Maros Regency

The agropolitan area here is interpreted as a functional system of villages as indicated by the existence of a village spatial hierarchy. Maros Regency is one of the areas in South Sulawesi

province that produces food crops. The economic structure of Maros Regency is still dominated by the agricultural sector, this shows that the majority of the population in Maros Regency until now still relies on agriculture to meet their daily economic needs (Berdegue et al., 2014). The agropolitan area development program is considered necessary to be implemented, especially in Mallawa Sub-district, Maros Regency, where the concentration of the pioneering pattern is by the application of the agropolitan area concept which is more focused on villages so that it will create development in Mallawa Sub-district, Maros Regency.

Agropolitan development is important to develop and socialize parties related to the development of agropolitan areas that need to be done so that a common understanding arises about the importance of developing agropolitan areas to realize harmonious, harmonious, and balanced development (Hakim, 2016). The master plan for the development of food crops and horticulture areas in South Sulawesi as a design for agricultural development in South Sulawesi. Therefore, gradual but continuous implementation is the key to success. Planning for regional development through a top-down policy approach, which is in line with the direction of national agricultural development policy and bottom-up planning, according to the needs of the community/farmers (Karim et al., 2023). The output of the planning is the design of the area and the medium-term action plan in annual details

Maros Regency has a very potential agricultural area to be used as an agropolitan area. This is possible because it is supported by the potential of natural resources and agricultural resources that are optimally managed, high-commodity agricultural sectors in Maros Regency experience obstacles in developing their areas (Abduh et al., 2024). This has an impact on regional progress in Maros Regency. If we look further, this regency has quite high potential, but it is not supported by adequate facilities and infrastructure, the absence of these supporting facilities will certainly reduce the quality of agriculture in Maros Regency, in addition, the uncontrolled urbanization process also suppresses agricultural productivity in Maros Regency. In the 2011-2031 Maros Regency spatial plan, it is stated that Mallawa Sub-district has been designated as an agropolitan area in Maros Regency.

In the concentration of its pioneering pattern, the application of the agropolitan area concept is focused on Mallawa Sub-district which has an area of $\pm 235.92 \text{ km}^2$ and is divided into 11 villages/sub-districts with a population of 13,080 people with a population density of 55.44 people/km². In Mallawa Sub-district, several commodities are found that can be classified as mainstay commodities which are then designated as superior commodities, such as rice, corn, and coffee. The superior commodities have not been able to be realized optimally because the supporting facilities and infrastructure to support the development of the agropolitan area in Mallawa Sub-district are inadequate. The general problems of the agropolitan area that have arisen so far are human resource factors including officers, facilities infrastructure, and information about agribusiness (Daga et al., 2024). Efforts to solve the problem are carried out by coordinating the province and district to carry out coaching and evaluation

2. Methodology

This study uses a sequential explanatory research method, which is a combination of sequential quantitative and qualitative research methods. Qualitative methods function to prove, deepen,

expand, weaken, and invalidate quantitative data obtained at an early stage and build research hypotheses. While quantitative methods used are descriptive, comparative, and associative (Sobirin, 2023). The steps are carried out carefully and holistically based on field facts, namely individual or group characteristics, and their relationship between the phenomena being investigated. This research was conducted in Malawa Sub-district, Maros Regency, South Sulawesi Province (Figure 1).

The research site was selected by considering: (1) The reality that develops in the field in general, (2) the agropolitan area of Malawa Sub-district has not developed as an integrated rural agribusiness system, (3) the production of food crops and horticulture tends to increase but has not been integrated with the market area system, (4) the increasing productivity of agribusiness businesses in Malawa Sub-district has not been accompanied by sustainable environmental management, and (5) the productivity of economic businesses has not been optimal in the framework of encouraging increased income, community welfare, and regional economic growth.

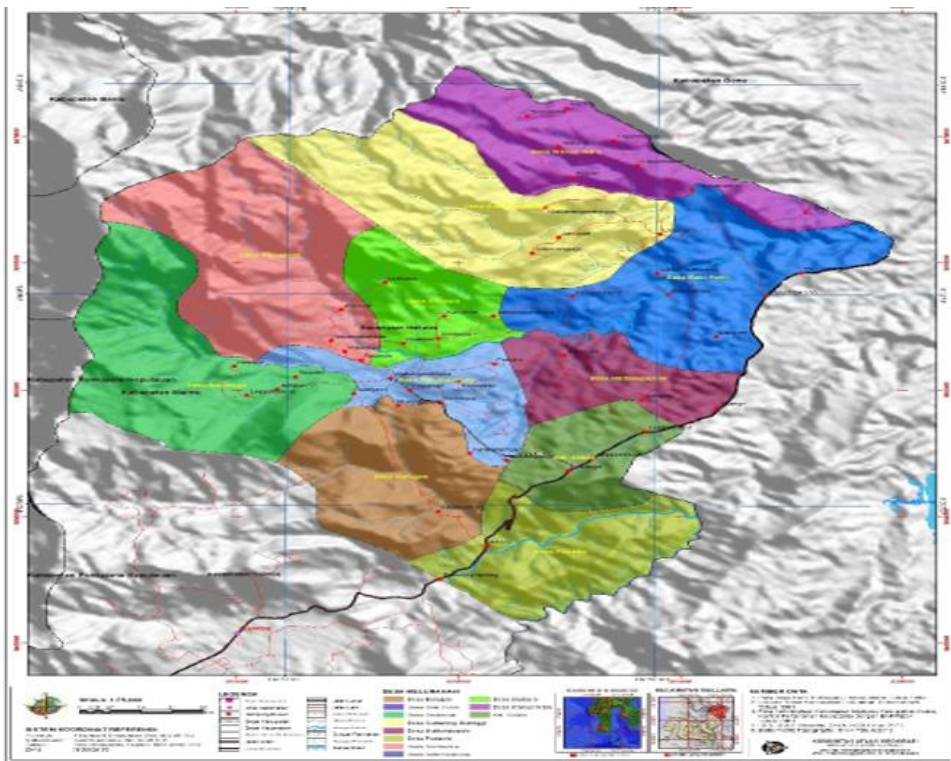


Figure 1: Administrative map of sub-districts in Maros Regency

Data collection methods are divided into two categories, namely: (1) Qualitative data collection is obtained through; (a) participant observation, to observe the social and economic characteristics of the community, and (b) focus group discussions are commonly conducted to explore the potential for productive economic businesses and the involvement of community institutions in the Malawa District agribusiness; and (2) quantitative data collection, carried out in three stages, namely (a) field observation, to observe the potential for economic

businesses managed by farmer groups and obstacles in the development of agropolitan areas, (b) surveys, to understand the perceptions of respondents and efforts made to increase the productivity of economic businesses, obstacles, and product marketing systems. The sample was determined using stratified random sampling (Wahyuni et al., 2022). The research sample consisted of 100 respondents who were categorized based on the following characteristics: (a) type of economic business, (b) income level, and (c) educational background. The survey was used to describe various types of productive economic businesses, welfare, and education. background based on the perceptions of respondents.

After that, the results of the observation and survey were described using the results of the documentation study. The qualitative analysis method was used to interpret the implementation of the potential of the agricultural sector in the Mallawa Sub-district, Maros Regency based on development as an agropolitan area. This aims to build a research hypothesis. Furthermore, quantitative analysis methods are used to test the hypothesis of qualitative research results, namely: the relationship or correlation of X^1 and X^2 on Y , the influence of X^2 and X^3 on Y , and the effects of X^1 , and X^2 on Y . The variables defined in this study include (a) economic production efforts (X^1), (b) commodity selling prices (X^2), (c) promotion of economic efforts (X^3), (d) infrastructure support (X^4), and (v) market areas (Y). Each answer to the question given by the respondent is given a score (a score of 5 is the highest). The second step is to divide the research results score by the ideal score. The correlation coefficient between variables uses the regression method. The equation used is $Y = a + b_1 X^1 + b_2 X^2 + b_n X_n$.

Sustainability of the implementation of the potential of the agricultural sector in Mallawa Sub-district, Maros Regency based on development as an agropolitan area using path analysis. Path analysis used is called variables including (a) X^1 exogenous independent variable (development of agropolitan areas), (b) X^2 exogenous independent variable (rural agribusiness system), (c) X^3 exogenous independent variable (productive economic efforts), (d) Y endogenous dependent variable (environmental management), and (e) Z endogenous dependent variable (ecosystem sustainability). Path diagrams use structural equations: $Y = PYX^1 + PYX^2 + PYX^3 + e^1$ Path analysis is used with several considerations including: (a) Research metric data is measured based on an interval scale, (b) Exogenous and endogenous dependent variables are multiple regression models, while intermediary variables refer to mediation models and combined mediation and multiple regression models which are complex, (c) the relationship between variables is one-way, and (d) cause and effect based on the theory that shows that there is a relationship or correlation between the development of agropolitan areas, rural agribusiness systems, productive economic efforts, strengthening community capacity for environmental management and ecosystem sustainability.

3. Result and Discussion

1. Description of research results

The development orientation that prioritizes high economic growth acceleration, more or less can affect the development inequality between regions that tend to be biased towards urban areas and discrimination against rural areas and the agricultural sector. The hatching effect

that was originally expected to occur, in fact, partly causes an unbalanced transfer of resources from rural areas to urban areas. This can cause income disparities between rural and urban communities, excessive population migration from rural areas to urban areas, and exploitation of rural areas that tend to ignore environmental aspects, resulting in ecosystem damage and triggering poverty in rural communities (Aoki & Yoshikawa, 2002). Gradually, this situation and condition are feared to hurt the performance of the agricultural sector. In addition, elasticity varies greatly depending on the affected sectors and regions and is very important to be determined by the structure of economic spatial planning.

The base sector has an important role in contributing to regional income and increasing community income and farmer welfare in rural areas through government policy support. The importance of early support from government and other partners for start-ups, capital, subsidies for access to training and technical assistance, and navigating complex bureaucratic systems, and the positive impacts can be increased productivity over time, economies of scale, and access to markets affect the potential for poverty reduction.

Table 1. Basic economic sectors in Maros Regency, South Sulawesi 2023-2024

Economic sector	The potential of economic sectors		LQ value
	Contribution to GDP (IDR)	Business index	
Agriculture	4,024.28	105.10	1.71
Mining and quarrying	1,960.90	113.60	1.37
Processing industry	3,941.52	103.05	1.69
Electricity and gas supply	13.55	109.09	0.90
Water supply; waste management, sewage, and recycling	27.59	107.50	0.97
Construction	2,622.54	110.93	1.41
Wholesale and retail trade; car and motorcycle repair	789.66	108.80	0.82
Transportation and warehousing	10,366.06	111.90	7.45
Provision of accommodation and food and beverages	84.36	112.01	0.47
Information and communication and information	316.42	106.67	0.60
Financial services and insurance	350.73	103.76	0.40
Real estate	351.86	106.87	0.29
Corporate services	7.98	104.56	0.15
Government administration, defence, and mandatory social security	872.41	102.60	0.95
Education services	353.18	102.60	0.95
Health services and social activities	192.82	1.088.50	0.40
Other services	113.10	113.80	0.35

Source: Author's findings, 2024.

The economic base sectors in Maros Regency can be seen in the table above. The economic base sectors of Maros Regency (Table 1) tend to increase, including (1) Agriculture with a contribution of Rp. 4,024.28, a business index of 105.10, and a location quotient value of 1.71 or $LQ > 1$. (2) Mining and excavation with a contribution of Rp. 1,960.90, a business index of 113.60, and a location quotient value of 1.37 or $LQ > 1$. (3) Manufacturing industry with a contribution of Rp. 3,941.52, a business index value of 103.05, a location quotient value of

1.69 or $LQ > 1$. (4) Construction with a contribution of Rp. 2,622.54, a business index value of 110.93, a location quotient value of 1.41 or $LQ > 1$. (5) Transportation and Warehousing with a contribution of Rp 10,366.06, a business index of 111.90 and a location quotient value of 7.45 or $LQ > 1$.

To increase regional competitiveness, efforts are needed to encourage the role of banking and non-banking finance, especially in developing infrastructure in leading sectors. Furthermore, the basic economic sectors that need to be improved in the future include: (1) agriculture, (2) mining and excavation (3) processing industry, (4) construction, and (v) transportation and warehousing. It can be concluded that agriculture, mining and excavation, processing industry, construction and transportation, and warehousing are strategic economic sectors that trigger economic growth in Maros Regency and South Sulawesi Province. Thus, harmonious innovation is needed so that all economic sectors can achieve these goals.

2. Regional economic growth

The shift in the economic structure of Maros Regency towards the GRDP of South Sulawesi Province for the 2019-2024 period shows that the potential for agriculture, mining, and quarrying, the manufacturing sector, the construction sector, the transportation and warehousing sector tends to increase with an average growth of 5.00 percent. This figure, after being confirmed in the field, illustrates that the growth of the sector is triggered by the existence of an agropolitan area in the Malawa Sub-district area and the existence of Maros Regency, which is part of the development of the Mamminasata metropolitan city in South Sulawesi Province (BPS, 2022). The current rapid economic growth is exclusively oriented towards resources. Moreover, the relationship between the following production programs leads to the responsiveness of larger PR factories needed for market needs: a reconfigurable SRS strategic system (RT reconfigurable technology supported by MS manufacturing and technology-TM management strategies), with an emphasis on the role of SCM intervention. The shift in the economic activity sector in Maros Regency can be seen in the following figure.

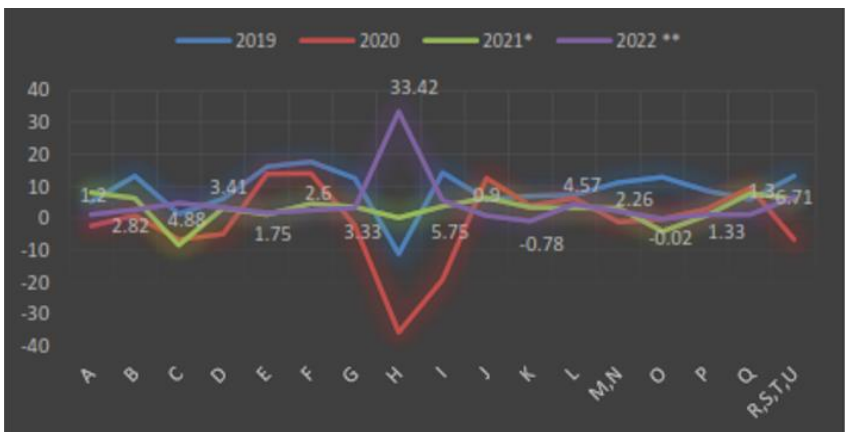


Figure 2. Economic growth rate of Maros Regency

Source: Author's findings, 2024.

The contribution of economic activity growth in the Maros Regency sector in Figure 2 shows a growth rate of 9.13%, higher than the national economic growth of 5.05 percent. Therefore, it could be concluded that the agricultural sector has a very strategic role in supporting the economic growth of South Sulawesi Province. This means that to increase the production of both food crops and horticulture, it is necessary to determine the area that is the center of production. In addition, agriculture contributes to MDG 1 through economic growth driven by agriculture and through improving nutrition.

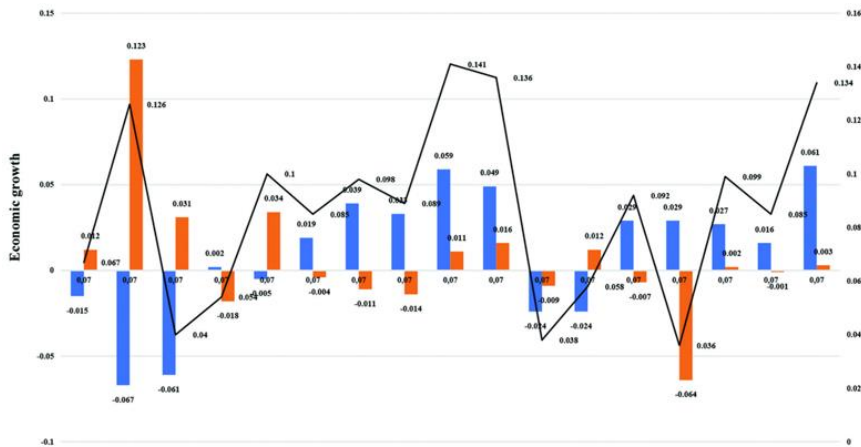


Figure 3. The competitiveness growth component of the regency.

Source: Author's findings, 2024.

The contribution of economic growth of Maros Regency based on the shift-share component is divided into four categories including: (1) Shifting of regional economic structure influenced by national with a value of 0.07, (2) proportional shift based on the gross value of each sector to the total of provincial economic activity sectors with a value of 0.169 or $PP > 0$. This means that the economic activity sector of Maros Regency shows rapid growth; whereas if $PP < 0$ then it does not have a specialization in the provincial economic activity sector, (3) differential shift or competitive position based on gross value added with the same sector with KPK of 0.117 or $PPK > 0$.

Agriculture, mining and excavation, processing industry, Construction, Transportation, and Warehousing compared to other economic sectors activities. Furthermore, the PEK value is 2.5 percent. This means that the economic growth of Maros Regency has the potential to develop in the future. Therefore, it can be concluded that the economic sector has the potential for Maros Regency to experience significant growth through the development of agropolitan areas in the future. A national development approach that emphasizes macroeconomics Economic growth tends to ignore the magnitude of development between regions of existing disparities (Hashemianfar et al., 2014). Moreover, the transition from a traditional economy to a circular economy requires the realization of environmental innovation and sustainable engineering solutions.

Agropolitan Development Based on Regional Agribusiness in Rural Areas Agropolitan areas are created and developed basically to increase the productivity of agricultural businesses

towards regional economic growth and overcome the gap between urban and rural areas. Efforts need to be continuously made in the development of agropolitan areas which are important for accelerating rural development in general and agriculture in particular (Karim & Syamsuddin, 2024). The economic system depends on various factors, such as producer and consumer behavior, technological change, resource availability and productivity, and population dynamics. Furthermore, the rural agribusiness system is a concrete manifestation of the business chain of the rural community economic system (Palisuri et al., 2024). The stronger role of market-related factors changing agricultural practices over time asks policymakers to design better market-based interventions and incentives to improve adaptation in agricultural communities. The results of the regression analysis can be seen in the following table.

Table 2. Summary of associative hypothesis testing results

Correlated variables	R-table	T-table	t-count	Sig.
Economic production efforts to market demand (ryx1)	0.116	1.960	5.409	0.003
Commodity selling price to market demand (ryx2)	0.116	1.960	8.326	0.002
Economic business promotion to market demand (ryx3)	0.116	1.960	2.587	0.036
Infrastructure support to market demand (ryx4)	0.116	1.960	2.980	0.014
Economic production efforts, selling price of merchandise, promotion of economic production efforts, and infrastructure support to market demand (R)	F count=62,996 > F table=2.60			

Source: Author’s findings, 2024.

The results of the regression on the tested variables (Table 2) obtained a picture: (1) the relationship between economic production of business and market demand is 5,409 with a coefficient of determination of the effect of 11.6. (2) the relationship between commodity selling prices and market demand is 8,326 with a coefficient of determination of influence of 11.6. (3) the relationship between economic business promotion and market demand is 2,587 with a coefficient of determination of influence of 11.6. (4) the relationship between infrastructure support and market demand is 2,980 with a coefficient of determination of influence of 11.6. It could be concluded that economic business production, commodity selling prices, economic business promotion, and infrastructure support together have a significant influence on market demand.

The results of the regression analysis confirm that remote rural areas that experience difficulties in marketing their products will experience significant changes with the existence of agropolitan areas developed in Malawa Sub-district, Maros Regency. Daily life in rural areas is often shaped by things that are different from urban life, especially in more remote rural areas; smaller labor markets, and access to social services such as schools, shops, and public transportation are often inadequate (Bahtiar et al., 2021). The agropolitan area will have a positive impact on economic growth in South Maros Regency, Sulawesi Province, and increase community economic efforts.

The role of the developed agropolitan area will encourage the creation of new jobs for rural

communities because of the spatial interaction through the distribution of production marketing and support for regional transportation systems. Manufacturing, which replaced the agricultural and other natural resource sectors in the first half of the 20th century, has declined as the population sector has increased, and since the 1980s the service sector has become the largest segment of the growing employment sector. In this context, it is understood that the progress of a region or city contributes positively to the process of population mobility, transportation services, and the distribution of goods and services are fully influenced by the attractiveness of the city as a geographical unit. In addition, the service industry is also mentioned as an important part of trade and industry in big cities, and cities are described as playing an important role as drivers of growth in the region.

The agropolitan area of Malawa Sub-district, Maros Regency is oriented towards several components of activities in its development, namely; (1) development of transportation infrastructure to facilitate the transportation process from production locations to market locations; (2) agricultural production facilities; (3) warehousing to collect products before being marketed; and (4) other supporting facilities related to the industry for the needs of production processes and technological innovation. These components of agropolitan area activities have the potential for environmental pollution threats that cause a decrease in the quality of the living environment (Karim et al., 2023). This means that the need for food is quite high and increasing consumer needs are supported by the existence of potential centres for agricultural production that cause environmental degradation due to high pollution caused by various economic activities. Population growth and increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important. The potential for environmental pollution in the agropolitan area in Malawa Sub-district, Maros Regency can be seen in the following image.

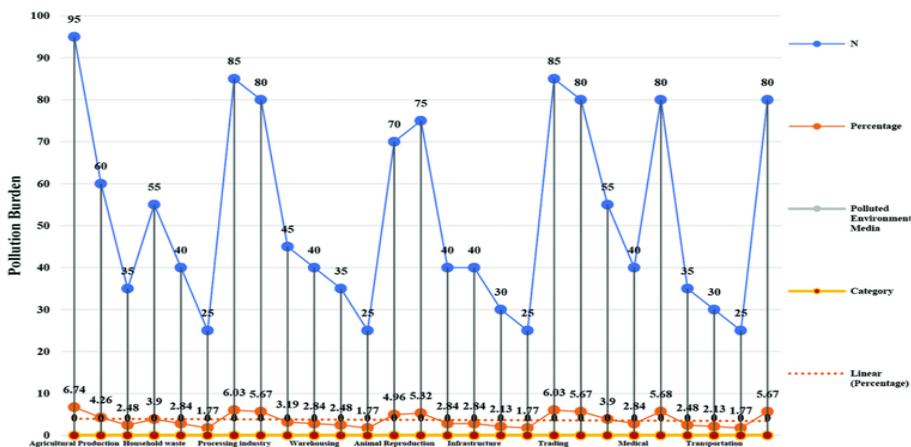


Figure 4. Sources of environmental pollution in the Agropolitan area, Malawa Sub-district

Source: Author's findings, 2024.

Market location, (1) agricultural production facilities, (2) warehouses to collect products before being marketed, and (3) other supporting facilities related to industry for the needs of the production process and technological innovation. These components of agropolitan area

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activities have the potential threat of environmental pollution which causes a decrease in the quality of the living environment. This means that the need for food is quite high and increasing consumer needs and is supported by the existence of centres that have the potential for agricultural production which causes environmental degradation due to high pollution caused by various economic activities (Safariah et al., 2016). Population growth and increasing food and energy needs have caused adverse impacts causing nitrogen pollution. In addition, globally, sustainable solid waste management in low-income countries is becoming increasingly important.

3. Integration of agropolitan area development system

Integration of agropolitan area development systems from the perspective of regional development is needed to synergize the productivity of economic efforts toward the production of marketing systems. Integration of agropolitan areas the development system is an effort to combine human resource capabilities and the utilization of natural resources to increase added value, artificial resources, and social capital that will increase regional capabilities in implementing development. Furthermore, the dominant trend in development and creation between regions is centered on economic growth and provides a positive contribution to spatial economic agglomeration. The regional transportation system plays an important role and is a driving factor in the distribution of the flow of goods and services towards economic agglomeration and spatial interaction between production centers and market areas.

Regardless of the relative importance of physical capital versus human resources, development cannot occur without both interacting as infrastructure cannot remain effective without proper operation and maintenance Economic activities cannot take place without an infrastructure base. Furthermore, the sustainability of agricultural production systems, rural economies, and the environment can be maintained and improved in an integrated agropolitan area development system. The pattern of marketing of regional spatial distribution and interaction can be seen in Figure 5 below.

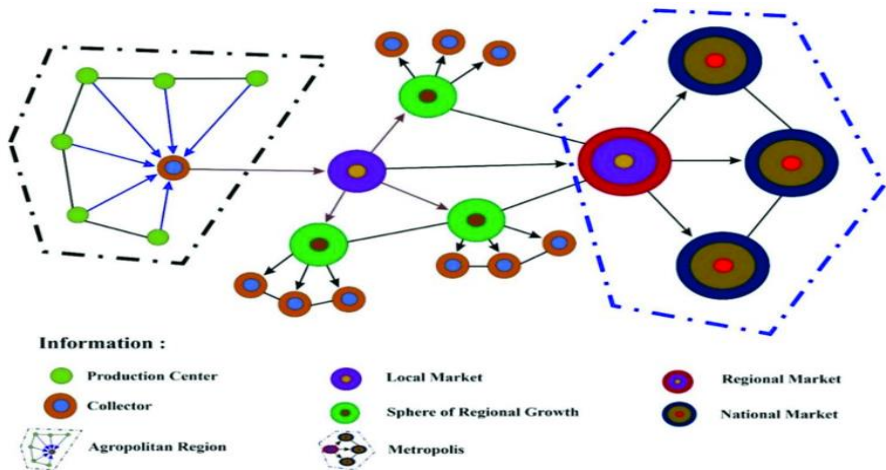


Figure 5. Agropolitan production marketing system in Maros Regency.

Source: Author's findings, 2024.

The agropolitan production marketing system will be interrelated to the existence of regional growth centers, regional markets, and the existence of metropolitan cities as centers of national markets (Figure 6) that are globally oriented. Regional development policies and practices have undergone significant transformations in the last five decades. Its relevance has been challenged in recent years by the new economic geography that has emerged given globalization and because most countries are turning towards a more democratic and decentralized approach to planning and implementing their various development activities.

Moreover, many large cities have transformed into manufacturing centers supported by modern transportation systems, including highways, railways, and river routes, in a sense, every citizen of each of the 28 major cities in the world interacts with rural areas and villages has a dependence, on a production marketing system for urban communities as consumers.

Interpretations of the process that can be conveyed include: First, the integration of production centre areas into production centre areas, in this case, the role of Malawa District as the initial distribution centre, starting from the production process, product packaging, and finally to be forwarded to the district capital to meet regional needs. In this process, there is a high possibility of uncertainty, and will be very vulnerable to risks and obstacles. That is, in the local business world, its supply is limited, and the chain network becomes increasingly vulnerable to uncertainty and complexity.

Second, the product of the marketing process from the capital city of Maros Regency at that time continued to the growth centre of South Sulawesi Province about the provision of products, to meet consumer needs at the regional level. The organization of the strategic supply chain (or supply network) which aims to reterritorialize the agri-food system through the development of what is in the field of economic literature is defined as a value-based food supply chain.

Third, regional marketing of the agropolitan production of this area is intended to meet the needs of the urban population within the scope of the metropolitan city. Thus, it is expected to encourage economic growth by creating new business opportunities and jobs, saving material costs, reducing price volatility, and increasing security supplies while reducing environmental pressures and their impacts.

Furthermore, transportation services have a very important role and the available choices include land transportation, air transportation, and sea transportation. This process shows that the role of production centres in this agropolitan area is very strategic as a driver for regional economic growth through relations between rural and urban areas towards sustainable integration of the regional development system. Supporting government regulations that protect the needs of the most vulnerable groups and formulating strategies related to provisions as a basis and requirement for sustainable economic growth. It can be concluded that the development of a well-managed agropolitan area has a positive impact on regional economic growth, integration of urban systems, and the relationship between local, regional, national, and global marketing toward sustainable regional development.

4. Discussion

The business economy that tends to increase through the rural agribusiness system pattern encourages economic growth and has had an impact on opening up employment opportunities

and reducing poverty in rural areas (Amri et al., 2023). Strong economic growth advances human development, which in turn encourages economic growth. Furthermore, rural investment, pro-poor policies, social protection, and strengthening rural institutions create positive climates needed for family farmers, small-scale producers, and poor rural communities to invest in their businesses and build sustainable, income-generating activities (UN, 2015). Figure 5 shows the results of the path analysis showing the development of agropolitan areas, rural agribusiness systems, productive economic efforts, and strengthening community capacity for environmental management and ecosystem sustainability.

The development of agropolitan areas through rural agribusiness systems based on economic empowerment that is oriented towards increasing the productivity of the community's economy is then contextualized towards the environmental sustainability of the ecosystem. The results are supported by the triple-bottom-line approach, namely, integrating economic, environmental, and social factors. Moreover, a sustainable circular economy not only adopts an environmental perspective but also considers economic, social, and environmental performance (Gomez-Limon et al., 2009). The results of the analysis confirm that the economic cycle of the community and the distribution of production marketing through the rural agribusiness system in the agropolitan area will remain stable and sustainable by optimizing natural resources, strengthening production factors, and using environmentally friendly technology towards sustainable economic growth in the region.

Economic productivity that remains stable and the selling price of production that tends to increase due to high market and consumer demand simultaneously has a simultaneous impact on the economic growth of Maros Regency and the economic growth of South Sulawesi Province. Capital accumulation has an impact on economic growth and the fundamental factor that inhibits economic growth is the reduced return on capital in the production process. Furthermore, the argument is based on several considerations, namely: (1) government policy support and political stability, (2) production stability and ecosystem balance, and (3) environmental pollution control. The results of this study illustrate that production stability and market demand that tend to increase followed by market stability will have an impact on optimizing production and utilization of natural resources towards the sustainability of agropolitan areas based on rural agribusiness systems.

The implementation of a complex agroforestry system must be followed by the development of basic and advanced industries to handle it with superior commodities in the agropolitan area and the setting of a reasonable basic price level for local commodities at the level of local producers, building a transportation network system, developing markets, and empowering local communities (Retnowati, 2003). Furthermore, the health status of regional soil and ecosystems has important theoretical and practical meanings for maintaining regional ecological security and promoting of similar social and economic sustainable development (Schneider et al., 2007). Figure 6 shows the development of agropolitan areas in Malawa Sub-district, Maros Regency based on ecosystem sustainability.

The development of the Malawa Sub-district agropolitan area is based on increasing regional economic productivity and ecosystem sustainability (Figure 6), in the context of several important principles, namely: (1) Ensuring the existence of production processes through biodiversity and food that are oriented globally towards long-term economic growth, (2)

encouraging renewable energy based on sustainable agriculture followed by soil and air conservation, (3) government-directed policies on law enforcement and consistency in sustainable management of natural resources and ecosystems, (4) realizing rural agribusiness systems supported by investment and the business world capital towards increasing welfare and opening up employment opportunities, (5) developing agricultural-based technological innovation systems towards ecosystem management, and (6) rotation of agricultural commodities based on conservation of natural resources and the environment. Policies that lead to effective training for entrepreneurs, by providing incentive support and opportunities to start a business.

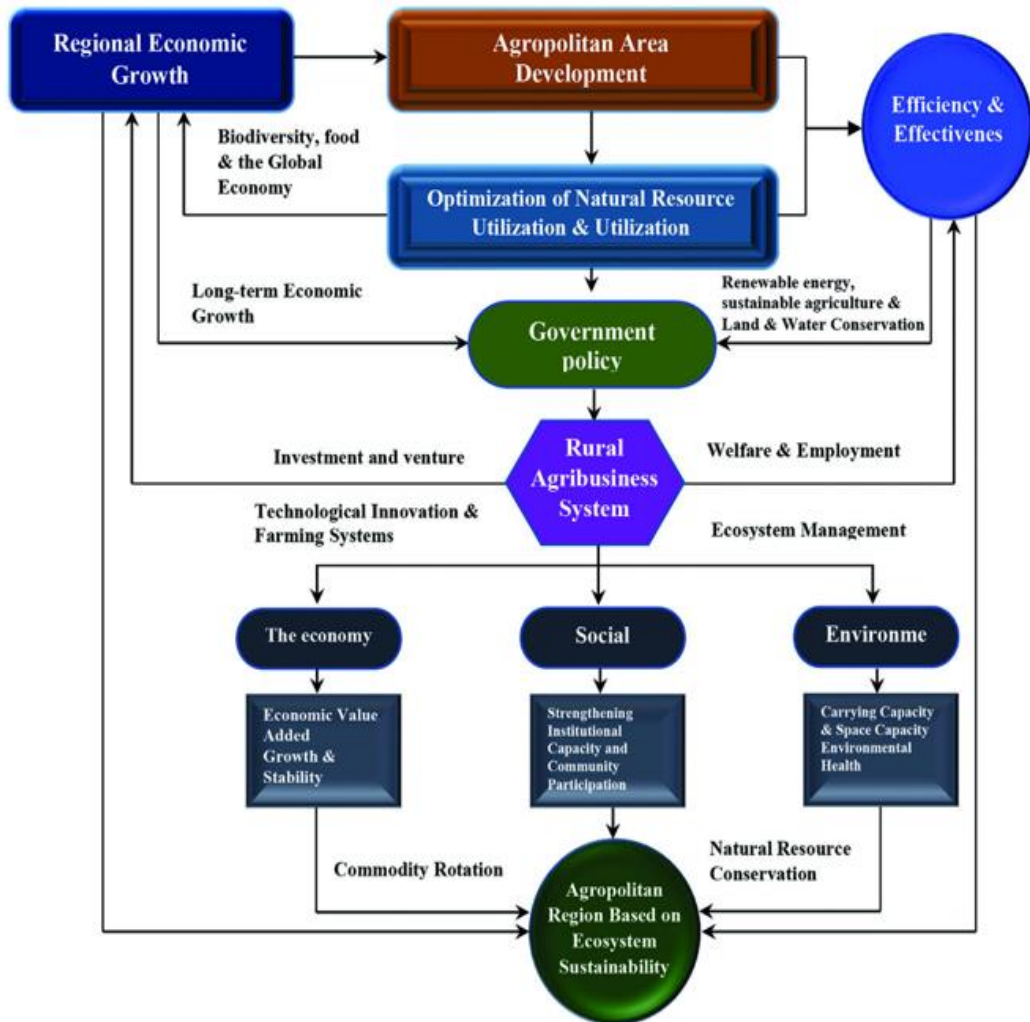


Figure 6. Development of agropolitan areas based on regional economic productivity and ecosystem sustainability

Source: Author's findings, 2024.

4. Conclusion

Regional growth supported by the positive economic base sector is related to the development of agropolitan areas based on rural agribusiness systems. Agropolitan areas developed towards economic production efforts, increasing production quality and stability of commodity price sales followed by promotion of economic efforts, and supporting infrastructure have a significant influence on meeting market demand. Regional development followed by the acceleration of agropolitan area development through rural agribusiness systems and followed by community empowerment and control of environmental pollution is positively correlated with the increase in economic business productivity and ecosystem sustainability.

Furthermore, agropolitan areas that are well and professionally managed are positively correlated with the integration of regional development systems. In addition, the relationship between local, regional, national, and global marketing to the stability of the economy of community circulation, stability of production marketing distribution, strengthening of production factors, and the use of environmentally friendly technology have an impact on increasing regional economic growth and ecosystem sustainability.

The direction of sustainability of agropolitan areas based on agribusiness will require government policy support in terms of political stability, production stability, product marketing, and environmental pollution control. The stability of production and market demand that tends to increase and is followed by market stability will have an impact on optimizing the use of natural resources towards sustainable development of agropolitan areas. Sustainability of the agropolitan area ecosystem to guarantee the existence of a production process through the development of biodiversity and food, the use of renewable energy based on sustainable agriculture followed by soil and water conservation and law enforcement.

Consistency in the management of natural resources and integrated rural agribusiness systems supported by investment and business capital actors and technology-based development of agricultural systems, ecosystem management, and commodity agricultural rotation based on natural resource and environmental conservation will encourage regional economic growth in an integrated system of independent agropolitan area development. The results of this study have implications for the development of regional planning science, built environment science, economic regions, and sociology of the Malawa sub-district area. This study explicitly has implications for the formulation of government policies and their implementation of the development of agropolitan areas based on the Malawa Sub-district agribusiness system in the future to maintain economic stability and sustainability of environmental management. The development gap in the context of cities and villages can be overcome and improved in the future by considering several indicators including the development of independent agropolitan areas, rural agribusiness systems, optimization and conservation of natural resources, strengthening the institutional capacity of government and community adaptation to global climate change based on data availability, spatial scale, regional scale, and period.

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