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Analysis of Agropolitan Area Development in Tinggimoncong Sub-District, Gowa District, South Sulawesi

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Abstract: Assessing the problems of economic growth, urbanization, and development prospects in Tinggimoncong District, Gowa Regency, South Sulawesi, Indonesia, have yet to catch up due to economic growth concentrated in cities. The concept of "Agropolitan" has been proposed to address this problem. The agropolitan concept combines human resources, natural resources, and added value in the agricultural sector to advance rural areas. Tinggimoncong sub-district has great potential to become an agricultural centre in the Gowa District for various types of crops. This study aims to analyze the status of sustainability and build appropriate strategies in the development of a rural area of horticultural agricultural production centres. The analysis method is multidimensional scaling (MDS) and SWOT. The results of this study indicate that agropolitan development strategies in Tinggimoncong District can utilize strong internal strengths, such as improving the quality of agricultural products, establishing an agricultural product processing industry, increasing training, and planning for the effective use of agricultural tools and machinery. In addition, it is also important to pay attention to ecological sustainability by educating farmers about good crop rotation, the use of organic materials as fertilizers, and sustainable soil conservation efforts. Cooperation between the government, farmers and various related parties can be the key to success in implementing the agropolitan concept and ensuring the sustainability of the region.

Keywords: Agricultural sector; Agropolitan; Economic development; Rural and urban economy

Introduction

Economic growth describes how economic activity results in an increase in people's income over a period of time. The economic growth rate is one of the most important factors in the development process and determines the success of a country. However, in reality, economic growth becomes a financial problem in the long run that is always experienced by a country (Andiny et al., 2017). The existence of inequality as a result of economic growth is a factor that continues to be discussed. The economic condition of people living in rural areas is inequality the economic condition of urban communities. The reason is that the focus of development, economy, and industrialization is concentrated in urban areas, so the expected role of urban areas in promoting rural development tends to slow rural growth. In addition, slow economic growth in rural areas results in the movement of people from villages to cities, also known as urbanization.

The negative impact caused by urbanization is natural disasters that occur more often due to overcrowding and lack of vacant land caused by illegal development for the community (Marsya, 2014). Not

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only in big cities, urbanization also causes problems in rural areas, such as reducing the number of people due to migrating to the city. This negatively impacts the village's growth and development, as stated in a study by Harahap (2013). Based on data released by the Central Bureau of Statistics in 2020, around 56.7% of Indonesia's population currently lives in urban areas.

Agriculture is a major sector in the idea of regional development planning in developing countries. In Indonesia, the development of agricultural areas is referred to as "Agropolitan". According to (Friedman et al. (1978), they propose a development approach that focuses on development in rural areas with populations ranging from 50,000 to 150,000. Exploration of the potential resources of a region is important, with the aim of increasing regional revenues fairly and independently. So, it has an impact on improving people's welfare. This can be achieved through a combination of human resource capabilities and natural resource exploitation, with increased added value, artificial resources, and social aspects.

Thus, it can improve the ability of an area to carry out development. The purpose of Agropolitan development is to increase the income and welfare of the community, especially farmers, in the long term. In the medium term, it includes the development and development of farmer business institutions, both related to production and other businesses that are effective, efficient, and competitive, and create a business environment that encourages community economic development. In the short term, this involves selecting a site that qualifies as an Agropolitan centre and supporting area and planning the development of an Agropolitan area (Setiyanto, 2013).

The concept attracts investment and supports and encourages agribusiness development in rural areas and surrounding areas (Hashemianfar et al., 2014). The application of the Agropolitan concept in rural areas has significantly impacted the region's development. These include improved community access facilities from settlements to farms, distribution to other areas, and improved farmer welfare (Burano, 2017). However, to achieve all these developments, there are several challenges in rural areas, such as a lack of ability in resource management, suboptimal product development, and a lack of effort in developing value-added agribusiness (Roidah, 2013a).

Gowa Regency is located in the province of South Sulawesi, with a poverty index of 1.38 in 2021. Despite an increase in economic growth of 1.46% compared to previous years, this has not resulted in an equitable economic increase for the entire population. The GDP of Gowa Regency in 2021 reached 21.53 trillion rupiah, with the agricultural sector dominating with a contribution of 27%. In an effort to reduce poverty, Gowa Regency can maximize the economic potential of the agricultural sector as a primary sector. Developing agropolitan areas involves improving various aspects of life to support agropolitan areas as an economy centered on agriculture (Agustina et al., 2017). The agricultural sector is mainly useful for improving people's welfare and income by accelerating regional growth and strengthening relations between villages and cities. This is achieved by supporting competitive, community-based, sustainable, centralized agricultural and business systems in agropolitan areas (Suroyo et al., 2014).

Tinggimoncong District, along with Tombolopao, Tompobulu, and Biringbulu Districts, is the centre of vegetable and horticultural crops in Gowa Regency, such as shallots, large chilli, cayenne pepper, potatoes, tomatoes, cabbage, leeks, garlic, cabbage, and biopharmaceutical plants such as ginger, laos, galangal, turmeric, and others, as well as various ornamental plants. Therefore, the role and contribution of the Tinggimoncong district to GRDP in Gowa Regency has great potential that can be increased or maximized. One way to achieve this is by applying the concept of Agropolitan.

Method

This research is development research where strategies for applying the Agropolitan concept will be developed. The research method is quantitative research characterized by numerical data collected in the field. The data to be taken were obtained from questionnaires, short interviews, and data from relevant agencies in the research area, such as the Food Crops and Horticulture Office, Central Statistics Agency (BPS), sub-districts, districts, villages and others. Data from questionnaires and short interviews become primary data, and secondary data are obtained from agency data.

This research will be carried out in Tinggimoncong District, Gowa Regency, precisely spread across 7 villages, namely Bonto Lerung, Bulutana, Gantarang, Garassi, Malino and Pattapang Villages and Parigi Village. The basis for site selection is based on the Gowa Regency Medium-Term Development Plan (RPJMD) 2016-2021, which states that Tinggimoncong District has the potential to develop agricultural areas because it has an area of 1.043 hectares of wet agricultural land and holistic land. 1.043 and 1.418 hectares of horticultural land, besides that it is also a potential area for the development of plantation cultivation areas with a land area of 4.069 hectares. Tinggimoncong sub-district is located in the highlands (1,000-2,800 above sea level) with a land slope of 40 degrees. Vegetable cultivation areas in upland areas have the potential to be developed in terms of land area and distribution or physical and

chemical characteristics of the soil (Haryati, 2014). The research was conducted from August to October 2022.

The research respondents were farmers in the Tinggimoncong sub-district. The number of farmer respondents in the research location was 100, the respondent data were taken from Bonto Lerung, Bulutana, Gantarang, Garassi, Malino and Pattapang Villages and Parigi Village. The variable used in this study is the amount of production of certain commodities in Tinggimoncong District, the research method is carried out based on the research design made.

This research was designed using two stages of research, namely the study of sustainability status to see the level of agricultural development in Tinggimoncong District in terms of its agropolitan factors, namely economic, ecological, and social, using Multidimensional Scaling (MDS) Analysis with the R Application. Second, building an agropolitan area development strategy in the Tinggimoncong District area this stage is carried out by considering the results of stage one and stage two research, then conducting a SWOT (Strength, Weakness, Opportunity, Threat) Analysis. The amount of production of certain commodities in Gowa Regency and South Sulawesi Province, the total production of the agricultural sector in Tinggimoncong District, the total production of the agricultural sector in Gowa Regency and South Sulawesi Province and the dimensions of sustainability status assessment (Environmental, Economic, Social dimensions).

Result and Discussion

Multidimensional Scaling (MDS) Results

The evaluation of the sustainability status of the agricultural sector in Tinggimoncong District, Gowa Regency, was carried out by considering three main aspects, namely environmental aspects (with 9 attributes), economic aspects (with 9 attributes), and social aspects (with 7 attributes).

Table 1. Index Analysis Results and Sustainability Status

Dimension	Sustainability Index Value		Difference
	MDS	Monte Carlo	
Environment	62.94	62.80	-0.14
Economy	61.84	61.84	0
Social	74.83	74.83	0

Source: Results of data analysis in 2023

Through Multidimensional Scaling (MDS) analysis, we can understand the extent to which Tinggimoncong District can maintain the sustainability of its agricultural sector, both for current and future needs. In addition, we can identify factors that can be improved through policies to be formulated based on the results of the sustainability index assessment, listed in Table 1.

Based on Table 2, the index values generated from 3 dimensions through Rapfish analysis show that the category is quite sustainable in the Environmental, Economic, and Social dimensions in the range of values of 50.01-75.00. Therefore, strategies are still needed to improve sustainability in this dimension.

Table 2. Differences in Sustainability Index Values of MDS and Monte Carlo Analysis

Dimension	Index Value	Sustainability Category
Environment	62.94	Quite
Economy	61.84	Quite
Social	74.83	Quite

Source: Results of data analysis in 2023

The difference between MDS and Monte Carlo's analysis of the sustainability index value is that it shows a value of less than 5%, so the confidence level in the total index is more than 95% (Widiatmaka et al., 2015). The difference between MDS and Monte Carlo, whose difference is less than 1, shows that the calculation of the MDS value reflects the true value with a high level of precision (Maharani et al., 2017). MDS research results can be ensured to have a small error rate with a difference of < 1 between MDS and Monte Carlo.

A comparison can be seen between the sustainability index values generated from the MDS (Multidimensional Scaling) analysis and the values generated from the Monte Carlo analysis in three different dimensions, namely the Environmental, Economic, and Social dimensions. In the environmental dimension, the MDS analysis results in a slightly higher sustainability index value compared to the results from the Monte Carlo analysis. This difference of -0.14 indicates that in the Monte Carlo simulation, there is a small variation that leads to a slightly lower value in terms of ecological sustainability.

In the social and economic dimensions, both analyses (MDS and Monte Carlo) also produced identical sustainability index values of 61.84 and 74.83. The difference in sustainability index values between the two analysis is 0. This shows that in the context of social and economic sustainability, there is no significant difference between the two approaches. However, in the environmental dimension, MDS analysis yielded slightly higher values compared to Monte Carlo analysis, showing little difference in ecological sustainability assessment between these two methods.

For the sustainability index of the environmental dimension, there are nine indicators, namely how to deal with agricultural waste, the type of fertilizer used, the variety of crops developed, planting agricultural crops (Rotation), land irrigation methods, access to water

sources, agricultural land conditions, plant pest control methods, and certified seeds. The results of the MDS analysis resulted in a sustainability index of 62.94, which, based on Table 2, falls into the moderately sustainable category because it has a score between 50.01 and 75.00, while the required target is to achieve a highly sustainable condition.

To see the attributes that are sensitive in influencing the sustainability index of the environmental dimension, a Leverage analysis is carried out. Mahida et al. (2019) states that the sensitive attribute in Leverage analysis is the one with the highest Root Mean Square (RMS) value. The most sensitive attributes are plant pest control methods and ways to deal with agricultural waste. The RMS (Root Mean Square) values of the two sensitive attributes are 3.31 and 3.01, respectively (Figure 1).

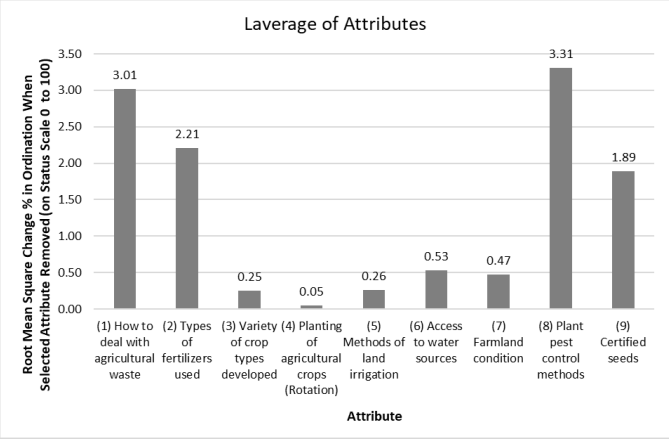

Figure 1. Sensitive attributes affecting the sustainability of the environmental dimension

The change in the RMS (Root Mean Square) value is the value obtained from the final results of the analysis. The more significant the change in the RMS value, the more sensitive the role of the attribute in the analysis. The more significant the change in RMS value, the more sensitive the role of the attribute in improving sustainability status. Therefore, to improve the sustainability of the environmental dimension, it is necessary to reduce the intensity of pest attacks. Pest control that is often practiced in the Tinggimoncong area is by spraying pesticides. Chemical pesticides that are used continuously will have a negative impact on environmental health. In addition, chemical pesticides have an expensive price and are included in imported products, which will make it difficult for farmers to obtain them (Nasution et al., 2018).

The negative impact of pesticide selection errors and application errors will cause failure in pest control, waste, and, most importantly, can threaten the safety of users, non-target bodies, and environmental pollution (Yulia et al., 2020). A method that can be used in controlling environmentally friendly plant pests is by using light traps. Pests that can be captured with this method include green leafhoppers, brown leafhoppers, real leafroller moths, false leafroller moths, white-stem borer moths, yellow-stem moths, and walang sangit. This is because these pests are active at night. Light traps can be an early detector of the presence of plant pests (Wati et al., 2017). Another way to reduce pest attacks is through crop rotation. Crop rotation can control pests, plant diseases, weeds, and insects, reduce soil erosion, and increase nitrogen contribution from legumes (Indiati et al., 2017). Therefore, it is necessary to increase farmers' knowledge about the importance of crop rotation because there are still some farmers in the Tinggimoncong Sub-district who still plant the same crop throughout the year (not rotating crops).

The second sensitive attribute that can be used to improve the sustainability of the environmental dimension is to improve the way agricultural waste is processed. At least three factors suppress agricultural development and produce environmentally friendly products, including sustainable agriculture which plays an important role in efforts to protect the environment by reducing industrial waste and exploitation of natural resources that can damage the earth's ecosystem as a whole (Dadi, 2021). The majority of agricultural waste in the Tinggimoncong Sub-district is only left to dry on farmland or burned, so there are still very few people who utilize it as animal feed or processed into crafts. Giving rice straw to livestock is given directly without any addition. However, due to the high silica and lignin content, farm animals prefer rice straw to eat and cannot be used as the main feed (Yanuartono et al., 2017). One of the technologies that can be applied to increase the protein value of straw and break the silica and lignin bonds is by making ammoniated straw (Harahap, 2013). In addition, straw can also be added to paddy soil to add nutrients.

There are nine attributes in assessing the sustainability of the economic dimension, namely: Ease of obtaining financial loans; Farming partnerships; Farm ownership status; Agricultural area; Income in 1 harvest; Availability of agricultural product processing industry; Price stability of agricultural products; Agricultural business capital; Availability of agricultural product marketing locations. The MDS analysis conducted shows a sustainability value of 61.84, which falls into the moderately sustainable category (between 50.01 and 75.00). Based on the leverage diagram (Figure 2), the most sensitive indicators influencing the economic dimension are farm ownership status, farm area, and the existence of an agricultural product processing industry.

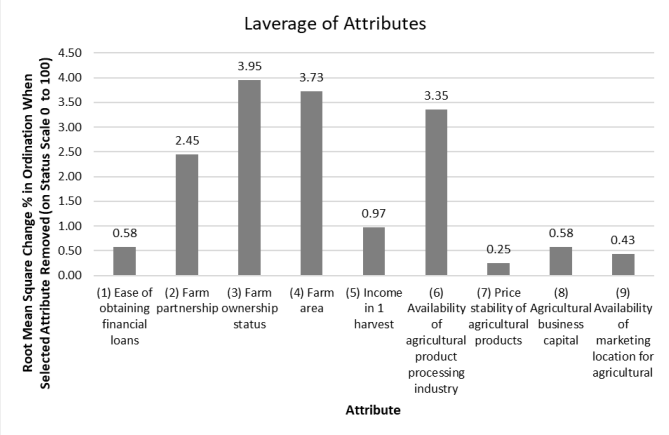

Figure 2. Sensitive attributes affecting the sustainability of the economic dimension

The size of agricultural land is certainly very influential in the economic sector because the more land you have, the higher the estimated profit. The more land used for farming, the higher the crop production. The majority of the land used for farming is self-owned, so that the profits obtained will be self-owned. But there are still some lands that are rented or only cultivated or profit sharing with the original owner. Increasing the land area and land ownership status will certainly increase the sustainability of farmers from an economic point of view.

Economic improvement is something that absolutely must be done in order to provide welfare to the community (Paramita et al., 2018). Improving the farm economy can be done by increasing the price of agricultural products. Price increases can occur if the products produced can be processed into products with more value than products that are directly marketed without any processing. Products with processing or processing such as quality control to ensure quality packaging that is more attractive and hygienic will be an added value for the product. Handling agricultural products is not only to prevent damage, but it can also create opportunities by increasing the added value after the product is transformed into a new form (Dyah et al., 2022). Therefore, the existence of an agricultural product industry in the Tinggimoncong sub-district needs to be added or developed. Based on the results of the interview, the Tinggimoncong sub-district needs a place for processing agricultural products or the creation of a processing place, which is only a plan. Processing of agricultural products is expected to improve the economy of the people in the Tinggimoncong Sub-district. Agroindustry is a very important effort to achieve economic sector development that is able to create jobs, increase foreign exchange earnings, improve income distribution, and create a resilient and superior agricultural sector (Suwandi et al., 2022).

There is one approach that can be applied in developing agro-industry, namely the OVOP (One Village One Product) approach or the one village one product program. This program is a community-based approach that aims to develop the potential of a region in an integrated manner so that the income, welfare, pride, and confidence of the community in their region can increase. In addition, OVOP can help increase people's per capita income. Three OVOP principles that can help the development of agricultural areas are (i) Independence and Creativity, (ii) Human Resource Development, and (iii) Think Locally but act globally (Ndione et al., 2019). The approach with OVOP can be done by: determining the product to be developed; identifying the potential for product development and problems related to product development; providing guidance to the local community related to processing, technology used, quality improvement, distribution of production and expansion; improving human resource capabilities; and monitoring and evaluating business activities for improvement.

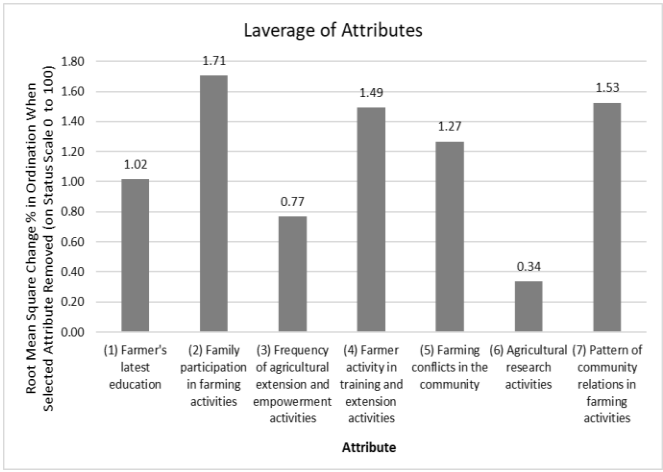

Figure 3. Sensitive attributes affecting the sustainability of the socio-cultural dimension

In assessing the sustainability of the socio-cultural dimension, there are 7 attributes included, namely: Farmers' latest education; Family participation in farming activities; Frequency of agricultural extension and empowerment activities; Farmers' activeness in training and extension activities; Farming conflicts in the community; Agricultural research activities; Patterns of community relations in farming activities. In addition, middle age and above have moral and personality links that have been established so that there is more participation at this age. The leadership factor means that in society, it is common that the head of the family must earn a living while other family members, such as the wife, generally take care of household needs. Land size is also a factor; the smaller the land size, the fewer people are needed to cultivate it.

Based on the results of the Leverage analysis above, it can be summarized all the sensitive attributes that have the most influence on the sustainability of each dimension as follows.

Table 3. Sensitive Attributes in Leverage Analysis

Dimension	Attribute	RMS Value
Environment	Plant pest control method	3.31
	How to deal with agricultural waste	3.01
Economy	Farm area	3.73
	Farm ownership status	3.95
	Availability of agricultural product processing industry	3.35
Social	Family participation in farming activities	1.71

Source: Research data, 2023

Table 3 Sensitive Attributes in Leverage Analysis is analyzed based on three dimensions: environmental, economic, and social. In the Environmental dimension, crop pest control methods and agricultural waste management have a significant impact on leverage. In the Economic dimension, farm size, farm ownership status, and availability of agro-processing industries play an important role in measuring leverage. In the Social dimension, family participation in farming activities plays a lesser role in the leverage analysis.

The first dimension, Environment, includes attributes relevant to crop pest control and agricultural waste management. The RMS value for this attribute is 3.31, indicating a level of sensitivity to environmental factors. The second dimension, Economy, includes attributes such as farm size, farm ownership status, and availability of agro-processing industries. The high RMS values of 3.73 and 3.95 indicate that these attributes play a significant role in the leverage measurement. The third dimension is Social and includes attributes such as family participation in farming activities. With a lower RMS value of 1.71, this table suggests that these social attributes may have a lower impact on leverage compared to attributes from the other dimensions.

SWOT Strategy for Agropolitan Area Development

Identification of internal and external factors in formulating sustainability strategies is organized using SWOT analysis. In addition to using MDS analysis, which has a Leverage diagram and sustainability status, LQ analysis is used as a determinant of superior commodities that can be developed in Tinggimoncong District and some questionnaire results that have been distributed to experts. The results of the identification analysis of the internal factors and external factors in question are as follows.

Identification of Internal Factors

The identification of internal factors is carried out by exploring the strengths and weaknesses that exist in the agricultural management of Tinggimoncong Sub-district in general. The identification of internal factors can be seen in the explanation below.

a. Strengths, are factors that support the development of the agropolitan area of Tinggimoncong District:
   - The majority of the population works in the agricultural sector, therefore the development of Tinggimoncong Sub-district as a sustainable agropolitan area is expected to be supported by the entire Tinggimoncong community (S1).
   - Each village in Kecamatan Tinggimoncong has formed a farmer group (S3).
   - Included in the highland area (slope) with a cold climate that is suitable for vegetable cultivation (S4).
   - High support and participation from the community to develop agriculture in Tinggimoncong sub-district, because agropolitan has the aim of prospering the community so that the community is certainly interested in supporting the program (S5).
   - The government's commitment to making Tinggimoncong sub-district a sustainable agricultural area. This is stated in (RTRW Kabupaten Gowa 2012-2032) that Tinggimoncong Sub-district is also a sustainable food land area for rice and corn commodities. (S6).
   - Has several superior commodities, namely leeks, chayote, carrots, and mustard greens. Featured commodities can be a promising potential for agricultural sustainability in Tinggimoncong Sub-district. It can be interpreted that agricultural products are able to be used to meet the needs of other regions (exports) so as to increase regional income (S7).
   - Becoming a vegetable supply center in Gowa Regency. This is supported by the statement in the Central Bureau of Statistics (BPS) data that Kecamatan Tinggimoncong along with Kecamatan Tombolopao, Tompobulu and Biringbulu are agricultural centers for vegetable and horticultural crops in Kabupaten Gowa (BPS Kabupaten Gowa, 2017) (S9).

b. Weaknesses:
   - Does not have a detailed regional development plan even though it has good potential in the agricultural sector (W1).
   - The existence of farmer group institutions is not yet of good quality, as evidenced by the results of interviews that many farmer group members rarely or do not attend activities or meetings. farmer

group associations, there are even farmers who do not participate in farmer group membership (W3).
- Many farmers are not active in farmer group activities or training (W4).
- The ability to capitalize farming is still low, so many farmers apply for KUR. People's Business Credit (KUR) is given by the government to overcome the inability of the community to start a business (W5).
- Agricultural supporting facilities and infrastructure still need to be developed (for example: agricultural financial institutions, farm roads, agricultural machinery and tools, etc.). These facilities need to be improved in order to launch the agropolitan implementation plan (W6).

Identification of External Factors

The identification of external factors has two factors that need to be explored, namely opportunities and threats that are specific to the sustainability of agriculture in the Tinggimoncong sub-district. The results of the identification of external factors are as follows.

a. Opportunity:
- Agropolitan is an agricultural-based regional development concept that has been successfully implemented in various regions in Indonesia (O1).
- Community demand for agricultural products outside the Tinggimoncong sub-district is still abundant (O2).
- Has the potential to partner with large industries that use superior products. Partnerships with large industries allow for additional employment opportunities for residents and increase community income, especially farmers in Tinggimoncong Sub-district(O3).
- Wide availability of vacant land (O4).
- Transportation access is very good. Transportation of agricultural products to other areas has roads that have been asphalted and of good quality, so that shipments can be made more quickly, only for access on land that is not entirely asphalt (O5).
- Tinggimoncong sub-district borders other areas, so marketing outside Gowa Regency can be done more quickly and minimize expenses in the distribution section (O6).

b. Threat:
- Many other regions are starting to develop their agricultural products, allowing for competition (T1).
- Market demand for good quality products is increasing (T2).
- The entry of imported products or products from other regions that have better quality (T3).
- Erratic weather changes (T4).

Policy Strategy Direction Based on SWOT Analysis

Based on the identification of internal factors and external factors above, a basic strategy is obtained in the development of agropolitan areas, namely the Strength-Opportunity (S-O) Strategy, which uses strengths and opportunities to succeed in the development plan of a sustainable agropolitan area in Tinggimoncong District, Gowa Regency. Strength-Threat Strategy (S-T), which is using the strengths possessed to overcome existing threats in the agropolitan area development strategy. Weakness-Opportunity (W-O) strategy, which is to take advantage of existing opportunities to minimize existing weaknesses in the regional development strategy, and finally, the Weakness-Threat (W-T) strategy, which is to minimize weaknesses and avoid existing threats.

IFAS and EFAS Matrix Analysis

Table 4. Calculation of the Weight of Internal and External Factors

Factor	Priority Scale (SP)	Constant (K)	SP x K	Weight
				Strength
S1	2	4	8	0.041
S2	4	4	16	0.083
S3	3	4	12	0.062
S4	4	4	16	0.083
S5	4	4	16	0.083
S6	3	4	12	0.062
S7	4	4	16	0.083
Factor Value			96	0.5
Weakness				
W1	4	4	16	0.117
W2	4	4	16	0.117
W3	4	4	16	0.117
W4	4	4	16	0.117
W5	1	4	4	0.029
Factor Value			68	0.5
External Strategy				
Opportunity				
O1	1	4	4	0.031
O2	4	4	16	0.125
O3	4	4	16	0.125
O4	1	4	4	0.031
O5	3	4	12	0.093
O6	3	4	12	0.093
Factor Value			64	0.5
Threat				
T1	3	4	12	0.125
T2	4	4	16	0.167
T3	2	4	8	0.083
T4	3	4	12	0.125
Factor Value			48	0.5

Based on the identification of internal and external factors above, the scores and weights are then calculated using the IFAS and EFAS matrices. The priority scale

starts from 4 (outstanding) to 1 (poor), based on the influence of these factors (Rangkuti, 2008). The results of the calculation of the weights of internal and external factors are presented in Table 4.

The next step is to determine the rating of each factor. The determination of the rating starts from a score of 4 (very influential) to 0 (no influence). IFAS analysis is used to determine the value of internal factors, namely Strength and Weakness.

Table 5. IFAS Analysis

Internal strategic factors	Weight (B)	Rating (R)	B x R
Strength			
S1	0.041	3	0.123
S2	0.083	3	0.249
S3	0.062	4	0.248
S4	0.083	4	0.332
S5	0.083	4	0.332
S6	0.062	3	0.186
S7	0.083	3	0.249
Total	0.500		1.719
Weakness			
W1	0.117	4	0.468
W2	0.117	3	0.351
W3	0.117	3	0.351
W4	0.117	4	0.468
W5	0.029	2	0.058
Total	0.500		1.696

The IFAS analysis results are obtained from reducing the total strength value with the total weakness value, namely 1.719 - 1.696, which is 0.023. Furthermore, the EFAS analysis is carried out with the results in Table 6 below.

Table 6. EFAS analysis

External strategic factors	Weight (B)	Rating (R)	B x R
Opportunity			
O1	0.031	2	0.062
O2	0.125	4	0.500
O3	0.125	3	0.375
O4	0.031	3	0.093
O5	0.093	4	0.372
O6	0.093	3	0.279
Total	0.500		1.681
Threat			
T1	0.125	3	0.375
T2	0.167	4	0.668
T3	0.083	3	0.249
T4	0.125	4	0.500
Total	0.500		1.792

The results of the EFAS analysis are obtained by reducing the total value of opportunities by the total value of threats, namely 1.681 – 1.792, which is -0.111.

IFAS and EFAS Quadrants

Based on the results of the EFAS and IFAS analysis, the values entered in the quadrant are as follows.

X = strength + weakness
= 1.719 – 1.696
= 0.023

Y = opportunity + threat
= 1.681 – 1.792
= -0.111

The position of X and Y is depicted in the form of a quadrant at the point (0.023; -0.111). From the results of the IFAS and EFAS analysis (Figure 4), the agropolitan area development strategy of Tinggimoncong Regency utilizes strength to prevent threats that can arise. This is known based on the IFAS - EFAS value in the quadrant of internal factors is 0.023, and external factors is -0.111. In this score can be seen that internal factors are greater than external factors, which means that internal factors are more influential than external factors to maximize the development of agropolitan areas. It is necessary to optimize internal factors to reduce external factors. Based on the SWOT quadrant, the development strategy is included in quadrant IV.

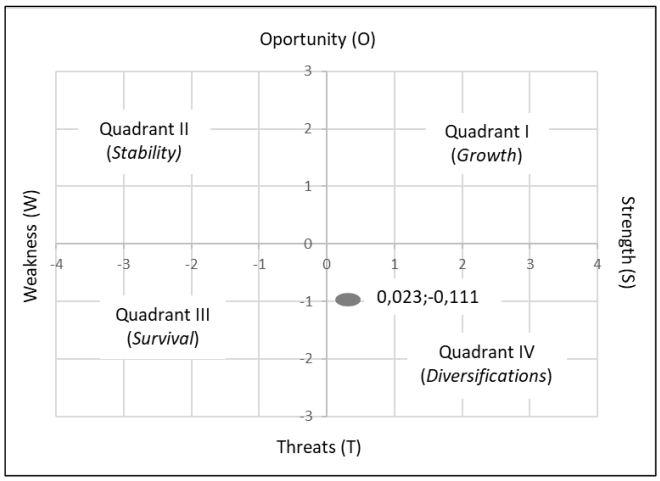

Figure 4. IFAS and EFAS quadrants

Quadrant IV can be interpreted that agriculture in Tinggimoncong District has enormous internal strengths despite having to face threats from the external. The perfect strategy to deal with the conditions is to make current strengths to reduce possible threats in the future by means of a diversification strategy (Kusumah, 2020). Diversification strategies can be carried out by adding new products or services. New products are related to the economic dimension of sustainability analysis, where it is necessary to realize the agricultural product processing industry into a variety of products that are more valuable so that they attract interest from customers. Marketing strategies and

product diversification are important to investigate because farmers not only need to understand how to produce quality, high-volume agricultural products, but also need to be able to process them into semi-finished or finished products to increase added value (Fauzani, 2021). For example, making shallots and garlic into ready-to-consume fried onions, various chili peppers into processed chili products, and vegetables made into crispy dried vegetable snacks. The essence of this diversification strategy is to increase customer interest in agricultural products so that they will be able to compete with agricultural products from other regions, which is included in the threats that may occur in the future. The development of the food processing industry is supported by agricultural natural resources, including vegetable and animal resources, which have the potential to produce a variety of processed products that can be produced and developed from local or regional resources (Farida, 2018). More specifically, the direction of the diversification strategy that utilizes existing strengths to reduce existing threats is described as follows:

a. Plan a strategy to improve the quality of agricultural products (for example, by providing super-quality seeds) so that competition for product quality with other regions can be avoided. The purpose of seed certification is to ensure that the commodity has genetic purity with good quality and that consumers get agricultural products that are guaranteed in quality and as desired (Meliyana et al., 2023). Poor-quality agricultural products are very likely not to attract consumer interest in buying and will only become waste. Quality seeds can be seen from four components, namely physiological quality, physical quality, seed health, and genetics. In the agricultural business, seeds and seedlings are vital components or important components in the agricultural business process (Chan, 2021). Seeds with good physical quality can be seen from size uniformity, bright color, and clean appearance. Physiological quality can be seen from germination power and vigor values such as span power, growth speed, and growth uniformity (Ningsih et al., 2018). The agency in charge of overseeing seed circulation and laboratory testing is the Agriculture Office of the Technical Unit for Seed Monitoring and Certification of Food Crops and Horticulture. In the Tinggimoncong sub-district, there are still some uncertified seeds. Therefore, it is necessary to have better supervision from the relevant agencies so that all seeds planted by farmers in the Tinggimoncong Sub-district are certified to ensure the sustainability of the implementation of the agropolitan plan. Seed quality control plays a major role in the entire seed production process. From the seed multiplication stage, processing, storage, to distribution and marketing, quality control must be carried out thoroughly. This includes quality testing, monitoring, implementing regulations, and providing certification to ensure that the seeds produced meet the set quality standards (Waluyo et al., 2018).
b. Realizing the plan to establish an agricultural processing industry in order to obtain agricultural products that have a high selling value. Several things constrain the plan to establish an agricultural industry in Indonesia: the quality and availability of agricultural products that have not been guaranteed; limited human resource capabilities; and the technology owned is still very simple. Therefore, it is important to improve the three constraints above so that this plan is well realized. Improvements in quality can be started as in point (a), namely improving the quality of seeds used, then making training in the management of agricultural products in the farming community as well as providing knowledge about processing equipment, both modern and traditional. The establishment of a processing industry can be started by selecting superior commodities with the consideration that these commodities are widely sold and must have many enthusiasts. According to Arifin (2016), considerations that need to be considered in establishing an agro-industry are:
    i. Technology; technology is definitely needed in preparing agro-industry, both modern and traditional technology. This will make it easier for agro-industry farmers to adjust to the technology to be utilized.
    ii. Site selection; site selection can be done based on several considerations, including:
        - Raw material availability
        - Availability of labor around the location.
        - Close to the marketing location
        - Availability of supporting facilities and infrastructure
    iii. Supply and input facilities; the most important consideration is the availability of key raw materials. The main raw materials must always be available to run a business. For this reason, it is necessary to consider the crop season if the agricultural products are available only in a certain season. What can be done is to produce certain products in certain seasons only or by storing raw materials in a warehouse and then processed so that they can be stored for a long time.
    iv. Planning of complementary materials for processing production; supporting materials are useful as complementary materials in production

activities and help the production process.

v. Production design planning; the main purpose of production planning is to ensure that products can be produced and sold according to market demand. In addition, production planning also aims to improve production efficiency through reducing production costs and improving product quality.

c. Plan strategies and training to improve agricultural productivity and quality without damaging soil quality. Although many farmers in the Tinggimoncong Sub-district plant crop rotations, not all of them understand the reasons and proper ways to do so. Expanding the variety of crops grown on farms and practicing crop rotation can improve soil quality, reduce reliance on chemical additives, and lower the risk of pests and diseases (Siregar, 2023). In addition, various ways can be done to improve the quality of the soil planted with agricultural crops because, basically, the soil in the Tinggimoncong Sub-district is prone to nutrient depletion if planting is carried out continuously. Improvements in the quality of nutrients in the soil can be made by fertilizing using organic materials, adding organic matter to the soil has a more significant impact in improving soil characteristics, especially in increasing the nutrient content in it (Roidah, 2013b). The use of organic matter as fertilizer can also support soil carbon conservation so as to prevent climate change that is slowly occurring. By increasing carbon storage in the soil, it will reduce the release of carbon into the air in the form of greenhouse gases. Generally, soil improvers such as organic materials tend to decompose for a long time, so it is necessary to add other materials, namely minerals such as lime and zeolite (Dariah et al., 2015). In addition, socialization and training for farmers must continue to be carried out to provide knowledge about good agricultural management, the latest technology and good production systems. Training and mentoring are needed so that farmers can master the use of the system and understand its benefits in farming (Sudirman et al., 2023).

From the explanation of LQ analysis strategies, sustainability analysis and development strategies using SWOT carried out, the sustainability status of farmers in Tinggimoncong District is getting higher. The important points that need to be improved are:

a. The government needs to carry out the function of BPP optimally so that it goes to the community regularly to monitor, provide information and provide motivation.
b. The existence of the agricultural product processing industry needs to be improved to provide the community with economic welfare, of course, by paying attention to how the waste produced is managed and how to minimize the disposal of waste into the environment without treatment.
c. Side jobs, this point is related to point (b), wherewith the processing industry, there will be the absorption of native labour. With the existence of employment, it will reduce the unemployment rate and poverty rate. This effort is one form of improving community welfare.
d. The use of cultivation tools and machinery, by introducing the community to the existence of agricultural tools that provide effectiveness in their farming, increases the production, quality and selling value of the agricultural products produced.
e. Farm road infrastructure improvements allow communities to market their agricultural products (effectively) more easily and cheaply.
f. Implementation of laws and regulations regarding agropolitan by applying the concept of sustainable agropolitan. It is hoped that the natural resources owned by the Tinggimoncong community can be utilized properly and can survive and continue for generations to come.
g. The agriculture office needs to cooperate with the Directorate General of Human Settlements in making mapping related to land functions and land suitability for farmers so that mapping for superior commodities does not cause errors and runs according to its sustainability plan. After that, it is necessary to form a special body that works together in carrying out the plan to form an agropolitan area.

These points, if carried out properly, will ensure an increase in the sustainability status of the area from moderately sustainable to highly sustainable. After the area in Tinggimoncong District becomes sustainable, other developments, such as agricultural ecotourism, can be implemented. Some countries in the world develop the agricultural sector not only as a main commodity, but also as a tourism attraction (Widhianthini et al., 2019). Ecotourism will be implemented as the culture of environmentally sustainable agriculture increases; even Tinggimoncong District can become a pilot location for other areas. With the agropolitan concept, the use of agricultural land in the Tinggimoncong District will be maximized from an economic perspective (productivity and quality) in terms of ecology or the environment. The creation of sustainable agriculture has positive impacts, such as reducing land clearing, reducing the possibility of flooding, and reducing population movement to urban areas.

Conclusion

This research shows that Tinggimoncong District has the potential to develop agropolitan concepts with a focus on superior commodities such as onions, potatoes, and cabbage. The agropolitan area in the Tinggimoncong district is categorised as moderately sustainable in three main dimensions (environmental, economic and social). Key attributes that are very influential in efforts to improve sustainability include crop pest control methods, agricultural waste management, agricultural area area, farm ownership status, development of agricultural product processing industries and family participation in agricultural activities. The agropolitan development strategy in Tinggimoncong District should rely on strong internal potential. Measures such as improving the quality of agricultural products, establishing agricultural product processing industries, training, and efficient use of agricultural equipment and machinery will encourage increased productivity and selling value of agricultural products. In addition, efforts to maintain ecological sustainability are also important, including educating farmers about good crop rotation, the use of organic fertilizers and sustainable soil conservation practices. To achieve sustainable agropolitan development in Tinggimoncong District, strong coordination between the government, agricultural actors and other stakeholders are needed. This includes expanding agricultural markets, planning strategies to improve the quality of agricultural products and strengthening groups of farmer institutions.

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Each author contributed a different amount: Rian Alfadillah collected data and wrote manuscripts; Luthfia Ayu Dhea analyzed the data; Fadillah Putra and Mahir compiled manuscripts, provided conceptual research ideas, and critically revised articles. All authors contributed to the final manuscript.

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Conflicts of Interest
The author emphasizes the importance of prioritizing the public interest in decision-making related to agropolitan development in Tinggimoncong, considering stakeholders' broad and diverse perspectives.

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