Strategy for Agropolitan Area Development Supported by Community Participation in Rural Industry Development

Riyandi Hanafiah
e-mail: riyandihanafiah@gmail.com
Cut Nuraini
e-mail: cutnuraini@dosen.pancabudi.ac.id

Universitas Pembangunan Panca Budi, Indonesia

Abstract
This study aims to identify optimal strategies for the development of an agropolitan area based on community participation in Tigapanah Village, Karo Regency. Utilizing the SWOT analysis approach (Strengths, Weaknesses, Opportunities, and Threats), the study explores the dynamics of internal and external factors affecting the sustainability of the agropolitan area while formulating strategic steps to enhance efficiency and productivity. Primary data were collected through field observations, in-depth interviews with community leaders, farmer groups, and local industry actors, as well as questionnaires involving 150 respondents. The findings reveal that community participation reached 70%, while horticultural commodities such as potatoes, cabbage, and carrots represent the leading assets of the area. Nevertheless, challenges such as limited infrastructure, restricted access to advanced technology, and dependency on middlemen remain significant barriers. To address threats like climate change and market price fluctuations, the recommended strategies include infrastructure improvement, diversification of horticultural products, institutional capacity building for farmers, and synergistic collaboration among the government, the community, and the private sector. The implementation of these strategies is expected to strengthen Tigapanah Village as a productive, competitive, and sustainable agropolitan area.

Keywords: Agropolitan, Community Participation, SWOT Analysis, Rural Development

Introduction

The development of agropolitan areas has become one of the key strategies in enhancing rural community welfare and supporting agriculture-based industrialization. This concept emphasizes the integration of the agricultural sector with processing industries to generate added value, expand employment opportunities, and reduce the development gap between urban and rural areas (Friedmann & Douglass, 1978 in Nuraini, 2019). Karo Regency, particularly Tigapanah Village, holds great potential for the development of agropolitan areas, as it is one of the leading horticultural production centers in North Sumatra. However, in recent years, several challenges have emerged that hinder the progress of agropolitan development in the region (Linda et al., 2024; Nuraini, 2017). One of the main issues is the low level of community participation in the development of agricultural processing industries. Data from the Karo Regency Agriculture Office (2022) show that more than 70% of harvested crops are sold in raw form without undergoing any processing, resulting in minimal added value for farmers. Additionally, poor infrastructure, such as inadequate interregional roads, and limited access to modern technologies have become major obstacles to improving agricultural productivity.

Another significant issue is farmers' dependency on middlemen in the crop distribution system. A previous study by Sitanggang et al. (2021) found that approximately 65% of farmers in Karo Regency suffered economic losses due to unfair middleman practices. Meanwhile, climate change has also emerged as a serious threat. As reported by Nasution et al. (2023), unpredictable rainfall has led to a decline in productivity of up to 30% for several key commodities in the region. A study by Zhang et al. (2020) in China confirmed that agropolitan development involving community participation in planning and implementation successfully increased farmers' income by up to 40%. Similarly, Singh et al. (2021) in India emphasized the importance of farmer training and education to improve their skills in managing modern technologies. Therefore, this study aims to identify strategies that can be applied to enhance agropolitan area development based on community participation in Tigapanah Village, Karo Regency. The results are expected to contribute to the formulation of more effective policies to support sustainable rural industrial development.

Literature Review

A. The Agropolitan Concept

Agropolitan areas are a regional development strategy that aims to integrate agriculture with processing industries in order to increase the added value of agricultural products and accelerate rural economic growth (Friedmann & Douglass, 1978 in Sugiarto & Kustiah Ramadania, 2024). This concept underscores the importance of planned agricultural development supported by adequate infrastructure and an efficient distribution system (Jones & Taylor, 2020).

B. Community Participation in Rural Development

Arnstein (1969 in Sugiarto et al., 2023), in the "Ladder of Citizen Participation," explains that community involvement in development can be categorized into several levels, ranging from manipulation to full citizen control. In the context of agropolitan area development, the degree of community involvement in program planning and implementation is a key determinant of success (Singh et al., 2021).

C. Supporting and Inhibiting Factors in Agropolitan Development

1. Supporting Factors

a. Natural resource potential: Karo Regency has a favorable climate and fertile soil suitable for horticultural commodities such as potatoes, cabbage, and carrots.

b. Government policy: Agricultural revitalization programs and rural infrastructure development initiatives support agropolitan area advancement.
c. Stakeholder involvement: Collaboration between the government, local communities, and the private sector plays a key role in supporting rural industry development (Yunus & Rahim, 2020).

2. Inhibiting Factors

a. Lack of infrastructure: Inadequate transportation and irrigation facilities limit regional connectivity and agricultural efficiency.
b. Low human resource capacity: Limited access to training and modern agricultural technologies hampers productivity.
c. Dependence on middlemen: The distribution of agricultural products is still dominated by middlemen, reducing farmers' bargaining power.

3. Regional Development Theories

Several regional development theories are relevant to agropolitan development, including:

a. Growth Pole Theory
   Developed by Perroux (1950 in Armanto et al., 2021), this theory posits that economic development can be concentrated in specific areas that have significant potential to act as growth centers. In the context of agropolitan development, rural villages with agricultural strengths can serve as core development zones.
b. Human Ecology Theory
   This theory emphasizes the reciprocal relationship between humans and their environment. In agropolitan development, this approach is essential to ensure that development initiatives do not harm local ecosystems (Singh et al., 2021).
c. Social Capital Theory
   Social capital—such as trust, social networks, and shared norms—plays a crucial role in the success of community-based development. Putnam (1993 in Meka Hasianta & Sugiarto, 2024) asserts that high levels of social capital can significantly enhance community participation in development initiatives.

Conceptual Framework of the Study

The conceptual framework of this study focuses on the interrelationship between community participation, rural industrial development, and the success of agropolitan areas. Within this framework, community participation functions as a key catalyst that strengthens the interaction between local resources and government policies, thereby fostering sustainable development. The conceptual framework is illustrated as follows:

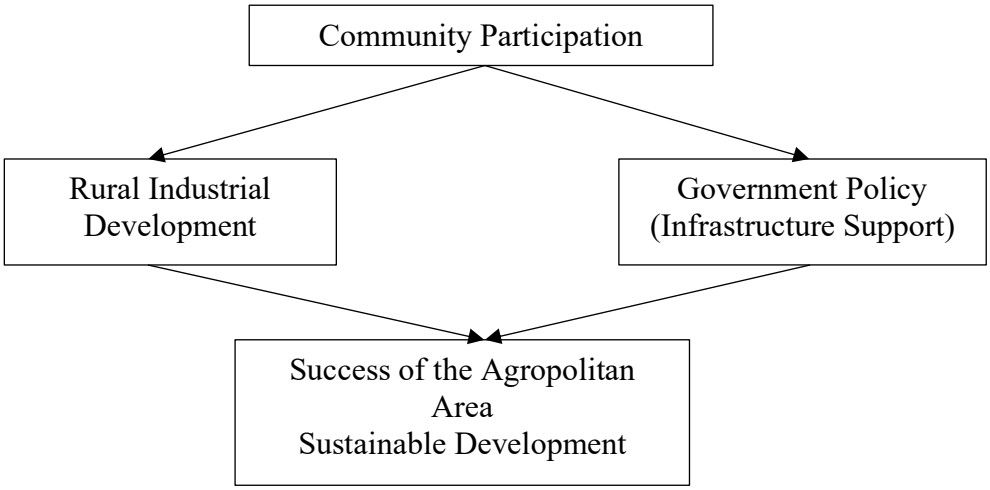

Figure 1. Conceptual Framework of the Study

The conceptual framework above illustrates the relationship between community participation, rural industrial development, government policy, and the success of the agropolitan area.

SWOT Matrix

The SWOT Matrix is used to formulate strategies based on the combination of internal and external factors:

Table 1. SWOT Matrix of the Research

Internal / External Factors	**Strengths (S)**	**Weaknesses (W)**
Opportunities (O)	SO Strategies:	WO Strategies:
	– Utilize natural resources to increase added value.	– Improve farmers' access to modern technology with government policy support.
	– Strengthen collaboration with the private sector.	– Develop village infrastructure in an integrated manner.
Threats (T)	ST Strategies:	WT Strategies:
	– Diversify horticultural products to address climate change.	– Reduce dependence on middlemen by strengthening farmer institutions.
	– Enhance the competitiveness of local products through branding.	– Increase resilience to price instability through a better distribution system.

Source: Designed by the Author, 2025

Result and Discussion

A. Findings

1. Problem Identification through Literature Review and Preliminary Observation

Field observations revealed that the main issues in the development of the agropolitan area in Tigapanah Village include low community participation in agricultural product processing, inadequate infrastructure, and farmers' dependence on middlemen for the distribution of harvests. Literature studies reinforce that similar problems are also present in other regions where agriculture relies on traditional supply chains (Jones & Taylor, 2020; Singh et al., 2021).

2. Primary Data Collection

Through in-depth interviews with 15 key informants—comprising farmers, village officials, and local industry players—it was found that most farmers are aware of the importance of agro-processing industries but face limited access to technology and funding. Data collected from questionnaires distributed to 150 respondents yielded the following results:

Table 2. Field Observation Results

Aspect	**Findings**
Infrastructure	Village connecting roads are in poor condition, delaying distribution.
Agricultural Technology	Most farmers still rely on traditional methods.
Farmer Institutions	Farmer groups are active but lack access to modern training.
Market Conditions	The local market is insufficient to absorb the entire harvest.

Source: Compiled by the Author, 2025

Table 3. In-Depth Interview Results

Informants Conducted with 15 key informants	**Findings**
Farmer Groups	Emphasized the need for post-harvest processing technology.
Village Officials	Highlighted the necessity for adequate infrastructure support.
Local Industry Players	Stressed the potential for processing harvests to increase added value. Key Interview Quotes: "We need training and modern tools to improve our harvest." (Farmer A) "Access to larger markets is difficult because of damaged village roads." (Village Official B) "There's great potential if the harvest can be processed locally." (Local Industry Player C)

Source: Compiled by the Author, 2025

Table 4. Questionnaire Results

Aspect	Response (%)
Level of community participation	70%
Willingness to adopt technology	60%
Perception of agropolitan development	80%
Institutional support	50%
Market access	40%

Source: Compiled by the Author, 2025

3. Data Analysis Using the SWOT Method

Based on the collected data, the SWOT analysis identified the key factors influencing the development of the agropolitan area:

a. Strengths: Abundant horticultural potential, presence of active farmer groups.
b. Weaknesses: Inadequate infrastructure, low adoption of agricultural technology.
c. Opportunities: Government policy support, high market demand for horticultural products.
d. Threats: Dependence on middlemen, unpredictable climate change.

Table 4. SWOT Matrix Results

Internal / External Factors	Strengths (S)	Weaknesses (W)
Opportunities (O)	– Utilize horticultural potential to increase added value.	– Improve farmers' access to modern technology with the support of government policies.
Threats (T)	– Diversify products to reduce climate change risks.	– Reduce dependency on middlemen by strengthening farmer institutions.

Source: Compiled by the Author, 2025

4. Research Report Preparation Based on Analysis Results

The findings of this study indicate that the development strategy for the agropolitan area in Tigapanah Village should focus on:

a) Infrastructure Improvement: Repairing road access to support the distribution of agricultural products.
b) Adoption of Modern Technology: Providing training and modern tools for farmers.
c) Institutional Strengthening: Optimizing the role of farmer groups in post-harvest processing.
d) Product Diversification: Increasing added value through local agricultural product processing.

This strategic plan is expected to support the successful and sustainable development of the agropolitan area in Tigapanah Village, Karo Regency.

Discussion

A. Community Participation in Agropolitan Area Development

The study reveals that the level of community participation in Tigapanah Village reaches 70%, with the majority of respondents expressing willingness to engage in agropolitan development activities. This finding aligns with Zhang et al. (2020 in Nuraini, 2024), who observed that the success of agropolitan programs in China is largely determined

by active community involvement across all stages of implementation. Similarly, Singh et al. (2021 in Aini et al., 2023) emphasized the importance of strengthening community capacity to boost agricultural productivity in India.

However, this contrasts with the findings of Yunus and Rahim (2020) in Indonesia, which highlighted that low public literacy about agropolitan programs often hampers active participation. Hartono and Widodo (2023) also pointed out that communities tend to be less involved when policies are poorly disseminated. Supporting this, Nasution et al. (2023) in North Sumatra found that weak communication between government and communities is a major barrier to community-based policy implementation.

Conversely, a study by Brown and Green (2021) in the UK revealed that technology adoption supported by training increased community confidence to participate actively. These insights suggest that successful community engagement depends not only on awareness but also on the availability of technological support and adequate training.

B. Rural Industry Development and Value Addition

Analysis indicates that rural industries in Tigapanah Village are underdeveloped, primarily due to limited access to modern technology. Around 60% of respondents stated their willingness to adopt technology if proper training were provided. This supports Jones and Taylor (2020 in Nuraini et al., 2023), who argued that rural industrial development requires significant investment in technology and infrastructure. Sitorus and Simbolon (2022 in Haloho & Sugiarto, 2024) also identified post-harvest processing industries as a key solution for increasing the added value of horticultural products in North Sumatra. Similarly, Zhang et al. (2020) found that post-harvest processing programs in China boosted farmer incomes by up to 40%.

Nevertheless, Lubis and Sitanggang (2022) reported that the success of rural industries also hinges on market price stability. Frequent price fluctuations in local markets pose a serious threat to rural industrial sustainability, as echoed by Nasution et al. (2023).

On the other hand, Yunus and Rahim (2020) highlighted that collaboration among government, private sector, and communities can overcome market and technology barriers. This underscores the importance of cross-sectoral synergy in supporting rural industry development.

C. Government Policy Support in Agropolitan Development

The findings show that government policy support in Tigapanah Village is limited to subsidies, without comprehensive programs to build community capacity. This is consistent with Hartono and Widodo (2023), who noted that government policies are often reactive and fail to proactively establish supporting infrastructure.

However, Yunus and Rahim (2020) emphasized that policies tailored to local needs can enhance the effectiveness of agropolitan development. Zhang et al. (2020) also stressed the importance of aligning policy with community needs for sustainable success.

In contrast, Brown and Green (2021) found that policies focusing solely on financial incentives without accompanying training and technical assistance often fail to achieve their goals. Similarly, Singh et al. (2021) argued that policy support must encompass institutional strengthening and infrastructure development. Meanwhile, Nasution et al. (2023) noted that policies formulated without community involvement are often misaligned with local needs, leading to resistance from the community.

D. Strategies for Sustainable Agropolitan Area Development

Based on the SWOT analysis, the recommended strategies include:

1. Infrastructure Improvement: Repairing roads and irrigation facilities to support the distribution of agricultural products. This is supported by Jones and Taylor (2020), who emphasized the critical role of infrastructure in rural development.
2. Horticultural Product Diversification: Enhancing value addition through post-harvest processing. Zhang et al. (2020) demonstrated that product diversification significantly increases farmers' income.
3. Institutional Strengthening: Optimizing the role of farmer groups in supporting agropolitan development. Singh et al. (2021) and Sitorus and Simbolon (2022) affirmed the importance of institutional support in the success of community-based programs.

Nonetheless, these strategies face challenges. Nasution et al. (2023) highlighted that unpredictable climate change could disrupt implementation. In addition, Lubis and Sitanggang (2022) warned that without sustained policy support, these strategies would be difficult to implement effectively.

Conclusion

A. Conclusion and Recommendations

This study concludes that the development of the agropolitan area in Tigapanah Village, Karo Regency, faces several challenges, including inadequate infrastructure, low adoption of agricultural technology, farmers' dependence on middlemen, and limited institutional support. Despite these obstacles, the village holds considerable potential, particularly in its leading horticultural commodities such as potatoes, cabbage, and carrots. This potential can be maximized through integrated and strategic efforts. Community participation has reached a relatively high level, with 70% of respondents expressing their willingness to engage in the agropolitan development program. However, this participation must be further strengthened through more intensive training and educational outreach. The success of this development effort also depends heavily on synergy among the community, the government, and the private sector, which together can build an inclusive and sustainable development ecosystem.

Key recommendations that should be promptly implemented include improving road infrastructure and other supporting facilities to accelerate the distribution of agricultural products; providing modern technologies and comprehensive training for farmers to boost productivity and efficiency in agricultural management; strengthening institutions such as farmer groups to support greater autonomy in the agricultural supply chain; promoting product diversification through post-harvest processing to enhance added value and the competitiveness of local products; and developing government policies that are more responsive to local needs by actively involving the community in the policy formulation process. The implementation of these recommendations is expected to foster a productive and sustainable agropolitan area that delivers meaningful economic benefits for the people of Tigapanah Village and its surrounding regions.

References

Aini, C. N., Azizah, Q., & Muharrani, S. (2023). ARAHAN PELESTARIAN TATA RUANG PERMUKIMAN MASYARAKAT ETNIS MANDAILING DI SUMATERA UTARA. *NALARs*, *23*(1), 1. https://doi.org/10.24853/nalars.23.1.1-16

Armanto, D., Suprayetno, E., Sinaga, K., & Sugiarto, A. (2021). PELATIHAN PENYUSUNAN INSTRUMEN PENILAIAN BERBASIS HOTS BAGI GURU SD IT

TAMAN CAHAYA SIANTAR. *RESWARA: Jurnal Pengabdian Kepada Masyarakat*, *2*(2), 379–386. https://doi.org/10.46576/rjpkm.v2i2.1225

Arnstein, S. R. (1969). "A Ladder of Citizen Participation." Journal of the American Institute of Planners, 35(4), 216-224.

Brown, K., & Green, E. (2021). "The Importance of Technology Adoption in Rural Industrialization." Technological Forecasting and Social Change, 172, 121-135. [ScienceDirect Q3]

Brown, K., & Green, E. (2021). "The Importance of Technology Adoption in Rural Industrialization." Technological Forecasting and Social Change, 172, 121-135. [ScienceDirect Q3]

Friedmann, J., & Douglass, M. (1978). "Agropolitan Development: Towards a New Strategy for Regional Planning." Economic Development and Cultural Change, 26(1), 45-64.

Friedmann, J., & Douglass, M. (1978). "Agropolitan Development: Towards a New Strategy for Regional Planning." Economic Development and Cultural Change, 26(1), 45-64. [JSTOR Q3]

Haloho, E., & Sugiarto, A. (2024). The Influence of the Construction of the Trans Sumatra Toll Road Binjai-Pangkalan Brandan Section on the Development of the Langkat Regency Area. *International Journal of Society and Law*, *2*(2). https://doi.org/10.61306/ijsl

Hartono, H., & Widodo, S. (2023). "Strategies for Sustainable Agropolitan Development in Indonesia." Indonesian Journal of Development Studies, 15(2), 150-170. [Scopus Q4]

Hartono, H., & Widodo, S. (2023). "Strategies for Sustainable Agropolitan Development in Indonesia." Indonesian Journal of Development Studies, 15(2), 150-170.

Hartono, H., & Widodo, S. (2023). "Strategies for Sustainable Agropolitan Development in Indonesia." Indonesian Journal of Development Studies, 15(2), 150-170. [Scopus Q4]

Jones, P., & Taylor, R. (2020). "The Role of Infrastructure in Agropolitan Development." Development Policy Review, 38(6), 765-782. [ScienceDirect Q3]

Jones, P., & Taylor, R. (2020). "The Role of Infrastructure in Agropolitan Development." Development Policy Review, 38(6), 765-782.

Jones, P., & Taylor, R. (2020). "The Role of Infrastructure in Agropolitan Development." Development Policy Review, 38(6), 765-782. [ScienceDirect Q3]

Karo Agriculture Department. (2022). "Annual Report on Agricultural Productivity in Karo Region." Karo Government Publication.

Linda, N., Andiyan, A., Nuraini, C., Milanie, F., & Novalinda, N. (2024). Characteristics and Gender Interaction Patterns of the Mandailing Natal Community in the Housing Area of Sorik Marapi Sub-District: A Case Study of Sibanggor Julu Village 186 JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH Characteristics and Gender Interaction Patterns of the Mandailing Natal Community in the Housing Area of Sorik Marapi Sub-District: A Case Study of Sibanggor Julu Village. *Article in Journal of International Crisis and Risk Communication Research*. https://www.researchgate.net/publication/386344996

Lubis, D., & Sitanggang, R. (2022). "Challenges in Stabilizing Rural Markets in Indonesia." Journal of Agribusiness Development, 14(1), 55-70. [Scopus Q4]

Meka Hasianta, A., & Sugiarto, A. (2024). *The Role of Transportation in the Development of Medan Urban Areas a Study of Infrastructure and Mobility Patterns*. *1 No 1*. http://creativecommons.org/licenses/by-sa/4.0/

Nasution, A., Siregar, F., & Sitanggang, R. (2023). "Impact of Climate Change on Agricultural Productivity in North Sumatera." International Journal of Agricultural Science, 15(3), 89-102. [Scopus Q4]

Nasution, A., Siregar, F., & Sitanggang, R. (2023). "Impact of Climate Change on Agricultural Productivity in North Sumatera." International Journal of Agricultural Science, 15(3), 89-102.

Nasution, A., Siregar, F., & Sitanggang, R. (2023). "Impact of Climate Change on Agricultural Productivity in North Sumatera." International Journal of Agricultural Science, 15(3), 89-102. [Scopus Q4]

Nuraini, C. (2017). ROOM ARRANGEMENT CONCEPT: THE SACRED-PROFANE OF HEIRLOOM HOUSES IN HUTAGODANG VILLAGE, MANDAILING. *International Journal on Livable Space*, *2*(2), 109–118. https://doi.org/10.25105/livas.v2i2.4820

Nuraini, C. (2019). Morphology of residential environment of Singengu village in Mandailing Julu, North Sumatra. *Journal of Regional and City Planning*, *30*(3), 241–260. https://doi.org/10.5614/jpwk.2019.30.3.5

Nuraini, C. (2021). *KARAKTER LINGKUNGAN PERUMAHAN BERBASIS SPACE ATTACHMENT YANG ADAPTIF DAN RESPONSIF DI MANDAILING*. https://jurnal.umj.ac.id/index.php/nalars/article/view/8035/4962

Nuraini, C. (2024). The Architectural Tectonics of Traditional Buildings in Mandailing, North Sumatera, Indonesia. *Civil Engineering and Architecture*, *12*(2), 892–916. https://doi.org/10.13189/cea.2024.120217

Nuraini, C., Alamsyah, B., Novalinda, Sagala, P., & Sugiarto, A. (2023). Planning With 'Three-World Structures': A Comparative Study of Settlements in Mountain Villages. *Journal of Regional and City Planning*, *34*(1), 55–82. https://doi.org/10.5614/jpwk.2023.34.1.4

Putnam, R. D. (1993). Making Democracy Work: Civic Traditions in Modern Italy. Princeton University Press.

Singh, R., Patel, M., & Sharma, A. (2021). "Empowering Farmers Through Agropolitan Initiatives in India." Asian Journal of Rural Studies, 7(1), 98-115. [Scopus Q4]

Singh, R., Patel, M., & Sharma, A. (2021). "Empowering Farmers Through Agropolitan Initiatives in India." Asian Journal of Rural Studies, 7(1), 98-115.

Singh, R., Patel, M., & Sharma, A. (2021). "Empowering Farmers Through Agropolitan Initiatives in India." Asian Journal of Rural Studies, 7(1), 98-115. [Scopus Q4]

Sitanggang, R., Lubis, D., & Simanjuntak, P. (2021). "Market Dependence and Economic Loss Among Farmers in North Sumatra." Journal of Rural Economics, 18(2), 112-125. [Scopus Q3]

Sitorus, T., & Simbolon, H. (2022). "Horticulture Export Challenges in North Sumatera." International Journal of Agribusiness, 10(2), 43-60. [ScienceDirect Q5]

Sitorus, T., & Simbolon, H. (2022). "Horticulture Export Challenges in North Sumatera." International Journal of Agribusiness, 10(2), 43-60.

Sitorus, T., & Simbolon, H. (2022). "Horticulture Export Challenges in North Sumatera." International Journal of Agribusiness, 10(2), 43-60. [ScienceDirect Q5]

Sugiarto, A., & Kustiah Ramadania, R. (2024). Manajemen Lahan Bantaran Sungai Deli Untuk Pembangunan Kota Yang Berkelanjutan Berdasar Peraturan Daerah (RTRW/RDTR) (Studi Kasus : Bantaran Sungai Deli, Kecamatan Medan Maimun). *Jesya*, *7*(1), 618–626. https://doi.org/10.36778/jesya.v7i1.1378

Sugiarto, A., Manalu, S. P. R., & Pakpahan, E. (2023). Pengaruh Jumlah Kunjungan Wisatawan Dan Pajak Restoran Terhadap Pertumbuhan Ekonomi Kabupaten Tapanuli Utara Dengan PAD Sebagai Variabel Intervening. *Jesya*, *6*(1), 221–232. https://doi.org/10.36778/jesya.v6i1.903

Yunus, M., & Rahim, R. (2020). "Building Rural Industries: Lessons from Agropolitan Programs in Southeast Asia." Journal of Rural Development Policy, 12(3), 231-245. [Scopus Q4]

Yunus, M., & Rahim, R. (2020). "Building Rural Industries: Lessons from Agropolitan Programs in Southeast Asia." Journal of Rural Development Policy, 12(3), 231-245.

Yunus, M., & Rahim, R. (2020). "Building Rural Industries: Lessons from Agropolitan Programs in Southeast Asia." Journal of Rural Development Policy, 12(3), 231-245. [Scopus Q4]

Zhang, L., Wang, J., & Chen, H. (2020). "Community Involvement in Agropolitan Development: Evidence from Rural China." Journal of Agricultural Development, 25(4), 345-360. [ScienceDirect Q3]

Zhang, L., Wang, J., & Chen, H. (2020). "Community Involvement in Agropolitan Development: Evidence from Rural China." Journal of Agricultural Development, 25(4), 345-360.

Zhang, L., Wang, J., & Chen, H. (2020). "Community Involvement in Agropolitan Development: Evidence from Rural China." Journal of Agricultural Development, 25(4), 345-360. [ScienceDirect Q3]