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Supporting and Inhibiting Factors for the Sustainability of Tobacco Farmers' Businesses in Various Agroecosystems in Kediri Regency

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ABSTRACT

Objective: *This study aims to analyze the factors that support and inhibit the sustainability of tobacco farmers' businesses in various agroecosystems in Kediri Regency.* ***Methods:*** *This study employed exploratory qualitative research methods, collecting data through in-depth interviews, observations, and document analysis from farmers, tobacco experts, companies, and the Agricultural Extension Agency.* ***Results:*** *The study indicates that the supporting factors for the sustainability of tobacco farmers' businesses include appropriate agroecosystem conditions, government support in the form of subsidies and training, as well as partnerships with the tobacco industry. However, the sustainability of this business also faces various obstacles, such as price fluctuations, dependence on intermediaries, limited access to capital and technology, and increasingly stringent regulations on the tobacco industry.* ***Novelty:*** *The differences in agroecosystems among the three sub-districts studied also impact the level of productivity and economic resilience of farmers. This study emphasizes the importance of government policies that are more pro-farmer and increasing access to more efficient agricultural technology to improve the competitiveness and welfare of tobacco farmers in Kediri Regency.*

INTRODUCTION

Indonesia is recognized as an agricultural country, with a significant proportion of its population engaged in farming. The agricultural sector contributes significantly to the national Gross Domestic Product (GDP), especially in the third quarter of 2023 at 13.57% (BPS, 2023). One of the strategic commodities in this sector is tobacco. Tobacco not only supports the local and national economy through employment absorption but also contributes to state revenues through exports and excise. Kediri Regency in East Java is renowned for its cultivation of tobacco. However, its land area and production volume are not as extensive as those of other regencies, such as Jember and Pamekasan. Kediri still holds an important position due to its diverse agroecosystems and its connection to the large cigarette industry based in the region. However, tobacco farming in Kediri faces various challenges, including dependence on middlemen, significant fluctuations in selling prices, limited capital and technology, and the influence of increasingly stringent regulatory policies in the cigarette industry.

In the context of sustainability, it is important to see how tobacco farming can survive and thrive amidst economic, social, and environmental dynamics. Sustainability, as defined by the Brundtland Commission (1987), emphasizes meeting the needs of the present without compromising the ability of future generations to meet their own needs. In agricultural practice, this means maintaining productivity while protecting natural resources and enhancing farmers' capacity to adapt to change.

The main problems faced in tobacco farming in Kediri include several crucial interrelated aspects (Safitri, 2021). High dependence on middlemen weaken farmers' bargaining position, especially when the selling price of tobacco experiences sharp fluctuations that are not comparable to production costs (Kemenko, 2024). Additionally, limited access to capital, modern agricultural technology, and market information hamper the productivity and efficiency of farming businesses. On the other hand, increasingly stringent regulations in the cigarette industry, both in terms of excise and consumption control, also add pressure to the sustainability of the tobacco business chain. The three sub-districts that served as the study locations also exhibited different variations in problems, depending on the characteristics of the agroecosystem and the socio-economic patterns of the farmers.

This research is urgent because few in-depth studies focus on the sustainability of tobacco farming within the context of different agroecosystems in a single district. By selecting three sub-districts — Grogol, Banyakan, and Tarokan — this study aims to comprehensively describe the variations in conditions faced by farmers and the adaptation strategies they employ. This understanding is expected to serve as the basis for evidence-based policy-making that can enhance the sustainability of tobacco farming.

RESEARCH METHOD

This study uses an exploratory qualitative approach. The primary focus of the study is to explore the experiences, understandings, and strategies employed by tobacco farmers to maintain the sustainability of their businesses amid changing conditions (Lagiman, 2020). The research locations were selected purposively in three sub-districts: Grogol, Banyakan, and Tarokan, each with unique agroecosystem characteristics. The research subjects consisted of active tobacco farmers, representatives from the Agricultural Extension Agency (BPP), industry players (PT Shadana), and local agricultural experts and observers. The selection of informants was carried out purposively, considering their direct involvement and understanding of tobacco sustainability issues (Hashanah, 2017; Lagiman, 2020).

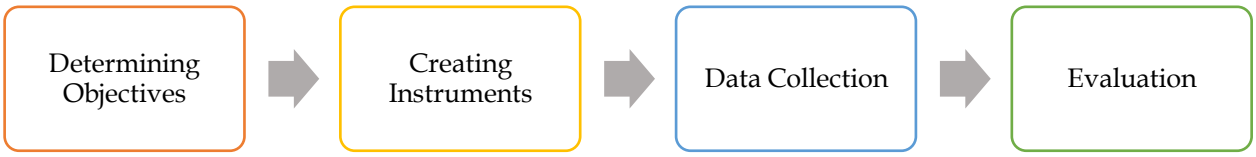

Figure 1. Research flow

Data collection techniques are carried out through:

1. In-depth interviews with semi-structured guidelines,
2. Direct observation to agricultural land,
3. Documentation in the form of field photos, BPP documents, and secondary data from the Department of Agriculture.

Data analysis was conducted using the interactive model of Miles and Huberman (1994), which includes data reduction, data presentation, and drawing conclusions and verification. Data validity is maintained through triangulation of sources and techniques. With this method, researchers can explore rich and in-depth contextual information, gaining a more accurate understanding of the factors that influence the sustainability of tobacco farming.

RESULTS AND DISCUSSION

Results

This study was conducted in three different sub-districts in Kediri Regency, which represent variations in agroecosystems: Grogol, Banyakan, and Tarokan Sub-districts. This study highlights economic, social, environmental, and agroecosystem factors that contribute to or hinder the sustainability of tobacco farming. The following table presents a comprehensive comparison of conditions in the three sub-districts.

Table 1. Analysis of economic, social, and environmental factors of tobacco farmers in three districts in Kediri Regency

Aspect	Grogol District	Banyakan District	Tarokan District
Economy	– Partnership with PT Shadana – DBHCT access- Production costs ± Rp 4 million/season – Marketing to partners or collectors Challenges: fertilizer prices are rising	– Not all farmers are partners – Production costs IDR 1.3–3 million/season – Capital from previous harvests/livestock Market access is difficult due to topography	– Partnership with PT Shadana – Production cost IDR 3–3.9 million/season Depending on non-subsidized fertilizer – Selling price drops during the rainy season
Social	– Active farmer groups – Regular training – Strong farmer communities with extension workers	– Farmer solidarity is quite high – Lack of advanced training – Dependence on middlemen	– No active farmer groups – Farming practices tend to be individual – Limited access to information
Environment	– Stable topography – Diverse water sources: irrigation, rivers, wells – Implementation of environmentally friendly agriculture	– High erosion risk – Depends on rainfed crops – Use of drought-resistant varieties	– Prone to flooding during rainy season – Poor drainage – High risk of crop failure
Agroecosystem	– Lowlands & small hills	– Medium to high hills	– Lowlands & basins – Saturated clay soils

Aspect	Grogol District	Banyakan District	Tarokan District
	– Rice fields & state forests – Complete irrigation system	– Clay & sandy soil-Borehole irrigation	– Limited irrigation, drainage crucial
Supporter	– Kemitraan industri – Bantuan DBHCT – Komunitas Kelompok tani – Pelatihan budidaya berkelanjutan	– Drought-resistant varieties – Agricultural equipment assistance – Drilling wells	– New cooperative program underway – Adaptation of wetland techniques – BLT Farm Workers
Inhibitor	– Harga pupuk mahal – Ketergantungan input eksternal – Regenerasi petani minim	– Difficult market access – Not all farmers understand new technology – Limited capital	– Poor drainage – Prices drop during the rainy season – Low leaf quality due to waterlogging

According to the research results, Grogol District demonstrated the most stable performance in supporting the sustainability of the tobacco business (Lagiman, 2020; Suud et al., 2023). This is supported by a strong partnership between farmers and PT Shadana, which provides guaranteed purchase prices and technical training. The government also supports this initiative through the Tobacco Excise Revenue Sharing Fund (DBHCT) and the development of active farmer groups. Environmentally, Grogol has a mixed topography that is not extreme, and it has diverse water sources, making the risk of crop failure lower than in other areas. Meanwhile, Banyakan District faces significant challenges in terms of water availability and market access due to its hilly land contours. However, farmers in this area can adapt by using drought-resistant varieties and a drilled healthy system (Gapari, 2020). Social solidarity among farmers is still maintained, but training and assistance from the government have not been distributed evenly throughout the region. Some farmers have also not established partnerships, so they continue to rely on intermediaries in the marketing process.

On the other hand, Tarokan District has more complex challenges, especially from an environmental perspective. Lowlands and poor drainage systems cause the land to be often flooded during the rainy season, which has a direct impact on the quality and quantity of tobacco harvests (Ibrahim et al., 2022). Limited agricultural infrastructure, inactive farmer groups, and dependence on non-subsidized fertilizers worsen the situation. Although cooperative programs and agricultural assistance are available, their implementation in the field remains suboptimal. From an economic perspective, farmers in all three districts face similar challenges, including fluctuating tobacco prices and rising production costs, particularly for fertilizer and labor. Dependence on intermediaries remains high, particularly in areas without formal partnerships. From a social perspective, the existence of farmer groups and communication between farmers and extension institutions greatly influence business sustainability. Grogol excels in this regard, while Tarokan lags. From an environmental perspective, the success of

sustainability is highly dependent on the ability to adapt to land and climate conditions, where Grogol and Banyakan show a more adaptive response than Tarokan.

Discussion

This discussion examines the main findings obtained from the field and relates them to the theory of sustainable agricultural enterprise, production, and agroecosystems. The three sub-districts where the research was conducted—Grogol, Banyakan, and Tarokan—displayed distinct dynamics in the economic, social, environmental, and technical aspects of cultivation, which collectively influenced the level of sustainability of tobacco farming.

1. Supporting Factors for Sustainable Tobacco Farming Business

According to the research results, Grogol District demonstrates a relatively good sustainability of the tobacco business. This aligns with the sustainability theory proposed by the Brundtland Commission, which states that sustainable development must meet current needs without compromising the ability of future generations to meet their own needs. In this context, Grogol has established a good partnership with PT Shadana, gained access to the Tobacco Excise Revenue Sharing Fund (DBHCT), and has active farmer groups that support both social and institutional aspects. Access to training and extension also helps farmers in implementing efficient and more environmentally friendly cultivation practices.

Based on the agroecosystem theory proposed by Miguel Altieri, success in agricultural systems depends on the interaction between ecological and socio-economic elements. In the case of Grogol, friendly topography, sound irrigation systems, and the availability of surface water and wells contribute positively to the stability of the agroecosystem. Farmers can organize planting and harvesting patterns more effectively, allowing for two tobacco planting seasons to be carried out with stable productivity. In addition, farmers' awareness of the importance of environmentally friendly agriculture has begun to form, as evidenced by training in the use of organic fertilizers and waste management (Sud et al., 2023; Masuda & Misumi, 1971).

In Banyakan, although not all farmers are in partnership with tobacco companies, there are efforts to adapt from an environmental perspective through the use of drought-resistant tobacco varieties and the use of drilled wells. This shows that sustainability is not only determined by external assistance but also by local innovation and adaptation carried out by farmers. The social aspect in Banyakan is also relatively strong, as reflected in the spirit of cooperation in land management and product processing. The Cobb-Douglas production theory is also relevant in explaining the efficiency of production input use in Banyakan, where farmers strive to optimize the utilization of family labor and minimize production costs through business diversification, such as livestock farming.

Meanwhile, Tarokan District still faces serious challenges in achieving sustainability. Despite efforts by the village government and extension workers to form cooperatives and introduce wetland farming techniques, environmental conditions such as poor

drainage, water-saturated clay soil, and frequent flooding during the rainy season make tobacco productivity unstable (Budi et al., 2018). This concept is based on the agroecosystem concept, which posits that an imbalance between the physical conditions of the environment and cultivation practices can lead to the degradation of the agricultural system. The absence of active farmer groups also has an impact on the lack of technological innovation and the low bargaining power of farmers against intermediaries.

2. Factors Inhibiting the Sustainability of Tobacco Farming Business

Fluctuations in tobacco prices are the main inhibiting factor that occurs evenly across the three sub-districts. Farmers often lack a bargaining position in determining selling prices, so they rely on unstable market conditions. When production is high, and demand is low, tobacco prices can drop drastically to below production costs. This causes farmers to suffer losses or even stop growing tobacco in the following season. Dependence on intermediaries also exacerbates this condition, particularly for farmers in Tarokan and Banyakan who lack direct access to the processing industry.

The rising prices of fertilizers and other production inputs pose a serious challenge, especially since many farmers lack equal access to subsidized fertilizers. In Grogol, although subsidies are available, not all farmers receive sufficient rations due to limited government quotas. In Tarokan, most farmers purchase fertilizers from public markets at significantly higher prices, which has an impact on decreasing their profit margins.

Access to modern technology is also not evenly distributed. Most farmers still use traditional tobacco drying techniques, such as sun drying, which is highly dependent on weather conditions. The quality of manually dried tobacco tends to be inconsistent, which affects its market selling price. Only a small number of farmers in Grogol have used mechanical dryers assisted by industry partners. This highlights the importance of increasing access to suitable technology to enhance production efficiency and improve the quality of tobacco products.

On the regulatory side, the government's increasingly stringent rules on nicotine levels, the prohibition of land clearing by burning, and restrictions on the distribution of tobacco products have a direct impact on small farmers. Many farmers lack adequate information or fail to understand the implications of these regulations. These regulations, although aimed at promoting public health and environmental sustainability, need to be communicated inclusively so that farmers do not feel burdened or left out during the transition process.

3. Implications for Sustainability and Practical Recommendations

Field findings show that the sustainability of tobacco farming is highly dependent on the synergy between institutional support, local adaptability, and strengthening farmer capacity. Grogol District is an example of how collaboration between farmers, government, and industry can produce a more stable, sustainable, and competitive tobacco farming system. Most show potential for adaptation through an agroecology-based approach, while Tarokan still requires more decisive structural intervention, both in terms of infrastructure and institutions.

More contextually and responsively tailored policies are needed to address the unique characteristics of each agroecosystem. Local governments can expand the scope of subsidies and technical training, especially for farmers in vulnerable areas such as Tarokan. Strengthening institutions through the revitalization of farmer groups and cooperatives can improve farmers' bargaining position in the tobacco value chain. In addition, efficient and affordable technology transfer must continue to be developed and disseminated to improve production quality and reduce dependence on conventional practices. Thus, the sustainability approach in tobacco farming cannot be separated from the integration of ecological, social, and economic factors. This study confirms that sustainability is not the result of a single aspect but rather the result of systemic interactions between actors, policies, and the production environment.

CONCLUSION

Fundamental Finding : This study finds that the sustainability of tobacco farming in Kediri Regency is shaped by environmental, social, and economic factors specific to each agroecosystem. Grogol District shows the highest sustainability due to strong industry partnerships and policy support, while Banyakan and Tarokan face challenges in infrastructure, technology, and market access. Key issues include price fluctuations, dependence on intermediaries, and regulatory pressures, highlighting the need for an agroecosystem-based approach and stronger farmer institutions. **Implication** : This study suggests that sustainable tobacco farming necessitates a collaborative approach that involves farmers, the government, and industry rather than relying solely on capital or one-sided policies. Strengthening farmer groups, providing suitable technology, and tailoring policies to local conditions are key. Enhancing farmer capacity through education, training, and access to information is also crucial for addressing challenges such as climate change and regulatory pressures. **Limitation :** This study has several limitations. First, the data obtained are qualitative and exploratory, so the generalization of the results is limited to the local context of Kediri Regency, especially the three sub-districts studied. Second, this study has not quantitatively measured land productivity, farmers' net income, or a more detailed cost-benefit analysis. Additionally, time constraints and limited field access have prevented researchers from exploring the dynamics of farmers' social relations in depth, including the influence of gender, the role of the younger generation, and potential agrarian conflicts. **Future Research** : Future research should explore the sustainability of tobacco farming more comprehensively using a mixed methods approach. Expanded areas of study include inter-district or inter-provincial comparisons, productivity and economic efficiency analysis, and the long-term impact of excise policies. Longitudinal studies are also important for tracking changes in cropping patterns, climate adaptation, and socioeconomic shifts. Additionally, the roles of women and youth in promoting farming sustainability deserve further attention as part of efforts to regenerate farmers.

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AUTHOR CONTRIBUTIONS

Gabriella Maylani Prasetyaningrum: Conceptualization, Methodology, Validation, Formal Analysis, Resources, and Writing - Original Draft; and **Lucky Rachmawati**: Data Curation, Project Administration, and Writing - Original Draft. All authors have read and approved the final version of this manuscript.

DECLARATION OF COMPETING INTEREST

The authors declare no known financial conflicts of interest or personal relationships that could have influenced the work reported in this manuscript.

DECLARATION OF ETHICS

The authors declare that the research and writing of this manuscript adhere to ethical standards of research and publication, in accordance with scientific principles, and are free from plagiarism.

DECLARATION OF ASSISTIVE TECHNOLOGIES IN THE WRITING PROCESS

The authors declare that generative artificial intelligence (Gen AI) and other AI-assisted tools were used judiciously, not excessively, during the research and preparation of this manuscript. Specifically, ChatGPT was used for brainstorming; Grammarly for grammar and style correction. All AI-generated materials have been reviewed to strengthen data accuracy, completeness, and compliance with ethical and scientific standards. The authors are fully responsible for the final content of the manuscript.

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