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COCOA RESTORATION AND AGRIBUSINESS TRANSFORMATION: A SOCIO-ECONOMIC AND INSTITUTIONAL SUSTAINABILITY PERSPECTIVE

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Abstract
This study aims to analyze farmers' perspectives on cocoa sustainability, the urgency of restoration, and the impact of cocoa agribusiness restoration on farm productivity. The research was conducted in Luwu and Soppeng Regencies, South Sulawesi, from November 2023 to March 2024, using a quantitative approach and involving a sample of 135 cocoa farmers. A mixed-methods approach was employed, combining quantitative analysis through Structural Equation Modeling (SEM) using Smart PLS 4.0 and qualitative descriptive analysis.
The findings indicate that farmer institutions have a positive and significant effect on cocoa agribusiness recovery ($t = 2.719$, $p = 0.006$), underscoring the critical role of cooperatives, farmer groups, and government agencies in shaping norms, providing resources, and expanding networks to enhance production and marketing.
Conversely, farmers' social capital does not exhibit a significant influence ($t = 0.843$, $p = 0.399$), which is attributed to low community participation, limited access to information, and inadequate skills in agricultural product management.
These findings emphasize the importance of strengthening institutional frameworks and enhancing economic incentives to support sustainable transformation in the cocoa sector. The policy implications suggest the development of a restoration model that prioritizes economic and institutional dimensions as the main pillars of cocoa agribusiness sustainability.

Keywords:
cocoa restoration; sustainability agribusiness; social aspect; economic aspect; institutional aspect

1. Introduction

Cocoa is a superior commodity that is important to the Indonesian economy. According to Fahmid et al.(2022) Indonesia ranks as the third-largest global exporter of cocoa beans, following the Ivory Coast and Ghana, and is the leading exporter of cocoa beans in Southeast Asia. Cocoa plays an important role in the Indonesian economy as a foreign exchange earner, a source of farmer income, creating farmer jobs, encouraging agribusiness and agro-industry, and has a real role in regional development ((Managanta et al., 2019). Increasing the productivity of cocoa farming means that the income received by farmers will also be high. A large production output will also significantly impact the income of

cocoa farmers; the higher the cocoa production, the higher the income of cocoa farmers, and vice versa (Mulyo & Hariyati, 2020). There are several problems in cocoa agribusiness, such as the cocoa bean marketing system based on market mechanisms, where price formation occurs through the market's balance of demand and supply. Generally, farmers' quality of cocoa beans is still low, causing prices to fluctuate ((Purnami et al., 2018). The decline in cocoa production each year is influenced by area size and productivity, non-intensive land management, and land that is not optimally used. It is also influenced by pest and disease attacks, non-intensive maintenance, an ever-changing climate, and technical and non-technical obstacles (Mulyo & Hariyati, 2020); (Depparaba & Karim, 2019). Declining cocoa farming productivity is one of the socio-economic factors that influence the restoration of cocoa agribusiness. The productivity of cocoa farming is determined by various factors, including seeds, fertilization, maintenance (including pruning and weeding), and pest and disease control. With good seeds and maintenance (good agricultural practices - GAP), including fertilization and pest control, cocoa beans with high productivity and sound quality can be produced. Good quality cocoa beans produced by good clones through good cultivation will not be categorized as good quality if they do not undergo a good post-harvest process, especially a good fermentation process ((Ariningsih et al., 2021). Cocoa development in Indonesia faces several challenges. Mulia et al.(2019) showed that Indonesian cocoa has low productivity due to the lack of use of superior variety seeds. On the other hand, Arsal et al.(2019) reported that apart from low productivity, the problems faced include 1) price fluctuations and unstable commodity markets; 2) high prices of several production inputs; 3) cocoa marketing is related to institutional aspects of the trading system; 4) lack of business capital; 5) low knowledge and skills of farmers; 6) lack of use of agricultural technology so that optimal cocoa production is not achieved; 7) very low land optimization; and 8) management that is less intensive and still traditional, so that it is not economically efficient. Furthermore, Rifin (2013) reported that the cocoa marketing process is still hampered, and Indonesian cocoa's competitiveness is still low compared to other cocoa-exporting countries in the cocoa bean and processed markets. Problems arise in cocoa production centers, such as Soppeng Regency, where the cocoa plantations owned by the people are not managed well; this occurs in cultivation techniques, such as unbalanced fertilization, environmental sanitation, and pruning ((Depparaba & Karim, 2019). This also occurs due to farmers' lack of knowledge and technology use. However, farmers' lack of institutional role in plantation management reduces access to capital in managing cocoa plantations (Boansi et al., 2024). Therefore, the restoration of cocoa plantation agribusiness is an absolute necessity. The restoration (improvement) of farming is a human business activity that cultivates land to obtain plant or animal products without reducing the ability of the land concerned to obtain further results. Farming is an organization of nature, work, and capital, aimed at production in the agricultural sector. Farming is carried out so that farmers obtain continuous profits and are commercial (Rivanda et al., 2015). Restoration (improvement) of successful cocoa farming is a progressive and dynamic approach that focuses on strengthening resilience in creating a future to adapt and further optimize environmental goods and services as community needs change or new challenges arise (Somarriba et al., 2021).

Restoration is carried out to increase cocoa productivity and quality while making the livelihoods more sustainable. The initial step in cocoa plantation restoration is cultivation techniques, which include fertilization, garden sanitation, maintenance, and use of certified seeds, as well as harvesting and post-harvest techniques, including fermentation and drying techniques. On the other hand, farmer institutions should be empowered by stakeholders by strengthening efforts to measure the potential for increasing productivity through comprehensive restoration efforts from cultivation to marketing (Somarriba et al., 2021)). However, previous studies have primarily focused on technical aspects of cocoa cultivation and post-harvest handling, while limited attention has been given to the role of social capital and institutional strengthening in sustaining cocoa agribusiness restoration. This creates a research gap in understanding how social networks, trust, and farmer organizations contribute to improving productivity and resilience in cocoa farming systems. Therefore, this research aims to examine the Social Capital and farmer institutions that influence cocoa agribusiness restoration. The novelty of this study lies in integrating socio-economic dimensions—specifically social capital and institutional roles—into the restoration framework, which has traditionally emphasized technical and agronomic interventions. By doing so, this research provides a holistic approach to cocoa agribusiness restoration that addresses both production and sustainability challenges**.**

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2. Material and Method

This study used both quantitative and qualitative approaches. Quantitative analysis was conducted using SEM PLS, while the qualitative approach was through qualitative descriptive data analysis. The study was conducted in Soppeng and Luwu Regency, South Sulawesi Province from November 2023 to March 2024. The research location was intentionally selected (purposive sampling) with considerations adjusted to the research objectives. Soppeng and Luwu Regency were chosen as the research location because the area is one of the cocoa production centers in South Sulawesi.

Populations and Samples

The research population comprised all farmer groups in Soppeng and Luwu Regency. Multistage Random Sampling was used as the sampling technique. The selected farmers were the heads of farmer groups based on the results of the randomization that had been carried out.

The determination of the number of farmers who became sample respondents was based on the Slovin formula $n = N / (1 + (N \times e^2))$ with a margin of error of 5%, and 135 respondents

Slovin's formula: $n = N / (1 + (N \times e^2))$

3. Results and Discussion

The inner model test was used to evaluate the relationship between the latent constructs hypothesized in this study. Based on the PLS version 4.0 output, the following results were obtained.

Table 1. Hypothesis Test Table

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Information
Social Capital -> Agribusiness Restoration	0.059	0.105	0.141	0.415	**0.679**	**Rejected**
Economy Aspect> Agribusiness Restoration	0.768	0.777	0.121	6.334	**0.000**	**Accepted**
Institution -> Agribusiness Restoration	0.061	0.067	0.143	0.431	**0.667**	**Rejected**
Agribusiness Restoration → Cocoa Farm Productivity	0.696	0.702	0.094	7.363	**0.000**	**Rejected**

Based on the table above, it can be concluded that the hypothesis tests that have a direct influence on each variable are as follows: The analysis results processed using Smart PLS 4.0 obtained the path coefficients ($t = 0.415$, $p = 0.679 > 0.05$). It can be concluded that social capital does not have a positive and significant influence on cocoa agribusiness restoration in Soppeng and Luwu Regency, South Sulawesi, Indonesia. Thus, the hypothesis of this study was rejected.

The influence of economic aspects on cocoa agribusiness restoration shows path coefficients ($t = 6.334$, $p = 0.000 < 0.05$). It can be concluded that economic aspects have a positive and significant effect on cocoa agribusiness restoration. Thus, the hypothesis in this study is accepted

The influence of institutions on cocoa agribusiness restoration was analyzed using Smart PLS 4.0, which obtained the path coefficients ($t = 0.719$, $p = 0.667 > 0.05$). It can be concluded that the

institutional aspect has not a positive and significant influence on cocoa agribusinesses' restoration. Thus, the hypothesis of this study was rejected.

The effect of agribusiness restoration on increasing cocoa farm productivity shows path coefficients ($t = 7.363$, $p = 0.000 < 0.05$). It can be concluded that agribusiness restoration has a positive and significant influence on improving cocoa productivity. Thus, the hypothesis in this study is accepted."

Institutions Towards Agribusiness Restoration

Cocoa farmer institutions include the organizational structures, regulations, and policies related to cocoa production and marketing. a forum formed by cocoa farmers to fight for their rights and interests. This organization can be a farmer group, cooperative, or union. This organization can help farmers access financing, markets, technology and training. Farmer groups in each village/sub-district have accommodated other farmers by holding regular meetings, making it easier for farmers to exchange information and increase their knowledge and technology to increase cocoa farming productivity. This is supported by (Lestari & Idris, 2019), who found that meetings between group members, whether they are held by farmer groups, are a forum for gaining knowledge, exchanging ideas, experiences, knowledge, and innovations obtained from various sources to improve cocoa farming activities, as well as a forum for sharing information and as a means of discussion to obtain solutions to every problem in terms of cocoa cultivation or handling pests and diseases that attack cocoa plants and as a forum to become one of the places to collaborate with parties who understand their cocoa farming activities and cooperation between farmer groups and their members.

In addition, several farmer group members from several groups can be said to be less active or less participative in group meetings or gatherings. This is supported by (Lestari & Idris, 2019), who stated that the lack of activeness of group members in activities carried out by farmer groups (group meetings/gatherings) is due to the lack of guidance related to farmer group institutions and the lack of knowledge of farmers who are members of farmer groups regarding cultivation and post-harvest in cocoa farming. The activeness of farmer group members in increasing cocoa farming productivity, according to (Basri et al., 2023) states that increasing group member participation is also an effective strategic activity in increasing cocoa plant production. Participation among group members facilitates the implementation of activities and serves as a control for implementing government programs. Providing production inputs greatly helps farmer group members to stimulate and learn the knowledge provided to provide the best production results, such as rejuvenation, intensification, and rehabilitation activities.

Table. 2 Activeness of Extension Worker Visits

NO	Extension Worker Activity/Number of Attendance (Per Month)	Amount	Percentage (%)
1	1	60	44,44
2	2	75	55,56
	Total	135	100,00

Source: Data Processed

The number of extension workers who often visit farmer groups is 2-3 people who make visits. The percentage of field extension worker visits is routinely 1–2 times per month. Field extension workers visit 135 farmer groups once a month and 60 farmer groups twice a month. In addition, field extension worker visits to farmer groups mainly include visits and socialization with them. There are 75 farmer groups, or approximately 55,56%, that received visits and socialization.

Farmer groups often receive consultation from the Agricultural Extension Institution as many as 2-3 extension workers, with a percentage of extension workers visiting 1-2 times a month. In addition to making visits, agricultural extension workers socialize with the farmer groups. Visits and socialization are usually in the form of discussions or providing information, providing input, and helping farmers

solve problems in the field, especially in implementing their farming businesses in a better direction. This is supported by(Novianda Fawaz Khairunnisa et al., 2021) that the role of extension workers as motivators is to influence, encourage, and encourage farmers so that they are willing to make changes for the better.

Table 3. Presence of Government and Private Institutions

NO	Presence of Government and Private Institutions	Amount	Percentage (%)
1	0	34	25,19%
2	1	94	69,63%
3	2	7	5,18%
	Total	**135**	**100%**

Source: Data Source, 2023

Visits by Agricultural Institutions such as the Department of Agriculture, occur twice a year. Visits are only conducted twice a year to provide the realization of a program to increase cocoa farming productivity, which can benefit cocoa farmers in the future. Meetings or visits that are not often conducted include socialization, consultation, training, mentoring, and providing quality seed assistance. The realization of the productivity improvement program greatly helps cocoa farmers improve their skills and knowledge of cocoa cultivation to increase the productivity and quality of cocoa produced. This is the opinion of ((Manistasari & Nurhadi, 2015); (Arsal et al., 2020), who state that one of the things that can increase cocoa farming productivity is selecting superior seeds, participating in consultation farmer groups, and seeking information about cocoa farming through books and mass media. In addition, (Masahuri, 2022) stated something similar, namely, in plantation crop cultivation, one of the main aspects that must be fulfilled is that plant materials can consist of various types, such as seeds, seedlings, or several types of plant materials obtained from vegetative propagation, such as cuttings, grafting, grafting, and others are determining factors for the success of plantation production.

Agribusiness restoration in cocoa farming entails a comprehensive and adaptive strategy that enhances productivity and quality, while supporting sustainable livelihoods. Key measures include improved cultivation techniques—such as optimized fertilization, rigorous garden sanitation, consistent maintenance, and the use of certified seedlings—alongside refined harvesting and post-harvest processes like controlled fermentation and standardized drying. Additionally, empowering farmer institutions through stakeholder engagement is essential to assess and boost productivity across the full value chain, from cultivation to marketing ((Somarriba et al., 2021).

This study found that institutional variables do not influence cocoa agribusiness restoration or improve cocoa farming productivity. Research indicates that farmer producer groups play a pivotal role in enhancing technical efficiency and yield among smallholder cocoa farmers—they facilitate access to training, extension services, and agricultural inputs. Membership in these groups significantly improves productivity by enabling collective learning and better resource utilization ((Donkor et al., 2023).

Theoretically, social capital acts as a catalyst for collaboration and knowledge sharing, while institutions provide formal structures to regulate interactions and resource access. If these aspects do not function optimally, agribusiness restoration—which involves improving cultivation techniques, post-harvest processes, and marketing systems—cannot be achieved effectively. These findings underscore the need for an integrated approach that combines institutional strengthening with organizational behavior strategies, such as enhancing group leadership, providing participation incentives, and fostering more intensive communication, to ensure sustainable cocoa agribusiness restoration

Social Capital for Agribusiness Restoration

The study's finding that social capital variables do not significantly affect cocoa agribusiness restoration and productivity aligns with evidence that community support and sustainable land management are critical determinants. In particular, Peruvian cocoa farmers exhibited higher adoption of soil conservation and sustainable farming practices when embedded within strong community

networks, underscoring the importance of social support in driving agribusiness restoration ((Cancino et al., 2022). Similarly, (Tennhardt et al., 2022) found that environmentally friendly cocoa farms with greater community involvement and sustainable practices yielded higher productivity despite trade-offs. These patterns suggest that while social frameworks are necessary, their enabling effect often depends on tangible collective action and ecological stewardship enabled by strong community support.

Recent research highlights that inadequate social support and limited access to information can hinder productivity improvements in cocoa farming. For example, a study of sustainable practices in Ecuador and Uganda found that farmers lacking community training and reliable advisory services were less likely to adopt improved cultivation methods (Tennhardt et al., 2022). Similarly, structural and educational deficiencies in community-based cocoa land management systems reduce opportunities for sustainable resource use and productivity gains (Kouassi et al., 2023).

In the context of cocoa agribusiness restoration and social factors affecting cocoa farming productivity, the theory used in this study to explain the relationship between variables is Social Capital Theory, which refers to the social resources available to individuals or groups to achieve their goals. In cocoa agribusiness restoration, this theory is applied to understand how social support from local communities and farmer participation in restoration activities can increase available social capital and cocoa farming productivity.

In this study, social aspects did not influence cocoa agribusiness restoration due to the lack of support from the cocoa farming community in the research locations (Soppeng Regency and Luwu Regency). In addition, the lack of information and skills among farmers in managing agricultural products is also one of the inhibiting factors for cocoa agribusiness restoration. It can be concluded that social aspects, such as local community support, farming experience, farmer participation, and sustainable land management, can affect the success of cocoa agribusiness restoration and improve cocoa farming productivity. However, in this study, these aspects could not be applied due to the lack of support from cocoa farmers themselves. Therefore, the management of cocoa agribusiness restoration must consider social aspects related to local communities and farmers to increase cocoa farming productivity

The Influence of Economic Aspects on Cocoa Agribusiness Restoration

Economic conditions significantly drive the revitalization of cocoa agribusiness and yield improvements. For instance, access to agricultural credit in Ghana notably enhanced cocoa yields, reduced production costs, and increased income (Boansi et al., 2024). Similarly, in Indonesia, farm efficiency—positively influenced by factors like market access, high-quality seeds, and extension services—has been linked to increased cocoa productivity (Effendy et al., 2019).

Economic theory in agriculture emphasizes that price, production costs, and market access are central to farmers' decisions on production and marketing. These elements shape strategic choices such as crop investment, input use, and output volume. For instance, access to credit in Ghana led to higher cocoa yields, improved income, and reduced production costs ((Boansi et al., 2024). In Indonesia, enhanced market access and efficient resource use contributed significantly to cocoa farm productivity(Effendy et al., 2019)

In the context of cocoa agribusiness development, the potential success of restoration largely depends on strengthening economic aspects. If cocoa prices remain stable and profitable, production costs are minimized, and market access is expanded, cocoa agribusiness restoration will provide significant economic benefits to local communities. However, it should be noted that social and environmental factors also play a role in restoration success, so a more comprehensive analysis must consider the interaction among these factors. Economic aspects have a strong influence on the success of cocoa agribusiness restoration. Factors such as price, production costs, and market access are key elements that must be considered in policy planning and cocoa agribusiness development strategies. Nevertheless, integration with social and environmental factors is essential to ensure the sustainability of cocoa agribusiness restoration.

The Effect of Agribusiness Restoration on Cocoa Farm Productivity

Agribusiness restoration significantly enhances cocoa farm productivity through systematic rehabilitation measures—such as organic and mineral fertilization, improved pest and disease control,

and soil conservation. A field experiment in South Sulawesi reported that adding compost and fertilizer tripled cocoa yields compared to untreated controls ((Fungenzi et al., 2021). Broader agroforestry systems reviews confirm that rehabilitation and renovation strategies substantially improve yields and resilience across diverse regions, reinforcing the role of integrated restoration approaches ((Somarriba et al., 2021).

The role of agribusiness restoration in improving productivity is consistent with principles of sustainable agriculture, which emphasize meeting current production needs while safeguarding resources for future generations. Sustainable cocoa farming integrates productivity gains with ecological and social considerations, including soil and water conservation, reduced pesticide use, improved waste management, and farmer participation in decision-making. Agroforestry and organic farming systems are widely recommended as strategies to achieve these goals, while social dimensions—such as farmer welfare, market access, and financial inclusion—remain essential for inclusive and resilient restoration outcomes ((Somarriba et al., 2021)(Tennhardt et al., 2022).

Achieving sustainable cocoa agribusiness restoration requires an integrated approach that combines technical innovations with institutional strengthening. Technical measures such as organic fertilization, integrated pest and disease management, soil conservation, and the adoption of climate-smart technologies are critical for improving productivity and resilience. At the same time, institutional collaboration among farmer organizations, local governments, research institutions, and private stakeholders plays a pivotal role in facilitating knowledge exchange, resource mobilization, and technology dissemination. Strengthening farmer cooperatives and producer groups enhances collective action, enabling better access to markets, credit, and extension services. Additionally, government-led initiatives, including farmer training programs and capacity-building interventions, are essential to support the adoption of sustainable practices and improve long-term competitiveness in the cocoa sector ((Somarriba et al., 2021); (Donkor et al., 2023)

Cocoa agribusiness restoration plays a pivotal role in enhancing farm productivity and farmer welfare. High productivity not only improves farmer income but also ensures better bean quality and contributes to regional economic growth. Therefore, restoration strategies must be designed holistically, integrating technical, environmental, and social dimensions to achieve sustainable cocoa agribusiness development.

Conclusion

This study concludes that cocoa agribusiness restoration plays a vital role in improving farm productivity and farmer welfare. The findings indicate that economic factors—such as price, production costs, and market access—and restoration practices, including organic fertilization and integrated pest management, are the main drivers of productivity. Conversely, institutional and social dimensions showed no significant effect, highlighting that formal structures alone are insufficient without leadership, participation, and technical capacity. Therefore, achieving sustainable cocoa agribusiness development requires a holistic approach that integrates economic strengthening, technical innovation, institutional support, and social engagement through collaborative efforts among stakeholders.

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