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The impact of agribusiness sustainability practices on economic growth

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Abstract

This study aims to investigate how sustainability practices in the agribusiness sector contribute to sustainable economic growth within the green economy framework. The research employs the Smart PLS analytical method to examine the influence of agribusiness activities, renewable energy use, green technology adoption, Environmental, Social, and Governance (ESG) principles, and workforce welfare on business and economic sustainability. Findings reveal that agribusiness and green technology adoption are crucial drivers of business sustainability, which subsequently enhances economic sustainability. Additionally, workforce welfare significantly supports the uptake of green technology, indicating that well-supported human resources stimulate environmentally friendly innovation. The study concludes that embedding sustainability practices into agribusiness strategies is essential not only for achieving immediate economic gains but also for promoting long-term, inclusive economic growth. Practically, these insights offer valuable guidance for business actors and policymakers aiming to develop an adaptive agribusiness sector responsive to environmental and social dynamics.

Keywords: Agribusiness, Economic growth, Green technology, Renewable energy, Sustainability, Workforce welfare.

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1. Introduction

The previous studies in Indonesia demonstrate that various sustainability initiatives in the agribusiness sector have positively impacted economic growth while supporting environmental sustainability goals.

- Implementation of Sustainable Agriculture in Indonesia

A study by the Ministry of Agriculture [1] highlights government initiatives to promote sustainable agriculture through programs such as the development of organic farming and eco-friendly technologies. These initiatives have had a positive

impact on food security and economic growth in several regions of Indonesia. Additionally, the programs encourage efficient use of natural resources, aligning with national sustainability targets.

- Application of ESG Principles in Agribusiness

According to a report by Sinar Mas Group [2], major companies like PT Astra Agro Lestari have integrated Environmental, Social, and Governance (ESG) principles into their business strategies to reduce greenhouse gas emissions and enhance sustainability. The study emphasizes how sustainability practices in the agribusiness sector can strengthen long-term economic growth by mitigating the environmental impacts of intensive agricultural activities.

- Renewable Energy in Agriculture

A study by the Central Statistics Agency [3] reported that the use of renewable energy sources, such as solar panels in agricultural areas of Bali and Central Java, has increased energy efficiency and helped farmers reduce their reliance on fossil fuels. The implementation of these technologies is also associated with improved crop yields and increased farmer incomes, contributing to local economic growth.

- Smart Farming Initiatives and the Use of Green Technology

Research conducted by WWF Indonesia [4] shows that green technology-based smart farming has been adopted in several regions to address environmental challenges. Technologies such as automated irrigation systems and the use of organic fertilizers have demonstrated the potential to increase productivity while preserving environmental sustainability, ultimately contributing to greener economic growth.

2. Literature Review

2.1. Food Security and Agribusiness

Food security continues to be a major global concern, particularly as climate change intensifies environmental stresses on agricultural systems. Recent research by Padmaja et al. [5] underscores the significant role of pearl millet within the framework of the green economy. Pearl millet is notable for its ability to thrive in harsh, arid environments where many staple crops struggle, offering a highly nutritious food source rich in essential nutrients. This resilience not only contributes to mitigating the adverse effects of climate change but also supports sustainable food production systems that align with global food security goals. Pearl millet's drought tolerance and low water requirements position it as a strategic crop for regions vulnerable to climate variability.

Parallel to this, sorghum has gained recognition in Indonesia as a vital crop for sustainable agriculture, particularly in regions with marginal lands such as Nusa Tenggara and parts of Java. Sorghum shares similar environmental adaptability to pearl millet, capable of growing under limited rainfall and poor soil conditions while providing substantial nutritional benefits. This crop exemplifies the potential of climate-resilient agriculture to address local and national food security challenges, aligning with broader sustainability objectives. The cultivation of sorghum thus represents an eco-friendly agricultural practice that contributes both to environmental conservation and socioeconomic resilience.

Beyond the cultivation of resilient crops, agribusiness plays a crucial role in integrating food security with sustainable economic development, especially through urban agriculture initiatives. O'Hara [6] highlights how agribusiness in American urban centers has innovatively linked local food systems to wider economic frameworks, fostering pathways toward more equitable and sustainable urban economies. These initiatives not only improve access to fresh, nutritious food in densely populated areas but also create employment opportunities and promote community engagement. The lessons from American cities provide valuable insights for Indonesia, where rapid urbanization has intensified food security challenges in megacities like Jakarta, Surabaya, and Bandung.

Implementing similar urban agribusiness models in Indonesia could stabilize local food supplies by reducing reliance on imports, enhancing food system resilience, and supporting inclusive economic growth. Integrated urban agriculture combined with national food systems presents opportunities for job creation and poverty reduction, especially among marginalized urban populations. Moreover, these strategies contribute to environmental sustainability by reducing food miles, encouraging organic farming practices, and fostering circular resource use within urban ecosystems. Thus, urban agribusiness emerges as a promising approach to addressing both food security and sustainable economic development in the context of Indonesia's growing urban landscape.

2.2. Competitiveness and Workforce Welfare

Agribusiness plays a multifaceted role within the agricultural value chain, encompassing a wide range of activities that extend from the initial production of crops and livestock to processing, distribution, and marketing of agricultural commodities. Schmitz et al. [7] emphasize that agribusiness is not confined to large-scale operations alone but involves numerous small-scale actors, such as smallholder farmers, processors, traders, and retailers. This diverse network of stakeholders collectively forms the backbone of a resilient and sustainable agricultural economy. The inclusiveness of agribusiness in involving actors across various scales ensures that value creation is spread throughout the chain, thereby promoting economic sustainability and social equity. Moreover, the integration of small-scale players within the supply chain enhances local economies and strengthens food systems by increasing accessibility and efficiency.

Worker welfare is a critical component in sustaining the competitiveness and ethical standing of agribusiness. Minimum wage policies have historically been pivotal in protecting workers' rights and ensuring a baseline standard of living. Mayilyan and Torosyan [8] trace the origins of minimum wage laws back to late 19th-century New Zealand, marking the beginning of formal labor protections worldwide. Although the adoption and enforcement of these policies differ significantly across countries, minimum wages remain a crucial mechanism to shield vulnerable workers, particularly in sectors characterized by low pay and informal labor arrangements.

In Indonesia, the implementation of minimum wage regulations has played a significant role in safeguarding the welfare of workers, especially in sectors like agribusiness where labor conditions are often precarious. Similar to global trends, Indonesia introduced minimum wage policies in the mid-20th century, aiming to guarantee workers a minimum income threshold that supports basic living standards. Despite regional disparities in wage levels and enforcement, these policies are fundamental in addressing economic inequality and protecting labor rights. In industries such as manufacturing and agribusiness where a large portion of the workforce may face low wages and limited social protections minimum wage regulations serve as an essential tool to improve livelihoods and foster social justice.

2.3. Policies and Sustainable Economic Growth in Agribusiness

The traditional economic growth model, which heavily relies on human capital, technological advancement, and natural resource exploitation, has undeniably improved living standards and human welfare globally. However, Brears [9] critically points out that this rapid economic expansion has also generated significant environmental degradation, including resource depletion and pollution. Compounding this are modern challenges such as population growth, urbanization, rising poverty and inequality, and climate change, all of which exacerbate pressures on finite resources and deepen social disparities. In response, multilateral organizations and policymakers increasingly advocate for a shift toward a green economy one that promotes human welfare and social equity while actively minimizing environmental harm.

Figueras [10], through a critical medical anthropology lens, explores the socio-economic and political challenges faced by farmers in Mexico, revealing how traditional economic systems perpetuate exploitation and dominance by elites over marginalized agricultural workers. The prevalent use of pesticides in Oaxaca symbolizes the environmental and social costs of an exploitative agribusiness regime that marginalizes local farmers. This narrative resonates with the situation in Indonesia, where smallholder farmers often grapple with similar inequities. The dominance of large agribusiness interests and policies favoring mass production frequently neglect environmental sustainability and the welfare of farming communities, resulting in ecological degradation and socio-economic hardship.

Addressing these intertwined challenges necessitates a transformative shift toward sustainable agribusiness practices. In Indonesia, potential solutions include empowering farmers through organic farming methods, improving market access, and expanding sustainable agriculture education. These initiatives not only strengthen farmers' negotiating power but also foster an equitable and environmentally conscious agricultural sector, thus underpinning sustainable economic growth.

Agribusiness is also pivotal in the transition toward a sustainable hydrogen economy, especially through biomass utilization. Dasappa et al. [11] highlight biomass gasification as a core process in producing green hydrogen an environmentally friendly energy carrier that significantly reduces carbon footprints and supports ecological conservation. This technological innovation exemplifies how agribusiness can contribute to green economy objectives by integrating sustainable and forward-looking solutions.

Furthermore, integrating economic strategies with social and environmental responsibilities is essential for agribusinesses to reduce their ecological impacts and enhance their reputation among stakeholders [12]. The adoption of Environmental, Social, and Governance (ESG) principles has emerged as a fundamental approach in this regard. Popkova and Sergi [13] illustrate how agribusinesses in Central Asia have embraced ESG frameworks to boost productivity while safeguarding the environment and social welfare. Similarly, Indonesia's agribusiness sector particularly in commodities like palm oil, coffee, and cocoa faces environmental challenges such as deforestation and ecosystem disruption. Implementing sustainable planting techniques, efficient water use, and reducing harmful chemical applications are critical measures to mitigate these impacts.

Social responsibility, including fair labor practices, worker protections, and community engagement, forms a complementary pillar of ESG efforts in Indonesia. The government actively promotes these principles through initiatives like the Indonesian Sustainable Palm Oil (ISPO) certification, which enforces sustainable production standards. By fostering governance that prioritizes transparency and accountability, Indonesian agribusiness can align its growth trajectory with the broader goals of sustainable development, balancing economic advancement with social equity and environmental stewardship.

2.4. Education, Training, and Labor Dynamics in Agribusiness

Schmitz et al. [7] discuss how agricultural policies shape the structure of agribusiness by influencing labor dynamics. Such policies not only affect the labor market and income distribution but can also encourage rent-seeking behavior, where certain groups seek to gain economic benefits through manipulation or exploitation of the regulatory environment. Understanding the multifaceted impact of agricultural policies on labor is essential for crafting fairer, more effective policies that promote equitable growth within the agribusiness sector.

The role of timely and accurate information is particularly crucial for small-scale farmers, as highlighted by Dlamini and Ngulube [14] in their study of sugarcane farmers in Swaziland. In a sector pivotal to the Swaziland economy, small-scale farmers rely heavily on information related to legislative compliance, cultivation techniques, market trends, transportation logistics, and financial management. Agricultural extension officers, farmer groups, and modern communication technologies serve as key channels for disseminating this information, which is vital to improving farmers' productivity and livelihoods.

Indonesian small-scale sugarcane farmers face similar challenges in accessing essential information and resources. Like their counterparts in Swaziland, Indonesian farmers depend on agricultural extension services that bridge knowledge gaps and facilitate compliance with government regulations. Extension officers act as intermediaries, helping farmers adopt better farming methods, navigate market access, and enhance transportation logistics. Additionally, farmer groups create support networks that enable resource sharing and collective bargaining, strengthening market positions. The increasing use of digital

tools, including agricultural apps and social media platforms, is also empowering farmers to acquire timely information, thereby boosting overall productivity and well-being.

Finally, the transition to a sustainable hydrogen economy requires substantial workforce engagement and training. Goel [15] emphasizes that equipping workers with the necessary skills and education is fundamental to adopting new technologies, supporting climate action initiatives, and ensuring a successful energy transition. This highlights the broader need for continuous capacity building within sectors linked to agribusiness and green energy to foster innovation and sustainability.

2.5. Investment and Green Economic Resources

Gupta et al. [16] highlight the critical role that the green economy plays in facilitating the global transition toward sustainable energy systems. Central to this transformation is hydrogen technology, which offers promising pathways to significantly reduce carbon emissions and stimulate innovation within the energy sector. Hydrogen, especially green hydrogen produced from renewable sources, stands out as a clean energy carrier capable of decarbonizing sectors that are otherwise difficult to electrify. Achieving this low-carbon economy requires substantial investments in green infrastructure, including renewable energy generation, hydrogen production facilities, and distribution networks. Moreover, supportive government policies and regulatory frameworks are essential to foster market development and drive widespread adoption, ensuring that the energy transition is both effective and sustainable.

On the environmental front, Schmitz et al. [7] underscore the profound impacts of climate change on agriculture, noting that the sector not only suffers from changing weather patterns but also contributes to greenhouse gas emissions. Traditional agricultural practices, particularly intensive tillage, exacerbate global warming by releasing stored carbon from soils into the atmosphere. To address this, sustainable agricultural techniques such as zero tillage have gained prominence. Zero tillage helps sequester carbon in the soil, mitigating emissions while preserving crop yields. These environmentally friendly practices are vital for maintaining agricultural productivity in the face of climate challenges and aligning farming systems with broader sustainability goals.

2.6. Technology and Innovation

Climate-smart agriculture has emerged as a critical pillar within global agribusiness strategies designed to confront the pressing challenges of climate change. Essaber [17] explains that this approach aligns with the objectives of the Paris Climate Agreement by seeking to sustainably increase agricultural productivity while conserving natural resources for future generations. Through the adoption of environmentally friendly technologies and innovative farming practices, climate-smart agriculture equips farmers with tools to adapt to changing climatic conditions, improve food security, and stimulate sustainable growth within the agribusiness sector worldwide. Such strategies promote resilience and sustainability by integrating crop diversification, water management, soil conservation, and efficient input use.

Alongside agricultural innovation, digital transformation plays a pivotal role in shaping the modern economy, including agribusiness development. Ismailova et al. [18] discuss the rapid digitalization efforts in Kyrgyzstan, highlighting initiatives such as the National Strategy for Sustainable Development and the Digital Kyrgyzstan program aimed at advancing the country's digital economy. Although Kyrgyzstan experiences significant growth in digital sectors, Ismailova et al. [18] emphasize the need for ongoing research to better understand the emerging challenges and opportunities posed by this digital era. Digital technologies, including precision agriculture, data analytics, and mobile platforms, hold great potential to enhance productivity, market access, and resource management in agribusiness, thereby supporting sustainable economic development.

2.7. Investment and Resources in Sustainable Agribusiness

Agribusiness plays a pivotal role in advancing the principles of the circular economy to promote sustainable agriculture. Dankevych et al. [19] argue that implementing circular economy concepts within agribusiness enhances the use of renewable resources and boosts resource efficiency, thereby encouraging environmentally friendly farming practices. This approach not only minimizes waste and maximizes the reuse of inputs but also significantly contributes to reducing carbon emissions, a critical factor in combating climate change and promoting environmental sustainability. Circular economy strategies thus form an essential foundation for transforming agricultural systems into more sustainable and resilient models.

Complementing this, Oncel [20] underscores the vital importance of the green economy in achieving broader sustainability objectives and the Sustainable Development Goals (SDGs). The green economy focuses on steering investments towards eco-friendly economic activities, sustainable infrastructure, and assets that generate employment and income growth. By aligning economic development with environmental conservation, the green economy fosters inclusive well-being, ensuring that growth benefits both people and the planet. This framework positions sustainability not just as an environmental imperative but as a core driver of equitable economic progress.

However, critical perspectives such as that of Bernhold [21] caution against uncritical adoption of global value chain enhancement strategies in agribusiness. In Argentina, these strategies have disproportionately favored large corporations, often marginalizing smallholders and other stakeholders. Such disparities highlight the need for reevaluating value chain approaches to ensure that development efforts are inclusive and equitable, enabling all participants in the agribusiness sector to benefit fairly from growth opportunities. This critique serves as a reminder that sustainable agribusiness development must incorporate social equity alongside economic and environmental goals.

3. Research Method

This study employs the Smart PLS (Partial Least Squares) version 3 method [22], which is a variant-based Structural Equation Modeling (SEM) technique. This method is particularly suitable for modeling complex relationships between latent

variables, both exogenous and endogenous, consisting of multiple indicators. In the context of this research, exogenous variables such as agribusiness, renewable energy, green technology, ESG principles, and labor welfare are analyzed to examine their influence on the endogenous variables, namely business sustainability and economic sustainability.

The first stage of analysis with Smart PLS is to measure the validity and reliability of the measurement model (outer model). The indicators used to measure the latent variables are evaluated through factor loading, Average Variance Extracted (AVE), as well as reliability through Composite Reliability (CR) and Cronbach's Alpha. Once the measurement model is validated, the next step is testing the structural model (inner model) to analyze the relationships between the latent variables. The influence of exogenous variables on endogenous variables is measured through the path coefficient and tested for statistical significance using T-statistics and p-values.

Smart PLS 3 utilizes the bootstrapping technique to evaluate the statistical significance of the built model. This technique repeats the resampling process from the original data to generate a statistical distribution of the model estimates, which is then used to assess whether the relationships between variables are significant. In this study, bootstrapping is employed to ensure that the effects of agribusiness, renewable energy, green technology, and labor welfare on business and economic sustainability can be statistically proven.

The main advantage of the Smart PLS 3 method is its flexibility in handling complex models and its ability to analyze data that does not have to follow a normal distribution. This makes it an ideal method for this research, considering the complexity of the relationships between the variables under study. The use of Smart PLS 3 allows the researcher to capture both direct and indirect effects between variables, and the results of this study demonstrate that agribusiness and green technology have a significant impact on business sustainability, which, in turn, strongly affects economic sustainability.

4. Discussion

To provide an accurate translation of your statement, I believe you want it translated into English. Here's how it can be stated: "The results of the testing using the SEM model, based on Figure 1, are as follows:"

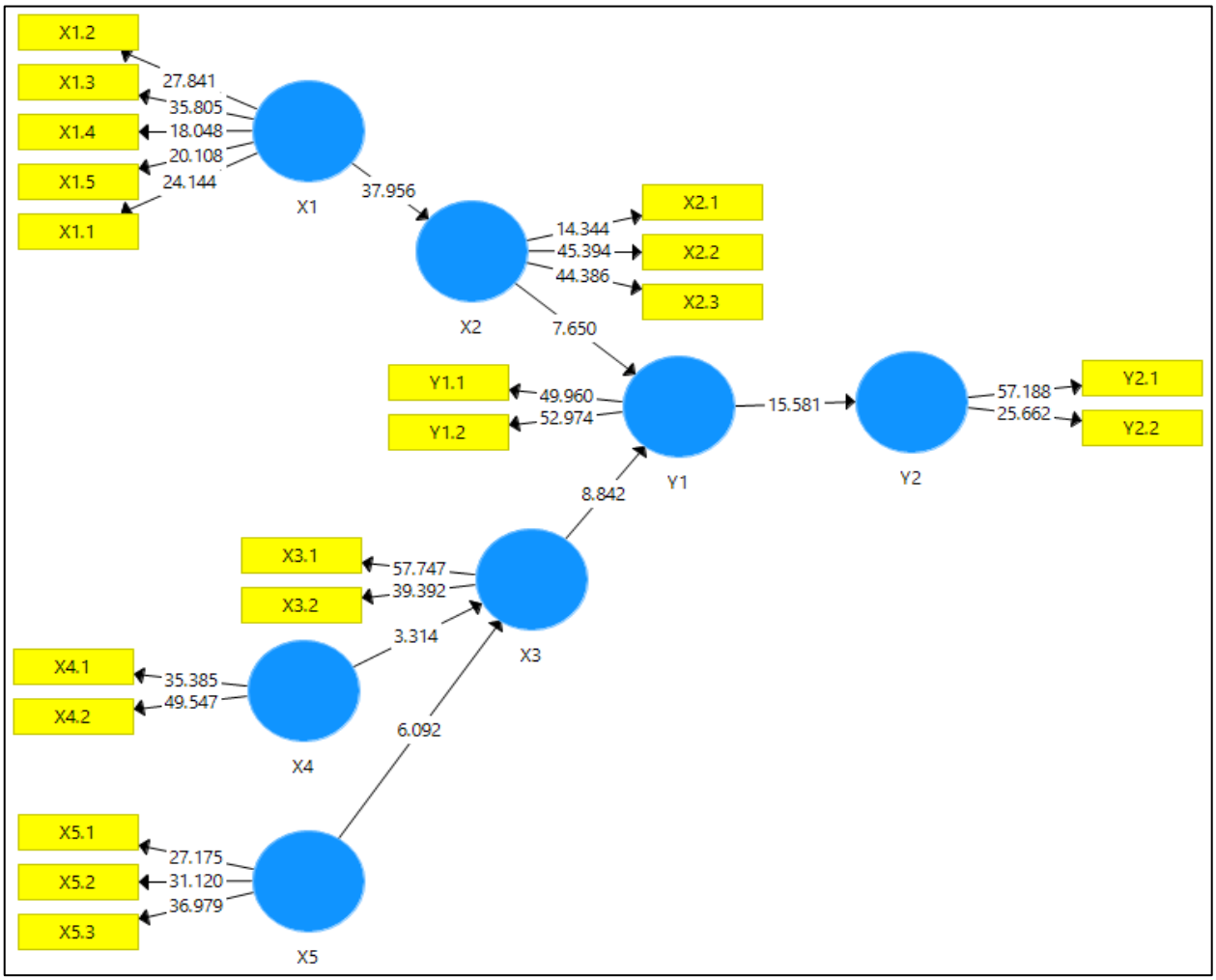

Figure 1.
Relationship of The Impact of Agribusiness Sustainability Practices on Economic Growth.

The results of the SEM model testing, as shown in Figure 1, indicate that Green Economy and Renewable Energy (X1, X2), with X1 (Agribusiness), have a strong influence on Y1 (business sustainability) with a path coefficient of 37.956. This shows that agribusiness managed with sustainability principles has a significant impact on the overall sustainability of the

agribusiness system. This value reflects the importance of implementing technology, innovation, and operational efficiency in the agribusiness sector to maintain business sustainability in the long term.

Next, X2 (Renewable Energy) shows a significant influence on Y1 with a path coefficient of 7.650. In other words, the greater the adoption of renewable energy in agribusiness, the greater its positive impact on business sustainability. Indicators of X2, such as X2.1 (14.344), X2.2 (45.394), and X2.3 (44.386), have high loadings, which emphasize the importance of renewable energy in achieving sustainability goals.

About Green Technology and ESG (X3), X3 (Green Technology and ESG) has a significant impact on Y1, with a path coefficient of 8.842. This means that the adoption of green technologies and ESG principles (Environmental, Social, and Governance) enhances the sustainability of agribusiness and company performance. This is reflected in the indicators X3.1 (57.747) and X3.2 (39.392), showing that the adoption of green technology and ESG policies significantly contributes to the strengthening of green performance in agribusiness, which ultimately affects overall business success.

In connection with Minimum Wage and Labor Welfare (X5), it is also shown that X5 (Wages and Labor Welfare) affects X3 with a path coefficient of 6.092, meaning that policies on minimum wage and good labor welfare contribute to the better implementation of green technologies and ESG policies within companies. Indicators X5.1 (27.175), X5.2 (31.120), and X5.3 (36.979) depict the important role of labor welfare in supporting sustainability and efficiency within agribusinesses.

Moreover, this study also discusses Business Sustainability (Y1) and Economic Sustainability (Y2), indicating that Y1 (Business Sustainability) has a significant effect on Y2 (Economic Sustainability), with a path coefficient of 15.581. This suggests that the higher the business sustainability performance in agribusiness, the greater the impact on overall economic sustainability. Indicators Y1.1 (49.960) and Y1.2 (52.974) show that these indicators are very strong in representing the business sustainability variable.

Y2 (Economic Sustainability), influenced by Y1, is measured by the indicators Y2.1 (57.188) and Y2.2 (25.662), confirming that business sustainability has a direct impact on the economy, especially in terms of resource use efficiency and competitiveness enhancement in the global market.

4.1. Relationship Between Variables

From these results, we can observe how the relationship between the exogenous variables (X1 to X5) and the endogenous variables (Y1 and Y2) influences each other in the context of agribusiness sustainability and the green economy. Several key points can be summarized from the path coefficients as follows:

- X1 (Agribusiness) has the largest influence on business sustainability, with a path coefficient of 37.956, emphasizing the importance of agribusiness efficiency in driving sustainability.
- X2 (Renewable Energy) and X3 (Green Technology and ESG) also make significant contributions to business sustainability (7.650 and 8.842, respectively), highlighting the importance of technological innovation and green policies in enhancing agribusiness performance.
- · Labor welfare (X5) affects X3 (path coefficient 6.092), indicating that fair labor practices also influence the company's ability to adopt green technologies and ESG policies.
- · Business Sustainability (Y1) has a strong direct influence on Economic Sustainability (Y2), with a path coefficient of 15.581, demonstrating the importance of business sustainability in supporting sustainable economic growth.

4.2. Practical Implications

The results of this analysis present several important implications for company management and policymakers:

- · Focus on Sustainable Agribusiness: With the significant path coefficient between X1 and Y1, efficient and sustainable agribusiness should be a priority to achieve broader economic sustainability.
- Investment in Renewable Energy and Green Technology: The path coefficient values for X2 and X3 show that increased use of renewable energy and green technologies can significantly strengthen the sustainability and productivity of companies.
- · Importance of Labor Welfare: Fair wages and labor welfare (X5) indirectly influence the company's ability to innovate and implement green policies, suggesting the need to invest in human resources as a supporting factor for sustainability.

Based on the data processing results using Smart PLS, the P-value can be seen in Table 1.

Table 1.
Variable measurement of the impact of agribusiness sustainability practices on economic growth.

Mean, STDEV, T-Values, P-Values					
	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
X1 -> X2	0.883	0.887	0.023	37.956	0.000
X2 -> Y1	0.465	0.466	0.061	7.650	0.000
X3 -> Y1	0.528	0.528	0.060	8.842	0.000
X4 -> X3	0.334	0.325	0.101	3.314	0.001
X5 -> X3	0.579	0.589	0.095	6.092	0.000
Y1 -> Y2	0.741	0.743	0.048	15.581	0.000

1. Green Economy and Renewable Energy (X1, X2)

- X1 (Agribusiness) to Y1 (Business Sustainability).
- Path Coefficient: 37.956 (P Value: 0.000).
- Analysis: This highly significant influence indicates that sustainable agribusiness not only ensures business continuity but also enhances competitiveness. This reflects the need for innovation and efficiency within the sector to adapt to sustainability challenges.
- X2 (Renewable Energy) to Y1:
- Path Coefficient: 7.650 (P Value: 0.000).
- Analysis: The higher the adoption of renewable energy in agribusiness, the more positive its impact on sustainability. This suggests that investing in renewable energy sources, such as solar or biogas, can be a key strategy for improving sustainability.

2. Green Technology and ESG (X3)

- X3 to Y1:
- Path Coefficient: 8.842 (P Value: 0.000).
- Analysis: The implementation of green technologies and ESG principles significantly enhances sustainability performance. The high loading indicators on X3.1 and X3.2 emphasize that innovative policies in green technology play a crucial role in supporting business sustainability.

3. Minimum Wage and Worker Welfare (X5)

- X5 to X3:
- Path Coefficient: 6.092 (P Value: 0.000).
- Analysis: Good worker welfare drives the adoption of green technologies. This highlights that companies that care about employee welfare will be more prepared to innovate and implement sustainability policies.

4. Business Sustainability (Y1) and Economic Sustainability (Y2)

- Y1 to Y2:
- Path Coefficient: 15.581 (P Value: 0.000).
- Analysis: This strong relationship indicates that business sustainability has a direct and significant impact on economic sustainability. Companies that successfully implement sustainable practices not only contribute to the continuity of their business but also to the overall health of the economy.

4.3. Relationships Between Variables

In the context of the green economy, the relationships among variables focusing on the sustainability of agribusiness and renewable energy are highly significant. X1 (Agribusiness) demonstrates a strong influence on Y1 (Business Sustainability) with a path coefficient of 37.956. This indicates that agribusiness practices managed with sustainability principles have a substantial impact on the continuity of the business. The implementation of technology, innovation, and operational efficiency in the agribusiness sector is critical to achieving this goal.

X2 (Renewable Energy) also significantly contributes to Y1 with a path coefficient of 7.650. The greater the adoption of renewable energy in the agribusiness process, the more positive the impact on sustainability. This is reinforced by indicators of X2, such as X2.1, X2.2, and X2.3, which highlight the importance of renewable energy in achieving sustainability.

Furthermore, X3 (Green Technology and ESG) significantly affects Y1, with a path coefficient of 8.842. The application of green technology and ESG principles has been proven to enhance sustainability performance in agribusiness. Indicators X3.1 and X3.2 demonstrate that adopting technology and ESG policies makes a significant contribution to strengthening green performance.

X5 (Minimum Wage and Worker Welfare) plays an essential role in influencing X3, with a path coefficient of 6.092. Effective policies regarding worker welfare contribute to improving the adoption of green technology and ESG policies within companies. This underscores the crucial role of investing in employee welfare to support sustainability.

Business sustainability (Y1) has a significant influence on economic sustainability (Y2), with a path coefficient of 15.581. This affirms that sustainability performance in agribusiness directly impacts economic sustainability. Indicators Y1.1 and Y1.2 highlight the strong representation of business sustainability variables, contributing to sustainable economic growth.

From this analysis, we can conclude that the relationships between exogenous variables (X1 to X5) and endogenous variables (Y1 and Y2) are interdependent in the context of sustainability. Efficient agribusiness, renewable energy, green technology, and worker welfare all contribute to broader economic sustainability.

The practical implications of these findings include the importance of focusing on sustainable agribusiness, investing in renewable energy and green technology, and paying attention to worker welfare. With a deeper understanding of these relationships, companies and policymakers can take strategic actions to support more sustainable and efficient practices.

5. Conclusion

This study shows that there is a significant relationship between variables in the context of agribusiness sustainability. Agribusiness (X1) has a very strong influence on business sustainability (Y1) with a path coefficient of 37.956. Renewable energy (X2) and green technology, along with ESG principles (X3), also significantly contribute to business sustainability. Worker welfare (X5) plays an important role in supporting the adoption of green technology. Lastly, business sustainability

(Y1) directly affects economic sustainability (Y2), demonstrating the importance of integrating sustainable practices into business strategies to support sustainable economic growth.

5.1. Recommendations

1. Focus on Sustainable Agribusiness: Companies should adopt sustainable agribusiness practices to enhance competitiveness and ensure business continuity.
2. Invest in Renewable Energy: Encourage the use of renewable energy in the agribusiness sector to strengthen sustainability and improve operational efficiency.
3. Enhance Worker Welfare: Develop fair wage and welfare policies that support innovation and the adoption of green technologies.
4. Strengthen ESG Policies: Integrate ESG principles into business strategies to improve sustainability performance and increase competitiveness in the global market.
5. Encourage Sector Collaboration: Foster collaboration between stakeholders, including the government and private sectors, to create an ecosystem that supports sustainability.

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