Optimizing Agricultural Food Institutions at the Farmer Level to Enhance Rice Productivity: A Strategic Approach for Sustainable Development

Emilia Istifadhoh[1*], Markus Patiung[2], Nughraini Susantinah Wisnujati[3]
[1]Department of Agribusiness, Universitas Wijaya Kusuma Surabaya, Indonesia
[2]Department of Agribusiness, Universitas Wijaya Kusuma Surabaya, Indonesia
[3]Department of Agribusiness, Universitas Wijaya Kusuma Surabaya, Indonesia.

[*]e-mail: emiliaistifadhoh@gmail.com

Abstract

This study aims to analyze the role of agricultural food institutions at the farmer level in enhancing rice productivity in Lamongan Regency, East Java. It examines the contributions of these institutions to productivity and identifies strategies to optimize their functions, thereby improving the overall business environment for farmers. Employing a descriptive research method with a survey design, primary data were collected through structured interviews and direct observations from agricultural extension workers and farmers, complemented by secondary data from relevant publications. The findings indicate that agricultural food institutions play a moderately effective role in boosting rice production, influenced by factors such as land ownership, farmer group participation, access to technology, and market access. Specifically, effective land management and high soil quality positively affect productivity, while appropriate technology and active engagement in farmer groups further enhance yields. However, challenges such as inadequate land management practices, the need for technological innovation, limited farmer participation in group activities, and insufficient market access hinder optimal productivity. This study contributes to understanding the intersection of institutional dynamics and agricultural productivity and offers insights for strengthening agricultural institutions to support sustainable agricultural development. Future research should explore different regions and crops and delve deeper into market dynamics, technological innovations, and policy interventions to enhance farmer welfare and productivity.

Keywords : agribusiness, agricultural food institutions, rice productivity, sustainable development

1. Introduction

East Java, one of Indonesia's most productive agricultural regions, plays a significant role in the country's rice production. The province is expected to generate 9.59 million tons of dry milled grain (DMG) in 2023, an increase of 0.68% from 2022, which produced 9.53 million tons (BPS Provinsi Jawa Timur, 2023). Of this, 5.54 million tons are allocated for domestic consumption, marking a slight rise from the 5.50 million tons produced in the previous year (BPS Provinsi Jawa Timur, 2023). While these figures demonstrate the province's capacity to contribute to national food security, several obstacles persist in achieving maximum productivity (Arif et al., 2020; Syaifullah, 2013). These challenges raise critical questions about how the agricultural sector, particularly rice farming, can be optimized through better institutional frameworks. In modern agriculture, high productivity is often directly linked to economic growth. Increased productivity not only ensures food security but also enhances farmers' incomes, elevating the overall economic stability of rural areas (Devereux, 2016; Fonta et al., 2011; Mwaniki, 2006; Timmer, 2000). By improving agricultural efficiency, farmers can reduce costs, increase yields, and improve the quality of their products, which ultimately leads to stronger market positioning. In the context of rice farming in East Java, however, the potential for further productivity gains remains largely

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untapped, due in part to underdeveloped agricultural food institutions at the farmer level. Strengthening these institutions presents a strategic opportunity to foster sustainable development within the region's agricultural sector.

Agricultural institutions, particularly those that function at the grassroots level, play an essential role in the agribusiness ecosystem (Degrande et al., 2012; Hermans et al., 2016). These institutions offer farmers access to vital resources, such as technology, financing, markets, and information, all of which are crucial for improving productivity and ensuring market competitiveness. Yet, in East Java, the institutional landscape remains fragmented. Farmers often face difficulties in organizing collective actions, accessing modern farming technologies, and engaging effectively with market mechanisms. This lack of cohesion between farmers, government bodies, and non-governmental organizations (NGOs) stifles their ability to maximize productivity (Suminah & Anantanyu, 2020). Furthermore, the limited understanding of the value of strong agricultural institutions hampers their adoption and integration into local farming practices. The business aspect of agriculture is increasingly relevant in today's globalized economy (Dicken, 2003; Hazell & Wood, 2008; Weis, 2007), where supply chains, market demands, and technological advancements are constantly evolving (Purboyo et al., 2021; Sari et al., 2021; Silitonga et al., 2020). Rice farming, once seen primarily as a subsistence activity, has now transformed into a commercial enterprise, with profitability hinging on efficiency, product quality, and market access. Farmers must navigate not only the production side of their operations but also the complexities of market dynamics, including price volatility, supply chain logistics, and consumer preferences. This transformation calls for a more sophisticated approach to agricultural management, where institutions at the farmer level act as critical intermediaries between individual farmers and the broader market economy.

Agricultural institutions in East Java, particularly in Lamongan Regency, could significantly contribute to increasing rice productivity by serving as platforms for collective action. For example, through better coordination and aggregation of resources, these institutions could facilitate bulk purchasing of inputs, such as seeds and fertilizers, at reduced costs. This would lower production expenses and increase profit margins for individual farmers (Fan et al., 2013; Madden, 1967). Moreover, institutions can negotiate better terms for farmers when selling their rice, helping to stabilize prices and secure better deals with buyers (Dawe et al., 2010; Demeke et al., 2012; Murphy, 2006; Streeten, 2016). Such coordinated efforts are particularly crucial in mitigating the risks posed by fluctuating market prices and ensuring that farmers receive fair compensation for their products. One of the key functions of agricultural institutions is to help farmers access new technologies, which can improve both the quantity and quality of rice production (Awotide et al., 2016; Mariano et al., 2012). In an increasingly competitive global market, farmers need to adopt modern farming techniques, such as precision agriculture, that use data-driven approaches to optimize resource use and enhance crop yields. Institutions can facilitate this transition by providing training, education, and financial support to farmers, enabling them to invest in advanced technologies. By embracing such innovations, farmers in East Java can increase their productivity, reduce waste, and improve the quality of their rice, which will ultimately enhance their competitiveness in both local and international markets.

Another critical role of agricultural institutions is in managing supply chains. For rice farmers in East Java, an efficient supply chain is essential for reducing post-harvest losses, maintaining product quality, and ensuring timely delivery to markets. Institutions can provide logistical support, helping farmers to store, transport, and process their rice more efficiently. This is particularly important in a region where infrastructure challenges, such as poor road networks and limited access to storage facilities, can hinder the movement of goods from farm to market. By improving

supply chain management, institutions not only help farmers maximize their returns but also contribute to food security by ensuring a stable supply of rice to consumers. Furthermore, agricultural institutions can play a pivotal role in providing farmers with access to financial services. Lack of capital is a common challenge faced by smallholder farmers, preventing them from investing in necessary inputs or scaling their operations. Through partnerships with financial institutions, agricultural cooperatives can help farmers secure loans or credit at favorable rates. This financial assistance enables farmers to purchase high-quality seeds, fertilizers, and machinery, which are essential for improving productivity. Moreover, access to credit can provide a safety net during difficult times, such as during periods of crop failure or market downturns.

In addition to these economic benefits, strong agricultural institutions contribute to the social fabric of rural communities. By fostering collaboration among farmers, institutions encourage knowledge sharing and collective problem-solving, which strengthens social capital and resilience within farming communities. This collaborative spirit is especially important in addressing common challenges, such as climate change, pest outbreaks, and resource scarcity. When farmers work together, they can share resources, pool risks, and develop innovative solutions that benefit the entire community. This study aims to analyze the role of agricultural food institutions at the farmer level in enhancing rice productivity in Lamongan Regency, East Java. By examining the contributions of these institutions to productivity, the research seeks to identify strategies that can optimize their functions and improve the overall business environment for farmers. The findings are expected to provide valuable insights into how agricultural institutions can be strengthened to support sustainable agricultural development, not only in East Java but also in other regions facing similar challenges. Furthermore, this research will contribute to the growing body of knowledge on the intersection of institutional dynamics and agricultural productivity, offering a framework for future studies and policy development in this critical area.

2. Method

This study employs a descriptive research method utilizing a survey design. According to Sugiyono (2017), survey methods are effective for collecting data from natural settings (as opposed to artificial environments) through the distribution of questionnaires, tests, or structured interviews. The objective is to gather comprehensive insights into the agricultural food institutions at the farmer level and their impact on rice productivity in Lamongan Regency, East Java.

Data collection for this research is conducted through various means and sources, classified as primary and secondary. Primary data is gathered directly from the original sources, while secondary data is obtained through intermediaries such as documents or other individuals. The techniques for data collection include interviews, questionnaires, and observations, or a combination of these methods (Sugiyono, 2017; Supriatin et al., 2022). This multi-faceted approach enhances the reliability of the findings by capturing diverse perspectives and data types.

The subjects or locations from which the data is obtained are referred to as data sources. In this study, the respondents for the questionnaires or interviews are individuals who provide answers either in written or oral form. Primary data is collected from agricultural extension workers and farmers through structured interviews and direct field observations. The data includes information about the farmers' identities, such as name, age, gender, education level, and work group, as well as institutional data concerning land area, farmer groups, and land ownership, collected from relevant publications by institutions like the Central Statistics Agency of Lamongan Regency.

The population for this study encompasses all units of analysis or measurement outcomes defined by specific criteria, including all farmers and agricultural land within Lamongan Regency. The population consists of two main groups: the farmers residing in the area and the agricultural

land itself. Sampling procedures are employed to select a subset of this population, utilizing probability sampling techniques to ensure that every member of the population has an equal opportunity to be chosen. The sample used in this research consists of farmers from Lamongan Regency.

Data collection instruments for this study include questionnaires and interviews. Sugiyono (2010) emphasizes that research instruments should be developed by first determining the variables to be investigated. Each variable is operationally defined, and specific indicators are identified for measurement. These indicators are then translated into a series of questions or statements. The measurement of data in this study uses ordinal data, facilitated by a "matrix for instrument development" or "instrument grid" to ensure accurate and relevant data collection. The operationalization of the variables is summarized in the following table:

Table 1. The operationalization of the variables

Variable	Indicator	Criteria	Score
Rice Productivity	Achieving rice harvest according to planned targets	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Producing high-quality rice	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Consistently increasing rice yields	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
Land Ownership	Managing land of high quality	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Properly managing land according to established stages	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Cultivating land that yields high rice productivity	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5

Variable	Indicator	Criteria	Score
Access to Agricultural Technology	Using agricultural technology effectively and optimally	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Utilizing effective planting methods to enhance satisfactory yields	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Availability of agricultural machinery for use	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
Farmer Groups	Actively sharing ideas and suggestions for agricultural improvement	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Participating in planning and implementing agricultural activities	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Having equal opportunities to contribute to agricultural planning	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
Market Access	Selling rice harvest at high prices	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5
	Having adequate market access for selling harvest	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5

Variable	Indicator	Criteria	Score
	Rice storage facilities assisting in the sale of harvest	a. Strongly disagree b. Disagree c. Neutral d. Agree e. Strongly agree	1 2 3 4 5

The data collected in this study focuses on optimizing food institutions at the farmer level to enhance rice productivity. The primary objective is to analyze the role of food institutions in improving rice productivity using Structural Equation Modeling (SEM) based on Smart PLS. This approach allows for a comprehensive understanding of both qualitative and quantitative aspects of the data. The research aims to provide a clear depiction of the actual conditions faced by farmers by collecting data from written farmer profiles and conducting direct interviews. The acquired data will be systematically described, categorized, and compared, enabling the identification of patterns and insights that are critical to achieving the study's objectives.

3. Result and Discussion

3.1 Characteristics of Respondents

In this study, we analyzed the characteristics of the 65 respondents involved in enhancing rice productivity. The distribution of respondents by gender reveals a significant majority of male participants, indicating a potential gender bias in agricultural involvement in the region.

Table 1. Percentage of Respondent Farmers by Gender

Gender	Percentage
Male	97.53
Female	2.57
Total	**100.00**

The data shows that 97.53% of the respondents are male, while only 2.57% are female. This stark disparity suggests that agricultural activities in the study area are predominantly undertaken by men, which may reflect broader societal norms and roles regarding gender in agriculture.

The age distribution of the respondents provides insight into the demographic profile of the farmers involved in the study.

Table 2. Percentage of Respondent Farmers by Age

Age Group	Percentage
18 - 28 Years	0.00
29 - 39 Years	23.10
> 39 Years	76.90
Total	**100.00**

The majority of the respondents, 76.90%, are older than 39 years, while 23.10% fall within the 29-39 year age bracket. Notably, there are no respondents in the 18-28 year category. This age distribution indicates that the farming population is predominantly older, which could have implications for the transfer of agricultural knowledge and practices to younger generations.

Next, we examined the educational background of the respondents, which plays a crucial role in their farming practices and productivity.

Table 3. Percentage of Respondent Education Levels

Education Level	Percentage
Elementary (SD)	4.00
Junior High (SMP)	32.30
Senior High (SMA)	57.50
Bachelor (Strata 1)	6.20
Total	**100.00**

The education levels reveal that 57.50% of respondents have completed senior high school, while 32.30% have completed junior high school. Only 6.20% hold a bachelor's degree, and 4.00% completed elementary school. This educational profile suggests that while a significant portion of farmers possess a reasonable level of education, there is still a limited representation of higher education, which may affect their access to advanced agricultural techniques and resources.

Finally, the occupational distribution of the respondents sheds light on their primary economic activities.

Table 4. Percentage of Respondent Occupations

Occupation	Percentage
Farmer	69.30
Student	1.50
Entrepreneur	21.50
Employee	7.70
Total	**100.00**

The data indicates that 69.30% of respondents are farmers, with 21.50% identifying as entrepreneurs and 7.70% as employees. A small percentage (1.50%) are students. This distribution highlights the dominance of farming as the primary occupation in the study area, underlining the critical role of agriculture in the local economy and community livelihood. The presence of entrepreneurs suggests an opportunity for agricultural diversification and innovation.

3.2 Evaluation of the Measurement Model

The correlation between indicator scores and construct scores can be used to evaluate the validity of reflective indicators. Reflective indicators demonstrate that changes in one measure within a construct coincide with changes in other indicators of the same construct. The following results were obtained using the SmartPLS software:

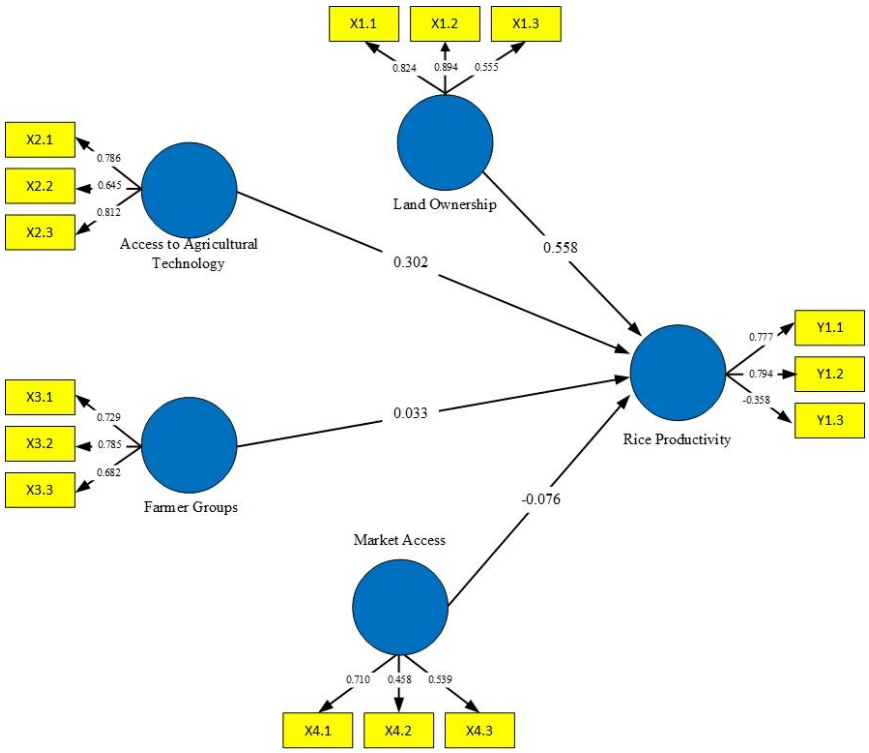

Figure 1. Output of Loading Factor Modeling

From the figure above, it can be seen that X1.1, representing the land ownership variable (X1), has a loading factor of 0.824. Since this value exceeds 0.6, it indicates a strong loading factor and can be considered a valid factor for land ownership. In contrast, the loading factor for X1.3 is 0.555, which falls below 0.6, leading to its exclusion from the model. For the technology access variable (X2), the factors X2.1, X2.2, and X2.3 are formed, with X2.1 and X2.3 being considered good as their values are above 0.6, while X2.1 is excluded from the model. In the case of the farmer group variable (X3), factor X3.3 has a value below 0.7, specifically X3.2, which is therefore removed from the model. For the market access variable (X4), two factors, X4.2 and X4.3, exhibit low loading factors and are consequently removed from the model. Similarly, in the productivity variable (Y), the factor Y1.3 has a loading factor below 0.7, resulting in its exclusion from the model.

3.3 Significance Testing

The significance testing in the PLS-based SEM model aims to assess the impact of exogenous variables on endogenous variables. Hypotheses are tested using the bootstrapping technique through SmartPLS software as the main analytical tool. The results of this test provide insights into the influence of exogenous variables on endogenous variables, as outlined below:

Table 3.1 Results of Bootstrapping Analysis

	Original Sample Estimate (O)	Sample Mean (M)	Standard Deviation (STD)	T Statistcs (IO/STDEVI)	P Values
Market Access (X4) -> Productivity (Y)	0.034	0.030	0.136	0.249	0.804
Technology Access (X3) -> Productivity (Y)	0.294	0.291	0.138	2.128	0.034

Farmer Groups (X2) -> Productivity (Y)	0.013	0.012	0.103	0.126	0.900
Land Ownership (X1) -> Productivity (Y)	0.496	0.506	0.138	3.592	0.000

The table above shows that the variable market access does not have a significant effect on productivity, as indicated by the P value of 0.804. Similarly, the farmer group variable does not significantly affect productivity, with a P value of 0.900. However, the variables that significantly affect productivity are technology access and land ownership.

3.4 Discussion

Land ownership plays a pivotal role in influencing rice productivity. Farmers who own their land demonstrate higher productivity levels compared to those who lease. This difference can be attributed to a stronger sense of ownership, which motivates farmers to maintain and manage the land more effectively. Personal ownership allows for long-term investments in land management practices that optimize productivity. On the contrary, farmers who lease land often lack the incentives to improve productivity since they do not fully reap the benefits of their efforts. Additionally, landowners enjoy greater control over agricultural practices, which further contributes to higher productivity, while tenant farmers face restrictions that limit their ability to implement optimal farming techniques.

Socioeconomic factors related to land ownership also affect productivity outcomes. Landowners typically have better access to key resources such as fertilizers, high-quality seeds, and advanced agricultural technologies. These resources are crucial for enhancing crop yields. In contrast, tenant farmers often face limitations in accessing these essential inputs, which hinders their productivity. Furthermore, urbanization and land conversion for non-agricultural purposes reduce the availability of agricultural land, negatively impacting overall rice productivity. Therefore, the relationship between land ownership and productivity highlights the importance of policies that support land tenure security and resource access for farmers.

Access to agricultural technology is another critical factor impacting rice productivity. The adoption of superior new varieties (SNVs) has been shown to increase rice production substantially, with studies reporting productivity gains of up to 8.85%. Additionally, modern farming techniques, such as Integrated Crop Management (ICM), optimize the use of resources like land and water, further improving productivity. The availability of these technologies empowers farmers to enhance efficiency and reduce losses caused by pests or suboptimal resource use. Moreover, access to agricultural extension services and training programs plays a significant role in facilitating the adoption of innovative technologies. Farmers who receive training on modern farming techniques can improve their yields more effectively. The use of smart agricultural technology, including IoT-based devices that assist in pest control and plant growth, offers further opportunities to boost productivity. Overall, technology access directly contributes to enhanced rice production and is a key driver of agricultural development.

The role of farmer groups in increasing productivity has been less significant in Lamongan. While farmer groups, such as those under the Farmer Group Sejahtera (TSNI), aim to promote collective action and resource sharing, several challenges have limited their impact. Resource constraints, including limited access to fertilizers and modern tools, remain a significant barrier. Furthermore, inadequate infrastructure hampers both the distribution of agricultural products and access to broader markets, making it difficult for farmers to fully benefit from their membership in these groups.

Low participation rates among members of farmer groups further weaken their effectiveness. This lack of engagement may be due to insufficient motivation or a lack of understanding of the benefits of collaboration. Without active participation, programs designed to increase productivity cannot be fully implemented. Moreover, many farmer groups lack adequate training in modern farming techniques, which is critical for improving productivity. Seasonal weather fluctuations and marketing challenges, such as price volatility and limited market access, also contribute to the limited success of farmer groups in enhancing productivity. Addressing these structural challenges requires more integrated efforts to empower farmer groups through training, improved resource access, and stronger marketing networks.

Market access, despite improvements, has not significantly impacted rice productivity in Lamongan. Economic institutions, such as agricultural cooperatives, play a weak role in supporting productive activities, leaving farmers without sufficient marketing and business management support. This weak institutional support hinders farmers from fully capitalizing on their production potential. Furthermore, price fluctuations, particularly during the harvest season, create uncertainty for farmers, discouraging them from increasing production. Infrastructure issues, including poor road quality and inadequate transportation facilities, also limit the benefits of improved market access. These logistical challenges prevent farmers from efficiently distributing their products to the market, reducing their ability to take advantage of favorable market conditions. Seasonal and environmental factors, such as bad weather during the harvest period, further complicate market access by affecting both crop quality and timing. Additionally, limited adoption of modern agricultural technologies and insufficient farmer training contribute to the underwhelming impact of market access on rice productivity. A comprehensive approach is needed to address these issues, with a focus on improving institutional support, stabilizing prices, and enhancing infrastructure to better support farmers in maximizing their productivity.

4. Conclusion

This study on optimizing agricultural food institutions at the farmer level to enhance rice productivity in Lamongan Regency, East Java, concludes that the role of these institutions is moderately effective in improving rice production. Key factors that influence productivity include land ownership, participation in farmer groups, access to technology, and market access. Land ownership, supported by effective land management and soil quality, directly boosts rice productivity. Similarly, the adoption of appropriate technology and efficient planting techniques has a positive impact on yields. Active engagement in farmer groups, where farmers collaborate and share knowledge for agricultural improvements, further enhances productivity. Market access, especially the ability to secure higher pricing, also plays a significant role in improving farmers' income and productivity. From a business perspective, optimizing these factors is essential not only for increasing productivity but also for ensuring the sustainability and profitability of the agricultural sector. However, the challenges that persist—such as inadequate land management practices, the need for technological innovation, limited farmer participation in group activities, and insufficient market access—hinder the full realization of the sector's potential.

This study is not without limitations. It focuses on a specific geographic area and crop, which may limit the generalizability of the findings. Additionally, external market conditions and government policy impacts were not fully explored. Future research should consider expanding the scope to include different regions and crops, as well as incorporating a deeper analysis of market dynamics, technological innovations, and policy interventions. A more in-depth exploration of the business models that could support the sustainability of agricultural food institutions would also provide valuable insights for enhancing farmer welfare and productivity.

References

Arif, S., Isdijoso, W., Fatah, A. R., & Tamyis, A. R. (2020). Tinjauan Strategis Ketahanan Pangan dan Gizi di Indonesia. *Jakarta: SMERU Research Instituate*.

Awotide, B. A., Karimov, A. A., & Diagne, A. (2016). Agricultural technology adoption, commercialization and smallholder rice farmers' welfare in rural Nigeria. *Agricultural and Food Economics*, *4*, 1–24.

BPS Provinsi Jawa Timur. (2023). *Data Produksi Padi di Provinsi Jawa Timur*. https://jatim.bps.go.id/id/pressrelease/2023/10/16/1385/produksi-padi-jawa-timur-pada-2023-sekitar-9-59-juta-ton-gabah-kering-giling--gkg-.html

Dawe, D., Block, S., Gulati, A., Huang, J., & Ito, S. (2010). Domestic rice price, trade, and marketing policies. *Rice in the Global Economy: Strategic Research and Policy Issues for Food Security. Los Baños, Philippines, International Rice Research Institute. 477p*.

Degrande, A., Franzel, S., Yeptiep, Y. S., Asaah, E., Tsobeng, A., & Tchoundjeu, Z. (2012). Effectiveness of grassroots organisations in the dissemination of agroforestry innovations. *Agroforestry for Biodiversity and Ecosystem Services–Science and Practice*, 141–164.

Demeke, M., Dawe, D., Tefft, J., Ferede, T., & Bell, W. (2012). *Stabilizing price incentives for staple grain producers in the context of broader agricultural policies: debates and country experiences*.

Devereux, S. (2016). Social protection for enhanced food security in sub-Saharan Africa. *Food Policy*, *60*, 52–62.

Dicken, P. (2003). *Global shift: Reshaping the global economic map in the 21st century*. Sage.

Fan, S., Brzeska, J., Keyzer, M., & Halsema, A. (2013). *From subsistence to profit: Transforming smallholder farms* (Vol. 26). Intl Food Policy Res Inst.

Fonta, W., Edame, G., Anam, B. E., & Duru, E. J. C. (2011). *Climate change, food security and agricultural productivity in Africa: Issues and policy directions.*

Hazell, P., & Wood, S. (2008). Drivers of change in global agriculture. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*(1491), 495–515.

Hermans, F., Roep, D., & Klerkx, L. (2016). Scale dynamics of grassroots innovations through parallel pathways of transformative change. *Ecological Economics*, *130*, 285–295.

Madden, J. P. (1967). Economies of size in farming. *Washington, DC*.

Mariano, M. J., Villano, R., & Fleming, E. (2012). Factors influencing farmers' adoption of modern rice technologies and good management practices in the Philippines. *Agricultural Systems*, *110*, 41–53.

Murphy, S. (2006). Concentrated market power and agricultural trade. *Ecofair Trade Dialogue, Discussion Papers*, *1*.

Mwaniki, A. (2006). Achieving food security in Africa: Challenges and issues. *UN Office of the Special Advisor on Africa (OSAA)*.

Purboyo, S. H., Kusuma, G. P. E., Sudirman, A., Sangadji, S. S., Wardhana, A., Kartika, R. D., Erwin, N. H., Syamsuri, S. S., & Marlena, N. (2021). *Perilaku Konsumen (Tinjauan dan Praktis)*. Bandung: CV. Media Sains Indonesia.

Sari, D. C., Wardhana, A., Darwin, M., Sulaiman, E., Rahmawan, G., Ridwan, M., Hastutik, S., Poltak, H., & Sangadji, S. S. (2021). *Manajemen Pemasaran*. Media Sains Indonesia.

Silitonga, H. P., Syamsuri, A. R., Halim, A., Haryani, D. S., Sangadji, S. S., & Samad, A. (2020). *PEMASARAN" Hasil pemikiran dari Para Dosen Berbagai Perguruan Tinggi di Indonesia (Book Chapter-)"*. Center for Open Science.

Streeten, P. (2016). *What price food?: Agricultural price-policies in developing countries*. Springer.

Sugiyono. (2010). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, kualitatif, dan R&D*. Alfabeta.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Suminah, S., & Anantanyu, S. (2020). Empowering poor-households women on productive economy businesses in Indonesia. *The Journal of Asian Finance, Economics and Business*, *7*(9), 769–779.

Supriatin, F., Marliana, I., S. Sangadji, S., Afkar, Paerah, A., & Dharta, F. (2022). *Metodologi Penelitian*. Cendikia Publisher. https://doi.org/10.31219/osf.io/ywemh

Syaifullah, Y. (2013). Ketahanan pangan dan pola distribusi beras di propinsi jawa timur. *JEJAK: Jurnal Ekonomi Dan Kebijakan*, *6*(2).

Timmer, C. P. (2000). The macro dimensions of food security: economic growth, equitable distribution, and food price stability. *Food Policy*, *25*(3), 283–295.

Weis, A. J. (2007). *The global food economy: The battle for the future of farming*. Zed Books.