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Analysis of Factors Influencing Rice Farming Production in Sawangan Magelang Regency

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Abstract

Sawangan District is a rice-producing area in Magelang Regency. The majority of its population relies on agriculture due to the region's significant agricultural potential. However, farmers face numerous challenges in rice production, including environmental, social, economic, and technological factors. This study aims to determine the factors influencing rice production by using a participatory approach that involves farmers in discussions during data collection. The method used in this study is descriptive quantitative, utilizing primary and secondary data. Data were processed using SPSS 16.0 software. The results of this study indicate that land area and seed quantity significantly influence rice production. Land area is the main determinant of rice production. According to classical production theory, land area is directly proportional to production. Meanwhile, seeds show a negative relationship with production: increasing the number of seeds planted leads to a higher seed density, resulting in suboptimal rice growth due to competition for nutrients, light, and root space. Other variables, namely age, education, number of workers, and amount of manure, do not significantly influence rice production. The results of this study are expected to inform policymakers in optimizing land use to increase productivity and determining the right number of seeds to achieve optimal production.

Keywords: farming; price; production; rice

Analisis Faktor-Faktor yang Memengaruhi Produksi Usahatani Padi di Sawangan, Kabupaten Magelang

Abstrak

Kecamatan Sawangan merupakan daerah penghasil padi di Kabupaten Magelang. Mayoritas penduduknya bergantung pada sektor pertanian karena potensi pertanian yang signifikan di tingkat regional. Namun, petani menghadapi berbagai tantangan dalam produksi padi, termasuk faktor lingkungan, sosial, ekonomi, dan teknologi. Penelitian ini bertujuan untuk mengetahui faktor-faktor yang memengaruhi produksi padi dengan menggunakan pendekatan partisipatif untuk melibatkan petani dan mengajak mereka berdiskusi selama proses pengumpulan data. Metode yang digunakan dalam penelitian ini adalah kuantitatif deskriptif, dengan menggunakan data primer dan data sekunder. Alat analisis yang digunakan adalah regresi linier berganda. Data diolah menggunakan perangkat lunak SPSS 16.0. Hasil penelitian ini menunjukkan bahwa luas lahan dan jumlah benih berpengaruh signifikan terhadap produksi padi. Luas lahan merupakan penentu utama produksi padi. Menurut teori produksi klasik, luas lahan berbanding lurus dengan produksi. Sementara itu, jumlah benih

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menunjukkan hubungan negatif dengan produksi, di mana peningkatan jumlah benih yang ditanam akan menghasilkan kepadatan yang lebih sempit, sehingga pertumbuhan padi menjadi suboptimal akibat persaingan untuk memperoleh nutrisi, cahaya, dan ruang akar. Variabel lain, yaitu usia, pendidikan, jumlah pekerja, dan jumlah pupuk kandang, tidak berpengaruh signifikan terhadap produksi padi. Hasil penelitian ini diharapkan dapat menjadi pertimbangan bagi para pembuat kebijakan dalam mengoptimalkan penggunaan lahan guna meningkatkan produktivitas dan memastikan jumlah benih yang tepat untuk mencapai produksi yang optimal.

***Kata kunci**: harga; padi, produksi; usahatani*

INTRODUCTION

Rice is a staple food for nearly 3.5 billion people worldwide, the majority of whom live in Asia (Hashim et al., 2024). As a staple food, rice is a primary source of carbohydrates enjoyed by all social classes, including the lower, middle, and upper classes. Rice is readily available, making it easy for people to consume it. Its price is relatively low and affordable, depending on the type of rice sold (Antriyandarti et al., 2024). Compared to other carbohydrate sources, rice has a higher glycemic index. A high glycemic index means rice is digested and absorbed more quickly by the body, causing a more rapid spike in blood sugar (Farooq & Yu, 2025). People are slowly becoming more health-conscious, especially those who believe that alternative carbohydrate sources can be obtained from higher-fiber commodities, such as potatoes, sweet potatoes, cassava, taro, corn, and grains. Nevertheless, rice remains a staple food source that is difficult to replace, especially since consuming rice has become a cultural and customary habit for Indonesians.

In Indonesia, demand for rice remains high and continues to rise with the growing population each year. Based on data from the United States Department of Agriculture, Indonesia is the 4th largest rice consuming country in the world (Antriyandarti et al., 2024). This condition is in line with global rice production and consumption, which have, for more than 20 years, been driven by population growth, rising food demand, and improvements in agricultural practices (Hashim et al., 2024; Widyawati et al., 2025). According to Habibah et al. (2024), almost all households in Indonesia use rice as their main source of carbohydrates. Central Java Province has the second-highest production and is the national food barn after East Java Province. One of the rice-producing areas is Magelang Regency, specifically in Sawangan Sub-district. Rice farming in Sawangan Sub-district is widely known and has become a pilot area for Asian countries in the application of organic rice farming. The area under organic rice cultivation has reached 2,000 ha in Magelang Regency, including Sawangan District (Setiawati et al., 2021). Organic farming is an effort and strategic step towards sustainable agriculture that is environmentally friendly and can meet the needs of domestic and international markets. Rice is a commodity that is vulnerable to production instability. Many factors affect rice production, including environmental, socioeconomic, and technological factors.

Land is a major factor as well as a production input that greatly affects rice productivity. A larger land area will provide the potential for higher yields. Data from the Central Bureau of Statistics (BPS)

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shows that the national rice harvest area tends to decrease every year. This decline is caused by a combination of natural and human factors, including the impact of climate change, massive conversion of agricultural land for industrial and office purposes, pest and disease attacks, and delays in the application of technology. The Central Bureau of Statistics (2025) recorded a 60.17 million-hectare decrease in the national harvest area in 2024, resulting in a decrease in production of up to 838 thousand tons. This decline in yields has a significant economic impact on farmers, the majority of whose income depends on grain sales. In addition, farmers also face socio-economic problems. According to Zakir et al. (2023) and Mantiri et al. (2019), the social and economic problems faced by farmers are limited access to capital and technology.

Farmers in Sawangan Sub-district are dominated by older farmers who have limited access to the latest information, especially new technology. Rapid changes in information flow cause farmers to stick to conventional cultivation techniques. They believe that the technique they have used is the best way and provides optimal results. On the other hand, farmers are also faced with the problem of erratic climate change. According to Hidayati & Suryanto (2015) and Herlina et al. (2018), climate change results in changes in annual patterns and crop yields. The research wants to examine what factors affect rice production in Sawangan Sub-district. The novelty in this research lies in its holistic approach by combining technical, social, and economic aspects in one analytical framework. This research aims to explore specific local dynamics in Sawangan Sub-district, such as local government policies, farmers' access to the latest technological information, and the level of agricultural technology adoption among local farmers. Thus, this research focuses not only on identifying factors that affect rice production, but also on recommending relevant policies that are based on the local context.

RESEARCH METHODS

This study employed a quantitative descriptive approach utilizing primary and secondary data. Primary data were collected through interviews using questionnaires and field observations, covering farmer age, education level, number of workers, land area, number of seeds, amount of organic fertilizer, and amount of inorganic fertilizer (Hashim et al., 2024). Secondary data were obtained from relevant agencies such as the Department of Agriculture, Statistics Indonesia (BPS), and supporting literature. The population in this study was rice farmers in Sawangan District, Magelang Regency. Additionally, a preliminary survey was conducted to obtain a general overview of farming conditions, such as rice production, fertilizer use, irrigation systems, pest control, and soil conditions.

The sampling method used purposive sampling, selecting respondents based on certain criteria, namely farmers actively cultivating rice in the study area. Simple random sampling was used, with the entire population having an equal chance of being selected. The sample size for this study was 30 respondents spread across all villages in Sawangan District.

The analytical tools used in this study were descriptive analysis and multiple linear regression analysis. Descriptive analysis is used to describe the general conditions of environmental, technical,

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economic, and social factors that influence rice production. The factors influencing production are explained as follows:

a. Environmental factors

The environment plays a crucial role in determining agricultural production levels. During each growth process, plants require optimal environmental conditions, such as climate, soil, and water availability, which are key factors in successful cultivation. Furthermore, temperature and sunlight intensity influence the rate of photosynthesis, rainfall and humidity determine water availability, and soil quality determines the plant's ability to absorb nutrients. Any component that is not in accordance will inhibit growth, reduce productivity, and even lead to crop failure. Climate, weather, and the dynamics that occur in the plant's growing environment are external factors that farmers cannot control, but they can adapt to changes that occur (Sairdama et al., 2025).

b. Technical factors

Modern agriculture is inextricably linked to the use of technology. This includes the use of agricultural tools and machinery, superior varieties, irrigation systems that make farming easier, and cultivation techniques that maximize production. Technology is used to facilitate land management, improve work efficiency and yields, and reduce labor costs (Abiri et al., 2023). Therefore, farmers' ability to access various technologies is a key factor in rice production.

c. Economic factors

Economic factors include rice selling prices, government support in the form of subsidies or technical assistance, farmer capital, and market supply and demand. A common problem faced by farmers is capital. Limited capital prevents them from adopting technologies and cultivation practices that can support production. In addition to capital, low farm-gate prices impact farmer income, especially if agricultural input prices continue to rise. The impact is on demand and supply which ultimately shifts the market equilibrium curve (Abokyi et al., 2020). Economic factors are crucial because they affect farmer welfare. Stable or increasing incomes will provide greater motivation for farmers to continue developing their businesses. This situation also influences the next generation's perception of the agricultural sector. When they see that agriculture can provide a decent and sustainable income, their interest in engaging in agricultural activities will increase. Conversely, if farmer incomes are uncertain and tend to be low, the younger generation will view agriculture as a less promising sector, making them reluctant to consider it as a future career option.

d. Social factors

Social factors are non-technical factors that indirectly influence a farming business. These factors include farmers' knowledge of agricultural technologies, group work patterns, and the social impact of agricultural policies in the region. Farmers' understanding of technological innovations can determine the effectiveness of their cultivation practices. Cooperation between farmers can strengthen information networks, facilitating the exchange of information across various contexts

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(Ejembi et al., 2018). Furthermore, the existence of communities or groups can facilitate access to assistance provided under applicable government policies.

Meanwhile, multiple linear regression analysis was used to measure the influence and relationship between these variables on rice production levels. The model used is:

$$Y=\alpha+\beta_1X_1+\beta_2X2_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6+ \beta_6X_6+\varepsilon$$

Description:

Y = Rice production (kg)

A = Constant

X_1 = Age of farmer

X_2 = Education

X_3 = Amount of labor

X_4 = Land area

X_5 = Amount of seed

X_6 = Amount of manure

X_7 = Amount of inorganic fertilizer

$\beta_{1...7}$ = Regression coefficient of each independent variable

ε = error

The results were then compared with previous research to provide a more comprehensive understanding.

RESULTS AND DISCUSSION

Respondent Characteristics

Productive age is the period from 15-49 years, when someone is very productive, 50-64 years, when they are less productive, and 64+ years, when they are unproductive. Farmers in Sawangan District are dominated by productive farmers in the age range of 15-64 years, totaling 21 people, while 9 farmers are classified as non-productive because they are over 64 years old. Age is a factor that influences farmer performance because this job requires dominant physical activity (Setiawati et al., 2021).

Education is a valuable investment in an individual's development. For farmers, formal education remains a separate component in supporting their mindset and decision-making in farming activities. The farmer's education is the last formal education completed by the farmer. The highest level of education for most farmers was high school, with 15 farmers. Only one farmer had a bachelor's degree.

Family is one of the influential factors in managing farming activities. Their involvement as family labor can reduce costs and wages (Sairdama et al., 2025). However, on the other hand, farmers' income decreases as the number of dependents increases, especially when only one person in the family works. The largest number of dependents in a farming family is 1, experienced by 10 farmers. Meanwhile, other farmers have between two and three dependents, and some have none.

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Factors Affecting Paddy Production

The coefficient of determination (Adjusted R^2) = 0.761, which means that 76.1% of the variation in rice production is explained by the independent variables, while 23.9% is explained by other factors outside the model (such as extreme weather conditions, pest outbreaks, or subsidized fertilizer policies). The complete data analysis results can be seen in Table 1.

Table 1. Results of Analysis of Factors Affecting Rice Production in Sawangan Subdistrict

Variable	Coefficient	Sig.	Description
Constant	1,581.243	0.304	Not significant
Age of farmer (X_1)	-19.299	0.279	Not significant
Education (X_2)	-7.100	0.923	Not significant
Amount of labor (X_3)	2.194	0.764	Not significant
Land area (X_4)	0.976***	0.000	Significant Positive
Amount of seed (X_5)	-41.784***	0.007	Significant Negative
Amount of manure (X_6)	0.526	0.328	Not significant
Amount of inorganic fertilizer (X_7)	0.507	0.629	Not significant

Source: Results of regression analysis (2025)

The data that has been analyzed produces a regression equation as follows:

$$Y = 1,581.24 – 19.30X1 – 7.10X2 + 2.19X3 + 0.98X4 – 41.78X5 + 0.53X6 + 0.51X7 + e$$

F Test

F test (simultaneous): Fcount = 11,397 with Sig. = 0,000 < 0,05. The regression model is significant overall. This means that the variables of age, education, labor, land area, seeds, manure, and inorganic fertilizer affect production simultaneously.

t Test

Age of farmer (X_1)

The significance value of the farmer age variable is 0.279, indicating that there is no real influence between farmer age and production output. The experience of older farmers is not enough to have a strong effect on output if it is not balanced with knowledge of new technology. This result is in line with the research of Mahmud et al. (2022) which states that the productive age (30-45 years) tends to produce higher labor efficiency and technological adaptation. Farmers who are approaching non-productive age or are already in the non-productive category tend to manage their farming activities based on the knowledge and practices they have accumulated throughout their working years. They are often reluctant to adopt new innovations whose effectiveness has not yet been proven, and instead prefer traditional methods. Meanwhile, farmland continues to shrink, creating a demand for land intensification and the application of appropriate technology to achieve maximum production. In this context, age is not a determining factor that guarantees older farmers will produce higher yields. Younger farmers with extensive experience in agricultural cultivation can become a dominant factor in

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increasing production, as their knowledge is sufficient to achieve optimal results. Experienced farmers also tend to be more receptive to innovations and recommendations provided through extension activities (Salam et al., 2024).

Education (X_2)

The significance value of the education level variable is 0.923, indicating that there is no real effect of education on production. Based on field results, the majority of rice farmers in Sawangan District are high school graduates. This condition indicates that farmers have a good understanding and general knowledge, they are able to process new information into good potential for their cultivation business. The educational background of farmers is not focused on agricultural competencies but rather general education, so it does not significantly have a direct impact on rice production results. According to Purnomo et al. (2025), formal education held by farmers cannot be a strong factor that can influence how farmers manage their farming inputs to achieve optimal results. Formal education can influence farmers if the knowledge gained can encourage a more logical mindset regarding various phenomena or risks that may occur. The results of this study are in line with Wulandari et al. (2024) that education owned by farmers has no effect on rice production. This can be understood because most farmers obtain cultivation knowledge from generation to generation, not from formal education. This condition confirms the importance of non-formal education such as training, counseling, and field schools to improve farmers' technical capacity.

Amount of labor (X_3)

The significance value for the variable number of workers is 0.764, indicating that the number of workers has no significant influence on production yields. Additional labor does not necessarily increase yields. This may be due to the small scale of farming, as rice farmers in Sawangan Subdistrict are classified as smallholders because the average size of their rice fields is less than 0.5 hectares; consequently, adding labor has no significant impact on productivity. Increasing the workforce within a limited area will have a greater impact on speeding up the process but will not significantly increase production if other factors remain unchanged. In addition, the labor involved is close to unproductive age so that the addition or reduction of labor does not have a significant effect on rice production. This is also in accordance with the research of Kharismawati & Karjati (2021) which states that the amount of labor has no effect on rice production. The effective human factor in increasing rice production does not lie in quantity but rather in the knowledge and skills possessed, a supportive environment, effective and efficient division and management of labor, and social support such as farmer groups, extension services, and access to information (Berdimurodov, 2023).

Land Area (X_4)

This variable has a significant positive coefficient (0.976; Sig. 0.000). Every 1 m^2 increase in land area has the potential to increase production by 0.98 kg. This finding is in accordance with classical production theory which states that output is directly proportional to the land factor up to a certain point (law of diminishing returns). According to the Cobb-Douglas function, land area has a positive

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relationship with total production. Land, as a farming input, impacts production changes. According to data from the Central Statistics Agency (BPS) in 2024, the annual decline in rice production is due to a decrease in land area. Population growth causes agricultural production to become unstable. This situation is unavoidable due to the ever-increasing population and the increasing need for housing. This result supports the research of Maksum et al. (2023) and Mantiri et al. (2019) which confirmed land area as the main determinant of rice production. In Sawangan, farmers with ≥1 ha of land have an average productivity of 1.3 times higher than farmers with <0.5 ha of land.

Number of seeds (X_5)

The significance value of the variable number of seeds is 0.007, indicating a real influence of the number of seeds on rice production, and the coefficient value of -41.784, which means that the use of excess seeds reduces production. Planting a large number of seedlings in the same area of land will lead to competition for soil nutrients. Consequently, rice plants will not grow optimally due to a lack of nutrients needed for tiller and panicle formation. Competition among plants in a limited space also affects the amount of light available, resulting in decreased productivity per clump (Nugraha et al., 2021). Therefore, optimal planting density is a factor in achieving maximum productivity. This finding supports the theory that suggests an ideal density of 100-150 kg of seeds per hectare. In the field, some Sawangan farmers use >180 kg/ha, which results in a decrease in productivity of around 10-15%.

Amount of manure (X_6)

The significance value of the manure variable is 0.328, indicating that there is no real influence between manure and rice production. Manure, which improves soil structure and long-term fertility, has not had a major impact on crop yields in a single season. This result is in line with the research of Wulandari et al. (2019) that the application of manure does not give a real growth effect on plant height and panicle length of rice plants. According to Sution & Nurdin (2017), panicle length can affect the number of grains because longer panicles will produce more branches, where each branch produces rice grains. The application of manure will have a real effect in the long term if integrated routinely. Using organic fertilizer alone is not enough to maintain and optimally adjust the nutrient availability plants require. The amount of nutrients that plants can absorb is relatively low, and the mineralization process takes a long time before they can be effectively utilized by plants (Chen et al., 2017).

Amount of inorganic fertilizer (X_7)

The significance value of the inorganic fertilizer variable is 0.629, indicating that there is no real influence of inorganic fertilizers on rice production. Inorganic fertilizers in rice growth help fulfill the N element during flower and fruit formation in the generative phase. But according to Lestari et al. (2024), the application of inorganic fertilizers alone does not produce as much total nitrogen as when combined with biological fertilizers. In addition, some Sawangan farmers began to switch to a semi-organic system that reduced the use of chemical fertilizers by 40%, resulting in large variations in data and reducing statistical significance.

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Based on data analysis, the results reinforce the view that physical factors (land and seeds) determine yields more than social (age, education) or economic factors (capital and labor). Land area acts as the dominant production factor, while the number of seeds becomes a limiting factor if not managed optimally. This suggests that increasing productivity in Sawangan is more appropriately directed through land optimization (e.g. by combining small plots of land into production clusters), determination of ideal seed dosage, and application of simple precision farming systems.

The involvement of field agricultural extension workers (PPL) is very important for providing technical assistance and encouraging farmers to shift their behavior from traditional to data-driven practices. The research results consist of descriptive statistics, non-parametric statistics, assumption test results, and hypothesis test results, which are then analyzed critically. Explanatory discussion of research results, linked to the results of previous studies, analyzed critically, and linked to relevant current literature.

CONCLUSION

Rice production in Sawangan Subdistrict is influenced by various factors, namely farmer age, education level, number of workers, land area, number of seeds, manure, and inorganic fertilizer. Based on the regression analysis results, the variables that significantly affect rice production are land area and the number of seeds. The larger land area will increase production, while the larger number of seeds on a fixed land area will provide space for growth and nutrient absorption that are not optimal due to competition. These results can serve as a basis for policies for farmers, local governments, and academics. For farmers, there is a need for policies to regulate optimal planting density and seed rate, gradually increase the use of organic fertilizers to maintain soil fertility, and provide training or counseling to adopt efficient cultivation technologies. For the government, these results can serve as a recommendation to provide incentives for small-scale land consolidation to achieve economies of scale, as a basis for preparing regionally based seed and fertilizer use control programs, and for integrating research results into sustainable agriculture programs. The results of this study can asserve be a reference for academics to conduct further research by incorporating microclimate variables, water quality, and agricultural policieston strengthen the productivity prediction model.

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BIBLIOGRAPHY

Abiri, R., Rizan, N., Balasundram, S. K., Bayat, A., & Abdul-hamid, H. (2023). Application of Digital Technologies for Ensuring Agricultural Productivity. *Heliyon*, *9*(12), 1–21.

Copyright © 2026 by Author

https://doi.org/10.1016/j.heliyon.2023.e22601

Abokyi, E., Strijker, D., Asiedu, F., & Daams, M. N. (2020). The Impact of Output Price Support on Smallholder Farmers' Income: Evidence from Maize Farmers in Ghana. *Heliyon*, *6*(2020), 1–13. https://doi.org/10.1016/j.heliyon.2020.e05013

Antriyandarti, E., Melati, N. S. K., & Maulana, R. A. (2024). Understanding Factors Affecting Rice Purchasing Decisions in Indonesia: Does Rice Brand Matter? *Open Agriculture*, *9*(1), 1–14. https://doi.org/10.1515/opag-2022-0303

Berdimurodov, U. (2023). Impact of Employment Growth in Agricultural Production. *E3S Web of Conferences*, *452*, 1–5. https://doi.org/10.1051/e3sconf/202345201026

Chen, D., Yuan, L., Liu, Y., Ji, J., & Hou, H. (2017). Long Term Application of Manures Plus Chemical Fertilizer Sustained High Ries Yield and Improved Soil Chemical and Bacterial Properties. *European Journal of Agronomy*, *90*, 34–42. https://doi.org/10.1016/j.eja.2017.07.007

Ejembi, S. A., Orkpe, F., & Bello, G. O. (2018). The Effects of Social Factors on The Adoption of Rice Production Technologies in Zone C of Benue State, Nigeria. *Jurnal Sosial Ekonomi Pertanian*, *14*(1), 55–64. https://doi.org/10.20956/jsep.v14i1.3623

Farooq, M. A., & Yu, J. (2025). Starches in Rice: Effects of Rice Variety and Processing/Cooking Methods on Their Glycemic Index. *Foods*, *14*, 1–30. https://doi.org/10.3390/foods14122022

Habibah, L., Futri, A., Khuzaeri, A. P., Shidqi, F., Winata, W. A., & Desmawan, D. (2024). Beras Sebagai Makanan Pokok: Faktor Penyebab Ketergantungan dan Dampaknya Terhadap Perekonomian Indonesia. *Bursa: Jurnal Ekonomi Dan Bisnis*, *3*(2), 110–114. https://doi.org/10.59086/jeb.v3i2.570

Hashim, N., Ali, M. M., Mahadi, M. R., Abdullah, A. F., Wayayok, A., Kassim, M. S. M., & Jamaluddin, A. (2024). Smart Farming for Sustainable Rice Production: An Insight into Application, Challenge, and Future Prospect. *Rice Science*, *31*(1), 47–61. https://doi.org/10.1016/j.rsci.2023.08.004

Herlina, N., Fajriani, S., & Rahman, F. A. (2018). Evaluasi Perubahan Iklim dan Pengaruhnya Terhadap Pola Tanam, Waktu Tanam serta Produktivitas Kedelai (*Glycine max L. Merrill*) di Kabupaten Malang Jawa Timur. *Jurnal Lahan Suboptimal*, *7*(2), 106–120. https://doi.org/10.33230/JLSO.7.2.2018.351

Hidayati, I. N., & Suryanto. (2015). Pengaruh Perubahan Iklim Terhadap Produksi Pertanian dan Strategi Adaptasi pada Lahan Rawan Kekeringan. *Jurnal Ekonomi Dan Studi Pembangunan*, *16*(1), 42–52. https://journal.umy.ac.id/index.php/esp/article/view/1217

Kharismawati, K. H. D., & Karjati, P. D. (2021). Pengaruh Luas Lahan dan Jumlah Tenaga Kerja terhadap Produksi Padi di 10 Kabupaten Jawa Timur Tahun 2014-2018. *Economie*, *3*(2), 146–162. https://doi.org/10.30742/economie.v3i1.1571

Lestari, C. A., Setiawan, A., Putri, A. M., Muqoddam, Khairunnisa, F. D., Rahmadi, R., & Rochman, F. (2024). Efektivitas Pemberian Pupuk Organik, Anorganik, dan Hayati Terhadap Produktivitas Tanaman Padi (*Oryza sativa L.*). *Planta Simbiosa*, *6*(2), 169–179. https://doi.org/10.25181/jplantasimbiosa.v6i2.3961

Mahmud, H., Rauf, A., & Boekoesoe, Y. (2022). Faktor-faktor Produksi Usahatani Padi Sawah di Kecamatan Boliyohuto Kabupaten Gorontalo. *AGRINESIA*, *6*(2), 96–102. https://doi.org/10.37046/agr.v6i2.15909

Copyright © 2026 by Author

Maksum, S., Noer, I., & Dulbari. (2023). Analisis Faktor-Faktor Produksi yang Memengaruhi Produksi Padi Sawah di Desa Dayamurni Kecamatan Tumijajar Kabupaten Tulang Bawang Barat. *Prosiding Seminar Nasional Pembangunan Dan Pendidikan Vokasi Pertanian Politeknik Pembangunan Pertanian Manokwari*, 567–576. https://doi.org/10.47687/snppvp.v4i1.680

Mantiri, R. I. K. A., Rotinsulu, D. C., & Murni, S. (2019). Analisis Faktor-Faktor yang Memengaruhi Produksi Padi Sawah di Kecamatan Dumoga. *Jurnal Pembangunan Dan Keuangan Daerah*, *8*(1), 1–15. https://doi.org/10.35794/jpekd.10766.18.1.2016

Nugraha, M. I., Nisa, C., & Saputra, R. A. (2021). Pengaruh Ragam Jarak Tanam Terhadap Pertumbuhan dan Produksi Sawi Hijau Organik. *Agrotechnology Research Journal*, *5*(2), 97–103. https://doi.org/10.20961/agrotechresj.v5i2.51845

Sairdama, S. S., Matakena, S., & Yonatan. (2025). Factors Affecting Production Rice Farming (*Oryza sativa. L*) in Biha Village Makimi District, Nabire Regency, Indonesia. *Jurnal Peneltian Pendidikan IPA*, *11*(5), 43–50. https://doi.org/10.29303/jppipa.v11i5.10884

Salam, M., Auliyah, N., Tenriawaru, A. N., Diansari, P., Rahmadanih, Muslim, A. I., Ali, H. N. B., & Ridwan, M. (2024). Determinants of Rice Production in Bantaeng Regency, Indonesia: In search of innovative sustainable farm management practices. *Heliyon*, *10*(2024), 1–15. https://doi.org/10.1016/j.heliyon.2024.e40634

Setiawati, A., Wijaya, M., & Setyowati, R. (2021). The Role of The Sawangan Organic Rice Farmers Association in Increasing The Economic Value of Organic Rice: Case study in Sawangan, Magelang. *IOP Conference Series: Earth and Environmental Science*, *715*, 1–6. https://doi.org/10.1088/1755-1315/715/1/012011

Sution, & Nurdin, M. (2017). Keragaam Beberapa Varietas Unggul Baru Padi Sawah Irigasi Semi Teknis Tanam pada Musim Kemarau. *Prosiding Seminar Nasional: Mewujudkan Kedaulatan Pangan Pada Lahan Sub Optimal Melalui Inovasi Teknologi Pertanian Spesifik Lokal*, 250–255. https://repository.pertanian.go.id/handle/123456789/9137

Widyawati, W., Hanani, N., Syafrial, S., & Sujarwo, S. (2025). Crafting the Future of Rice in Indonesia: Sustainable Supply Through Systems Thinking. *Cogent Social Sciences*, *11*(1), 1–14. https://doi.org/10.1080/23311886.2025.2488113

Wulandari, A., Ilsan, M., & Haris, A. (2024). Pengaruh Karakteristik Petani Terhadap Produksi Padi Sawah dan Kelayakan Usahatani di Desa Mappesangka. *WIRATANI: Jurnal Ilmiah Agribisnis*, *7*(2), 165–176. https://doi.org/10.33096/wiratani.v7i2.470

Wulandari, Y., Siswadi, & Triyono, K. (2019). Kajian Macam Pupuk Kandang Terhadap Pertumbuhan dan Hasil Padi Merah (*Oryza sativa L.*). *Innofarm:Jurnal Inovasi Pertanian*, *21*(1), 22–27. https://doi.org/10.33061/innofarm.v21i1.3313

Zakir, I., Bakari, Y., Rauf, A., & Hippy, M. Z. (2023). Prioritas Persepsi Permodalan dan Strategi Prioritas Sumber Modal Usahatani Padi Sawah: Analisis AHD dan SWOT. *Jurnal Sosial Ekonomi Pertanian*, *16*(1), 13–24. https://doi.org/10.19184/jsep.v16i1.37950

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