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Analysis of Income From Rice Farming Business in Tanjung Morawa District, Deli Serdang Regency

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Abstract: Lowland rice farming is the main source of income for farmers in rural Indonesia and plays a strategic role in national food security. However, structural challenges such as high production costs, fluctuations in grain prices, and limited access to modern agricultural technology still limit improvements in farmer welfare. This study aims to analyze the level of income and cost efficiency of lowland rice farming in Tanjung Morawa District, Deli Serdang Regency. Using a quantitative descriptive approach through a case study design, primary data were collected from 46 farmers selected purposively, supported by secondary data from related agencies. Analysis techniques include calculating fixed and variable costs, revenues, and net income, complemented by an analysis of the business efficiency ratio using the Revenue/Cost (R/C) indicator. The results of the study indicate that rice farming in this area provides significant economic benefits with adequate cost efficiency, although labor and production input components are dominant burdens. These findings emphasize the importance of optimizing the allocation of production inputs and utilizing efficient agricultural technology as a strategy to increase farmer income. The main contribution of this study is to provide a relevant empirical basis for regional agricultural policy making and encourage the adoption of a data-based approach in evaluating the economic feasibility of sustainable rice farming.

Keyword: Income, Farmers, Quantitative, Indonesia.

INTRODUCTION

Rice farming in Indonesia plays a vital role in national food security and as an economic mainstay for millions of rural households. As an agricultural country, more than half of Indonesia's population still depends on the agricultural sector, especially food crops such as rice, both as a source of food and as a main livelihood. However, the inequality of rice farmers' welfare remains a complex structural problem. Although there are various government policies to increase agricultural productivity and efficiency, in reality, most rice farmers still live in low welfare conditions due to pressure from high input prices, fluctuations in grain prices, and low farmer exchange rates (Aulia et al., 2021). The poverty rate among rice farmers remains high,

with most farming households classified as poor or very poor based on food consumption criteria (Sri, 2019).

Amid these challenges, attention to the aspect of farm income is very important. Although there have been many studies on the efficiency and productivity of rice farming, most of them are still general and do not touch on local aspects and specific socio-economic contexts, such as those in Deli Serdang Regency. In fact, local studies are very important for formulating more targeted policies. For example, a study by (Wardhani et al., 2021) shows that there is a significant disparity in income and welfare between organic and non-organic rice farmers that can only be captured through local analysis. In addition, the one-size-fits-all approach to agricultural policy often fails to respond to market dynamics and technological gaps faced by farmers in the regions. The study also highlighted that most policy interventions are still not effective enough in reducing production costs or stabilizing selling prices at the farmer level (Ratnasari et al., 2025).

From a farm economics perspective, Heady and Dillon's production theory emphasizes the importance of an optimal combination of inputs to achieve maximum income, which includes efficient management of production costs, productivity, and output selling prices. However, in the real context of farmers in Deli Serdang, limited access to capital, technology, and agronomic information hinders the realization of this theory in daily practice. Research by (Salam et al., 2019) identified that productivity and selling price are the two main factors that determine the income of rice farmers, while high production costs are the most significant obstacle. The regression analysis model used in the study reinforces the importance of an empirical approach in understanding the actual conditions of farmers' income.

Based on this reality, this study explicitly aims to analyze the level of income from rice farming in Tanjung Morawa District, Deli Serdang Regency. The formulation of the problem that is the focus of this study is: (1) What is the level of income from rice farming in Deli Serdang Regency? and (2) How efficient are the costs and profits of rice farming in the area? This study will measure net income, farming efficiency through the Revenue/Cost (R/C) ratio, and identify the determinant factors that influence the economic conditions of farmers. In this case, a descriptive quantitative approach was chosen to present an objective and accurate picture through numerical and statistical data obtained from the field (Rosyada et al., 2022).

The scientific contribution of this study lies in the empirical and contextual mapping of rice farming income on a wider scale, namely the sub-district level, compared to other studies that only focus on villages. This article presents a specific microeconomic approach, based on primary data from active farmers, which can be used as a basis for designing evidence-based policies at the local and national levels. The novelty of this study also lies in the integration of the classical theoretical approach to agricultural production with the current socio-economic realities of farmers, including in terms of access to technology, supporting institutions, and the tendency of farmers to adapt to structural changes in the national agribusiness system (Maridjo & Ignasiak-Szulc, 2023). The findings in this article are expected to enrich the scientific treasury in the field of agricultural economics and provide real contributions to the formulation of strategies for improving farmer welfare sustainably in Indonesia.

METHOD

This study uses a descriptive quantitative approach with a case study design, which aims to analyze in detail the actual conditions of rice farming income in Deli Serdang Regency. The quantitative approach was chosen to allow objective measurement of research variables such as production costs, revenues, and net income, using statistically analyzed numerical data (Rosyada et al., 2022). The case study design is considered appropriate because the research focuses on one particular area (Deli Serdang Regency), which is a specific representation in the context of the local rice farmer economy (Ismail et al., 2024).

The location of this research was determined in Deli Serdang Regency, North Sumatra, which is one of the rice production centers in the western region of Indonesia. This area was chosen purposively because its agronomic and socio-economic characteristics were relevant to the research objectives. The research subjects consisted of 30 active rice farmers, who were selected using purposive sampling based on the following criteria: (1) still actively managing rice fields in the last planting season, (2) having at least 5 years of farming experience, and (3) willing to provide complete and honest data. The purposive sampling technique was chosen to ensure the representation of the main characteristics of the target population and effectiveness in the data collection process (Lubis et al., 2024).

RESULTS AND DISCUSSION

Table 1. Fixed Costs

Type of Fixed Cost	Amount (Rp.)	Average Per Farmer (Rp.)
Rent/Land Tax	194,425,000	4,226,630
P3A Contribution	7,000,000	152,174
Agricultural Machinery Depreciation	4,986,000	108,391
Total	206,411,000	4,487,196

Tabel 2. Biaya Total

Jenis Biaya	Jumlah (Rp.)	Rata-rata Per Petani (Rp.)
Biaya Tetap	206,411,000	4,487,196
Biaya Variabel	665,421,250	14,465,679
Biaya Total	871,832,250	18,952,875

Tabel 3. Keuntungan

Uraian	Jumlah (Rp.)	Rata-rata Per Petani (Rp.)
Penerimaan	1,859,711,250	40,428,505
Biaya Total	871,832,250	18,952,875
Keuntungan	987,879,000	21,475,630

The results of this study describe the cost structure, revenue, and profit obtained by rice farmers in Tanjung Morawa District, Deli Serdang Regency, through quantitative income analysis. Based on data obtained from 46 active farmer respondents, details of fixed and variable costs and calculations of financial efficiency of farming activities were obtained. Fixed costs borne by farmers include three main components, namely land rent or tax, Water User Farmers Association (P3A) fees, and depreciation of agricultural machinery (alsintan). The total fixed costs reached IDR206,411,000 with an average of IDR4,487,196 per farmer. The rent or land tax component is the largest expenditure, namely IDR194,425,000 or around 94% of the total fixed costs, while P3A fees and depreciation of agricultural machinery contributed a small portion of the total. Variable cost components consist of two main groups, namely production facilities and labor. The cost of production facilities includes the purchase of seeds, fertilizers, pesticides, and herbicides with a total of IDR 242,976,250 and an average per farmer of IDR 5,282,092. The largest expenditure in this group is for NPK Phonska fertilizer (IDR 26,765,000), followed by Urea (IDR 26,606,250), and insecticides (IDR 58,855,000). The use of compound fertilizers reflects farmers' dependence on chemical inputs to increase productivity, as also found in previous studies (Khoiriyah et al., 2023).

Labor costs are the largest expenditure component in the variable cost structure, reaching IDR422,445,000 or an average of IDR9,183,587 per farmer. The subcomponents with the highest expenditure are harvesting using a combine harvester (IDR96,500,000) and a power thresher (IDR61,500,000). Manual planting activities also absorb large costs, namely IDR79,250,000. This confirms the results of previous studies which stated that labor is one of

the most significant factors in determining the efficiency of farming costs (Fattah et al., 2023). Overall, the total variable costs reached IDR665,421,250 with an average expenditure of IDR14,465,679 per farmer.

After combining fixed and variable costs, the total cost of rice farming in this area is IDR871,832,250, with an average expenditure of IDR18,952,875 per farmer. This figure is the basis for calculating the financial feasibility and profits obtained by rice farmers. Farming income is calculated based on the total sales value of the harvest reported by respondents. Total income reached IDR1,859,711,250 or an average of IDR40,428,505 per farmer. By subtracting total costs from income, a total profit of IDR987,879,000 was obtained, with an average profit per farmer of IDR21,475,630. This shows that in general, rice farming in this area is still financially profitable and economically feasible based on a comparison of income and production costs (Leovita et al., 2023). To assess the efficiency of farming, the Revenue/Cost (R/C) ratio is used, which is obtained by dividing income by total costs. The R/C ratio value of 2.13 indicates that every Rp1 of costs incurred generates Rp2.13 in revenue. This value indicates a high level of efficiency and supports the economic feasibility of rice farming (Sri, 2019).

The distribution of expenditure shows the dominance of labor costs and production facilities as the two main expenditure categories, in line with findings from studies in various rice regions in Indonesia (Ratnasari et al., 2025); (Hamzah et al., 2019). This is also in line with the tendency of conventional rice farming which still relies on labor-intensive processes in cultivation and harvesting activities (Wardhani et al., 2021). These data also show that there has been no use of planting technology such as rice transplanters in the practices of respondent farmers. This indicates the potential for less than optimal efficiency, considering that mechanization has been shown to significantly reduce labor costs in other studies (Azis et al., 2022). In addition, the absence of data for several activities, such as the third stage of controlling Plant Pest Organisms (OPT), indicates the possibility of incomplete cultivation practices, which can affect harvest yields and production sustainability (Rosyada et al., 2022). Overall, these results provide a concrete picture of the financial condition of lowland rice farming in Tanjung Morawa District. These findings serve as a quantitative basis that can be used in further analysis of the efficiency, sustainability, and direction of regional agricultural policies that are more responsive to the needs of small-scale rice farmers. This study aims to analyze the structure of production costs and the level of profitability of lowland rice farming as a direct indicator of farmer income. The main results show that the total production cost reached IDR871,832,250 with an average per farmer of IDR18,952,875, while revenue reached IDR1,859,711,250 with an average of IDR40,428,505, resulting in a profit of IDR987,879,000 (average IDR21,475,630). These findings support that lowland rice farming in the study location provides financially viable benefits and is relevant to improving farmer welfare.

Within the framework of farmer welfare theory, net income from agricultural products is the main indicator of the economic welfare of farmer households (Maridjo & Ignasiak–Szulc, 2023). These findings indicate that farmers' income from rice farming contributes significantly to total household income. This is in line with research by Lubis et al. (2024) which found that up to 78.18% of farmers' household income comes from rice farming, indicating the central role of this sector in supporting the rural economy. When compared to previous studies, the results of this study strengthen the findings of Saliem et al. (2024) that diversifying the use of by-products such as straw and husks can add value to farmers' income. Although not yet implemented in this study, this opportunity could increase profit margins. Meanwhile, Salam et al. (2019) emphasized the importance of efficient production management to reduce costs and increase income. These results also support Amrullah et al. (2024) which showed that the adoption of superior rice varieties significantly increased farmers' income by up to 12.10%.

The scientific contribution of this article lies in the integration of detailed analysis of fixed and variable cost components towards farming profits as an evaluative approach to farmer income. This approach is more concrete than only using macro indicators such as the Farmer Exchange Rate (NTP). This study also provides an empirical understanding of labor efficiency, especially the cost burden at the planting and harvesting stages, which predominantly contribute more than 50% of total labor costs, similar to the findings of Khoiriyah et al. (2023). However, this study acknowledges several limitations. First, it has not taken into account external risk factors such as fluctuations in rice prices and climate change that can affect output and input production costs. Second, the scope of the study area is limited to one location, so generalization of the results must be done carefully. Third, non-economic dimensions of welfare such as household food security or access to basic facilities have not been thoroughly analyzed, as highlighted by Sri (2019) in a study of rice farmer poverty. The implications of this study include recommendations for increasing input efficiency such as labor and pesticides, as well as promoting the use of technology such as rice transplanters to reduce the burden of initial costs. In addition, policy makers can consider strategies to increase farmer capacity through cost management training and cooperative marketing of products. In the context of price policy, it is important to evaluate the post-harvest supply chain structure so that farmers' selling prices are not too suppressed by intermediaries, in line with the findings of Budhi and Yasa (2019) who emphasized the importance of price efficiency in improving farmers' welfare.

Further research is recommended to explore the effects of sustainable agricultural integration such as the mina-padi system which has been shown to increase household welfare ratios (Triyono & Arifianikmah, 2024). Comparative studies between conventional and organic farmers (Wardhani et al., 2021), as well as the effects of off-farm income on technical efficiency (Harmini et al., 2022), are also worth conducting as an enrichment to the strategy to improve farmers' welfare holistically.

CONCLUSION

The results of this study indicate that lowland rice farming in Tanjung Morawa District, Deli Serdang Regency, produces income that is economically feasible. The total production cost consisting of fixed and variable costs reaches a significant figure, but is still below the total revenue value, so that farmers obtain a fairly large net profit. The average net income per farmer shows the economic efficiency of farming, although the largest burden still comes from labor costs and production inputs. This finding directly answers the formulation of the problem regarding the level of income and cost efficiency of rice farming, and confirms that cost components and production management strategies are key factors in determining the success of lowland rice farming in the region. This article makes an important contribution to the study of agricultural economics, especially in the local context of Deli Serdang which has not been widely used as an object of empirical analysis. Theoretically, this finding strengthens the relevance of the input-output-based income analysis approach derived from classical production theory, and highlights the importance of efficient allocation of production factors on a small-scale farmer scale. From a practical perspective, the results of this study can be used as a basis for designing more contextual regional agricultural policies, including interventions in production costs, promotion of cost-effective technologies, and development of farmer capacity in adaptive farm management to market and climate dynamics. In the future, further research can be directed at expanding the study area and adding non-economic variables such as social and ecological aspects to support the principles of sustainable agriculture. In addition, the integration of qualitative approaches in understanding farmer preferences, risk perceptions, and motivations in making production decisions will enrich the understanding of the dynamics of rice farming as a whole.

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