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Impact of Management Practices on the Income of Transmigrant Farmers in Wonosari, Gorontalo

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ABSTRACT

The transmigration program aims to improve welfare, mainly through wet rice farming. This research objectives are: 1) To analyze the management of wet rice farming in transmigration areas; 2) To analyze the income of wet rice farming in transmigration areas; and 3) To analyze the influence of management and other factors on the income of wet rice farmers in transmigration areas. A quantitative descriptive research method was employed, with sampling conducted through purposive sampling. The study identified two management models used by wet rice farmers. Model 1 employed the *jajar legowo* planting pattern, utilizing irrigation and labor from within and outside the family. Model 2 applied the *tabela* planting pattern, relying on both irrigation and borehole irrigation, and predominantly employs labor from outside the family. The average income of rice farmers in Model 1 was IDR 3,278,446.21 per planting cycle, while in Model 2, it was IDR 1,797,150.33. Factors affecting the household income of transmigrant wet-rice farmers include age, education, land area, and farm management model.

Keywords: Transmigration; rice farming; management; income.

INTRODUCTION

The food needs of people in Indonesia are increasingly diverse, but rice remains the most essential food commodity each year (Rusdiana & Maesya, 2017) Mergono Adi Ningrat et al., 2021). Meeting the demand for rice heavily depends on the supply of rice and grain, necessitating thoroughly considering the food crop agricultural business system. This detailed understanding of wet-rice farmers' operations is crucial for ensuring food availability in Indonesia (Wijoyo et al., 2020) (Pratama et al., 2019). Additionally, Indonesia's geographical conditions are highly favorable for wet rice farming ((Pratama, Sudrajat, & Harini, 2019)., presenting a significant opportunity for Indonesian farmers.

Farming conditions in Gorontalo Province, however, differ. In this region, wet rice production is not as significant as corn production. Despite rice being a staple food for Gorontalo, its productivity fluctuated from 2020 to 2023. Concurrently, the population of Gorontalo Province increased from 1,171,681 in 2020 to 1,192,737 in 2022. The growing population has led to higher food demands (Nuryanti & Kasim, 2017), allowing farmers in Gorontalo to cultivate rice as a primary income source.

Wonosari Sub-district stands out as a unique transmigration program

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development area in Gorontalo Province, known for its successful wet rice farming on government-granted land. This farming serves as the primary source of household income. In 2022, Wonosari Sub-district had a rice harvest area of 6,354.18 hectares, producing 29,991.48 tons, showing an increasing trend compared to the previous year (BPS Gorontalo Province, 2023). This aligns with research by Syamsir (2020), which noted increased wet rice production in Wonosari District. The transmigrant community in Wonosari Sub-district cultivates their land to meet their needs and sustain their livelihoods.

Despite the potential and opportunities of wet rice farming in transmigration areas, several problems pose significant challenges to food production. These include the scarcity of seeds and fertilizers during planting seasons, land conversion, irrigation system issues, land ownership legality, and overlapping land status with local plantation companies. Land area is a critical factor affecting wet rice production (Tumundo *et al.,* 2023). If these issues persist, they will render the agricultural sector unattractive to farmers and the younger generation, potentially jeopardizing national food security (Tanjung, 2018). (Priani et al., 2023). Effective wet rice farming management is therefore crucial to address these challenges.

Given these problems, the research objectives are: 1) To analyze the management of wet rice farming in the transmigration area of Wonosari District; 2) To analyze the income of wet rice farming in the transmigration area of Wonosari Sub-district; and 3) To analyze the effect of management and other factors on the income of wet rice farming in the transmigration area of Wonosari Sub-district, Gorontalo Province.

RESEARCH METHODS

The research was conduted in the transmigration area of Wonosari District placement, Gorontalo. The location was chosen because it is one of the transmigrant locations for developing wet rice farming with a production level of 29,894.90 tons, the highest among others (BPS Boalemo Regency, 2015).

Data collection were conducted through surveys, interviews, and observations from January to February 2024. The respondents were selected using a non-probability sampling method (purposive sampling, with a total of 40 transmigrant farmer households. The number of respondents is feasible and meets the minimum requirements for quantitative data analysis (Sugiyono, 2019).

To address the first objective, the analysis of the management of wet rice farming was done by descriptive quantitative, classifying the management model into two models. Model 1 was a farmer household applying the *jajar legowo* planting system, irrigation system and labor within and outside the family. Model 2 was a group of farmers applying the *tabela* planting system with irrigation and borehole irrigation system, and dominated by the use of labor from outside the family. The data obtained were then analyzed in cross-tabulation and percentages. The analysis results were then presented with the support of field observation data.

To address the second objective, the cost and income of wet rice farming, the following analysis was used (Agribusiness et al., 2013) (Bakari, 2019) (Ibrahim et al., 2021).

$$TC = FC + VC \quad (1)$$

TC (Total Cost) is the cost incurred in the activities of rice paddy farming per one planting. FC (Fixed Cost) is the cost incurred by farmers whose value does not

depend on the amount of production produced. In this study, the cost of equipment depreciation is included as a component of fixed costs. VC (Variable Cost*)* is a cost whose value is influenced by the amount of production. In this study, it consists of the cost of seeds, fertilizers, pesticides, labor, and tractor rental costs (Saul et al., 2023).

The income of wet-rice farmers in Wonosari Subdistrict was obtained from the subtraction between total revenue and total costs using the following formula (Prastiwi, 2023).

$\Pi = TR - TC$…….. (2)

Π is the income earned from rice paddy farming per one planting. TR (Total revenue) is the revenue calculated from multiplying the amount of wet rice production multiplied by the selling price per growing season.

To address the third objective, the effect of management models and other factors on the household income of wet rice farmers, multiple regression analysis was done using the following equation (Moroki et al., 2018) (Julianto et al., 2019) (Tumundo et al., 2023).

$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + ...e$ (3)

Y is wet rice farming income per growing season, X_1 is the age of wet rice farmers, X_2 is land size, X_3 is education, and X_4 is the management model.

RESULTS AND DISCUSSION

Characteristics of research respondents

Table 1 displays the characteristics of the research respondents, including their education, length of farming experience, age, number of family members, and participation in farmer groups.

Table 1.
Characteristics of respondents

Variables	Description	Percentage	Min	Max	Mean	Stdev
Education level	Not in school	6	0	16	9.41	4.16
	Elementary	37				
	Junior High School	26				
	Senior High School	29				
	Higher Education	17				
Farming experience (years)	≤ 3	20	1	50	17.6	12.6
	4 – 10	17				
	11 – 20	31				
	≥ 21	31				
Age (year)	20 – 40	26	21	73	47.1	14.9
	41 – 60	71				
	≥ 61	3				
Number of family members (people)	1 – 3	89	1	7	2.31	1.27
	≥ 4	11				
Farmer group	Yes	77	0	1	0.77	0.43
	No	23				

Source. Primary data analysis, 2024.

Regarding education, most wet rice farmers in the transmigration area of Wonosari Subdistrict have an elementary school education (37%). The agricultural sector is predominantly occupied by low-educated farmers. However, there is also a notable trend of increasing participation by younger, highly educated individuals in the agricultural sector. Table 1 underscores the crucial role of family in the agricultural sector. Most households have 1-3 family members, who are actively involved in farming activities, helping to save on labor expenses. However, it's important to note that having more non-productive family members can increase household expenses, highlighting the delicate balance that needs to be maintained.

Farmer involvement in farmer groups is essential because seed and fertilizer assistance is distributed through these groups (Prastiwi, 2023). According to Table 1, 77% of households of wet rice farmers in transmigration areas are involved in farmer groups. These groups provide a platform for farmers to exchange information and experiences.

Management model of wet rice farming in transmigration area

In this study, the management model of wet rice farming is categorized into two groups. The first group, referred to as Model 1, consists of farmers who use the *jajar legowo* planting pattern, employ an irrigation system, and utilize both family and external labor. The second group, referred to as Model 2, includes farmers who implement the tabela planting system, use a combination of irrigation and borehole irrigation, and predominantly rely on external labor. Based on Table 2, it is evident that 82.86% of farmers in the transmigration area of Wonosari District apply Management Model 1.

Management model of wet rice farming in the transmigration area of Wonosari District, Gorontalo

Table 2

Management	Percentage	Characteristics of the management model
Model 1	82,86	The *jajar legowo* planting system, Irrigation watering system In-house and out-of-household labor
Model 2	17,14	*Tabela* planting system Irrigation and borehole watering systems Labor is predominantly outside the family

Source. Primary data analyzed in 2024.

The jajar legowo system applied in the transmigration area of the Wonosari Subdistrict is characterized by alternating between two or more rows of rice plants and one empty row (Warman & Dani, 2016). Farmers typically use 3-5 seeds per planting hole, though some use 6-10 seeds, believing that more will yield better results. The *jajar legowo* planting distance used in Wonosari is 4:1, meaning four planting rows per legowo unit. According to Safrizal (2022), the 4:1 jajar legowo system is a planting pattern where every row benefits from crop inserts, making it suitable for less fertile land conditions.

The tabela planting system in the Wonosari Subdistrict involves planting rice without a nursery and seed transplanting process, effectively using a direct seed planting method. Planting distances are not fixed. Research by Wicaksana & Rachman (2018), Alapján-

(2016) and Mamondol (2017) supported that the tabela system involves directly sowing rice seeds without transferring them to another area. The seeds are sown at a specific distance and are still germinating, using better varieties for improved results.

Costs and income of wet rice farming in transmigration areas

The cost components of wet rice farming in Management Models 1 and 2 are shown in Table 3. The difference lies in the cost per financing component. The average cost incurred in Management Model 2 is lower than in Management Model 1. However, the total production in Model 1 is higher than in Model 2. This analysis shows that each model of wet rice farming applied by farmer households in transmigration areas has advantages and disadvantages.

Based on Table 3, households using Model 1, the *jajar legowo* planting pattern with irrigation and labor from both within and outside the family, obtained an income of IDR. 3,278,446.21 per harvest, while farmers using Model 2 obtained an income of IDR. 1,797,150.33 per harvest. This finding is supported by Julian (2023), showing that the *jajar legowo* planting system in Model 1 offers higher rice production than other planting systems, resulting in increased income. On the other hand, Marpaung et al., (2021) found that using the tabela planting system as applied in Model 2 can save farming costs.

Table 3.
Wet Rice Farming Income in transmigration areas.

Description	Model 1	Model 2
Production (kg)	900	700
Selling price (IDR)	10,129	10,667
Reception	9,116,100	7,466,900
Cost (Rp)		
Seedlings	611,613	443,333
Fertilizer	691,677	555,000
Pesticides	1.223,226	886, 667
Tractor Rental	713, 226	775, 000
Kindergarten Planting	716,129	933,333
Kindergarten Harvesting	1,737,097	1,950,000
Transportation TK	81,512	70,000
Tool depreciation	63,173,79	56,416,67
Total Cost (IDR)	5,837,653.79	5,669,749.67
Revenue (IDR)	3,278,446.21	1,797,150.33

Source. Primary data analyzed in 2024

Management and other factors affecting the income level of wet rice farming in the Wonosari sub-district.

In this study, factors that are thought to affect the household income of transmigrant farmers include age, land area, education, and management model. Based on the analysis results in Table 4, it can be explained that the age of farmers significantly affects the income of wet rice farming in the transmigration area of Wonosari District with a significance of 0.021 (<0.05). Age is related to farmers' experience, knowledge, insight, and behavior to manage and organize farming businesses (Guo et al., 2015). (Guo et al.,

2015) (Soekartawi in Burano & Siska, 2019). It should be noted that the age of farmers also shows their experience and skill level in wet rice farming activities. In line with research (Moroki, *et al 2018*), age affects farmers' physical ability in farming activities and work outside the agricultural sector.

Table 4.
Factors affecting the income of transmigrant farmers

Variables	*B*	*t*	*Sig*
Constant	- 21534222,77	- 6,006	0,001***
Age	127326,239	2,446	0,021**
Land area	6539581,696	5,963	0,001***
Education	254932,354	1,699	0.100 NS
Management model (Dummy)	4615842,480	2,868	0,008***
Adjusted R^2			0,636
F			25,536***

Source. Primary data processed.2024

The variable land area significantly affects the income of wet rice farming (p=0.001). This means that larger land areas owned by wet rice farmers in transmigration areas provide an opportunity to increase their income, while smaller land areas result in lower income. This finding aligns with research by (Sofianita et al., 2022) (Ouattara et al., 2022), stating that land area affects the income of wet-rice farmers. Therefore, transmigrant households must effectively utilize the land provided by the government, especially if it is in good condition (Aini, 2019). The condition of the land is crucial, as fertile soil significantly impacts the amount of production, and maintaining soil fertility ensures better agricultural yields.

The analysis of education variable shows an insignificant effect on the income of wet rice farming in the Wonosari Subdistrict transmigration area. According to interviews with farmers, most have only an elementary school education. There has been a tendency that higher education levels correlate with lower interest in farming (Saputra et al., 2022). However, education remains essential for improving human resource capabilities and achieving social and economic development goals Julianto & Utari, 2019). (Nasirudin et al., 2020).

Table 4 shows that the management model variable significantly affects wet rice farming income (p=0.008). This is supported by research by (Canon et al., 2018) (Nasirudin et al., 2020), arguing that applying family labor management and land management significantly impacts wet rice production. Fauziah & Dwi Nugroho (2020) also demonstrated that effective management of nursery activities, land management, and collaborative planting with other farmers can increase farm income. This study indicates that applying management Model 1 likely results in higher farm income than Model 2. Thus, the jajar legowo planting system, irrigation system, and the use of family and external labor significantly contribute to increasing the income of farmer households' income in wet rice farming.

CONCLUSION

There are two anagement models of wet rice farming for transmigrant households in the Wonosari sub-district. A total of 82.86% of transmigrant farmer households apply Model 1, which includes the *jajar legowo* planting system, an

irrigation system, and the use of both family and external labor. Meanwhile, 17.14% of transmigrant farmer households apply Model 2, which uses a tabela planting system with irrigation and boreholes, predominantly employing external labor. The average income generated by Model 1 farmers is IDR. 3,278,446.21 per planting, while Model 2 farmers generate an average income of IDR. 1,797,150.33 per planting. Thus, the total household income of Model 1 farmers is higher than that of Model 2 farmers. Factors affecting the household income of transmigrant farmers farming wet rice include age, land area, and management model.

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