

Comparative Analysis of Rice Farming Using Tabela and Transplantation Patterns in Harapan Village

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Abstract

This study aims to determine the production costs and income of lowland rice farming using the Tabela planting pattern and the shifting planting pattern in Harapan Village, Wonosari District. This study involved 41 rice farmers. The research method is a survey, using a farming analysis that provides an explanation of the large production costs and income of lowland rice farming in the table planting pattern and the shifting planting pattern in Harapan Village. The results of the study show Based on the results of the analysis that has been carried out, it can be seen that the average farming costs incurred by rice farmers with a shifting planting pattern are Rp. 10,600,959 (Per Kg / Farmer / MT) and the average farming costs incurred by rice farmers with a Tabela planting pattern are Rp. 2,676,347 (Per Kg / Farmer / MT) in Harapan Village, Wonosari District, and the average income of rice farmers with a shifting planting pattern is Rp. 22,289,950 (Per Kg / Farmer / MT) and the average income of rice farmers with a Tabela planting pattern is Rp. 32,313,126 (Per Kg / Farmer / MT) in Harapan Village, Wonosari District

Keywords: Cost, Comparison, Income, Table, Transplantation, Farming.

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INTRODUCTION

Indonesia is an agrarian country where the agricultural sector is the lifeblood of the community and a pillar of the national economy. As a primary food crop, rice plays a crucial role because it is the staple food for the majority of the population. The primary goal of agricultural development is to improve farmers' living standards by increasing their income. This income is significantly influenced by production volume, selling price, and cost efficiency. To achieve maximum yields, farmers must be able to manage production factors such as land area, appropriate input use, and efficient cropping patterns.

Gorontalo Province has strategic potential, with the largest public expenditure being on the rice sector. In Boalemo Regency, the agricultural sector supports the regional economy, with a land area of 1,518 hectares. Specifically, in Wonosari District, rice production in 2015 reached 29,894.90 tons from a harvested area of 5,382 hectares. Despite this high production, productivity remains relatively low compared to other

regions due to the use of inappropriate inputs. Harapan Village is one of the rice paddy centers in Wonosari District, serving as the economic mainstay of the local community. However, farmers in this village still face challenges such as low income and declining land productivity due to a heavy dependence on chemical inputs.

In practice, there are differences in the application of cultivation technologies, namely between the Tabela (Direct Seed Planting) and Transplantation (Transplanting) planting patterns. These two methods have different cost characteristics, labor requirements, and production results. Therefore, the author wanted to investigate the production costs and income of lowland rice farming using the Tabela and Transplantation planting patterns.

Agricultural Science

Agricultural science is the study of how to determine, organize, and coordinate the use of production factors as effectively and efficiently as possible so that agricultural production generates greater farmer income (Erlangga & Vaulina, 2025). Therefore, agricultural science studies the ways in which farmers organize agriculture. Agricultural science is the activity of organizing or managing assets and methods in agriculture. Farming can also be defined as an activity that organizes agricultural production facilities and technology in a business related to agriculture (Razak et al., 2020).

According to Leovita et al (2023), farming is the science that studies how farmers manage inputs or production factors (land, labor, capital, technology, fertilizer, seeds, and pesticides) effectively, efficiently, and continuously to produce high production so that farm income increases. From several definitions, it can be concluded that what is meant by farming is an effort carried out by farmers to earn income by utilizing natural resources, labor and capital, where part of the income received is used to finance expenses related to farming.

The factors at work in farming are nature, labor, and capital. Nature is a crucial factor in farming, and to a certain extent, humans have successfully influenced natural factors. However, beyond that, natural factors are the determining factor and must be accepted as they are. Natural factors can be divided into two: soil factors and the surrounding natural environment. Soil factors include soil type and fertility. Environmental factors include climate, which is related to water availability, temperature, and so on. Nature has various characteristics that must be understood because farming is a highly sensitive endeavor (Ahmadia et al., 2022).

Farming Costs

Costs are generally the monetary amounts spent by economic actors to obtain necessary goods or services. For producers, costs are defined as the monetary amounts spent to purchase goods and services used as inputs in the production process, which are then used to produce outputs or commodities. Meanwhile, costs incurred by consumers are used to meet consumption needs, whether in the form of final goods or services, which can provide benefits to consumers. Farming costs are the costs incurred by farmers in the production process. In this case, costs are classified into cash costs (real costs incurred) and non-cash costs (Sutarman et al., 2024).

Production costs are required in farming activities. Production costs are all expenses incurred by farmers to acquire the production factors used in rice farming. Production costs for rice farming consist of two types of costs: fixed costs and variable costs. Variable costs include the cost of production inputs, namely seeds, pesticides, labor costs, and other costs. Fixed costs are the depreciation of equipment. Farming costs are calculated based on the amount of money actually spent by farmers to finance their farming activities, which includes the cost of production inputs, labor costs, and other costs (Nurhadi et al., 2024).

Farm Income

Income is the profit or net yield earned by farmers from their production. A farmer can achieve maximum profits by taking steps to increase yields by suppressing prices and simultaneously implementing technical and price efficiency. Income is one of the most important economic factors for farmers. Farmer income levels provide capital for farmers in their farming endeavors. Income levels can indicate a farmer's ability to manage their farm, particularly in adopting new technologies (Razak et al., 2020).

Revenue is the increase in a company's assets, including cash, receivables, and other assets resulting from the sale of goods or services, resulting in increased capital. Farm revenue is the product of the total production obtained and the cost of production. Farm revenue is the difference between revenue and all costs incurred in a single period. Farm income is the difference between revenue and total costs. Farm income is the product of production multiplied by the selling price. According to Prabowo et al. (2021), total farm income (net income) is the difference between total revenue and total costs incurred in the production process, where all inputs owned by the family are counted as production costs.

Tabela planting pattern (direct seed planting)

Transplanting is a planting pattern where seeds are first sown in a nursery, then after a certain age they are transferred (transplanted) to rice fields. This technique is commonly used by traditional and modern farmers because it allows for more uniform plant growth. The advantages of the transplanting pattern are: plants grow stronger because the seeds are ready to adapt, weed control is easier, plant populations can be more regulated, the disadvantages of the transplanting pattern, require more labor, labor costs for sowing, removing seedlings, and planting are higher, and plants experience stress when transferred, which impacts the age of harvest (Nurhadi et al., 2024).

Transplanting planting pattern

Tabela (direct seeding) is a method of planting seeds directly in the field without going through a nursery process. This technique has become popular because it is considered more efficient in terms of labor. The advantages of the tabela planting pattern include eliminating the need for a nursery or transplanting seedlings, saving labor in the initial planting stage, and a faster and more practical planting time. The disadvantages of the tabela pattern include a high risk of pest attacks such as those caused by birds, the potential for uneven plant populations, and the need for intensive

weed management during early growth. The differences between these two planting patterns affect costs, labor, productivity, and farmer income (Musmuliadi, 2018) .

METHODOLOGY

This study used a survey method with a quantitative descriptive approach. This study used a quantitative approach. Quantitative research is a systematic and objective approach to data collection and analysis that involves the use of numerical data to gather and analyze valid and reliable information about a particular phenomenon or problem (Berlianti et al., 2024). Quantitative research was chosen because this study focuses on the analysis of farming costs. To calculate all costs, the formula used is

$$TC = FC + VC$$

Where :

TR = Total Cost

FC = Total Fixed Cost

VC = Total Variable Cost (Variable Cost)

Furthermore, this research also focuses on income analysis. To calculate income or profit, the first thing that must be known is the farm income (TR). Farm income (TR) is obtained using the formula:

$$TR = PQ$$

Where :

TR = Total Return / Total Revenue (RP)

P = Price (RP/Kg)

Q = Quantity / Production (Kg)

Income

$$I = TR - TC$$

Where :

I = income

TR = Total return or total receipts (Rp)

TC = Total cost or total costs (Rp)

The research population that became the focus of the research was 536 rice farmers in Harapan Village. From the research population, the sample was determined using the Slovin formula with an error rate of 15%, so that the sample size was 41 rice farmers, as follows:

$$n = \frac{N}{1 + N(e^2)}$$

$$n = \frac{536}{1 + 536(0,15)^2}$$

$$n = \frac{536}{1 + 536(0,0225)}$$

$$n = \frac{536}{1 + 12,06}$$

$$n = \frac{536}{13,06}$$

$$n = 41$$

RESULTS AND DISCUSSION

1. Analysis of costs and income of paddy farming based on cropping patterns

Fixed costs

Fixed costs are costs that remain constant regardless of changes in production volume. Fixed costs are costs that do not affect production and are incurred regardless of whether production is high or low, and regardless of whether production is low. Fixed costs incurred in this study include only the depreciation of equipment (NPA) and the land and building tax (PBB) for two types of paddy field planting patterns, namely *tabela* and shifting planting (Sirsan et al., 2025).

Table 1. Average equipment depreciation value (NPA) in the *tabela* and transplanting planting patterns per hectare of rice paddy farmers in Harapan Village, Wonosari District, Boalemo Regency

		Hoe	Sickle	Hand spray
Transplanting Pattern	Starting Price (Rp)	162,500	157,500	522,727
	Old Price (Rp)	92,182	63,000	209,091
	Duration of Use (Years)	4	4	6
	Depreciation (Rp)	22,673	23,559	57,273
Table Pattern	Starting Price (Rp)	163,158	163,158	536,842
	Old Price (Rp)	99,895	99,895	327,895
	Duration of Use (Years)	4	4	5
	Depreciation (Rp)	19,477	16,896	40,895

Source: Data processed 2025

Table 1 presents a comparison of the average depreciation value of the main non-production tools (NPA) such as hoes, sickles, and handsprays in the *tabela* and transplanting planting patterns per hectare for rice farmers in Harapan Village, Wonosari District, Boalemo Regency in 2025. Data includes the initial price, old price (remaining value), duration of use, and annual depreciation value, showing that the transplanting pattern has a higher depreciation overall than the *tabela* pattern. In the transplanting pattern, the depreciation of hoes is Rp22,673, sickles Rp23,559, and handspray Rp57,273, with initial prices of Rp162,500, Rp157,500, and Rp522,727, respectively, and a usage period of 4-6 years. Meanwhile, the *tabela* pattern shows lower depreciation: hoe Rp. 19,477, sickle Rp. 16,896, and handspray Rp. 40,895, with initial prices of Rp. 163,158, Rp. 163,158, and Rp. 536,842 and a usage period of 4-5 years.

The transplanting system requires separate seeding and replanting, causing tools such as sickles (+39% depreciation) and hand sprayers (+40%) to wear out more quickly due to the high frequency of manual uprooting, transplanting, and spraying; the cost of hoes also increased by 16% due to the additional nursery bed preparation. In contrast, the *tabela* system (direct seeding) is tool-efficient because planting occurs immediately after tillage, reducing the usage cycle and lowering depreciation despite similar initial costs. In the field in Harapan Village, transplanting farmers face faster tool wear due to intensive manual labor (manual uprooting, alternating planting), especially in limited irrigated rice fields that require repeated hand spraying for

nursery weeds. The tabela system is more efficient for farmers with small dependents (70% 0-3 people) who lack labor, in line with the regeneration trend of older farmers who find complex processes difficult. This is in line with the study "Comparison of the Feasibility of Rice Farming Using the Transplanting and Tabela Systems" by Sutarman et al. (2024) stated that the depreciation costs of equipment such as hand sprayers, hoes, and sickles are higher in tapin compared to tabela due to the intensive seeding and transplanting process, similar to the pattern in Harapan Village where hand sprays have a depreciation of +40%. Other studies such as Musmuliadi, (2018) "Comparison of the Transplanting System (TAPIN) and Tabela" (latest year) highlight the more frequent use of tools in tapin, causing rapid depreciation, while tabela is economical due to direct sowing.

Table 2. Average land and building tax (PBB) costs for rice farmers in Harapan Village, Wonosari District, Boalemo Regency

No	Fixed cost components	Transplanting Planting Pattern	Tabela Planting Pattern
	PBB Fee (Rp/ha/year)	82,500	85,263
	Amount	Rp. 82,500	Rp. 85,263

Source: Data processed 2025

Table 2 above shows that the land and building tax (PBB) for rice farmers in Harapan Village for the shifting cropping pattern is IDR 82,500 per hectare/year, and for the tabela cropping pattern it is IDR 85,263 per hectare/year. Differences in rice land rental costs between the shifting cropping (tapin) and tabela patterns often arise due to factors such as land quality, strategic location, and perceived productivity, which influence rental price negotiations. Tabela land tends to be more expensive if it is considered fertile and easy to manage without intensive nursery cultivation. Tabela is usually rented more expensively because it is suitable for high-quality, flat land with stable irrigation, allowing direct sowing of seeds that save water and labor, so landowners set a premium for the potential for stable harvests. Conversely, tapin is often used on marginal or muddy land that requires additional cultivation, depressing rental prices due to the risk of nursery flooding or low productivity (Sutarman et al., 2024).

Table 3. Recapitulation results of the average fixed costs incurred by rice farmers in the tabela and transplanting planting patterns in Harapan Village, Wonosari District.

No	Description	Average total fixed costs (Rp)	
		Transplanting Planting Pattern	Tabela Planting Pattern
1	Equipment depreciation	103,505	77,268
2	value (NPA)	82,500	85,263
	Land and building tax value		
	Amount	Rp. 186,005	Rp. 162,531

Source: Data processed 2025

Table 3. Shows that the average total fixed costs incurred by farmers with a transplanting pattern in a 1 MT period is IDR 186,005/farmer, which consists of the average depreciation value of equipment and the average value of land and building tax. Furthermore, the average total fixed costs incurred by farmers with a tabela planting pattern are IDR 162,531/farmer. In the transplanting pattern, the production process requires more types and more intensive use of tools. Because the number of tools is greater and the frequency of use is higher, the depreciation value of the tools is greater, the economic life of some tools is shorter because they are often used in the nursery stage, as a result, fixed costs in the transplanting pattern are higher (Gagliardi et al., 2025) .

In theory, the amount of PBB should be the same between the two planting patterns if the land area and ownership status are the same, but in practice, field research often finds differences in PBB costs , for several reasons, namely differences in the area of land used by farmers who use the tabela pattern sometimes use a larger area because the process is faster and does not require a nursery, while in the transplanting pattern, part of the land is used for a separate nursery area. In addition, there are differences in land status (Sutarman et al., 2024) .

Variable costs

Variable costs are costs that frequently change with changes in production volume. In lowland rice farming, variable costs include labor costs from land preparation to harvest, seed costs, fertilizer costs, and pesticide costs (Erlangga & Vaulina, 2025) . The following is a comparison of variable costs between the tabela and transplanting cropping patterns:

Table 4. Average variable costs in the shifting planting pattern and the tabela planting pattern in Harapan Village, Wonosari District, Boalemo Regency

No	Types of variable costs	Average total variable costs (Rp/MT)	
		Transplanting Planting Pattern	Tabela Planting Pattern
1	Labor costs		
	- Land processing (Rp/MT)	8,672,727	833,684
	- Seed Distribution (Rp/MT)	100,000	100,000
	- Fertilization (Rp/MT)	100,000	100,000
	- Pest and Disease Control (Rp/MT)	100.00	100,000
	- Harvesting (Rp/MT)	736,364	633,158
2	Seed Cost (Rp)	181,591	188,158
3	Fertilizer costs (Rp)	405,636	411,597
4	Cost of medicines (Rp)	118,636	177,237
	Average Total Amount Variable Costs	10,414,954	2,543,834

Source: Data processed 2025

Table 4 presents the average variable costs of lowland rice farming in the shifting planting pattern with a total average *variable cost* of Rp10,414,954/MT and the

tabela planting pattern with a total average *variable cost* of Rp2,543,834/MT. There is a difference in variable costs between the costs incurred by lowland rice farmers who use the shifting planting pattern and the tabela pattern in Harapan Village, Wonosari District, Boalemo Regency in 2025, with the dominance of labor costs reaching 83% of the total in shifting planting. Costs consist of labor (land preparation, seed distribution, fertilization, pest control Rp736,364/MT for transplanting and Rp633,158/MT for tabela, harvesting), seeds (Rp181,591/MT and Rp188,158/MT), fertilizer (Rp405,636/MT and Rp411,597/MT), and medicines (Rp118,636/MT and Rp177,237/MT). This difference reflects the reality of Harapan Village farmers with small dependents (70% 0-3 people) who have difficulty supplying labor for transplanting, making the tabela pattern more feasible in terms of variable costs even though the potential yield of transplanting is higher. This is in line with the value of equipment depreciation where fixed depreciation is also higher in transplanting (Sutarman et al., 2024) . To calculate the total costs for the tabela planting pattern, use the formula:

$$TC \text{ (total cost)} = FC \text{ (fixed cost)} + VC \text{ (variable cost)}$$

Table 5. Average total costs for rice farming using the transplanting and table planting patterns in Harapan Village, Wonosari District.

No	Types of costs	Average Total Cost (Rp)	
		Transplanting Planting Pattern	Tabela Planting Pattern
1	Fixed Costs	186,005	162,531
2	Variable Costs	10,414,954	2,543,834
	Amount	10,600,959	2,706,365

Data source processed 2025

So the average total cost of rice farming in Harapan Village with a shifting planting pattern is Rp.10,600,959 and The average total cost of a rice paddy farming business using the tabela planting pattern is Rp. 2,706,365.

2. Analysis of rice farming income based on shifting planting patterns and table planting patterns

Rice paddy farming income is generally defined as the difference between *total revenue* and total production costs *associated* with rice farming activities in a given period (e.g., per planting season or per year). Operationally, income is calculated as the selling price multiplied by the quantity of the harvest; total costs include variable costs (seeds, fertilizers, pesticides, labor wages) and allocated fixed costs (depreciation, land rent, taxes) (Prabowo et al., 2021) . Income is the profit or net result obtained by farmers from their production. A farmer can obtain maximum profits provided that the farmer takes action by increasing his yield by suppressing prices, implementing technical efficiency and price efficiency simultaneously. Rice paddy farming income in Harapan Village, Wonosari District comes from the difference between income and total costs used or incurred. In rice paddy farming in Harapan Village, Wonosari District, net income is calculated from the difference between income and expenses (Leovita et al., 2023) .

Table 6. Total Income from Paddy Farming Businesses using the shifting planting pattern in Harapan Village, Wonosari District, Boalemo Regency

Transplanting Planting Pattern	Average production (Kg/Farmer/MT)	2,323
	Average selling price (Rp/Kg//Farmer/ MT)	14,182
	Average Income (TR) (Rp/Kg//Farmer/ MT)	32,890,909
	Average Total Cost (Rp/Kg//Farmer/ MT)	10,600,959
	Income (Rp/Kg//Farmer/ MT)	22,289,950
Tabela Planting Pattern	Average production (Kg/Farmer/MT)	2,358
	Average selling price (Rp/Kg//Farmer/ MT)	14,842
	Average Income (TR) (Rp/Kg//Farmer/ MT)	34,989,474
	Average Total Cost (Rp/Kg//Farmer/ MT)	2,676,347
	Income (Rp/Kg//Farmer/ MT)	32,313,126

Source: Data processed 2025

Table 6 above compares rice farming income between two cropping patterns, namely the shifting and the tabela patterns, in Harapan Village, Wonosari District, Boalemo Regency. The main focus is to examine the production, revenue, costs, and ultimately income earned by farmers per planting season. For the shifting pattern, the average production per farmer per planting season is approximately 2,323 kg, with a selling price of approximately Rp 14,182 per kg. The combination of production and prices yields an average total revenue of approximately Rp 32,890,909 million per farmer per planting season, with total costs of approximately Rp 10,600,959, resulting in a net income of approximately Rp 22,289,950. For the tabela pattern, average production is slightly higher, at around 2,358 kg per farmer per planting season, with a higher selling price of around Rp 14,842 per kg. This increases average revenue to around Rp 34,989,474 per farmer per planting season, with total costs of around Rp 2,676,347 million and net income of around Rp 32,313,126. million per planting season.

Table 6 shows that the tabela system provides higher income and revenue than the transplanting system, both because of its slightly larger production and because of its higher selling price. A very striking difference is also seen in total costs, where the tabela system in this table is recorded as having much lower costs resulting in higher income. From a farming perspective, the tabela system appears more profitable because it generates greater income per farmer per planting season, making it more economically feasible to recommend to farmers in the study area. This is in line with the recent research of Sutarman et al. (2024) , which shows that comparing income between the tapin and tabela systems is important to see which system is more efficient and financially feasible. They also compare the costs, income, income, and R/C ratio

of rice farming between the transplanting and direct seeding systems, and report that the tabela system has a slightly higher R/C ratio making it economically more profitable than the tapin system, in line with the findings of Table 16 which show higher income in the tabela system compared to transplanting in Harapan Village, Wonosari District, Boalemo Regency.

CONCLUSION

Based on the results of the data analysis that has been obtained along with the discussion that has been presented, the conclusion can be obtained that the average farming costs incurred by rice farmers with a shifting planting pattern are Rp. 10,600,959 (Per Kg/Farmer/MT) and the average farming costs incurred by rice farmers with a tabela planting pattern are Rp. 2,676,347 (Per Kg/Farmer/MT) in Harapan Village, Wonosari District, and the average income of rice farmers with a shifting planting pattern is Rp. 22,289,950 (Per Kg/Farmer/MT) and the average income of rice farmers with a Tabela planting pattern is Rp. 32,313,126 (Per Kg/Farmer/MT) in Harapan Village, Wonosari District.

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