COMPARISONOF FARMERS INCOMEOF RICE FIELD (ORYZA SATIVA L) WITH TRANSPLANTING TECHNIQUES (TAPIN) AND DIRECT SEED PLANTING TECHNIQUES (TABELA) (CASE STUDY: ARAS VILLAGE, AIR PUTIH SUBDISTRICT, BATU BARA DISTRICT)

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ABSTRACT

The rice farming activities cultivated by farmers in addition to aiming to meet the food needs of their families are also a source of livelihood. From the rice farming business, it produces a number of income. To get maximum income, farmers try to do cultivation techniques innovation, and one of them is by Direct Seed Planting Technique (TABELA). Even so, there are also farmers who cultivate the transplanting techniques (TAPIN). This study aims to determine whether there are differences in the income of rice farmers by using transplanting techniques (TAPIN) and direct seed planting (TABELA) and how the efficiency of rice farming in the village of Aras, Air Putih sub-district, Batu Bara regency. The research sample amounted to 20 TAPIN farmers from 100 populations and 20 TABELA farmers from 200 farmers with purposive sampling technique. Data analysis using descriptive analysis, cost analysis and statistical analysis of average or t-test difference (independent sample t-test). The results of the study showed that the Tapin farming income was Rp. (9.346.085) greater than the revenue from Tabela (8.600.990). The average difference test shows that the income of farmers who use the Tapin technique is greater than the farmers who use the Tabela technique. And shown t-count> t-table then H0 is rejected and H1 is received where t-count is 5.25> t-table 1.68. The B / C ratio in the Tapin system rice field farming is 1.07, where the value is 1.07> 1 then the Tabela system farming is said to be efficient. while the B / C ratio in the Tabela system farming is 1.04, where 1.04> 1 then the Tabela system farming is said to be efficient.

Keywords: transplanting techniques, direct seed planting techniques, income, farmers, rice field

A. INTRODUCTION

The agricultural sector is a very important sector in driving the Indonesian economy. Agricultural production which is a staple for direct consumption and primary materials for agro-industry makes human demand in the agricultural sector will not go down. Besides that, the production process from tillage to marketing for one planting season makes the agricultural sector a sector that is able to provide employment. One of them is a rice field farming business, which in general can be carried out three times in one year.

Rice production in the province of North Sumatra has fluctuated as in 2006 rice production was 2,870,944 tons with an area of rice farming of 652,531 Ha. Then in 2010 there was an increase in rice production to 3,422,264 tons with a land area of 702,308 Ha, and in 2016 there was an increase in rice production reaching 4,387,035.9 tons with an increase in land area of 826,695.8 Ha. Increased rice production is one of the forms of improvement in farmer's household income. The increase in production occurred on the island of Java as much as 1.22 million tons and outside Java was 2.52 million tons. The increase in production was due to an increase in harvested area of 919,098 hectares (ha) or an increase of 6.51% from 14,116,638 ha to 15,035,736 ha. The relatively large increase in rice production in 2016 is estimated to occur in South Sumatra (21.81%), West Java (6.83%), South Sulawesi (7.66%), Lampung (11.13%), East Java (2 , 93%), North Sumatra (8.86%), Jambi (48.13%), West Kalimantan (15.21%), Banten (7.56%) and South Kalimantan (7.67%) (Anto Kurniawan , 2016)

One of the efforts made to increase rice productivity is by improving the quality of farming, namely the method of planting, the arrangement of the planting system that is currently widely used by Indonesian farmers is the direct seed planting system (tablea) and the transplanting system (tapin). Although the transplanting system is a cropping system that has long been used, there are still many farmers who continue to use the cropping system. Many farmers also initially used the transplanting system (tapin) which had left the cropping system and switched to the direct seed planting system (Prasetyo, 2010). Furthermore, to increase agricultural production, it is necessary to improve appropriate technology. Technology in the field of food that has long been known by the farming community is called the Sapta farming technology. Sapta farming is a package consisting of seven types of activities. These activities include the use of superior seeds, good soil processing, good irrigation water management, fertilizer use and eradication of pests and diseases, harvest handling, post-harvest handling and marketing of crops.

At present rice field cultivation is required to use a more efficient system, both labor, water utilization, and time use. The system that can meet these criteria is the direct seed planting system (table). This system has long been recognized by the Indonesian people as a traditional system of upland rice cultivation. Upland rice cultivation is carried out on processed dry soil, while the table

for wetland rice cultivation is carried out on muddy soil that has been completely processed. Rice cultivation is carried out without going through the nursery stage, so that it can save water for seeding. In addition, the labor needed for the cultivation of the table system is relatively small. Labor savings are found in the activities of making nurseries, extracting, transporting and planting seeds in the fields (Suharno, 2006).

Aras Village, Air Putih sub-district, Batu Bara district, is one of the villages where most of the people make a living in the agricultural sector, namely rice farming. The direct seed planting technique (TABELA) was reintroduced to farmer groups in the village of Aras starting in 2005. Constraints that arose during the trial of TABELA farming included; Plant maintenance is more difficult because weeds grow early, many pests and diseases attack plants. These constraints affect the management process so that it will affect agricultural production. Differences in planting techniques will affect production costs which will also affect farmer income. The level of income of farmers using direct transplanting and seed planting systems needs to be compared as an evaluation of the use of existing cropping systems. Through the application of the right planting system, it is expected that farmers can reduce production costs in an effort to increase their farm income. The research problem that will be seen is how is the difference between the income of rice farmers by using transplanting techniques (TAPIN) and direct seed planting (TABELA) in Aras Village, Air Putih sub-district, Batu Bara district, and how is the efficiency of rice farming in these two planting techniques.

B. RESEARCH METHODS

The study used was a case study conducted in Aras Village, Air Putih sub-district, Batu Bara district. The research location was determined purposively. The population in this study were rice farmers who numbered 300 farmers consisting of 200 petai with TAPIN techniques and 100 farmers with TABELA techniques. The number of population sampled is 20 farmers each. So the total number of samples is 40 farmers. The sampling technique is by using purposive sampling method. The data used in this study consisted of primary data and secondary data. To solve the first problem about the comparison of the income of lowland rice farmers using Tapin and Tabela techniques, it was analyzed using the t-test statistical test to see the difference in income between the rice farming system Tabela and Tapin. For income, the income formula is used, namely:

With the formula:

Pd = TR - TC

Information:

Pd = Farm income (Rp)

TR = Total revenue (Rp)

TC = Total cost (Rp)

Then compared the average income of farmers for lowland rice farming, the transplanting system (Tapin) with lowland rice farming. Lasung Seed Planting (Tabela). After that, it was analyzed using t-test statistic test to see the real or not different farming income of wetland rice transplanting systems. with direct seed planting. To test hypotheses, it can be done with an average or t-test statistic analysis (independent sample t-test) with a one-way test used for research comparing two variables. According to Sugiyono (2010) if the number of samples is different ($n_1 \neq n_2$) and homogeneous variance ($\alpha 12 = \alpha 22$) so that the pooled variant formula, degrees of freedom (dk) = $n_1 + n_2 - 2$. can be used mathematically.

$$\frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1){s_1}^2 + (n_2 - 1){s_2}^2}{n_1 + n_2 - 2}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Information :

$\bar{x}_1$ = Average income of tapin technique

$\bar{x}_2$ = Average income of the table technique

S12 = Variance from the tapin technique sample

〖S_2〗 ^ 2 = Variance from the technical sample table

n_1 = Number of tapin samples

n_2 = Number of samples of table technique

With the test criteria:

If t counts ≤ t-table, then Ho is accepted and H_1 is not accepted.

If t count> t-table, then Ho is not accepted and H_1 is accepted.

Efficiency of farming

To determine the efficiency of rice farming with tapin and table system, the following formula is used:

$$\frac{B}{C} = \frac{\Sigma(Yi \,.\, Pyi)}{\Sigma(Xi \,.\, Pxi) + \Sigma(DAi + \Sigma(Cl)}$$

Information:
B = Revenue
C = Cost (cost)
Yi = Total production i
PYi = Price per unit of product i
Xi = Input production i
PXi = Price per unit of input i
DAi = Depreciation of the tool to i
Cl = Other fixed expenses.

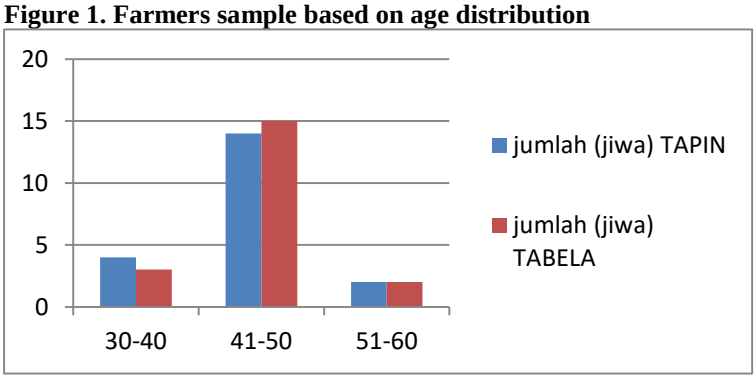
heoretically can be explained as follows:
B / C ratio> 1, then rice farming can be said to be efficient, because an increase in costs of one rupiah results in an increase in revenue greater than one rupiah.
B / C ratio = 1, then rice farming under break event point or return home due to an increase in the cost of one rupiah results in an additional revenue of one rupiah.
B / C raio <1, then rice farming can be said to be inefficient because an increase in costs of one rupiah results in an additional income of less than one rupiah.

C. RESULTS AND DISCUSSION

Characteristics of Sample Farmers

1. Age

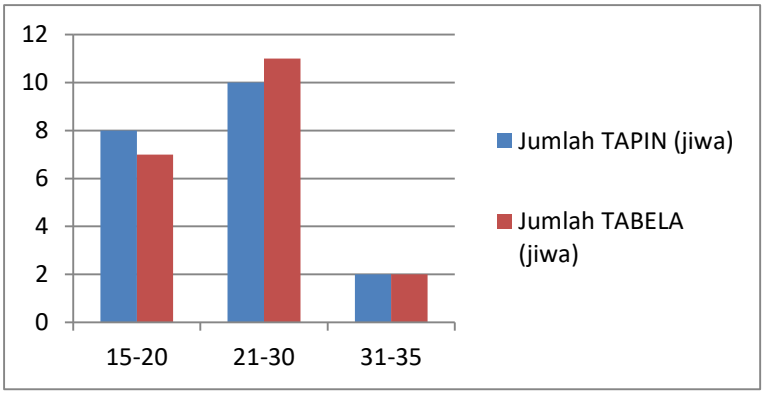
Figure 1. Farmers sample based on age distribution



It can be seen that the farmers of Tapin technique samples and Tabela techniques generally have a age range of 41-50 years. The 30-40 year old age range is more for the Tapin technique sample farmers which are 4 people while the technique is for 3 people. It can be said that the sample farmers with the Tapin technique are farmers with a lower age range than the farmers of Tabela.

2. Farming experience

Figure 2. Sample farmers based on the distribution of farming experience



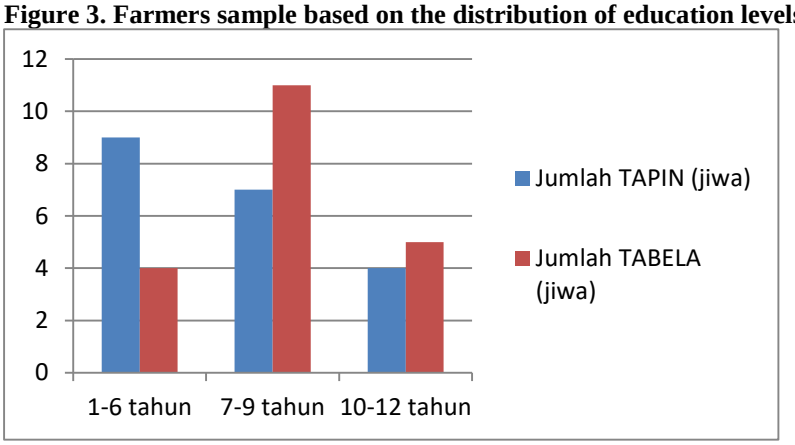
Source: Primary data processed 2018

One's experience in trying to influence in accepting innovation from outside. Those who have long enough experience will find it easier to implement innovation. Basically the longer the experience of a

farmer in the field of agriculture, the level of skill and knowledge possessed to increase production will be maximized. In the picture it can be seen that the farming experience of farmers in the Technical Sampa sample is in the range of 21-30 years more than the Tapin technique

1. **Level of education**

Figure 3. Farmers sample based on the distribution of education levels



Education is an important thing, where with the education that has been followed by someone will directly affect the mindset and knowledge. In this case the education in question is formal education. The distribution of formal education in the picture shows that Tabela farmers generally have a higher level of formal education than the sample farmers tapping Tapin.

Tapin farming costs and Tabela techniques

Farming costs are all costs incurred by farmers in conducting seasonal seasonal rice ushatani. Production costs consist of seeds, labor, fertilizer, medicine and shrinkage of equipment. The amount of production costs can be seen in the table below.

Table 1. Cost of Average Production of Tapin Technique and Tables for Planting Season

No	Component	Average Tapin	Average Tabela
1.	**Land area (Ha)**	**0.594**	**1**
		0.620	**1**
1.	Seeds (Rp/kg)	307.000	516.835
		127.250	205.242
2.	Fertilizer (Rp/kg)	907.000	1.526.936
		980.750	1.581.855
3.	Pesticide (Rp)	1.024.550	1.724.831
		979.250	1.567.232
4.	Land lease (Rp)	2.227.500	3.750.000
		2.257.500	3.612.000
5.	Depreciation tool (Rp)	125.615	211.473
		127.900	206.290
6.	Labor (Rp)	4.139.750	6.969.276
		3.762.360	6.068.323
Total		**Rp.8.731.915**	**Rp.14.699.351**
		Rp.8.235.010	**Rp.13.240.942**

Source: Primary data processed 2018

From table 1, it can be seen that the largest farming costs are found in the Tapin technique farming on average Rp. 8,731,915 for an average land area of 0.594 Ha and Rp. 14,699,351 for a land area of 1 Ha. Whereas with the Tabela technique the average average cost is Rp. 8,235,010 for a land area of 0.620 Ha and Rp. 13,240,942 for a land area of 1 ha.

Seed Costs

The type of seed used by farmers at the study site was the Inpari 32 variety. Farmers in the study area used the seed variety. The cost of seeds used for the Tapin technique (Rp.516,835 / Ha) is greater than the Tabela technique (Rp. 205,242 / Ha). This is because the technique of Tabela seedlings are used directly into the planting hole in the paddy field that has been prepared. Whereas for Tapin there is a seed seeding process that uses more seeds to plant.

Fertilizer

The type of fertilizer used in farming is Urea Fertilizer, ZA, Phoska, SP 36. These types of fertilizers as a whole are used by all samples. The average cost of fertilizer spent on Tapin techniques is Rp. 1,526,936 / Ha and the average fertilizer cost spent on the Tabela technique is Rp. 1,581,855 / Ha per planting season. Thus in the use of technical fertilizers Tabela uses a higher cost than the Tapin technique.

Labor costs

The labor cost for the Tapin technique is greater than the Tabela technique. The use of labor costs for the Tapin technique is more, namely during the process of planting seeds after the seeding process of rice seeds. lease land While in the Tabela technique do not do seed seeding.

Tapin and Tabela Farming Acceptance

Tapin and Tabela farm income is obtained from the results of multiplication between production results and selling prices. From the research that has been carried out in Aras Village, it is known that the price of tapin technical grain with an average of Rp.4,600 / kg, while the price of Tabela technical grain with an average of Rp.4,600 / kg. To see more clearly how much the Tapin and Tabela farming techniques receive can be seen in the table below.

Table 2. Average Farming Techniques for Tapin and Table Per Planting Season

Component	**Average Tapin**	**Average Tabela**
Land lease (Ha)	0.594	1
0.620	1	
Production (kg)	3.930	6.700
3.660	6.400	
Price (Rp)	4.600	4.600
4.600	4.600	
Total	**Rp.18.078.000**	**Rp.30.820.000**
Rp.16.836.000	**Rp.29.440.000**	

Source: Primary data processed 2018

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From table 1 it can be stated that the acceptance of the Tapin technique farm in the research area is Rp.18,078,000 and the technique is Rp. 16,836,000.

Tapin and Tabela Farming Net Income

Tapin and Tabela farm income is derived from the average total revenue minus the average total production costs. To see more clearly how much the farm income of Tapin and Tabela techniques can be seen in table 3.

Table 3. Average Income of Tapin Techniques and Tables per Planting Season

Keterangan	**Average Tapin**		**Average Tabela**	
Land lease (Ha)	0.594	1	0.620	1
Acceptance (Rp)	18.078.000	30.820.000	16.836.000	29.440.000
Production cost (Rp)	8.731.915	12.946.500	8.235.010	12.318.000
Total	**Rp.9.346.085**	**Rp.17.874.500**	**Rp.8.600.990**	**Rp.17.122.00**

Source: Primary data processed 2018

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From table 3, it is known that the Tapin technique farmers' income is Rp. 9,346,085, while the technical farming table is Rp. 8,600,990.

Average Difference Test

The average difference test in this study uses independent T-sample statistical technique with the help of SPSS version 20 for windows. The average value of income in the Tapin technique is 9.3457 and in the table technique of 8.6005 the value shows that the income of farmers who use the Tapin technique is greater than the farmers who use the Tabela technique. And shown t-count> t-table then H0 is rejected and H1 is received where t-count is 5.25> t-table 1.68. The value of 5.25 is obtained from t-count where to generate t-count through data processing by using SPSS method, while the value of 1.68 is obtained from table-t by looking at df 38 with a significance of 0.05 or 5%, so the value 5.25 is obtained by looking at table t. The results of this study are in line with the research conducted by Chansah Arfa (2013) which states that the average / ha of rice farming income from the transplanting system (Tapin) is greater than the average income / ha of rice farming systems for direct seed planting systems (Table)

Efficiency of paddy rice farming systems Tapin system and Tabela system

By using primary data that has been processed, the B / C value of this farm is as large as:

1. Tapin farming B / C value for planting and per hectare season

$$B/C = \frac{9.346.085}{8.731.010} = 1,07 \qquad B/C = \frac{17.874.000}{12.946.000} = 1.38$$

2. Value of B / C farms Tabela season planting and per hectare

$$B/C = \frac{8.600.990}{8.235.010} = 1,04 \qquad B/C = \frac{17.122.000}{12.318.000} = 1.39$$

The B / C ratio in the Tapin system rice field farming is 1.07> 1, the Tabela system farming is said to be profitable. This means that if every expense that is sacrificed by the farmer is Rp. 1 then the farmer will get a profit of Rp. 1.07. While the value of B / C Ratio in the Tabela farming system is 1.04> 1, the Tabela system farming is said to be profitable. This means that if every expense that is sacrificed by the farmer is Rp. 1 then the farmer will get a profit of Rp. 1.04. The B / C value obtained shows that the Tapin system of paddy farming is more efficient than the paddy farming system of Tabela system because the B / C ratio of the Tapin system is higher than that of Tabela. The results are not in line with the research obtained by Siregar, Weldy Arnikho (2015) shows that the TABELA system with a B / C ratio of 1.00 is more efficient than the TAPIN system with a B / C ratio of 0.04. 3.

D. CONCLUSION

From the results and discussions conducted in the field, it can be concluded:

1. Tapin technical farming income is greater than the technical income of the table. Where the average income of the Tapin technique is Rp. 9,346,085, and the average income of the Tabela technique is Rp. 8,600,990.
2. Based on the average difference test, the average income value in the Tapin technique is 9.3457 and in the Tabela 8.6005 technique the value shows that the income of farmers who use the Tapin technique is greater than the farmers who use the Tabela technique. And shown t-count> t-table then H0 is rejected and H1 is received where t-count is 5.25> t-table 1.68. Where Tapin's income is greater because farmers in carrying out their farming maintenance are more organized both in fertilizing, controlling, and controlling water.
3. The B / C ratio of the Tapin system rice field farming is 1.07, where the value of 1.07> 1 then the Tabela system farming is said to be efficient. while the B / C ratio in the Tabela system farming is 1.04, where 1.04> 1 then the Tabela system farming is said to be efficient. The B / C value obtained shows that the Tapin system of paddy farming is more efficient than the paddy farming system of Tabela system because the B / C ratio of the Tapin system is higher than that of Tabela.

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