Indonesian Printing Journal (JII)
p-ISSN: 2828-1284 e-ISSN: 2810-062x
website: https: //rivierapublishing.id/JII/ index.php / jii /index

Comparison of Costs and Income of Farming Businesses Rice Fields That Use Harvesting Machines Combine Harvester with Power Thresher (Case in Karanganyar Village, Kandanghaur District, Indramayu Regency)

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Keywords

Cost, Revenue, Combnine Harvester, Power Threser

Abstract

Agricultural mechanization, such as combine harvesters (CH) and power threshers (PT), is critical to addressing labor shortages and improving rice farming efficiency in Indonesia. This study compares the costs, income, and feasibility of CH and PT in Karanganyar Village, Indramayu. A quantitative approach with purposive sampling (40 farmers) was used, employing income analysis and paired t-tests (SPSS 26). CH reduced total costs by Rp3.36 million/ha (Rp22.28 million vs. PT's Rp25.64 million) and increased net income by Rp5.88 million/ha (Rp12.60 million vs. PT's Rp6.72 million), with a higher R/C ratio (1.57 vs. 1.26). Statistical analysis confirmed significant differences (Sig. 0.000). CH enhances profitability by cutting labor costs and minimizing post-harvest losses, supporting its adoption for sustainable rice farming. Policymakers should promote CH through subsidies and training.

INTRODUCTION

Indonesia has an abundant diversity of natural resources, one of which is in the agricultural sector. This agricultural sector should indeed continue to be developed in Indonesia. As an agrarian country, agriculture is one of the sources of the country's economy. Grace. (2022). Indramayu Regency has a raw rice field area of 125,442 Ha, with an average planting area of 249,699 Ha, rice harvest area of 244,420 Ha, rice production of 1,763,724.60 Tons/GKP with an average productivity of 72.16 Ku/Ha and Indramayu Regency is one of the highest rice-producing districts in Indonesia at 789,657 Tons (BPS, 2019).

Karanganyar Village is one of the villages located in the Kandanghaur District, Indramayu Regency, West Java Province. The area of Karanganyar Village is 740 Ha. In general, the topographical condition of Karanganyar Village is a lowland area so the soil condition is very good and suitable for agricultural areas. The area of land used for rice fields is approximately 626 hectares. Seeing the huge opportunity in the agricultural sector requires being able to maximize as many natural resources as possible, both human resources and

natural resources, especially as the number of farm labor is decreasing and production costs are getting higher.

Harvesting is the activity of taking plant products after optimal maturity or has great potential that is possible if processed into industrial raw materials or direct consumption. Harvest time is critical because it is too late, so the quality and quantity of the results decrease. Rice as a crop grown with a simultaneous planting system requires a lot of labor at harvest time to complete the harvest on time. The need for a large number of workers during harvest is a problem, especially in Karangannyar Village. Therefore, for areas with large rice fields, many harvesters are needed. However, currently the demand for harvesters is decreasing, because many agricultural workers are absorbed into the industrial sector so that harvest wages are getting more expensive. An alternative that can be done to overcome the lack of labor and reduce yield losses during harvesting, is to use modern harvesting machine tools. Herdiyanti, H., Eko Sulistyono, & Purwono. (2021).

The need for agricultural mechanization is increasing in line with the increasing scarcity of agricultural labor and there is a real increase in wages in rural areas, especially in high-intensity areas. Farming is defined as the science that studies how a person allocates existing resources effectively and efficiently for the purpose of obtaining high profits at a certain time. Wati, C., Indrawati, & Parante, G. (2017). In rice farming, the Combine Harvester is a rice harvester tool that can cut the grains of standing plants, knock and clean the grain while walking in the field. Janah H.T., F., Zakiah, Z., & Arida, A. (2022). Proper harvest and post-harvest handling can ensure that crops must be processed properly so that they can be sold at a good price. So that farmers get good added value (Kembaran & Muchsin, 2021).

The use of combine harvester harvesters has a significant impact that farmers feel such as lower production costs, increased output so that farmers' income increases. Therefore, we want to research the comparison of the cost and income of paddy rice farming businesses that use combine harvester harvesters with farmers who use power thresher harvesting machines in Karanganyar Village, Kandang Haur District, Indramayu Regency.

The purpose of this study is to find out the amount of cost and income of paddy rice farming using combine harvester and power thresher harvesting machines as well as the difference in cost and income of paddy rice farming using combine harvester and power thresher harvesting machines in Karanganyar Village, Kandanghaur District, Indramayu Regency. The current research provides a detailed comparative analysis of the economic efficiency between combine harvesters and power threshers in rice farming, specifically focusing on cost, income, and feasibility (R/C ratio) in Karanganyar Village, Indramayu Regency. Unlike prior studies (e.g., Nasution, 2019; Amrullah & Pullaila, 2019), which primarily examined yield losses or labor displacement, this study quantifies the significant cost savings (Rp. 3.36 million/ha) and higher net income (Rp. 5.88 million/ha) from combine harvesters, supported by rigorous statistical validation (paired t-test, Sig. 0.000). Additionally, it highlights the role of mechanization in reducing labor dependency (e.g., eliminating the *bawon* system) and improving post-harvest quality, offering empirical evidence for policymakers and farmers to adopt combine harvesters.

RESEARCH METHODS

The research was conducted in Karanganyar Village, Kandanghaur District, Indramayu Regency, selected due to its large rice field area, accessibility, and use of combine harvesters by farmers. A quantitative approach was employed, using questionnaire data and statistical analysis (paired sample t-test) to examine the economic impact of combine harvesters versus power threshers. Purposive sampling targeted rice farmers in the area. Data collection involved interviews, observations, and documentation. Analysis included income comparison and t-testing to evaluate farming efficiency between the two harvesting methods.

This study uses descriptive and quantitative data analysis techniques, namely income analysis and t-test (paired sample t-test). The analysis model used to determine the income of paddy rice farming using a combine harvester and power thresher is:

Pd = TR – TC

TR = P X Q

TC = VC + FC

Information:

Pd = Farming's net income

TR = Total Revenue

TC = Total Production Cost

P = Basic price per kg (Price)

Q = Production quantity (Quantity)

VC = Variable Production Cost (Variable Cost)

FC = Fixed cost

To determine the feasibility of farming using a combine harvester and power thresher, the formula (Suratiyah, 2016) is used, as follows:

$$R/C\ Ratio = \frac{Total\ of\ acceptance}{Total\ cost}$$

Criterion:

R/C Ratio > 1, farming is worth farming

R/C Ratio < 1, farming is not suitable for farming

R/C Ratio = 1, farming impasse

Paired t-test is one of the hypothesis testing methods where the data used is not free (paired), before the analysis is carried out, the data is first subjected to a requirement test, namely the normality test. The normality test is used to test whether a variable is normal or not. Normal here in the sense of having normal data, to test the normality of the data, you can use the Kolomogrov-Smirnov test and the Shapiro-Wilk test with the provision that if the sig > 0.05, then the data is normally distributed.

The purpose of the t-test is to test the mean difference between two dependent data groups, while the test criteria use significance, namely:

a. If the sig ≥ 0.005 then H0 is accepted
b. If sig < 0.005 then H0 is rejected

The formula for the paired t-test is as follows:

$$t_{hit} = \bar{d}$$

$$\overline{sd/\sqrt{n}}$$

The standard deviation value can be calculated with the following formula:

$$Sd = \sqrt{\frac{\sum d^2 - \frac{\left[(\Sigma d)^2\right]}{n}}{n-1}}$$

= Statistical value t-count

= Mean value of difference between paired observations

Sd = Standard deviation of the difference between paired observations

n = Number of paired observations

d = Differences between paired data

$\bar{d}$ = Average difference/difference

RESULTS AND DISCUSSION

The Cost of Rice Farming

Production costs or total costs are all expenses required to produce rice farming production, production costs in this farming include variable costs and fixed costs. Variable costs are costs that affect the amount of production produced by farmers, which is determined by the level of use of factors of production used by farmers such as labor and means of production. Fixed costs are costs that do not affect the amount of production produced that is included in this cost, namely land rent, land taxes or depreciation costs (Felix et al., 2023).

The total cost used by paddy farmers in Karanganyar Village during the rice production process using combine harvesters and power threshers can be seen as shown in the table.

Table. 1 Total average production cost per 1 Ha of paddy farming

No.	Description	Total Cost	
		Combine Harvester	Power Threser
1	**Variable Cost (VC)**		
	a) Workforce	10.841.250	14.172.250
	b) Seeds	240.000	240.000
	c) Fertilizer	1.547.500	1.547.500
	d) Pesticides	3.388.275	3.388.275
	Variable Cost Amount	**16.017.025**	**19.348.025**
2	**Fixed Fee (FC)**		
	a) Lease of paddy fields during the planting season	6.000.000	6.000.000
	b) Rice field land tax for the planting season	98.000	98.000
	c) Depreciation Costs	169.801	198.239
	Amount of Fixed Fees	**6.267.801**	**6.296.239**
	Total Cost (TVC + TFC)	**22.284.826**	**25.644.264**
	Difference Value (*Power Thresher – Combine Harvester*)		
	= IDR 25,644,264 - IDR 22,284,826		
	= Rp. 3,359,438		

Source : Primary Data Processed, 2025

Based on table 1, it shows that the variable cost of rice farmers using combine harvesters for one planting season is Rp. 16,017,025 and rice farmers using power thresher is Rp. 19,348,025. Meanwhile, the fixed cost for rice farmers using combine harvesters is Rp. 6,267,801 and rice farmers using power thresher is Rp. 6,296,239. The total production cost of farming incurred by rice farmers using combine harvesters is Rp. 22,284,826 and rice farmers using power thresher is Rp. 25,644,264, so that the production costs of farmers using combine harvesters with power thresher in Karanganyar Village, Kandanghaur District, Indramayu Regency have a difference of Rp. 3,359,438.

Variable costs in rice farming include labor costs, seeds, fertilizers and pesticide costs. This is a factor that affects production yields and affects the income of farmers in Karanganyar Village, based on the results of research that combine harvester and power thresher farmers use seeds with new superior varieties, namely Ciherang, Mekongga, and Inpari 32 and use Urea, NPK, SP fertilizers which are useful for growth, development and good production results in rice plants. Fixed costs in farming include the cost of renting rice fields, rice field land tax costs, and depreciation costs. The shrinkage method used in this study is the straight line shrinkage method.

The cost component of rice production is all factors that affect the amount of cost of producing rice in one planting season, and the largest cost component is the cost that has the highest value compared to other cost components (Felix et al., 2023). Based on the results of the average production cost of rice farming in Karanganyar Village during one rice planting season per 1 hectare, the production cost of rice farmers using power thresher is greater than the production cost of rice farmers using combine harvesters. This is due to the high variable costs, especially labor in rice farmers who use power thresher, so there is a difference in costs. To find out the largest cost components in rice farming, combine harvester and Power Thresher can be seen in the following table:

Table. 2 Total average of the largest cost components per 1 Ha of paddy farming

Components of Farming Business Costs During the Planting Season	Combine Harvester		Power Thresher	
	Nominal (Rp)	Presentase (%)	Nominal (Rp)	Presentase (%)
A. VARIABLE COST (VC)				
a. WORKFORCE				
1. Gameplay	362.500	1,63	362.500	1,41
2. Tillage	1.680.000	7,54	1.680.000	6,55
3. Improvement of rice paddies	657.500	2,95	657.500	2,56
4. Leveling of rice fields	155.000	0,70	155.000	0,60
5. Planting	1.680.000	7,54	1.680.000	6,55
6. Embroidery	296.250	1,33	296.250	1,16
7. Peng. Weeds on Rice Fields	200.000	0,90	200.000	0,78
8. Weeding	540.000	2,42	540.000	2,11
9. Fertilization	400.000	1,79	400.000	1,56
10. HPT Protection/Control	1.320.000	5,92	1.320.000	5,15
11. Harvest Costs				
a. Harvest/Transportation Labor Costs	750.000	3,37	5.481.000	21,37
b. Harvesting Labor Costs (Operators) and Harvesting Tools	2.800.000	12,56	1.400.000	5,46

Components of Farming Business Costs During the Planting Season	Combine Harvester		Power Thresher	
	Nominal (Rp)	Presentase (%)	Nominal (Rp)	Presentase (%)
Amount a	**10.841.250**	**48,65**	**14.172.250**	**55,26**
b. MEANS OF PRODUCTION				
1. Seeds	240.000	1,08	240.000	0,94
2. Pupuk :				
a. Urea (Kg)	575.000	2,58	575.000	2,24
b. NPK (Kg)	625.000	2,80	625.000	2,44
c. SP (Kg)	144.500	0,65	144.500	0,56
d. Others (NPK Phonska+ and Mutiara 16-16-16)	203.000	0,91	203.000	0,79
Number of Fertilizers	1.547.500	6,94	1.547.500	6,03
3. Pesticides:				
a. Insecticide (Ltr/Bks)	1.443.925	6,48	1.443.925	5,63
b. Fungicide (Ltr/Bks)	969.000	4,35	969.000	3,78
c. Molluscasida (Bks)	176.125	0,79	176.125	0,69
d. Herbicide (Ltr/Bks)	799.225	3,59	799.225	3,12
Number of Pesticides	3.388.275	15,20	3.388.275	13,21
Number b	**5.175.775**	**23,23**	**5.175.775**	**20,18**
NUMBER VC (a + b)	**16.017.025**	**71,87**	**19.348.025**	**75,45**
B. FIXED FEE (FC)				
1. Rent rice field land during the planting season	6.000.000	26,92	6.000.000	23,40
2. Rice field land tax for the planting season	98.000	0,44	98.000	0,38
3. Tool depreciation cost	169.801	0,76	198.239	0,77
Number of FC	**6.267.801**	**28,13**	**6.296.239**	**24,55**
TOTAL COST AMOUNT (TC = VC + FC)	**22.284.826**	**100,00**	**25.644.264**	**100,00**

Source: Primary Data Processed, 2025

Regarding the variable cost of labor, based on the data in table 2, it can be seen that the largest cost of labor is the cost of labor during harvest, the labor cost of the combine harvester is smaller than the power threser, the labor cost of farmers using the combine harvester caused by the cost at the time of labor use and machine rental is Rp 3,550,000 or 15.93% while the cost of labor and rental of the power threser machine is Rp 6,881,000 or 26.83%, So there is a significant difference in production cost expenditure between rice farmers who use combine harvesters and power threser rice farmers.

The low cost of labor use in combine harvester farmers is due to the reduced use of labor or the loss of labor use in the cutting and collection of rice grain so that there is no bawon system, in contrast to power thresher farmers who still use labor in cutting and collecting rice grain so that the harvest costs incurred follow the 1:6 bawon system where if there is a harvest of 6 Kg, then the labor/farm labor get 1 Kg of parts, this is what causes the high cost of using labor in rice farming of power thresher farmers. From this statement, it can be concluded that the use of combine harvester harvesting machines in rice farming can save production costs, one of which is because it saves the cost of using labor at harvest. This is in line with the opinion of Smith in Purba et al (2015) that a combine harvester is a rice harvesting machine that can cut the grains of standing plants, thresh, and clean the grain while walking in the field,

thus the rice harvesting time is shorter than using human labor (manual) and does not require a large amount of human labor like in traditional harvesting.

Rice Farming Business Receipts

Farming revenue is the result of the production received by rice farmers in Karanganyar Village, the gross income received by rice farmers using combine harvesters and power threshers in one planting season is obtained from the production of rice in harvested dry grain (GKP) during one planting season which is then multiplied by the prevailing selling price of rice at that time. To find out the amount of revenue received by rice farmers, both farmers who use combine harvesters and power thresresrs in Karanganyar Village, you can see the following table:

Table 3. The total average revenue per 1 Ha of rice farming.

No.	Description	Farmer Receipts	
		Combine Harvester	Power Threser
1	Production/kg	5.450	5.220
2	Selling Price of Rice/Rp	6.400	6.200
	Total Admissions (Pd = Q x P)	**34.880.000**	**32.364.000**
	Production Difference (CH-PT) = 5,450 kg - 5,220 kg = 230 kg		
	Acceptance Difference (*Power Thresher – Combine Harvester*) = IDR 34,880,000 - IDR 32,364,000 = IDR 2,516,000		

Source: Primary Data Processed. 2025

Based on table 3, it can be seen that the average rice farming revenue by farmers using combine harvesters, which is Rp 34,880,000 kg, is obtained from the result of multiplying the total production of 5,450 kg multiplied by a price of Rp 6,400 while the average rice farming revenue by power thresher farmers of Rp 32,364,000 is obtained from the production of 5,220 times at a price of Rp 6,200. It can be concluded that the income of combine harvester farmers is greater than that of power threser farmers, this is due to the difference in the selling price of rice Rp. 200 per Kg because the results of the combine harvester have good quality both from the moisture content and the lower vacuum/dirt content compared to the power threser and the large difference in rice production in rice farming between combine harvester farmers and power threser farmers due to the loss factor (loss/shrinkage) results during the harvesting process). From the results of interviews with farmers, the harvesting process using a power thresher machine makes the harvest or rice production decrease due to the open milling process, using makeshift tarpaulins, the rice cutting process and also in the accumulation of rice grain before going to the threshing process with a power thresher, many rice grains fall or are lost in this process so that it causes a reduction in rice production because many rice is scattered and lost, In contrast to harvesting using a combine harvester which is a process of separating rice grains with a closed system where rice is cut and milled at the same time and then the crop can be bagged directly so that not many rice grains are scattered and lost. Because there is a production difference of 270 kg between combine harvester farmers and power threser, the

difference in income between farmers using combine harvester and power threser is Rp 2,516,000.

. This was also revealed by Nasution (2019) in his research entitled "The Impact of the Use of Combine Harvesters on Labor Outpouring and Losses in Rice Field Harvesting in Sidodadi Village, Beringin District, Deli Serdang Regency" which stated that the production of paddy rice farming before using a combine harvester was 7,000.3 Kg per Ha while the amount of production after using a combine harvester was 7,067 Kg per Ha and the total production potential was based on The result of increased production and losses is 7,125.3 Kg per Ha, so losses before using the combine harvester are 1.77% and after using the combine harvester of 0.82%, a loss difference of 0.95% is obtained. The loss of production is caused by the rice cutting process, the accumulation of rice before the milling process, and the process of putting rice into the power thresher machine.

Then the same thing was also conveyed by Amrullah and Pullaila (2019) in a journal entitled "The Impact of the Use of Combine Harvesters on Rice Yield Loss in Banten Province" which explained that the use of combine harvester machines in rice farming can reduce yield losses by 200.39 kg per hectare or around 3.52% of the total yield. The use of combine harvester machines in the rice harvesting process can reduce yield losses during harvesting activities so that the production obtained by farmers increases.

Income from Rice Farming

Rice farming net income is the value of the difference between total revenue (gross income) minus production costs (total costs) of rice farming during one rice planting season. So to find out the amount of net income obtained by farmers, whether they use combine harvesters or power threshers in Karanganyar Village, Kandanghaur District, Indramayu Regency, can be seen in the following table.

Table 4. Total average net income per 1 Ha of rice farming business.

No.	Farmer	Difference (-)		
		Total Revenue (Rs.)	**Production Costs (kg)**	**Income (Rs.)**
1	Combine Harvester	34.880.000	22.284.826	12.595.174
2	Power Threser	32.364.000	25.644.264	6.719.736
	Net Income Difference (CH-PT) IDR 12,595,174 - IDR 6,719,736 IDR 5,875,438			

Source: Primary Data Processed. 2025

Based on Table 4, it can be seen that the average net income from rice farming received by combine harvester farmers is greater when compared to the average net income received by power thresher farmers. The average net income from rice farming for combine harvester farmers is Rp. 12,595,174, while net income from rice farming for power thresher farmers is Rp. 6,719,736. From the table above, it can be concluded that the net income of rice farming

of combine harvester farmers is greater than the net income of rice farming of power thresher farmers on the same land area of 1 Ha with a difference in income of Rp. 5,875,438.

The difference in net income between combine harvester rice farmers and power thresher farmers in Karanganyar Village is due to the difference in production and revenue costs, where there is a difference in production costs incurred in combine harvester rice farming and power thresher rice farming which is Rp. 3,359,438, while the difference in revenue between combine harvester rice farmers and power thresher rice farming is Rp. 2,516. 000.

This proves that rice farming in Karangannyar Village using combine harvester rice harvesters is more profitable to run and develop in the future, this is because using a combine harvester machine can cut production costs during harvesting activities so that it will have an impact on farmers' income.

Eligibility of Rice Field Farming Business

Revenue Cost Ratio (R/C Ratio) is a measure of comparison between total revenue and total costs incurred in running farmers' rice paddy farming in Karanganyar Village. So to find out the feasibility of rice farming businesses either using a combine harvester or power thresher, you can see the following table.

Table 5. Rice Field Farming Eligibility per 1 Ha.

No.	Farmer	Total Revenue (Rs.)	Total Cost (Kg)	Income (Rs.)
1	Combine Harvester	34.880.000	22.284.826	1,57
2	Power Threser	32.364.000	25.644.264	1,26

Source: Primary Data Processed. 2025

Based on Table 5, it can be seen that the R/C ratio value of the total cost of rice farming carried out by farmers who use combine harvesters and farmers who use power thresher harvesting tools is feasible to be developed because it has an R/C value above 1 (R/C ratio > 1). However, farming using combine harvester harvesters is more profitable with an R/C value of 1.57 than farming using power thresher harvesting tools with an R/C value of 1.26. This shows that the rice field farming that is carried out provides benefits and is worthy of continuing.

Uji Hypothesis

Hypothesis tests were carried out to test the truth of the hypothesis in this study and the test was carried out using the SPSS 26 Application. The T-test is one of the statistical methods used to test the hypothesis of the mean difference of two different populations. The purpose of doing the T-test is if we are interested in drawing conclusions whether the parameters of two populations are different or not, which is the mean of the parameters here, for example, the mean value, we conduct a comparative study (comparison) between the two populations. Before the data analysis is carried out, a requirement test is carried out, namely the Normality

Test. The normality test is used to test whether a variable is normal or not, Normal here in the sense of having normal data, to test the normality of the researcher using the Shapiro-Wilk test.

Normality Test

The normality test is used to test whether a variable is normal or not as one of the prerequisite tests for conducting the Paired Sample t-Test analysis. Normal here in the sense of having normal data. To test the normality, the researcher used the ShapiroWilk test with the condition that if the sig > 0.05, the data is normally distributed. So to find out whether the cost and income data of rice farming that uses combine harvester or power thresher are distributed normally or not can be seen in the following table.

Table 6. A Comparative Study of the Cost of Rice Farming.

Tests of Normality

	Shapiro-Wilk		
	Statistic	df	Itself.
Biaya_Combine Harvester	.938	40	.030
Biaya_Power Thresher	.924	40	.010

a. Lilliefors Significance Correction

Based on table 6, the results of the normality test using Shapiro-Wilk show that the significance value of the combine harvester cost is 0.030 > 0.05, then the data is normally distributed, so the variable of the combine harvester cost is normally distributed and the value of the significance of the power thresher cost is 0.010 > 0.05, then the data is normally distributed, so the variable of the power thresher cost is normally distributed.

Table 7. Normality Test

Tests of Normality

	Shapiro-Wilk		
	Statistic	df	Itself.
Pendapatan_Combine Harvester	.961	40	.179
Pendapatan_Power Thresher	.959	40	.158

a. Lilliefors Significance Correction

Income from rice paddies.

Based on table 7, the results of the normality test using Shapiro-Wilk show that the significance value of the combine harvester cost is 0.179 > 0.05, then the data is normally distributed, so the variable of the combine harvester cost is normally distributed and the value of the significance of the power thresher cost is 0.158 > 0.05, then the data is normally distributed, so the variable of the power thresher cost is normally distributed.

Paired Sample T-Test

This hypothesis test was carried out using the analysis of the Dependent t-Test (Paired Sample t-Test). This paired t-test is a procedure used to compare the average of two variables in a group. This analysis is useful for testing one sample that received treatment which will

then be compared to the average of the sample. It can also be explained by calculating the difference between the values of the two variables for each case and testing whether the average difference is zero.

The purpose of this t-test is to test the mean difference between the two dependent data groups so that from this test it can be known whether there is a significant difference in cost and income between rice farmers using combine harvesters and power thresher farmers. With the test criteria using significance, namely:

a. If the sig ≥ 0.005 then H0 is accepted
b. If sig < 0.005 then H0 is rejected

The hypotheses that will be tested in this study are as follows.

Hipotesis :

H1 a. H0 : There is no significant difference between the cost of paddy rice farming using a *combine harvester* and *power thresher* harvesting machine in Karanganyar Village, Kandanghaur District, Indramayu Regency.

b. H1 : There is a significant difference between the cost of rice field farming that uses a *combine harvester* and *power thresher* harvesting machine in Karanganyar Village, Kandanghaur District, Indramayu Regency

H2 a. H0 : There is no significant difference between the income of paddy rice farming using combine *harvester* and *power thresher* harvesting machines in Karanganyar Village, Kandanghaur District, Indramayu Regency

b. H1 : There is a significant difference between the income of paddy rice farming that uses combine *harvester* and *power thresher* harvesting machines in Karanganyar Village, Kandanghaur District, Indramayu Regency

So to find out if there is a significant difference in the cost of rice farming and rice farming income between rice farmers who use combine harvesters and power thresher farmers can be seen in the following table.

Table 8. A Sample of the Cost of Rice Farming.

Paired Samples Test

		Paired Differences							
		Mean	Hours of deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Biaya_CH - Biaya_PT	-3359437.500	471851.572	74606.284	-3510342.954	-3208532.046	-45.029	39	.000

Source : SPSS 26 (processed)

Based on table 8, the results of the t-test of rice field farming costs show that the significance value / Sig.(2-tailed) is 0.000, because sig < 0.05 means less than 0.05, then Ho is rejected and H1 is accepted. So it can be concluded that there is a significant difference between the cost of rice farming using a combine harvester and power thresher harvesting machine. From the average (mean), it can be seen that the average cost of rice field farming using a

combine harvester harvester machine is smaller than that of farmers who use power thresher harvesting machines in Karanganyar Village, Kandanghaur District, Indramayu Regency.

Table 8. A Sample of the T-Shirt Is A Test Of Rice Paddy.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Hours of deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pendapatan_CH - Pendapatan_PT	5875437.500	2163407.760	342064.802	5183546.132	6567328.868	17.176	39	.000

Source : SPSS 26 (processed)

Based on table 8, the results of the t-test of rice farming income show that the significance/Sig.(2-tailed) value is 0.000, because the sig < 0.05 means less than 0.05, then Ho is rejected and H1 is accepted. So it can be concluded that there is a significant difference between the income of rice field farming that uses combine harvester harvester and power thresher. From the average (mean), it can be seen that the average income of rice field farming businesses that use combine harvester harvesters is greater than that of farmers who use power thresher harvesting machines in Karanganyar Village, Kandanghaur District, Indramayu Regency.

CONCLUSION

The study concludes that rice farming using combine harvesters is more cost-effective than power threshers, with lower total costs (Rp. 22,284,826 vs. Rp. 25,644,264) and higher net income (Rp. 12,595,174 vs. Rp. 6,719,736), primarily due to reduced labor expenses. The R/C ratio further confirms the greater feasibility of combine harvesters (1.57 vs. 1.26), supported by a significant t-test result (Sig. 0.000). For future research, it is recommended to explore long-term economic and environmental impacts, adoption barriers among farmers, regional comparative studies, integration with precision agriculture, policy and subsidy influences, and labor market shifts to better understand the broader implications of mechanization in rice farming.

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