

Comparative Analysis of Farming Direct Sowing Cropping System by Legowo Planting System

(Case: Paya Rahat Village, Banda Mulia Sub-district, Regency Aceh Tamiang)

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Abstract - The aim of this research is to analyze the difference of labor cost, production cost, productivity difference, acceptance and to analyze the difference of income used in Direct Seed Sowing System and Legowo Planting System in research area. Data analysis method used in this research is by using statistical test of t-test (Test of average difference of Independent sample t-test). The results of peneltian indicate that there is a real difference between the amount of labor outpours that is the amount of labor outpours of farming using direct seed sowing method that is equal to 50.08 HKP / Ha and farming using legowo planting method that is equal to 79.24 HKP; there is a difference in production costs ie the average amount of production costs on the method of sowing seeds directly lower seed is Rp. 3,707,391.37 / Ha, and the total production cost in the legowo method is higher at Rp. 5.827.522 / Ha; there is a difference in productivity; ie productivity using direct seed sowing method of total productivity of 51.36 Kw / Ha; while the total productivity of wetland paddy farming using legowo planting method is 64,86 Kw / Ha; there is a significant difference in farming acceptance by planting method of tabela that is equal to Rp. 15,309,783- / Ha, with farming acceptance by legowo planting method that is equal to Rp. 18.271.677 / Ha, - There is a significant difference in farming income with the method of planting tabela that is Rp., 11.593.282- / Ha, with farming income with legowo planting method that is Rp. 12.422.889 / Ha.

Keywords - Curation Of Labor; Production Cost; Productivity; Income.

I. INTRODUCTION

From the data in Table 1 below, it is known that Banda Mulia sub-district is the biggest productivity in Aceh Tamiang Regency which is 9 Ton / Ha. Followed by District

Rantau, Seruway, Bendahara, and Banyak Payed, ie with productivity of 7 Ton / Ha.

Table 1. Planting Area, Harvest Area, Production, Rice Productivity in Aceh Tamiang District by District, 2015

No	Sub District Name	Plant Area (Ha)	Crop Area (Ha)	Production (Ton)	Productivity (Ton/Ha)
1.	Tamiang Hulu	1,045	870	4,437	5
2.	Bandar Pusaka	1,050	890	5,382	6
3.	Kejuruan Muda	1,466	1,194	7,219	6
4.	Tenggulun	1,235	1,168	5,914	5
5.	Rantau	1,634	1,001	6,500	7

6.	Kota Kuala Simpang	-	-	-	-
7.	Seruway	4,434	4,328	27,943	7
8.	Bendahara	4,360	4,260	30,294	7
9.	Banda Mulia	2,448	2,331	21,291	9
10.	Karang Baru	4,343	4,343	29,084	7
11.	Sekerak	71	50	286	6
12.	Manyak Payed	8,141	8,140	53,118	7
Amount		30,227	28,575	191,468	7

Source: BPS Kabupaten Aceh Tamiang, 2016.

In an effort to meet the rice needs of domestic rice production and to suppress and eliminate the import of rice is through extensification and intensification of rice fields with the application of rice cultivation technology innovation. Technological innovations that are capable of increasing rice production are, among others, the technology approaches of Direct Seed and Legowo Systems (Pitojo, 2003).

The advantages of this system of Seeds Direct Seed is among others able to reduce the labor outpour about 28% (Hazairin and Manalu, 1993). The cost of production means is 5-10 percent lower.

II. RESEARCH METHODS

A. Location Determination Method

The research was conducted in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang District. Determination of research area is done purposively (intentionally)

Table 2. Number of Population and Sample Research

Farmer	Population	Sample
Sistem Jajar Legowo	191	35
Sistem Tabela	152	35
Amount		70

C. Data analysis method

1. To analyze the first objective is the difference of labor outpours on rice farming in Paya Rahat Village then done through the stages:

- The calculation of labor outpours on rice farming in Paya Rahat Hernanto Village (1993) states that the unit of labor in farming is differentiated on:
 - Men's day (HKP) = 1 HKP
 - Women's day (HKW) = 0.8 HKP

B. Method of Determination of Population and Sample

Determination of the number of samples in this study can be calculated by the Solving formula, namely:

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

Information :

n = Sample Size

N = Population Size

e^2 = Tolerant sampling error rate

From the calculation result using Slovin formula, the samples obtained for farmers applying the legowo system in Paya Rahat Village to be studied are 35 and the number of samples for farmers applying direct seed sowing system in Paya Rahat Village is 35 samples with error level ie (e) = 15%.

- Child work day (HKA) = 0.5 HKP
 - Labor Day (HKT) = 5 HKP
 - Day machine (HKM) = 25 HKP
- b) The test of labor outpours at direct paddy farming system of direct seed sowing with legowo rice farming in Paya Rahat Village was analyzed by using t-test statistic test (T-test average of Independent sample t-test) with SPSS.
- By criteria
- If significant value > 0,05; then H_0 accepted

- If significant value <0.05 ; then H_1 is accepted
- 2. To analyze the second goal, the difference of farm cost is done through two stages:
 - a) Calculation of farm costs or total cost is the sum of fixed and variable costs, can be formulated as follows:
 $TC = FC + VC$
 Information:
 TC = Total Cost (Rp)
 FC = Fixed Cost (Rp)
 VC = Variable Cost (Rp)
 - b) Different test of farm cost or total cost at direct paddy farming system of direct seed sowing with legowo rice farming system in Paya Rahat Village was analyzed by using t-test statistic test (T-test average of Independent sample t-test) with SPSS.
- 3. To analyze the third objective of the difference of productivity in rice farming in Paya Rahat Village then done through two stages:
 - a) Calculation of productivity in rice farming in Paya Rahat Village used the formula:

$$\text{Productivity of Kwintal / ha} = \frac{\text{Land} = \text{Production (kwintal)}}{\text{Land area (ha)}}$$
 - b) Different productivity test on rice farming system of direct seed sowing with legowo rice farming system in Paya Rahat Village was analyzed by using t-test statistic test (T-test average of Independent sample t-test) with SPSS.
- 4. To analyze the purpose to kempat that is the difference of income on rice farming in Paya Rahat Village is done by the formula:
 - a) Revenue farming is the multiplication of production obtained at the selling price, this statement can be written as follows:
 $TR = Y \cdot PY$

information:

TR = Total Receipts (Rp)

Y = Production obtained in a farm.

PY = Price (Rp)

- b) Different recruitment test at direct paddy farming system of direct seed sowing with legowo rice farming in Paya Rahat Village was analyzed by using t-test statistic test (T-test average of Independent sample t-test) with SPSS.
- 5. To analyze the fifth objective, the difference of income in rice farming in Paya Rahat Village is done by two stages :
 - a) The calculation of income in rice farming in Paya Rahat Village is used income analysis that is:
 $Pd = TR - TC$
 Information :
 Pd = Farm income (Rp)
 TR = Total Receipts (Rp)
 TC = Total Cost (Rp)
 - b) Different income test on wetland paddy farming system of direct seed sowing with legowo rice farming system in Paya Rahat Village was analyzed by using t-test statistic test (T-test average of Independent sample t-test) with SPSS.

III. RESULTS AND DISCUSSION

Differences of Curbing Labor, Farming System of Direct Seed Sowing System and Legowo Planting System in Aceh Tamiang District.

To see the significance of labor union difference between rice farming system with direct seed system and legowo system in Paya Rahat Village, Banda Mulia Sub-district of Aceh Tamiang Regency can be seen in the following table showing the significance value of Independent Sample t-Test test result.

Table 3. Levene Test Results and Independent Sample T-test
Curbing of Labor Farming with Planting System and Legowo Planting System
Independent Samples Test

Manpower Intelligence	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	6,758	,001	-15,744	28	,001	-964,00000

Equal variances not Assumed			-15,744	25,327	,000	-964,00000
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Source: Appendix 11.

Different sample of free sample with independent sample t-test was performed.

Test Criteria:

If Significance > 0.05, then H0 is accepted or H1 is rejected

If Significance < 0.05, then H0 is rejected or H1 accepted

The estimation results show a significance value of 0.01. Thus the significance < 0.05 (0.00 < 0.05). Then H1 accepted, which means there is a difference between the amount of labor between rice farming is real between Rice farming on the system of sowing seed directly with legowo planting system in Aceh Tamiang District.

Differences in production costs on wet land paddy farming with direct seed sowing system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang Regency

The following table shows the significance value of the Independent Sample t-Test test results to see whether or not there is a difference in production costs between farming system and the direct seed sowing system and the legowo system in Paya Rahat Village, Banda Mulia District, Aceh Tamiang District.

Table 5. Levene Test Results and Independent Sample T-test Production Cost Independent Samples Test

Production cost	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	5,733	.019	-1,156	68	.000	6.2793E5
Equal variances not Assumed			-1,167	63.433	.000	6.2793E5

Source: Appendix 12.

Different average test of free sample is done with independent sample t-test.

If Significance > 0.05, then H0 is accepted or H1 is rejected

If Significance < 0.05, then H0 is rejected or H1 accepted

The estimation results show a significance value of 0.00. Thus the significance < 0.05 (0.00 < 0.05). Then H1 is accepted which means there is a difference of production cost of real rice farming between wetland paddy farming on planting system directly sowing with legowo planting system in Aceh Tamiang Regency.

Productivity differences on wetland rice farming with direct seed sowing system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang District

To analyze productivity differences on rice farming system with direct seed sowing system and legowo system in Aceh Tamiang district, independent sample t test is used.

The following table shows the significance value of the Independent Sample t-Test test results to see whether or not there is a difference in productivity between farming system with direct seed sowing system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang District.

Table 6. Levene Test Results and Independent Sample T-test Productivity Test

Independent Samples Test

Produktivitas	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	33.704	.000	-13262	68	.000	-1809.29085
Equal variances not Assumed			-12927	36.946	.000	-1809.29085

Source: Appendix 13.

Different average test of free sample is done with independent sample t-test.

If Significance > 0.05, then H0 is accepted or H1 is rejected

If Significance < 0.05, then H0 is rejected or H1 accepted.

The estimation results show a significance value of 0.00. Thus the significance < 0.05 (0.00 < 0.05). Then H1 is accepted which means there is real rice productivity difference between farm with direct seed system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang Regency.

Differences in revenue on wet land paddy farming with direct seed sowing system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang Regency

To analyze difference of acceptance on rice farming with direct seed system and legowo system, free t test sample (independent sample t test) was used.

The following table shows the significance value of the Independent Sample t-Test test results to see whether or not there is a difference of acceptance between wetland rice farming with direct seed sowing system and legowo system in Aceh Tamiang District

Table 7. Levene Test Results and Independent Sample T-test Receipt of wetland rice with direct seed sowing system and legowo system in Aceh Tamiang District

Independent Samples Test

Income	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	10.031	.001	-4.628	68	.001	-6864771E6
Equal variances not Assumed			-4.712	71.608	.000	-6864771E6

Source: Appendix 20.

Different average test of free sample is done with independent sample t-test.

If Significance > 0.05, then H0 is accepted or H1 is rejected

If Significance < 0.05, then H0 is rejected or H1 accepted

The estimation results show a significance value of 0.01. Thus the significance < 0.05 (0.01 < 0.05). Then H1 is accepted which means there is a real difference between the

acceptance of wetland rice farming with the system of direct seed sowing and legowo system in Aceh Tamiang Regency either in units per hectare or every once planting season.

Differences in income on wetland paddy farming with direct seed sowing system and legowo system in Paya Rahat Village, Banda Mulia Sub-district, Aceh Tamiang Regency

The following table shows the significance value of the Independent Sample t-Test test results to see whether or not there is a difference in income between wetland rice farming with direct seed sowing system and legowo system in Aceh Tamiang District.

Table 8. Levene Test Results and Independent Sample T-test Rice paddy with direct seed sowing and legowo system in Aceh Tamiang District

<i>Independent Samples Test</i>						
Income	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	11.020	.001	-3.315	68	.001	-.964375E6
Equal variances not Assumed			-3.356	59.707	.000	-.964375E6

Source: Appendix 20.

Different average test of free sample is done with independent sample t-test.

If Significance > 0.05, then H₀ is accepted or H₁ is rejected
If Significance < 0.05, then H₀ is rejected or H₁ accepted

The estimation results show a significance value of 0.01. Thus the significance < 0.05 (0.01 < 0.05). Then H₁ is accepted which means there is a real difference between rice farming income with direct seed sowing system and legowo system in Aceh Tamiang Regency either in units per hectare or every once planting season.

IV. CONCLUSION

The results of penelitian indicate that there is a real difference between the amount of labor outpours that is the amount of labor outpours of farming using direct seed sowing method that is equal to 50.08 HKP / Ha and farming using legowo planting method that is equal to 79.24 HKP; there is a difference in production costs ie the average amount of production costs on the method of sowing seeds directly lower seed is Rp. 3,707,391.37 / Ha, and the total production cost in the legowo method is higher at Rp. 5,827,522 / Ha; there is a difference in productivity; ie productivity using direct seed sowing method of total

productivity of 51.36 Kw / Ha; while the total productivity of wetland paddy farming using legowo planting method is 64,86 Kw / Ha; there is a significant difference in farming acceptance by planting method of tabela that is equal to Rp. 15,309,783- / Ha, with farming acceptance by legowo planting method that is equal to Rp. 18,271,677 / Ha, - There is a significant difference in farming income with the method of planting tabela that is Rp., 11,593,282- / Ha, with farming income with legowo planting method that is Rp. 12,422,889 / Ha, -.

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