

The Impact of Using Combine Harvester on Economic Factors of Rice Farmers in Gowa Regency

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Abstract.

Efforts from a development process cannot be separated from the existence of effective agricultural information and technology as well as accurate information in the hope that there will be changes in the behaviour and abilities of farmers in farming activities and increased production to realize the goals of a development process, namely rice self-sufficiency. Gowa Regency is a district whose population is mostly engaged in agriculture and areas that do not escape the government's attention, especially in the agricultural sector. In applying new technology, of course, there must be the roles of certain parties in the application of technology, both from the government, extension agents and farmers (target/community). The data needed in this study are primary data and secondary data. Primary data is data obtained directly from the field through direct interviews with sample farmers who are guided by prepared questionnaires. The data obtained are primary and secondary data processed by quantitative methods. In this study, the analysis used is the different test for two different samples (t-test) and the Structural Equation Model (SEM) analysis model. Combine harvester affects the socio-economic income of lowland rice farmers in Gowa Regency with the presence of agricultural machine tools combine harvester, so rice farmers are more benefited from a time-efficient point of view and the need for labour was minimal and income also increased by about 15% from conventional harvesting. There is a need for socialization of the use and utilization of agricultural so that farmers are more interested in using agricultural machine tools in the field.

Keywords: *Bivalvia, bray-curtis, canonical correspondence analysis, density, gastropoda.*

1. INTRODUCTION

Until now, the agricultural sector still has a very important role in national development as well as supporting the nation's economy. Efforts in a development process cannot be separated from the existence of effective agricultural information and technology as well as accurate information in the hope that there will be changes in the behaviour and abilities of farmers in farming activities and increased production to realize the goals of a farm. the development process is rice self-sufficiency [1].

[2]stated that the "development" of society is a multi-dimensional structural process that includes all aspects of society, but initially necessary, especially

economic development. A form of change is not only in terms of physical form, but change can also be related to the form of the program. The program in question is a program implemented at the individual, family, group and community level as an empowerment effort (fostering farmers from disabilities to empowerment), to achieve a better life [3]. [4] define empowerment as the process by which people become strong enough to participate in various controls over various programs and influence events and institutions that affect their lives. The main approach in the concept of empowerment is that farmers are not the object of various development projects, but the subject of development efforts.

In economics what is meant by labour is a means of physical strength and the human brain that cannot be measured from humans and runs a production business [5]. Farmers are people who work directly or indirectly or from time to time in farming and other activities related to the life and livelihoods of rural farmer families [6]. Human labour is divided into male, female and child labour. If the age is relatively young, it will be faster to complete the work than the relatively old age. On the other hand, workers who are relatively old are more experienced so that they are more skilled at completing work than those who are less experienced. Education will influence, think and work [7]. Farmers and families are the targets of agricultural extension workers whose behaviour must be changed in farming and farming practices to increase farmers' production and income.

Umur Petani	Variabel
0 – 14 Tahun	Belum Produktif
15 – 64 Tahun	Produktif
65 Tahun Keatas	Tidak Produktif

Sumber: Badan Pusat Statistik 2015

[8]The combined harvester is a rice harvester technology that was first developed in South Korea and Japan. Combined harvester is basically a rice harvester that helps farmers in harvesting rice. This technology is very helpful in terms of labour, time, harvest costs and harvest speed. The rice harvesting process using a combination harvester is very helpful for farmers in harvesting rice, which can increase the time speed by up to 75% compared to using human labour. In the last period of time, the use of agricultural machine tools in agriculture has grown to overcome the limited workforce in rural areas. The working capacity of the combined harvester itself is 5.05 hours/ha. [9].

II. METHODS

This research will be conducted in Gowa Regency. The location of this study was determined on purpose with the consideration that Gowa Regency is one of the districts that has implemented an empowerment program for the use of a combine harvester to increase lowland rice production. This research will be carried out from October to November 2019.

The data needed in this study are primary data and secondary data. Primary data is data obtained directly from field interviews with sample farmers who are guided through a prepared questionnaire. Meanwhile, secondary data is supporting data from related institutions in this research, research results, scientific magazines, journals and literature studies related to this research. The data technique used by the researcher was structured interviews with farmers guided by a questionnaire that had been prepared and direct observation of the research location.

The data obtained are primary and secondary data processed by quantitative methods. In this study, the analysis that will be used is the different test for two different samples (t-test) and the Structural Equation Model (SEM) analysis model. The difference test is used to see if there is a significant difference in the income of farmers before using the combine harvester and farmers after using the combine harvester.

$$\sigma^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}$$

$$\sigma_{x_1 - x_2} = \sqrt{\frac{\sigma^2}{n_1} + \frac{\sigma^2}{n_2}}$$

$$t = \frac{x_1 - x_2}{\sigma_{x_1 - x_2}}$$

Descriptive analysis is an analysis that describes systematically, accurate facts and characteristics about the population/ activities carried out in certain fields that make research subjects based on data from variables obtained from the group of subjects under study and facts that occur in the field.

III. RESULT AND DISCUSSION

The Combine Harvester is a complex agricultural machinery in various post-harvest uses over a very large area of land. Actually, to increase the productivity of agricultural products, people should see a role. important from the application of this tool, which is very profitable from an economic point of view. The existence of the combine harvester makes it easier for farmers in the harvesting process and can also

cut transmission costs at harvest. The following is a comparison before using the combine harvester and after using the combine harvester.

Source: Primary Data After Processing, 2019

With the Combine Harvester, the harvest time becomes more efficient so that the harvest schedule and to replant can be faster and easier. If you look at the table below, which is the estimated time used by farmers before and after using the Combine Harvester, it is very clear, here is a table that shows the efficiency of harvesting using conventional methods and after using the Combine Harvester technology.

No	Farmers	harvest process before using the combine harvester	harvest process after using the combine harvester
1	Lego Romangloe	81,5 day	53 hour
2	Baji' Pa'mai	87,5 day	50,5 hour
3	Salaku Romangloe	62,5 day	36,5 hour
4	Tamalayu Pallantikang	99 day	62 hour
5	Teamate Jaya Pallantikang	63,5 day	45hour
	Total	394 day	247 hours

Source: Primary Data After Processing, 2019

By facilitating farmers with the Combine Harvester machine that can speed up the harvesting process, it can automatically influence the opinions of farmers, which can be said to greatly influence opinions from before using conventional methods or using the Combine Harvester, the table below will show that the comparison of income farmers before and after using the Combine Harvester as follows:

No	Farmers	Farmers' Net Income Before using Combine	Farmers' Net Income after using Combine
1	Lego Romangloe	Rp450.000.000	Rp499.100.000
2	Baji' Pa'mai	Rp404.400.000	Rp449.333.333
3	Salaku Romangloe	Rp246.000.000	Rp283.333.333
4	Tamalayu Pallantikang	Rp486.000.000	Rp541.333.333
5	Teamate Jaya Pallantikang	Rp364.200.000	Rp404.333.333
	Total	Rp1.950.600.000	Rp2.177.433.332

Source: Primary Data After Processing, 2019

The Results Of The Research Analysis Using The T Test

From the results that have been obtained when carrying out research in the field and carrying out the processing, it is necessary to obtain the results needed.

The Results Of Spss For Farmers Net Income Before And After Using A Combination Of 5 Farmer Groups

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	sebelum	3.90E8	5	9.277E7	4.149E7
	sesudah	4.35E8	5	9.945E7	4.448E7

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	sebelum - sesudah	-4.537E7	7165581.357	3204545.402	-5.426E7	-3.647E7	-14.157	4	.000

Source: Primary Data After Processing, 2019

SPSS Results For Rice Harvest Costs Before And After Combining 5 Farmer Groups

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	sebelum	9.73E7	5	2.252E7	1.007E7
	sesudah	5.38E7	5	1.220E7	5454952.747

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	sebelum	7.88000E1	5	15.738488	7.038466
	sesudah	2.05800	5	.394707	.176518

Source: Primary Data After Processing, 2019

Source: Primary Data After Processing, 2019

red Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	before - after	4.345E7	1.041E7	4654837.552	3.052E7	5.637E7	9.334	4	.001

Harvest Time Before and After Using Combine 5 Groups

Source: Primary Data After Processing, 2019

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before-after	7.674200E1	15.374201	6.875552	57.652409	95.831591	11.162	4	.000

Source: Primary Data After Processing, 2019

The use of labour at harvest before and after using combine 5 farmer groups

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	sebelum	140.80	5	2.950	1.319
	sesudah	64.00	5	6.519	2.915

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	sebelum & sesudah	5	-.533	.355

Source: Primary Data After Processing, 2019

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before-after	76.800	8.468	3.787	66.286	87.314	20.281	4	.000

Source: Primary Data After Processing, 2019

V. CONCLUSION

Combine harvester has an effect on the socio-economic income of lowland rice farmers in Gowa Regency with the existence of the agricultural machine tools combine harvester so that rice farmers benefit more from a time efficiency perspective and also fewer labour needs and income increases by about 15% from conventional harvesting. Lowland rice farmers to use a combine harvester in Gowa Regency are efficient in

terms of time, labour and farmer net income has increased. The utilization of Alsintan that is given by the government to farmers must be utilized as well as possible by the farmers, so that the farmers will find it easier in the farming process, starting from land processing to harvesting so that it can save time and maintenance costs can also be reduced. There is a need for socialization of the use and utilization of agricultural machinery so that farmers are more interested in using agricultural machine tools in the field.

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