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THE EFFECTIVENESS OF THE USE OF MODERN RICE HARVESTING MACHINES (COMBINE HARVESTER) ON INCREASING THE PRODUCTIVITY OF RICE FARMERS IN TENDE VILLAGE

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Abstract

This study aims to find out whether modern rice harvesting machines in increasing rice harvest productivity in Tende Village have been effective. This study uses a quantitative method with a descriptive approach. Data was obtained through observation, questionnaires, and documentation. The data analysis used is a simple linear regression analysis. The results of this study show that the use of modern harvesting machinery has a positive and significant effect on crop productivity, which is shown by the results of a simple linear regression analysis with the equation Y = 25.172 + 0.368 which means that the value of the constant a is 25.172, the use of modern harvesting machinery (bX) is 0.368 which shows a positive direction with a significant level of 0.013. The hypothesis in this study rejects H0 and accepts H1. Therefore, from this conclusion, H0 is rejected and H1 is accepted, meaning that Modern Harvesting Machinery has a Positive and Significant Effect on Crop Productivity. Based on the results of the Overall Equipment Effectiveness (OEE) method which measures the overall effectiveness of production equipment or machinery showing an OEE result of 71.2%, we can see that the rice combine harvester machine is effective at 71.2%.

Keywords: *Effectiveness, Use of Modern Harvesting Machinery, Yield Productivity*

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INTRODUCTION

Indonesia is an agrarian country where most of the population is melted in the agricultural sector. Agriculture is a sector that has an important role in human life. Life in society we often encounter changes in all lives, including changes in society itself. Because basically there is no static society. There are always changes in society dynamically. These changes are constructive in the sense of a positive impact on their lives for the community. One of these changes is technological innovation. This is in accordance with the concept related to efforts to build villages into superior villages through economic development, one of which is that with the help of technology or information management systems, it can generate income and have an impact on the welfare of the people in the village (Yanto, et al, 2023).

Indonesia's agricultural Gross Domestic Income (GDP) is currently in the 5th position in the world. Agricultural development has proven to contribute to encouraging Indonesia's economic growth both in the short term and in the long term. Therefore, many Indonesian citizens work as farmers. In this agricultural sector, the role of technology is indispensable for the success of the productivity of the farming business produced. The development of agricultural technology has gradually brought growth to the way people grow crops.

Agricultural development in Indonesia is intended to increase competitiveness and improve the welfare of farmers with modern agricultural patterns. One of the characteristics of farmers that can increase the productivity and efficiency of resources as well as the value of technological agricultural products is a tool for humans to achieve goals. Technology was created to facilitate agricultural products, meaning to facilitate a job. Agricultural product processing technology means utilizing technology to facilitate and improve the quality and quantity of agricultural product processing.

The government's efforts to make Indonesia a rice barn continue to be carried out. One of them is by overhauling the old agricultural system with modernity. The main factor that supports modern agriculture is human resources (HR). The concept of modern agriculture not only discusses efforts to meet human food needs and the breeding of agricultural species, but has also moved towards how to optimize farming to produce quality food that is very concerned about crop yields both in terms of quality and quantity, especially for the welfare of farmers.

In the countryside, you can find handtractors and rice millers who are hesitant to adopt this technological development, because farmers think that new technology will sometimes disrupt normal systems and habits that they have adopted for generations. Another reason farmers do not adopt technology is because often the recommended technology does not answer the problems faced by target farmers, the technology offered is difficult for farmers to apply and may not be better than existing technology. Technological innovation actually creates new problems for farmers because it is not in accordance with social conditions, economy, cultural norms, social institutions and habits of the local community, the application of technology requires high costs while the incubates obtained by farmers as adopters are inadequate.

Tolitoli Regency is one of the districts in Central Sulawesi with an area of 15,000 hectares of rice fields and land for the development of Horticultural commodities is still wide open. The Ministry of Agriculture supports the Tolitoli district government's priority program of maintaining and even expanding agricultural land to ensure food

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production and cover needs independently. The head of the Tolitoli agriculture office said that agricultural development in Tolitoli is not only maintaining existing agricultural land, but also by increasing the area of agricultural land through the assistance of a printing program from the Ministry of Agriculture.

The Food Crops and Horticulture Office of Tolitoli Regency, continues to provide assistance to farmers in Tolitoli Regency, the Head of the Food Crops and Horticulture Office of Tolitoli Regency to RRI said that assistance is carried out starting from cultivation, land cultivation, harvesting and post-harvest, where assistance is carried out on an ongoing basis and is carried out in each Kecematan in Tolitoli Regency, his party also involves all Technical Implementation Units (UPT) in each The village, which is ready to accompany and serve the community as optimally as possible, so that what is the vision and mission of the Tolitoli Regent to increase agricultural potential in Tolitoli Regency can be realized as expected together.

Post-harvest handling is a very strategic effort in order to support an increase in rice production. The contribution of post-harvest handling to the increase in rice production can be reflected in the reduction of yield loss and the achievement of grain/rice quality according to quality requirements. Setyono (2010). (in the journal Iqbal Maksudi, et al., 2018) stated that the main problem in handling post-harvest rice is the high yield loss and the grain and rice produced are of low quality. This occurs at the stages of harvesting, threshing, and drying.

Basically, the rice harvesting process can be done through two ways, namely through the traditional way and using a stationary type rice threshing machine. Considering the existence of several types of land, these two methods are considered less than optimal, so it is necessary to design and develop rice harvesting machine products (combine portable). This rice harvesting machine has the ability to work to shed rice grains from the stems and at the same time be able to cut down the rice stalks.

Tende Village is one of the villages in Galang District, Tolitoli Regency, Central Sulawesi. Which has one of the leading sectors in the agricultural sector. The results of development in the agricultural sector, especially food crop agriculture, have been felt by most of the residents in Tende Village, Tolitoli Regency. With a land area of 137 hectares, Tende Village is a fertile field for agricultural productivity. This vast land provides opportunities for local farmers to grow a variety of crops and create abundant crops, making the village a highly competitive center of agricultural activities in the region.

In Tende Village, Kacamatan Galang, most of them have used machine power to harvest their rice products. To reduce labor costs and save time, if done with the traditional system, it will take days. However, using a modern rice harvesting machine only takes 1 day and can save operational costs. However, there are farmers who have small rice fields complaining where they usually harvest their own rice fields using the traditional method by cutting rice stalks with a sickle and then shedding the rice grains by slamming them on the threshing board. By harvesting their own rice paddy products until they are wasted, they incur profit-sharing costs to the owners of modern harvesting machines (Combine Harvester).

The purpose of this study was to find out whether the use of modern harvesting machines is effective in increasing crop productivity in Tende Village

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METHODOLOGY

This research was conducted in Tende Village, Kecematan Galang, Tolitoli Regency. The time needed in this study is approximately three 2 months from April 2024 to May 2024.

In this study, the author uses a type of quantitative associative research, quantitative research. The data is sourced from primary data and secondary data obtained through observation, interviews, documentation, and questionnaires. The population in this study is every rice farmer in Tende Village, Kecematan Galang, Tolitoli Regency who uses a modern rice paddy machine. The number of rice farmers in Tende Village is 200 people with sampling by purposive sampling as many as 15 people.

RESULTS AND DISCUSSION

Based on the results of the analysis used, namely using SPSS v26, the following results were found:

Validity Test

Validity tests are used to determine the validity of a study (Ghozali, 2018). In this study, to test valid or invalid questionnaires, namely using the SPSS application, it is declared valid if the questions submitted are in accordance with the indicators and can show something measurable, the questionnaire will be validated if "r calculate > r table" and the value of sig. < a value of 0.05.

Harvesting Machine (X)

Table 1. Variable X Validity Test

Indicator	Item	R Table	R Calculate	Information
	X1.1	0,514	0,735	Valid
	X2.2	0,514	0,681	Valid
	X3.3	0,514	0,628	Valid
	X4.1	0,514	0,553	Valid
	X5.2	0,514	0,596	Valid
	X6.3	0,514	0,560	Valid
	X7.1	0,514	0,632	Valid
	X8.2	0,514	0,677	Valid
	X3.3	0,514	0,686	Valid

Source: data processed 2024

Based on table 4.6, the results of the validity test of this research instrument show that each item of the questionnaire statement has a valid criterion by looking at the corrected item-total correlation (r-calculate) value greater than 0.514 (rtable). This shows that the entire statement item used is able to reveal something measured in the questionnaire.

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Produktivitas (Y)

Tabel 2. Uji Validitas Variabel Y

Indikator	Item	R Tabel	R Hitung	Keterangan
	Y1.1	0,514	0,546	Valid
	Y2.2	0,514	0,586	Valid
	Y3.3	0,514	0,806	Valid
	Y4.1	0,514	0,799	Valid
	Y5.2	0,514	0,589	Valid
	Y6.3	0,514	0,617	Valid
	Y7.1	0,514	0,617	Valid
	Y8.2	0,514	0,799	Valid
	Y3.3	0,514	0,617	Valid

Sumber: Data diolah 2024

Based on table 4.7, the results of the validity test of this research instrument show that each item of the questionnaire statement has valid criteria by looking at the corrected item-total correlation (r-calculate) value greater than 0.514 (r-table). This shows that the entire statement item used is able to reveal something measured in the questionnaire.

Reality Test Results

The questionnaire is said to be reliable if the questionnaire is re-measured, then the same results are obtained. To determine the consistency of the measuring tool, the method used to test the reliability of the questionnaire in this study uses the statistical test method of cronback alpha greater than a significant level of 60% or 0.6, then the questionnaire can be considered reliable.

Table 3. Reliability Test

Variable	*Cronbach's Alpha*	*Role of Thumb*	Information
Modern Harvesting Machine (X)	0,787	9	Reliable
Yield Productivity (Y)	0,818	9	Highly Reliable

Sumber data: data diolah 2024

Based on table 4.8 above, it shows that the Cronbach's Alpha value of the Modern Harvest Machine variable is 0.787, and the Yield Predictability variable is 0.818. Thus, it can be said that the statements in this questionnaire are reliable because Cronbach's Alpha value is more than 0.60.

Correlation Coefficient Test

Table 4 Correlation Coefficient Test

Correlations			
		Mesin Panen	Produktivitas
Efektivitas	Pearson Correlation	1	.449*
	Sig. (2-tailed)		.013
	N	30	30
Produktivitas	Pearson Correlation	.449*	1
	Sig. (2-tailed)	.013	
	N	30	30
*. Correlation is significant at the 0.05 level (2-tailed).			

From table 4.9 above, the correlation analysis for the harvest machine variable is 0.449 or 44.9%

Simple Linear Regression Test

Table 5. Simple Regression Analysis

Variabel	Korfisien β	Standar Error
Constant	25,172	5,599
Mesin Panen Modern (X)	0,368	0,138

Sumber: Data diolah, 2024

From the above equation, it can be seen that the direction of influence has a positive value which means that it is in the same direction, namely:
Variable coefficients of the use of modern harvesting machines (Combine Harvester) positive value means that every increase in the variable of the Use of Modern Harvesting Machinery (Combine Harvester) per unit, the Yield Productivity variable also increases by 0.368.
The equation can be written as follows:

$$Y = \alpha + bX$$

$$Y = 25.172 + 0.368\ X$$

When the variable has a positive or unidirectional value, then if variable X goes up by 1, then variable Y also goes up by 1, and if variable X goes down by 1, then variable Y also goes down 1. Meanwhile, if the variable has a negative or opposite value, if the X variable goes up, the Y variable goes down, and if the Y variable goes up, the X variable goes down. So, in this study, the variable has a positive value where the use of modern harvesting machines (Combine Harvester) increases the productivity of rice farmers in Tende village.

Hypothesis Test Results
Test Results t

Table 6. Test Results t

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Variabel	Sig.	Kriteria	Keterangan
Constant	0,013	<0,05	Berpengaruh
Variabel	t hitung	>t tabel	Keterangan
Mesin Panen Modern (X)	2,659	2.051	Berpengaruh

Sumber: Data diolah, 2024

Dari tabel 4.11 diatas, tabel koefisien nilai signifikan mesin panen modern (X) diperoleh nilai t hitung sebesar 2,659 sedangkan t tabel sebesar 2,051. Hasil perhitungan ini menunjukkan bahwah t hitung > dari t tabel dengan tingkat signifikan sebasar 0,013 yang berarti hipotesis pada penelitian ini menolak H0 dan menerima H1. Maka dari kesimpulan tersebut H0 di Tolak dan H1 diterima artinya Mesin Panen Modern Berpengaruh Secara Positif dan Signifikan Terhadap Produktivitas Hasil Panen.

Hasil Koefisien Determinasi (R2)

Analisi koefisien determinasi bertujuan untuk mengetahui besarnya Mesin Panen Modern (X) dan Produktivitas Hasil Panen (Y), maka dapat dilakukan perhitungan dengan rumus koefisien determinasi. Koefisien determinasi = (r)2x 100%.

Crop Effectiveness

Overall Equipment Effectiveness (OEE) is a method that measures the overall effectiveness of production equipment or machinery. Hansen (2001) in his book "Overall Equipment Effectiveness: A Powerful Production Tool" explains how OEE can be used to improve productivity and efficiency in various types of industries.

CONCLUSION

Based on the research and discussion conducted on the Effectiveness of the Use of Modern Harvesting Machines (Combine Harvester) on Increasing the Productivity of Rice Farmers in Tende Village, it can be concluded that: (1) The use of modern harvesting machines (combine harvester) has a positive effect on increasing the productivity of rice farmers in Tende Village; (2) The results of the Overall Equipment Effectiveness (OEE) method which measures the overall effectiveness of the equipment or production machinery show positive results, we can see that the modern combine harvester harvesting machine is 71.2% effective but can still be improved.

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References:

Arikuanto, S (2010). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineka Cipta.
Arikuanto, S (2012). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineka Cipta.
Ghozali, Imam. (2018). Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25. Semarang: Badan Penerbit Universitas Diponegoro.
Hansen (2001) "Overall Equipment Effectiveness: A Powerful Production Tool"
Sugiono. (2012). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung : ALFABETA
_____. (2015). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung : ALFABETA
_____. (2016). Metode Penelitian Kuantitatif, Kualitatif, dan R&D : ALFABETA
_____. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D : ALFABETA
_____. (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung : ALFABETA
Ali, A. (2017). Pengaruh teknologi pertanian terhadap produktivitas hasil panen padi di kecamatan maritengngae kabupaten Sidenreng Rappang. AKMEL Jurnal Ilmiah, 14(3).
ANJASMARA, A. (2022). PERBANDINGAN EFEKTIVITAS PENGGUNAAN MESIN COMBINE HARVESTER DENGAN ALAT MANUAL DI DESA WAWONDURU KABUPATEN DOMPU (Doctoral dissertation, Universitas_Muhammadiyah_Mataram)
Anzhita, S. (2019). Dampak Penggunaan Mesin Panen Padi Sawah (Combine Harvester) Terhadap Sosial Ekonomi Masyarakat Dan Pendapatan Usahatani Padi Sawah Di Kabupaten Aceh Timur. In Prosiding Seminar Nasional Pertanian (Vol. 2, No. 1).
Dedi, H. (07 Februari 2024). Unjuk Kinerja Mesin Pemanen Padi (Combine Harvester) Yanmar Aw70v Di Lahan Sawah Kecamatan Seputih Raman Kabupaten Lampung Tengah.
Erwis, N. A. (2012). Efektivitas Penagihan Pajak Dengan Surat Teguran dan Surat Paksa Terhadap Penerimaan Pajak Pada Kantor Pelayanan Pajak Pratama Makassar Selatan. Skripsi. Makasar. Universitas Hasanudin.
Maksudi, I., Indra, I., & Fauzi, T. (2018). Efektivitas Penggunaan Mesin Panen (Combine Harvester) Pada Pemanenan Padi Di Kabupaten Pidie Jaya. Jurnal Ilmiah Mahasiswa Pertanian, 3(1), 140-146.
Sujaya, D. H., Hardiyanto, T., & Isyanto, A. Y. (2018). Faktor-Faktor yang berpengaruh terhadap produktivitas usahatanitani mina padi di Kota Tasikmalaya. Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis, 4(1), 25-39.
Parayudhi, A. F., Rasyid, R., & Ilsan, M. (2021). Pengaruh Penggunaan Teknologi Mesin Combine Harvester Terhadap Produktivitas Hasil Panen Padi (Studi Kasus Kelurahan Kadidi, Kecamatan Panca Rijang, Kabupaten Sidrap). Wiratani: Jurnal Ilmiah Agribisnis, 4(1), 1-14.
Yanto, E., Dewi, A. R. S., Fakhriyah, S. F., Indrabayu, I., Aqfir, A., & Syahputra, R. A. (2023). PENGELOLAAN EKOWISATA DESA KAPAS BERBASIS SISTEM INFORMASI MANAJEMEN (SIM) MELALUI KEMITRAAN BUMDES. Community Development Journal: Jurnal Pengabdian Masyarakat, 4(6), 12038-12041.
Yuliawati, E. (2019). Pengaruh Penggunaan Alat Pemanen Padi Modern Terhadap Kesejahteraan Buruh Tani Desa Nampirejo Kecamatan Batanghari Kabupaten Lampung Timur Persfektif Ekonomi Islam (Doctoral dissertation, IAIN Metro).
Ahmad (05 juli 2023). Kondisi Pertanian Di Kabupaten Tolitoli. Diambil dari rri.co.id.