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THE IMPACT OF COVID-19 ON THE PRODUCTION AND INCOME OF HYBRID CORN (*Zea mays L*) FARMER IN WATANG KASSA VILLAGE, BATULAPPA DISTRICT, PINRANG REGENCY

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ABSTRACT

Pinrang Regency is one of the centers for the development of Hybrid Corn (*Zea mays L*) which is spread in several sub-districts, including Batulappa District, as BPS listed the largest shelled corn producing area in Pinrang Regency. Corn production in 2016-2018 continued to increase successively, were in 2018 it was able to produce shelled corn of 56,185 tons. The Covid-19 pandemic has had an impact on several sectors, one of which is the agricultural sector. This study aims to analyze the impact of the Covid-19 pandemic on the production and income of hybrid corn farmers in Watang Kassa Village, Batulappa District, Pinrang Regency. The area was chosen because it is the largest corn producing area and the majority of the surrounding population depend on corn farming. The data collected in this study are primary data and secondary data. Primary data was obtained through interviews with respondents using questionnaires, while secondary data is obtained indirectly or through intermediary media, data that has been available in various forms by relevant government agencies. Total sample in this study were 42 corn farmers. Researchers used descriptive quantitative methods through interviews with farmers and filling out questionnaires as a support to obtain data. Corn farming was analyzed using income analysis and further with hypothesis testing, namely the Paired Sample T-Test average difference test. The results showed that there was a real or significant difference in corn production and there was an average decrease in corn production by 537/kg while the average income of corn farmers increased by IDR 1,097,000.

Keywords*:* impact of covid-19, production, income, hybrid corn.

INTRODUCTION

Covid-19 (Coronavirus Disease) 2019 or Corona Virus has spread massively to various countries in the world, including Indonesia. Indonesia was first confirmed positive for Covid-19 on March 2, 2020 and continues to increase (Pinrang District Health Office, 2020)**.** The spread of Covid-19 in Indonesia is not

only spread in urban areas, but has spread to various regions in Indonesia. So there are several regular areas, be it Provinces, Regencies, and Sub-districts issue policies for determining red, orange/yellow and green risk zoning maps. This is done thoroughly, including Pinrang Regency which is one of the regencies in South Sulawesi Province.

Ministry of Health (2020) reported that Pinrang Regency experienced a gradual decline in regional security which was initially in the green zone, dropped one level to the orange zone and reached the worst condition, namely the red zone with a total of 16 people who were positively exposed to Covid-19 as of September 18, 2020. Therefore, the Pinrang Regency Government has gradually implemented several policies related to handling the spread of Covid-19, namely Large-Scale Social Restrictions (PSBB).

In addition to threatening health, this virus also affects all sectors, including the agricultural sector. As the most dominant sector cultivated by the Indonesian people, agriculture plays an important role in fulfilling the economy of most Indonesians, especially in the midst of a pandemic Covid-19. The working population by sector as of August 2020 is 128.45 million people. From this data, most of them work in the agricultural sector, namely 38.23 million people or 29.76% of Indonesians who work in this sector. In the agricultural sector, the most widely used by Indonesian people is the Palawija plant, one of which is corn[3].

Corn is one of the leading commodities of food crops in Indonesia, this plant has taken a role in the development of the agricultural sector. The demand for corn in Indonesia continues to increase every year, this is due to the large demand for corn for consumption, both as food and as animal feed ingredients (Maulidiwati, 202)**.** The prospect of corn farming is quite bright if it is managed intensively and commercially with an agribusiness pattern.

Batulappa District which consists of 4 villages, including Watang Kassa Village. Watang Kassa Village is one of the hybrid corn development areas which is the main economic source of the farmers in the village. Batulappa sub-district is the only one that makes corn as the main superior food crop commodity (Suryani et al, 2020). In line with this, most of the farmers in the area only depend on agricultural production of rice and secondary crops (hybrid maize).

Table 1. Hybrid Corn Production Per District in Pinrang Regency 2013-2017 (Tons)

No	Subdistrict	2013	2014	2015	2016	2017
1	Suppa	1.202	2,903	1.394	3.876	4.196
2	Mattiro Sompe	1.251	128	82	1,102	147
3	Lanrisang	4.648	2.403	3.616	7,586	8090
4	Feather Mattiro	1.305	3,713	619	6.259	14,445
5	Watang Sawitto	354	54	67	305	220
6	Paleteang	201	324	283	1.148	668
7	Tiroang	1.574	432	291	1,799	358
8	Patampanua	2.898	4.253	13,822	13.048	17.109
9	cempa	12,883	10,753	1.418	10,606	11.772
10	Duampanua	17.202	16,524	16,826	23,382	14,826
11	**Batulappa**	**32.666**	**31,205**	**30,759**	**35,037**	**52,141**
12	Lembang	18,758	22,275	17,854	33,862	34,258
13	**Pinrang**	**94,942**	**94,966**	**93.031**	**138.010**	**158,232**

Source: Central Bureau of Statistics of Pinrang Regency, 2018

Hybrid Corn Production per sub-district in Pinrang Regency in 2013-2017 shows that Batulappa District is listed as the largest corn-producing area in Pinrang Regency which is successively in 2013-2017. The Central Bureau of Statistics of Pinrang Regency (2019) reported in 2017 the production reaches 52,141 tons. Corn production in Batulappa District from 2016 to 2018 has consistently increased, in 2018 the total production reached 56,185 tons, this means that the increase is approximately 4,000 tons from 2017.

Seeing the policies implemented by the local government related to Covid-19, namely large-scale social restrictions, of course it will affect the activities of the agribusiness subsystem in the corn farming process from upstream to downstream which in turn will also affect the amount of production, production costs, revenues and have an effect. also on the income of farmers in the area. As the area where most of the people work in the agricultural sector which focuses on corn farming, the Watang Kassa Village area will received a more tangible impact.

This study aims to analyze the impact of the Covid-19 pandemic on the production and income of hybrid corn farmers in Watang Kassa Village, Batulappa District, Pinrang Regency.

RESEARCH METHODS

This research was conducted in Watang Kassa Village, Batulappa District, Pinrang Regency. The determination of the research location was chosen purposively based on certain considerations (Rosdianto et al., 2017). The selection of this location was based on considerations (1) the selected location is the largest source of corn producers in the village, (2) most of the people make corn as their main source of income, (3) the next consideration is the affordability of the research location by researchers, both seen from the in terms of funds, energy, and in terms of time efficiency. The research was carried out between August-October 2021.

The sample for this study was randomly selected 10% of the total population (Arikunto, 2012). Found as many as 420 populations so that 42 farmers were found as samples.

The type of data used in this research is descriptive quantitative data. Sources of data used in this study are primary and secondary data. Primary data were obtained directly from respondents, in this case farmers, through interviews using a questionnaire which containing a set of questions that had been prepared. Secondary data is obtained indirectly or through intermediary media, data that has been available in various forms by relevant government agencies such as the Watang Kassa Village Office and also from textual references and other online data.

The analysis used in this study isIncome Analysis Before and During Covid-19, namely in 2019 and 2020. To test the hypothesis using the paired sample t test or the average difference test.

Total Production Cost

TC=TFC+TVC………...……………(1)

Information:
TC = Total Cost (IDR)
TFC = Total Fixed Cost (IDR)
TVC = Total Variable Cost (Cost Not Fixed) (IDR)

Reception

Calculation of corn farmers' farm income can be formulated with the following calculations:

TR = Q x P...(2)

Information:
TR = Total Revenue (IDR)
Q = Quantity (IDR)
P = Price (IDR)

Income

π = TR-TC...(3)

Information:
π = Income (IDR)
TR = Total Revenue (Total Revenue) (IDR)
TC = Total Cost (Total Cost) (IDR)

Hypothesis

To test hypothesis, used in this study is the Difference Test with related samples (Paired Sample T Test) with the help of IBM SPSS (Statistical Product and Service Solutions) version 22. Paired Sample Test This T-Test aims to determine whether there is a difference in the mean of two samples (two groups) that are paired together. Paired sample t-test was used if the data were normally distributed with a significant level of more than 0.5. Paired t-test in this study was used to analyze the difference in the average production and income of corn farmers.

The determination of the significance level is by considering the following values (Santoso, 2014):

1. If the value of sig (2-tailed) < 0.05 then there is a significant difference or the hypothesis is accepted (H0 is rejected and Ha is accepted).
2. Vice versa, if the value of sig (2-tailed) > 0.05 then there is no significant difference or the hypothesis is rejected (H0 is accepted and Ha is rejected).

The hypothesis used in the test is as follows:

H0 = There is no real difference in corn production before and during the pandemic

H1 = There is a significant difference in corn farmers' production before and during the pandemic

H0 = There is no significant difference in the income of corn farmers before and during the pandemic

H1 = There is a significant difference in the income of corn farmers before and during the pandemic.

RESULT AND DISCUSSION

Impact of the Pandemic on Average Hybrid Corn Production in Watang Kassa Village

Based on the results of research on the impact of Covid-19 on hybrid corn production in Watang Kassa Village, it can be seen in table 5.6. following:

Table 2. Average Land Area of Corn Production in Watang Kassa Village Before and During the Pandemic

No	Note.	Average Land Area	Average Production Ha (Kg)
1.	Before the	1.2	3.679
2.	During the Pandemic	1.2	3.142

Source: Primary Data After Processing.

Table 2 shows the average hybrid corn production in Watang Kassa Village before the pandemic was 3,679 Kg with an average arable area of 1.2 hectares, while during the pandemic with the same (average) land area, production was 3,142. kg. This means that during the pandemic maize production decreased by an average of 537 kg.

The declining of hybrid corn production is caused by the use of less than optimal inputs. Based on interviews with respondent farmers, it found out most said that the decline in corn production occurred because the majority of farmers were overwhelmed in finding fertilizers, especially Phonska NPK because this type of fertilizer was the most difficult to find. In contrast, other inputs such as seeds and pesticides which are relatively easy to find. Most of the respondent farmers said that Saprodi, in this case fertilizer during the pandemic, was increasingly difficult to access, while only 2 respondents said it was easy to access and the rest, namely 40 people, said it was difficult to get access to fertilizer during the pandemic.

Seeing that the planting time for each farmer was approximately the same in the two hamlets, this resulted in the time of fertilization, the farmer who planted first and also searched for fertilizer faster would also get it, while the last planting would wait until fertilizer was available at the subsidized fertilizer distributor.

Moreover, because the majority of the surrounding community will only fertilize after it rains, this will cause fertilization time is not optimal, especially when it rains fertilizer is still not available, then of course there will be another delay in fertilizing corn plants. This causes delays in applying fertilizer to corn plants. This situation, will impact on the maximum growth of corn plants.

Lack of nutrients in corn plants as a result of limited fertilizers among farmers which makes plants less well maintained in fulfilling nutrients so that these plants will produce small corn fruit. Another reason is because the majority of farmers only fertilize once per growing season, while according to the recommendation of Balitbangtan (Agricultural Research and Development Agency) it is best to fertilize corn 3 times per growing season, namely when the plants are 7, 25 and 40 days after planting. This will give double higher yield productivity compared to the application of fertilizer which is only done twice or only once in one growing season.

From the results of SPSS 22 data processing using the Paired Sample t-Test (Test paired average) shows a significant value (2-tailed) of 0.000 where this value is smaller than the standard benchmark significance value of 0.05. Then H0 is rejected and H1 is accepted. Thereore, it can be concluded that there are significant or significant differences in corn production before the pandemic and during the pandemic in Watang Kassa Village.

Farmers as well as regional fertilizer distributors admit that the fertilizer during the pandemic is increasingly difficult to obtain, in particular during the peak of the pandemic, the distribution to distributors is hampered.

During the pandemic the corn grinding service (Daros) had stopped operating for almost two weeks, this happened at the time of the peak of the pandemic due to the implementation of the Large-Scale Social Restrictions policy. The policy applies to coincide with the corn harvest time in Watang Kassa Village, which causes farmers' production to decline, because it makes corn production, especially those that are harvested first, attacked by fungi and pests.

Table 3. Average Difference Test Results Against Average Hybrid Corn Production Data in Watang Kassa Village Before and During the Pandemic.

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	Production Before the Pandemic - Production During the Pandemic	514.952	835,625	128,940	254.553	775,352	3,994	41	,000

Source: Processed Results SPSS 22

Table 4. Differences in Average Fixed Costs and Variable Costs Before and During the Pandemic

No	Information	Average Fixed Cost (Rp)	Average Variable Cost per Ha (Rp)
1.	Before the Pandemic	267,000	4,454,000
2.	During the Pandemic	267,000	4,372,000

Source: Primary Data After Processing.

Table 5. Average Corn Production Costs Before and During the Pandemic

No	Information	Average Production Cost /Ha(Rp)
1.	Before the Pandemic	4,721,000
2.	During the Pandemic	4,639,000

Source: Primary Data After Processing

Table 6. Distribution of Differences in Average Variable Costs of Corn Farming in Watang Kassa Village Before and During the Pandemic

No	Information	Before the Pandemic (IDR)	During the Pandemic (IDR)
1.	Average Seed Cost /Ha(Rp)	1.354,000	1,406,000
2.	Average Fertilizer Cost /Ha(Rp)	847,000	854,000
3.	Average Pesticide Cost /Ha(Rp)	728.000	708.000
4.	Average Labor Cost /Ha(Rp)	1,525,000	1,404,000

Source: Primary Data After Processing

The Impact of the Pandemic on Corn Production Costs in Watang Kassa Village

The data in Table 4 shows that the average fixed cost per ha is IDR 267,000, then for the average variable cost per Ha before the pandemic was IDR 4,454,000 and during the pandemic it was IDR 4,372,000 per Ha, it means that during the pandemic the variable costs decreased by IDR 82,000. The decreasing in production costs was mainly due to the costs sacrificed by corn farmers in Saprodi, especially fertilizers. In purchasing Saprodi, the sale and purchase transaction uses two prices, the price differs between farmers who make direct payments (cash) and those who borrow (credit) payment.

Table 5. shows the average data cost of corn production before the pandemic was IDR 4,721,000. While the average production cost during the pandemic is IDR 4,639,000. It can be seen that during the pandemic the production cost decreased by IDR 82,000. The decreasing in the average production cost of corn farming was due to the decrease in variable costs as previously described in Table 4.

The data in the table shows that the average cost of seeds per hectare before the pandemic was IDR 1.354,000 while during the pandemic the average cost of seeds per hectare during the pandemic was IDR 1,406,000. So this means that there was an increasing in cost of seeds by IDR

52,000. Furthermore, the average cost of fertilizer per ha before the pandemic was IDR 847,000 and during the pandemic. of IDR854,000, which means an increasing average cost of fertilizer by IDR 7,000. By far, for the average cost of using pesticides per hectare before the pandemic was IDR 728,000 and during the pandemic IDR 708.000, which means that during the pandemic there was a declining in the average cost of pesticides by IDR 20,000. The increasing in costs was due to the fact that most of the respondent farmers paid for the Saprodi (seeds).

Furthermore, labor costs before the pandemic is IDR 1.525,000 and during the pandemic of IDR 1,404,000, which means that during the pandemic there was an increasing in the average production cost of IDR 121,000. The workforce is divided into two, namely family labor and outside the family. Workers outside the family are divided into two, namely wage labor and mutual cooperation workers. This family labor and mutual cooperation will make the burden incurred by farmers lower than wage labor, because the costs incurred by land owners are only limited to the cost of consuming labor and most land owners will prepare food independently, so they can suppress themselves. costs for labor consumption.

Especially for the cost of wage labor, it is determined or depends on the category of work, for example labor for planting, the wages are seen from the number of seeds used, as well as fertilization where the determination of wages is determined by how much fertilizer (sak) is used by the land owner, for Harvesting is determined by how many (Kg) seeds are planted. Then the costs with the most potential expenditures are on the use of milling services and transportation of tassi as a means of transporting corn farming products after grinding, both of which are determined by the amount of production produced by the land which is calculated on a per sack count, thus the more production produced, this will lead to an increase in costs incurred by farmers.

The Impact of the Pandemic on the Average Revenue of Corn Farming Results in Watang Kassa Village

Based on the processed data in Table 7 shows that the average income of corn farmers per hectare before the pandemic was IDR 1.317,000. Revenue is the result of multiplying the corn production obtained by farmers with the selling price of the corn. Therefore the amount of the selling price and the amount of production greatly affect the size of the income. If production has been maximized and the selling price is higher, it will have a positive effect on farmers' income.

The processed data in table 8 shows that the average selling price of corn per kg in one hectare before the pandemic was IDR 2,674 while during the pandemic the average selling price of corn IDR 3,614. This means that during the pandemic the selling price of hybrid corn in Watang Kassa Village has increased by a difference of IDR 940. According to respondent farmers, the selling price of corn both before the pandemic and during the pandemic experienced price fluctuations. Before the pandemic the highest price was IDR 3.100/kg while during the pandemic the highest selling price reached IDR 4,100/kg. This increase price is good news for farmers because for the first time the price of corn can reach such a high price.

The increase in selling prices among farmers during the pandemic was due to unstable production during the pandemic. According to farmers in Watang Kassa Village, price increases usually occur if the supply of corn is reduced and on the other hand, it makes them happy because for the first time the selling price of corn reaches IDR 4,000. This is in line with the explanation of Carolina (2021) which said that the increase in corn prices was caused by reduced corn stocks, this disrupted the supply of corn. In accordance with Catriana (2021) statement which said that the increase in selling prices was due to the non-optimal domestic corn production and the policy of the

Enforcement of Community Activity Restrictions (PPKM) which had an impact on increasing maize logistics costs between regions.

Table 7. Average Acceptance of Hybrid Corn Farmers in Watang Kassa Village Before and During the Pandemic

No	Information	Before the Pandemic	During the Pandemic
1.	Production (Kg)	3.679	3.142
2.	Selling Price (Rp)	2,674	3,614
3.	Revenue (Rp)	9,689,000	11.005.000

Source:Primary Data After Processing.

Table 8. Average Selling Price of Hybrid Corn Before and During the Pandemic.

No	Information	Average Selling Price /Kg/Ha (Rp)
1.	Before the Pandemic	2,674
2.	During the Pandemic	3,614
	Difference	940

Source: Primary Data After Processing.

Table 9. Average Income of Hybrid Corn Farmers in Watang, Kassa Village Before and During the Pandemic

No	Information	Average Income per Ha(Rp)
1.	Before the Pandemic	5,261,000
2.	During the Pandemic	6,358,000

Source: Primary Data After Processing.

Table 10. Results of the Average Difference Test on the Average Income of Hybrid Corn Farmers in Watang Kassa Village Before and During the Pandemic

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	Income Before the Pandemic - Income During the Pandemic	-1110269,833	2506951,593	386831,029	-1891490.945	-329048,722	-2,870	41	,006

Source: SPSS 22 Data Processing Results

The Impact of the Pandemic on the Average Income of Hybrid Corn Farmers in Watang Kassa Village

Based on the processed data above, it shows that the average income of hybrid corn farmers before the pandemic was IDR 5,261,000 while during the pandemic the income of hybrid corn farmers was IDR 6,358,000. This means that during the pandemic the average income of hybrid corn farmers has increased by IDR 1,097,000. This increase in income was due to the rising selling price of corn during the pandemic experienced a fairly large increase.

The increase in the selling price of corn certainly has a positive impact on corn farmers in Watang Kassa Village. The positive impact was felt by both farmers who experienced increasing in production and farmers who experienced a decreasing in production, because it helped by an increase in the selling price of corn, which result in revenues and incomes also increase

The Paired Samples t-test in Table 10 is the main table of the outputs that shows the results of the tests carried out. This can be seen from the significance value (2-tailed). From the results of data processing in SPSS 22 using the Paired Sample T Test, it shows a significant (2-tailed) value of 0.006 where this value is smaller than the standard significance value of 0.05. Therefore, it can be concluded that there are real or significant differences in the income of hybrid corn farmers in Watang Kassa Village before the pandemic and during the pandemic. The results showed that there was a real or significant difference in corn production and there was an average decrease in corn production by 537/kg while the average income of corn farmers increased by IDR 1,097,000. In line with Siregar's finding (2021) that revealed there are real or significant differences in the production and income of corn farmers during and after the co-19 pandemic (Siregar, 2021).

CONCLUSION AND SUGGESTION

Conclusion

Based on the analysis the impact of Covid-19 on maize production and the income of hybrid maize farmers in Watang Kassa Village before and during the Covid-19 pandemic, it can be concluded that:

1. There was a significant or significant difference in the production of hybrid corn farmers in Watang Kassa Village before and during the Covid-19 pandemic. During the pandemic there was a decrease in the average hybrid corn production of 537 Kg, this was due to the lack of nutrition for corn plants. Moreover, during the pandemic, the difficulty accessing fertilizers, resulting in delays in fertilizing farmers plants, where they often fertilized only once per growing season. Apart from that, during the pandemic the corn shelling service (daros) had stopped operating for almost two weeks thus had impact in declining corn production.
2. There is a significant or significant difference in the income of hybrid corn farmers in Watang Kassa Village before and during the pandemic. There is an increase in the average income of corn farmers during the pandemic, by IDR 1,097,000 which has a positive impact on farmers. The increase in farmers' income was due to the selling price of shelled corn increased, so although in terms of the amount of corn production, farmers experienced a decline, but it could still be helped by the increase in corn prices.

Suggestion

1. The government should tighten the supervision of aid distribution to farmers in order farmers do not experience delays in fertilizing crops. In addition, it is necessary counseling about good cultivation, especially about fertilization in order to further maximize corn production.
2. Farmers can look for other types of fertilisers other than subsidized fertilizers whose prices of subsidized fertilizers. This is intended that farmers do not depend on one type of fertilizer, which in fact they are overwhelmed in accesing it.

REFERENCES

Annur, C. M. (2020) *The Agricultural Sector Absorbs the Most Indonesian Workers* https://databoks.katadata.co.id

Arikunto, S. (2012) Research Methods. March 23, 2021. https://eprints.uny.ac.id

Carolina, R. A. (2021) Analysis of the Development of Staple Food Prices in Domestic and International Markets. Journal of the Center for the Study of Domestic Trade: Ministry of Trade.

Catriana, E. (2021) Ministry of Agriculture and Ministry of Religion Differing Opinions on the Cause of the Increase in Corn Prices. November 12, 2021. https://kompas.com/Kementan-dan-Kemenag-Beda-Opinions-Soal-Cause-Kenaikan-Price-Corn

Maulidiwati, N. D. (2020) Analysis of Corn Farming Production and Income in Margaharja Village, Sukadan District, Ciamis Regency. Thesis. Muhammadiyah University of Yogyakarta.

Ministry of Health. (2020) The Latest Situation of the Development of the Corona Virus Covid 19. March 2, 2021. https:// infectionemerging.kemenkes.go.id.

Pinrang District Health Office. (2021) *Pinrang Regent Presides the Red Zone Pinrang District* Discussion Meeting. https://dinkes.pinrangkab.go.id/arsip/658

Rosdianto, H. et al. (2017) Implementation of the Poe Learning Model to Improve Students' Concept Understanding on Newton's Law Material. Journal of Physics Education. Vol. 6 No. 1

Santoso, S (2014) How to Test Sample T-Test and Interpretation with SPSS. https://www.spssindonesia.com/2016/08/cara-uji-paired-sampel-t-test-dan.html?=1

Siregar, D.H. (2021) Dampak Pandemi Covid-19 Terhadap Pendapatan Petani Padi Sawah di Desa Payabakung, Kecamatan Hamparan Perak. Skripsi: Universitas Sumatera Utara Medan. Vol. 1-100.

Suryani, S et al. (2020) Study of Labor Statistics for the development of agricultural land for food crops based on superior commodities in Pinrang Regency, South Sulawesi. Journal of the Territory and the Environment, 8(2), 147-160. doi:10.14710/jwl.8.2.147-160.

The Central Bureau of Statistics of Pinrang Regency. (2019) Batulappa District in 2019 Figures.