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THE IMPACT OF THE SERASI PROGRAM APPLICATION ON THE PLANTING INDEX AND FARMING INCOME IN THE BANYUASIN DISTRICT

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ABSTRACT
Introduction: *The match program is a swampland management program to increase food production and farmer welfare with the performance target of increasing tidal swamplands' planting index and productivity. This study aims to analyze the impact of implementing the SERASI program by comparing the cropping index, productivity and farm income before and during the implementation of the SERASI program.* ***Methods:*** *This study uses a type of quantitative research. The sample used the solving formula and obtained a random sample of 2522 people. The data were processed and tested statistically using the Paired T-test and the Independent T-Test in the SPSS version 26.0 program.* ***Result:*** *Research conducted in Banyuasin Regency in 2 (two) sub-districts, namely Tanjung Lago District and Muara Telang District, gave results based on the T-test, there was an increase in the planting index of 20.1728%, an increase in the productivity of rice planting season I (MT I) of 12.981%, increased productivity of rice planting season II (MT) by 8.257% and increased productivity of corn by 7.248%, and there was an increase in farmers' income from rice and corn farming by 31.458% when implementing the matching program.* ***Conclusion:*** *The productivity of MT I rice farming is higher when the program is compatible with an increase of 12.981%, the productivity of MT II rice farming is higher when the program is compatible with an increase of 8.267%, the productivity of corn farming is higher when the program is compatible with an increase of 7.248%. (3) Farmers' income from rice and corn farming is higher when the program is compatible, with an increase of 31.498%.*

Keywords: *Compatible Program, Planting Index, Productivity, Income.*

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INTRODUCTION

To meet the community's food needs, Government policies in the agricultural sector are directed at increasing the production of national food commodities, namely rice, corn, and soybeans (Rusdiana & Maesya, 2017). To achieve this goal, the Ministry of Agriculture has implemented land use optimization in various land agroecosystems by increasing the cropping index (IP) and agricultural productivity, one of which is tidal swamp land. The use of tidal swamp land for food production is still faced with complex problems related to tidal fluctuations, infrastructure conditions that are not yet functioning optimally, physical and chemical conditions of the land and low socio-economic conditions of the community (Suriadikarta, 2012); (Alwi, 2014); (Arsyad, 2014) so that to increase the cropping index and productivity in tidal swamp land, it is necessary to carry out management related to these problems.

The Save Swamp for Farmers' Prosperity Program (SERASI) is a swampland management program to increase food production and farmer welfare with the performance target of increasing

cropping index and productivity (Permentan No 40.1/2018). The cropping index shows the frequency of use of a plot of land for farming. The index of land cultivation can be measured by comparing the area planted to the land size for agriculture, while land productivity is through a comparison between the results of land production and the location of land used in farming. In SERASI, land management to increase cropping index and productivity is carried out by implementing aspects of water management through the rehabilitation of tertiary irrigation networks (RJIT) and the assistance of water pumps to meet water needs during the dry season and control excess water during the rainy season, implementing land management so that can be utilized with plants that are in accordance with the type of land overflow and aspects of plant nutrient management through the assistance of production facilities such as adaptive superior seeds for swamp land, dolomite, biological fertilizers, pesticides and subsidized fertilizers which are expected to improve soil nutrient conditions while at the same time meeting the needs of production facilities in farming , while the assistance of agricultural machinery is expected to speed up land preparation, planting and harvesting so that it can save time and overcome the scarcity of farm labor and reduce yield losses at harvest, this is in line with the opinion (Alihamsyah, 2002) who states It can be concluded that management of swamp land in an integrated manner through water management, management of plant nutrients or integration between the two can increase plant productivity in tidal swamp land.

With the fulfillment of the various aspects needed in farming, it is hoped that the utilization of tidal lowland rice fields as food production land can increase from one cropping or Planting Index (IP) 100 to two plantings (IP 200) or three plantings (IP 300). The management of tidal lowland rice fields through SERASI is not only intended to improve land for rice cultivation, but the combination of rice planting with other food crops such as corn or horticultural crops adjusted to the type of overflow on each land is expected to increase overall farming revenue, and the impact on improving the income received by farmers is strengthened by research (Noor & Jumberi, 2008) ; (Muhamad Hidayanto et al., nd) that the development of tidal swamp land in an integrated and multi-commodity manner can provide quite good added value and can increase farmers' income. Based on the description above, this research was conducted to analyze the impact of implementing the Serasi Program by comparing the planting index, productivity and farm income before and during the implementation of the Serasi program in Banyuasin Regency, which is one of the districts that received assistance from the 2019 Serasi program.

METHODS

This research was conducted in Muara Telang District (Telang Jaya Village and Sumber Hidup Village) and Tanjung Lago District (Banyuarip and Telang Sari Villages). The selection of research locations was carried out purposively with the consideration that the two sub-districts were recipients of program assistance and were centers of food crop production (rice and corn) in Banyuasin Regency. The number of farmers participating in the matching program in the two sub-districts is 2522. Using the solving formula, a random sample of 96 farmers was obtained, with 24 farmer respondents representing each village. Furthermore, to answer the research objectives, first calculate the cropping index, productivity and farm income using the following formula:

$$IP = \frac{Planting\ Area\ MT - I + Planting\ Area\ MT - II + Planting\ AreaMT - III}{Paddy\ Field\ Area}$$

Where:
IP = Planting Index
MT = Planting Season

$$Land\ Productivity\ \left(\frac{kg}{ha}\right) = \frac{Production\ Amount\ (kg)}{Land\ Area\ (ha)}$$

Farming Income with the formula:
BT = BTpT + BV
Pn = H x Y
Pd = Pn – BT
Where:
BT = Total cost of farming (Rp/ha/mt)
BTpT = Fixed price of agriculture (Rp/ha/mt)
BVT = Variable cost of farming (Rp/ha/mt)
Pn = Farm revenue (Rp/ha/mt)
H = Price of Harvested Dry Grain/dry shelled corn (Rp/Kg)
Y = Productivity (Kg/ha/mt)
Pd = Farm income (Rp/ha/mt)

After knowing the cropping index, productivity and farm income before and when the program was matched, the data was processed and tested statistically using the Paired T-test and the Independent T-Test in the SPSS program version 26.0. The hypotheses used are H 0: X1 = X2 and H1: X1 ≠ X2, where X1 = index of cropping, productivity, and farm income before farmers implement a compatible program and X2 = index of cropping, productivity, and farm income when farmers apply for a consistent schedule, with decision rule:

- t-count < ttable = accept H0, it means that the planting index, productivity, and farm income are lower when farmers apply for the matching program
- t-count > t-table = reject H0, meaning that the planting index, productivity and farm income are higher when farmers implement a compatible program

RESULTS AND DISCUSSION

1. Implementation of the Serasi Program in Banyuasin Regency

The Serasi program aims to increase food production and farmers' welfare by increasing the planting index and productivity in swamps, one of which is the tidal swamps in the Banyuasin Regency. Paddy fields in Banyuasin Regency reach 178,808 Ha, divided into 152,808 Ha tidal paddy fields and 25,902 Ha lebak swamps, spread over 21 sub-districts including Tanjung Lago sub-district and Muara Telang sub-district. The 2019 Serasi Program in Tanjung Lago District was implemented in 9 villages, including Telang Sari Village with an area of rice fields that received assistance from the Serasi Program of 532 Ha and Banyuurip Village of 808 Ha, while for Muara Telang District, it was implemented in 15 villages including Telang Jaya Village with an area of 934 Ha of paddy fields and 1,324 Ha of Sumber Hidup Village with the realization of the assistance given to farmers participating in the Serasi Program as follows:

Table 1. Realization of Serasi Program Assistance in Banyuasin Regency

District/Village	Help Type
Tanjung Lago/Telang Sari	Rehabilitation of tertiary canals, water pumps, tillage, production facilities 42,560 kg, dolomite 266,000 kg, 53,200 kg NPK, liquid biological fertilizer 1,596 liters, pre-emergence herbicide 1,596 liters
Tanjung Lago / Banyuurip	Rehabilitation of tertiary canals, water pumps, soil treatment, seed production facilities 64,640 kg, dolomite 404,000 kg, 53,200 kg NPK, liquid biological fertilizer 2424 liters, pre-emergence herbicide 2424 liters
Muara Telang / Telang Jaya	Rehabilitation of tertiary canals, water pumps, tillage, seed production facilities 74,720 kg, dolomite 467,000 kg, NPK 93,400 kg, solid biological fertilizers 23,350 kg, pre-emergence herbicides 2802 liters
Muara Telang / Source of Life	Rehabilitation of tertiary canals, water pumps, tillage, seed production facilities 105,920 kg, dolomite 662,000 kg, NPK 132,400 kg, solid biological fertilizer 33,100 kg, pre-emergence herbicide 3,972 liters

Source: Department of Food Crops and Horticulture District. Banyuasin

The implementation of the Serasi Program began from January to December 2019, where the rehabilitation of tertiary irrigation canals for Tanjung Lago District, Telang Sari Village was carried out in April 2019, Banyuurip Village in June 2019 and rice production facilities were provided before the MT I rice planting target in September 2019, while the rehabilitation of tertiary irrigation canals for Muara Telang District was carried out in April 2019 with the target of producing MT I riced in September 2019. In implementing the match program, farmers receive assistance from the Food Crops Agriculture and Horticulture Office of Banyuasin Regency, which consists of a technical team, extension workers and field coordinators for each district. The types of assistance carried out include assistance in preparation for cooperative programs (preparation of CP/CL data which contains potential program aid recipient areas, the establishment of group activity management units, preparation of group activity proposal plans, preparation of production facility needs, etc.), assistance in the implementation of tertiary rehabilitation canals, installation and checking of water pumps, service in the utilization of production facilities up to harvest and post-harvest. With the performance of the cooperative program by farmers in Banyuasin Regency, it is hoped that it will have an impact on increasing the cropping index and productivity and, in the end, can increase the income received by farmers.

2. Characteristics of Land and Farming Business in Banyuasin Regency

The hydrographic condition of the rice fields in Tanjung Lago District, Telang Sari Village is tidal swampland with overflow type B, namely the paddy fields can be overflowed by tides only during the rainy season, while Banyuurip Village is included in the overflow type C namely the paddy fields are not overflowed by water. Surges directly both in the rainy and dry seasons, but the tides affect the groundwater level in paddy fields. For Muara Telang District, Telang Jaya Village and Sumber Hidup Village have areas of paddy fields that are dominant in overflow types B and C. Paddy fields with overflow type B are the potential for one paddy planting combined with horticultural crops or two paddy plantings during the rainy season and during the dry season 1 time to plant corn while land with overflow type C can be produced with rice one time to grow during the rainy season and one time to plant during the dry season. Utilization of the potential

of each land can be increased if the water supply in each season is sufficient, so it is necessary to ensure that the available water channels for irrigating rice fields can function properly and the availability of good water pumps. Paddy fields in Muara Telang and Tanjung Lago sub-districts already have a complete water management network, from primary and secondary canals to tertiary channels.

3. Rice Farming Business

Rice farming activities in Tanjung Lago District generally plant 1 to 2 times rice in Oct/Nov to March (Planting Season I), while in Muara Telang District, the plant typically 1 to 2 times rice with a rice planting schedule MT I Oct/Nov to Jan/ Feb and MT-II rice from Feb to May, before the match program the majority of farmers used seeds with various rice varieties including Ciherang, TW, Tubah Gendit, Inpara42, Manggar and Mapan rice, while during the seed match program used Ciherang, Inpari 42, Inpari 32 Rice farming activities start from land processing, planting, fertilizing, replanting, spraying, harvesting to post-harvest activities. Land preparation begins with spraying herbicides with a dose of + 4-5 l/ha. Its use is to kill weeds in the field and crop residue from the previous planting season so that it is hoped that it will not interfere with the growth of rice plants when they have been planted, then land processing is carried out by tractors rented by farmers with prices ranging from Rp. 800,000 to Rp. 1,000,000, - per hectare of land. When implementing the cooperative land management program was accompanied by applying dolomite and soil amendment fertilizers, the farmers received assistance with land processing costs of Rp. 300,000 per hectare of land, whereas before the compatible program, only a few farmers used dolomite when cultivating the ground. This was due to the limited costs that farmers had to pay. The next activity is planting seeds. The seed planting system applied is the direct sow seed system (TABELA) which is directly spread by farmers to paddy fields using rice seeds ranging from 20 kg to 87 kg per hectare. Fertilization was carried out three times with the usual fertilizer, namely urea fertilizer at a dose of 100 to 200 kg/ha, NPK fertilizer at 200 to 300 kg/ha and additional liquid fertilizer + 2 liters/ha. During the match program, farmers received seed assistance of 80 kg/ha, dolomite 500 kg/ha, biological fertilizer 3 liters/ha or 25 kg/ha, and NPK fertilizer 100 kg/ha.

The next stage is maintenance, which includes spraying pesticides according to the needs of the field. After the rice is pregnant and yellow, the rice is ready to be harvested. The harvesting process is quite modern; using a combine harvester, this machine can harvest rice quickly, only requiring around 1 to 2 people per hectare. The wages that apply are a wholesale system with a nine-to-one distribution of the harvest obtained. Farmers do not experience difficulties selling their crops because the collectors directly come to the farmers to buy their produce. The yields sold by farmers to collectors are in the form of harvested dry grain (GKP).

4. Corn Farming Business

Corn farming activities in the Tanjung Lago and Muara Telang sub-districts start from land processing, planting, fertilizing, embroidery, spraying harvest and post-harvest. The initial stage in corn farming is to prepare the land by spraying herbicides on the weeds remaining from the rice planting, after that the farmers make +10 ditches/worm channels per hectare; these ditches are made because the corn plants are very susceptible to excess water, so the gutters function to

control excess moisture in the field. Usually, farmers use machines to make ditches with a wage of Rp. 80,000 per ditch. After that, corn seeds are planted using a corn planter, or what farmers call an otok-otok machine; this machine makes it easier to plant and saves time. Usually, the labor required to plant corn manually reaches 10 to 20 people per hectare, with an otok-otok machine only requiring 1 to 2 workers per hectare. The seeds used by farmers are hybrid corn seeds such as Bisi 18 and Pioneer 32 corn, with the amount of grain used ranging from 15 to 30 kg per hectare of land.

Fertilization is done for corn plants more than rice plants. Use of Urea fertilizer with a quantity of 250 to 400 kg per hectare, NPK fertilizer 300 to 500 kg per hectare, farmers also use organic fertilizer ranging from 750 kg to 2,000 kg/ha. Fertilizer application approximately three times in the growing season. The corn harvesting process is carried out by farmers using a combined harvester machine that has been modified so that when the corn is harvested, it is directly shelled. Farmers sell the crops to various collectors. Some sell immediately at harvest, but some carry out post-harvest activities by drying the corn for + more than three days or until the moisture content reaches an average of 14 to 17%.

5. Characteristics of Respondent Farmers

The characteristics of the respondent farmers are an overview of the background of the farmers participating in the SERARI program in Banyuasin Regency. The features of the respondent farmers include various things, including those taken in this study, such as age, education level and farming experience can be seen in table 1 below:

Table 1. Distribution of Respondent Farmers by Age, Education Level and Years in Business.

Component	Subdistrict		Total	Percentage (%)
	Muara Telang (Farmer)	Tanjung Lagos (Farmer)		
Age (Years)				
Productive (15-64 Years)	46	46	92	95.84
Not Productive (≥ 65 Years)	2	2	4	4,16
Level of education				
SD	7	15	22	22.91
Middle and High School	39	33	72	74.99
BACHELOR	2	-	2	2.08
Length of Farming (Year)				
< 10	4	5	9	9.37
10 – 20	16	17	33	34.75
>20	28	26	54	56,25

Source: Primary data processing results, 2022

Farmer's age is the farmer's age from birth until the research was conducted. According to the Central Bureau of Statistics, the composition of the population according to age is divided into two groups, namely the non-productive age group 0 to 14 years and those aged > 65 years and over, and the second group, namely the productive age group, with the age group 15 to 64 years. Based on Table 1. it can be seen that 95.84% of the respondents in this study were farmers in the productive age group, while 4.16% were farmers in the unproductive age group. Farmers

in the effective age group are usually more open and able to receive information and technological advances well, so they are expected to have a good impact on implementing the cooperative program. Judging from the level of education, 22 farmer respondents were in a low category (SD) or 22.91%, the respondent farmers in the middle and high school categories were 72 farmers (74.99%), while the respondent farmers were in the middle and high school categories. Higher education (SMA) has as many as two farmers, or 2.08%. The education level of the farmers in this study was in the medium category, which farmers dominated at junior high and high school levels. This shows that farmers' awareness of the importance of education is starting to increase; of course, this level of education is expected to positively impact the SERARI program's implementation.

The length of time in farming is the length of time a farmer has worked as a farmer, be it his main or side job. Respondent farmers from Muara Telang and Tanjung Lago sub-districts have varied farming experiences, ranging from under ten years to more than 20 years. Fifty-four farmers in Tanjung Lago and Muara Telang Districts have experience in farming for more than 20 years, which is 56.25% of the total 96 respondents. This follows the opinion (Manyamsari & Mujiburrahmad, 2014), which states that farming time is divided into three categories, namely new (less than ten years), medium (10 to 20 years), and old (more than 20 years). Farmers in Muara Telang District and Tanjung Lago District are dominantly in the senior category > 20 years because the average farmer is a migrant/transmigration farmer who has been in Banyuasin Regency since the opening of transmigration in 1980, in line with research (Fusilawati et al., 2021) which states that 83 percent of tidal farmers in the Tanjung Lago sub-district are immigrants from the island of Java.

6. Comparison of Land Cultivation Index Before and During the Coordination Program

The cropping index is the ratio of the planted area to the land area owned several times growing in a year. The cropping index shows the frequency of production on a plot of land. Based on the survey results, the average planting index on farming land before and during the match program can be seen in Table 2 below.

Table 2. Farming Land Planting Index Before and During the Compatibility Program

Description	Paddy Field Area (Ha)	Farm Planted Area (ha)			Farming Land Planting Index (IP)
		Rice Planting Season (MT) I	Rice Planting Season (MT) II	Corn	
Before the Serasi Program					
Tanjung Lago District	1.86	1.86	0.00	1.57	1.84
Muara Telang district	2,15	2,15	1.23	0.29	1.71
Banyuasin Regency	2.01	2.01	0.61	0.93	1.77
After the Compatibility Program					

Tanjung Lago District	1.86	1.86	0.00	1.80	1.96
Muara Telang district	2,15	2,15	1.79	0.98	2,29
Banyuasin Regency	2.01	2.01	0.90	1.39	2,14

Source: Primary data processing results, 2022

The table above shows that before the compatible program, the farming land cropping index in Tanjung Lago District was 1.84 or 184%. During the compatible program, it reached 1.96 or 196%, while in Muara Telang District before the farming land matching program the index was 1 .71 or 171%, and when the compatible program reached 2.29 or 229%, the difference in the results of the land cropping index before and during the compatible program was carried out by a paired sample t-test with SPSS version 26.0. and the results are obtained in table 3 below:

Table 3. Results of the Paired Sample T-Test Index for Farming Land before and during the Match Program

Land Cultivation Index Before and After the Serasi Program	Mean Paired Differences	t	df	Sig. Two-Sided P	Increase in Land Planting Index (Ha)
	-26.08333	-5,764	95	0.000	20.1728 %

Source: Primary data processing results, 2022

Table 3 shows that the t-count value of 5.764 is greater than t-table 1.9852; referring to the test criteria, it can be concluded that Ho rejects, which means that the farming land cropping index is higher or increases by 20.1728% when farmers apply for a compatible program or if seen from the results of Sig. (2-sided p) is 0.000 less than 0.05; this result is in line with research (Anggrainy, 2022) that the congruence program implemented in Muara Beliada Subdistrict, Muara Enim Regency, in 2019 had a positive impact on increasing the planting index of shallow swamp farmers. During the match program, the increase in the planting index in Banyuasin Regency occurred due to differences in the average planting area for rice and corn plants. In contrast, for Tanjung Lago District, there was an increase in corn planting area which was originally an average of 1.57 Ha to 1.80 Ha or a difference of 0.23 Ha. The increase in corn planting area was obtained from planting in Telang Sari Village. Based on the results of interviews with farmers, information was received that the factors driving the increase in corn planting areas included increased demand for corn and the profits obtained by farmers were quite high due to the selling price of corn commodities. They range from Rp. 4,400 up to Rp. Five thousand two hundred dries shelled per kg, which is higher than the figure set by the government with a price range of Rp. Three thousand one hundred fifty with a moisture content of 15% (Permendag No. 07, 2020), in addition to the availability of agricultural machinery when planting, such as corn planters or otok-otok machines, as well as when harvesting with a combine harvester provide convenience when cultivating and harvesting thereby saving time and labor, the use of agricultural machinery had increased among farmers when the program is matched due to the ease of access to agricultural machinery in paddy fields when the excavation soil compatibility

program resulted from the normalization of the tertiary canal was used to strengthen and widen the embankment. Normalization of tertiary channels when the program is in harmony accompanied by repairs of tertiary sluice gates is also very helpful for farmers to be able to supply water to crops according to crop needs because corn plants are prone to wet conditions, so floodgates are needed to control water needs and make existing worm channels. Paddy fields can also help to accelerate the decrease in water if the land conditions are inundated.

For rice planting in Telang Sari Village, there was no increase in the planting area; this is very unfortunate because Telang Sari Village made it possible to increase the IP 100 rice planting index to IP 200 considering that Telang Sari Village has overflow type B. After all, the location is not too far from the river so that in the month Jan to April can still be planted with rice because water is still sufficiently available, however, the uncertainty of rainfall makes some farmers prefer not to risk failure when deciding to plant rice, so some farmers leave the land unplanted until waiting for the corn planting season to enter while other farmers choose to cultivate horticultural crops such as watermelons or chilies, farmers do this because market interest in watermelon and chili plants is quite high during these months due to entering the holy month of Ramadan and Eid.

The results of the planting index in Banyuurip Village differed from Telang Sari Village, where in Banyuurip Village, there was no additional planting area for rice and corn crops. This is understandable because the paddy fields in Banyuurip Village are in the category C type of land overflow where the tide does not enter the rice fields but can only affect the height of the groundwater table so that to enter the water from the tertiary canal to the paddy fields, a water pump is needed. Water pump assistance provided through the SERARI program can help overcome water shortages during the dry season. Still, farmers say that if the secondary canal as a canal connected to the tertiary channel is not repaired, it will affect the available water capacity in the tertiary canal. Hence, farmers prefer to optimize land use for rice commodities only once in the rainy season and once in the dry season for corn.

For Muara Telang District, the difference in cropping index before and during the match program occurred due to an increase in the rice planting area for the second planting season, which was originally an average of 1.23 Ha to 1.79 Ha or a difference of 0.56 Ha and an increase in the initial average corn planting area. 0.29 Ha to 0.98 Ha or a difference of 0.69 Ha. The increase in the planting area of rice and corn during the match program occurred in both villages, both Telang Jaya and Sumber Hidup villages. An increase in rice planting area in the second planting season or a planting index of 200 rice can occur due to changes in farmers' perceptions of the possibilities that can occur when planting rice in the second planting season, improvements to water management infrastructure such as normalization of tertiary canals, repair of tertiary sluice gates, provision of water pumps give hope to farmers that enough water will be available for plant growth and development for both rice and corn. The availability of agricultural production facilities assistance from a compatible program for rice farming in the first planting season consisting of seeds, NPK fertilizers, biological fertilizers, dolomite, and herbicides helps reduce production costs that must be incurred so that farmers can transfer their financing to the next planting season. This is following research (Silvia, 2018) which states that farmers' decisions in

applying the 200 Lowland Rice Planting Index are influenced by culture, economic perceptions and availability of capital, in line with research results (Amaliyanti, 2012) that the economic environment, namely the availability of funds and production facilities, shows a real influence on farmers' decisions in increasing the cropping index. In addition, when implementing a cooperative program, there is an agreement between farmers jointly increasing the planting index and uniformity of planting time, giving confidence that farmers will not experience losses. Yields if you improve the cropping index because usually, if in one stretch of paddy fields only a few paddy fields increase the cropping index, pest attacks will be difficult to overcome, according to research (Nopiana, 2017) that farmers' perceptions of increasing the cropping index are influenced by technical suitability, social factors and economic benefits that farmers can receive.

7. Comparison of Farming Business Productivity Before and During the Serasi Program

Productivity is the ratio between production results and land area. Productivity is measured in kilograms per hectare. The average productivity of rice and corn farming before and during the match program can be seen in Table 4 below.

Table 4. Farming Productivity Before and During the Compatibility Program

Average	Before Saras	When Serasi	Difference (%)
MT I Rice Farming Business			
Arable land area (ha/mt)	2.01,-	2.01,-	
Production (kg/Lg/mt)	11.478,-	13.234,-	
Productivity (kg/ha/mt)	5.830,-	6,586,-	12.981%
MT I Rice Farming Business			
Arable land area (ha/mt)	0.61,-	0.90,-	
Production (kg/Lg/mt)	2,700,-	4.261,-	
Productivity (kg/ha/mt)	4,394,-	4,757,-	8.267%
Corn Farming Business			
Arable land area (ha/mt)	0.93,-	1.39,-	
Production (kg/Lg/mt)	6007,-	9.610,-	
Productivity (kg/ha/mt)	6.443,-	6910,-	7.248%

Source: Primary data processing results, 2022.

Based on the table above, it can be seen that the average MT I rice productivity before the match program was 5,830.- Kg/ha/mt and during the match program, it was 6,586,- Kg/ha/mt, there was an increase of 12.981%, MT-II rice productivity before the match program was 4,394,- kg/ha/mt and when the program was compatible it was 4,757.- kg/ha/mt, there was an increase in productivity of 8.267%, while the productivity of corn before the program was compatible was 6,443.- kg/ha/mt, and when the program was matched, it was 6,910,- kg/ha/ mt, there was an increase of 7.248%. The difference in the productivity of MT I rice was carried out by paired t-test. In contrast, the difference in MT II rice's productivity and maize's productivity was carried out by an independent t-test with SPSS version 26.0. with the results in Table 5. below.

Table 5. Results of the Paired and Independent T-Tests - Farming Land Productivity Test Before and During the Match Program.

Productivity of farming land before and after the match program	Mean differences	Q	df	Sig. Two-Sided P
Paddy MT I	-756,77083	-13,424	95	,000
Paddy MT II	-363,22844	-2,477	81	,015
Corn	-467.05153	-2,170	118	.032

Source: Primary data processing results, 2022

Table 5. shows that MT I rice productivity has a t-count value of 13.424 greater than t-table 1.9852, MT-II rice productivity has a t-count value of 2.477 greater than t-table 1.9896 and corn productivity has a t-count value of 2.170 is greater than the t-table of 1.9802, referring to the test criteria it can be concluded that Ho rejects which means the productivity of MT I rice, MT-II rice and corn is higher when farmers apply for the matching program.

Increased productivity in Tanjung Lago Subdistrict and Muara Telang Subdistrict occurred due to differences in management conditions before and during the match program (Alwi, 2014) found that differences in rice productivity could occur due to several factors, including the type of paddy field, soil type or properties, management level and varieties planted. (Girsang & Raharjo, 2021) The management of nutrients, soil pore space and climate information can affect the productivity of tidal swamp rice in South Sumatra.

When the program is compatible, the availability of water is sufficient to support plant growth and development because rainfall is in normal conditions on average, ranging from (100 – 300 mm) (BPS Kab Banyuasin, 2022), and the smooth tertiary canal has been rehabilitated helps maintain water availability. Water for plants can improve the chemical and physical properties of the soil so that it is in conditions that can support plant growth and development for rice and corn plants.

The conditions for managing plant nutrients during the match program were carried out with balanced urea and NPK fertilization following the recommendations given and the addition of organic and non-organic ameliorants to the soil, which aims to help improve soil conditions so that the absorption of plant nutrients will be more optimal. According to (Fahmi & Khairullah, n.d.), amelioration is a material that can increase soil fertility; amelioration can be in the form of lime, dolomite, and organic matter or husk ash and sawdust or other agricultural (Haryono et al, 2013); when the program is compatible, farmers use beka fertilizer which is applied to the remaining straw half a month before sowing the seeds at a dose of 4 liters/ha. This used fertilizer functions as a decomposer for accelerating the overhaul and decomposition of organic matter from plants into compost. Compost derived from rice straw is an excellent organic material for increasing the growth and production of rice plants (Sitepu, 2013). In addition to beka fertilizers, dolomite applications are also given to farmers during land preparation to neutralize soil acidity; during the program, according to dolomite assistance of 500 kg per hectare of land, although several studies have shown that dolomite doses to increase soil pH varies depending on soil acidity (Anwar, n.d.) in general an amount of 0.5 – 1 ton is sufficient to improve soil chemistry as a source of Ca and Mg nutrients needed by plants.

The application of biological fertilizers is also carried out during the match program. Farmers receive assistance with natural fertilizers in the form of microbion fertilizers, and bio-

rich fertilizers are applied 12 days after sowing the seeds. Biofertilizers are inoculants from active living organisms (Simanungkalit et al., 2006). The use of biological fertilizers aims to increase the number of microbes and accelerate microbiological processes to improve nutrient availability so that it can be utilized by plants, in line with several research results showing that the provision of ameliorants in the form of beka and dolomite fertilizers produce higher rice production compared to no ameliorants. The combination of water management, amelioration (Hutapea & Irsan, 2021) and fertilization, and tolerant varieties can increase rice production in acid-sulfate soils of tidal swamps (Khairullah et al., 2021).

The superior varieties used by farmers during the match program were Inpari 32, Inpari 42 and Ciherang, which were adaptive varieties in tidal swamps. The results of the study (Subur, n.d.) show that the Inpari 32 variety is suitable for planting in tidal marshes if managed properly, in line with the results of the study (M Hidayanto et al., 2021), which shows that the superior variety Inpari 32 produces higher productivity. Compared to local types, the same is true for Inpari 42 and Ciherang varieties, which can adapt well to tidal swamplands (Ratmini & Irsan, 2021). In utilizing various agricultural production facilities with assistance from the compatible program, farmers also receive assistance from the farm service/extension officers/plant pest control officers (POPT) so that it is easier for farmers to consult if there are obstacles in the implementation of the compatible program, this is supported by research (L. Wulandari, 2021) which shows that the performance of extension workers in implementing the synchronous program in Tanjung Lago, Banyuasin Regency is in the very good category.

8. Comparison of Farmers' Income Before and During the Serasi Program

Income is calculated from the total farm revenue minus production costs. Total production costs are obtained from the sum of fixed costs and variable costs. The fixed costs of farming are measured by the depreciation of the tools used in agriculture, namely spray machines, corn planter machines, sprayers, slashing machines, hoes and machetes. In contrast, variable costs are measured by the costs incurred by farmers and are used up in one growing season. They consist of seed costs, fertilizer costs, sack costs, pesticide costs, land processing costs (equipment rental), labor costs and harvest and post-harvest costs. The following shows the average production cost of farming before and during the compatible program.

Table 6. Farm Production Costs Before and During the Compatibility Program.

farming	Average	Before	After
		(Rp/ha/mt)	(Rp/ha/mt)
Paddy MT I	**Total Production Cost**	**8,907,889,-**	**6,932,335, -**
	Fixed cost	256.456,-	256.456,-
	Variable Cost	8,651,433, -	6,657,879, -
Paddy MT II	**Total Production Cost**	**7,521,270,-**	**7,975,499,-**
	Fixed cost	256.553,-	253.972,-
	Variable Cost	7,264,711	7,721,527,-
Corn	**Total Production Cost**	**11.132.498,-**	**11,394,578, -**
	Fixed cost	396.925,-	389,761,-
	Variable Cost	10,808,374,-	11.077.942,-

Source: Primary data processing results, 2022

Table 6 shows that the average total production cost of rice farming in planting season I, when the program was matched, was lower than before the program was reached; this was because, in MT I, farmers received assistance from the program in the form of seeds of 80 kg/ha, dolomite 500 kg/ha, 3 liters/ha herbicide, 3 liters/ha biological fertilizer, 100 kg/ha NPK fertilizer and Rp. Farmers in MT I farming, while in MT II rice farming and corn farming, the total production costs during the compatible program were higher than before the compatible program; this happened because the increased production resulted in increased costs that had to be incurred during the harvest, rice harvest and corn using a combine harvester rented by farmers with a 9: 1 profit sharing system from the number of products produced, the greater the show made, the higher the production costs that must be incurred, then in table 7. the average farm income before and during the match program is presented.

Table 7. Farming Acceptance Before and During the Serasi Program.

farming	Average	After (Ha/mt)	After (Ha/mt)
Paddy MT I	**Revenue (IDR)**	**24,061,458, -**	**27.102.188,-**
	Production (kg)	5.830,-	6,586,-
	Selling Price (IDR)	4.132,-	4.119,-
Paddy MT II	**Revenue (IDR)**	**18,307,051, -**	**20047045, -**
	Production (kg)	4,394,-	4,747,-
	Selling Price (IDR)	4.167,-	4.205,-
Corn	**Revenue (IDR)**	**28,261,321, -**	**29,191,791, -**
	Production (kg)	6.443,-	6910,-
	Selling Price (IDR)	4.406,-	4.221,-

Source: Primary data processing results, 2022.

Farming revenue is obtained from the products produced from each farm multiplied by the prevailing selling price. It can be seen in Table 7. MT I paddy receipts before the match program averaged Rp. 24,061,458 ha/mt, while when the program was compatible, it reached Rp. 27,102,188, - ha/mt, MT-II paddy receipts before the match program averaged Rp. 18,307,051, - ha/mt and when the program was compatible, it was Rp. 20,047,045, - ha/mt, while for corn farming, the income before the compatible program was an average of Rp. 28,261,321, - ha/mt; when the program is compatible, it becomes Rp. 29,191,791, -, ha/mt, after obtaining production costs and farming revenue, farm income can be calculated with the results in Table 8. as follows:

Table 8. Farming Income Before and During the Compatibility Program.

farming	Average	Before (Rp/ha/mt)	After IDR/ha/mt)	Difference %
Paddy MT I	**Income**	**15.153.570,-**	**20.169.852,-**	**33.103**
	Reception	24,061,458, -	27.102.188,-	
	Total Production Cost	8,907,889,-	6,932,335, -	
Paddy MT II	**Income**	**10.785.782,-**	**12.071.547,-**	**11,921**
	Reception	18,309,798, -	20047045,-	
	Total Production Cost	7,521,270,-	7,975,499,-	

Corn	**Income**	**17.128.823,-**	**17,797,213, -**	**3,902**
	Reception	28,261,321, -	29,191,791, -	
	Total Production Cost	11.132.498,-	11,394,578, -	

Source: Primary data processing results, 2022

Table 8 shows that the rice farming income of MT I averaged Rp before the match program. 15,153,570, -ha/mt when the program is compatible; the average is Rp. 20,169,852 ha/mt, there was an increase in income of 33.103%, MT-II paddy income before the average match was IDR 10,785,782, -ha/mt, and during the match program, it was IDR. 12,071,547, - ha/mt there is a difference in the increase of 11.921% and corn farming income before matching an average of Rp. 17,128,823, -ha/mt, and when the program was checked, the average was 17,797,213, -ha/mt an increase of 3.902%. To analyze the difference in farmers' income before and during the matched program, a paired sample t-test was conducted with SPSS version 26.0.

Table 10. Results of the Paired Sample T-Test of Farmers' Income Before and During the Serasi Program.

Farmers' Income Before and During the Serasi Program	Mean Paired Differences	Q	Df	Sig. Two died P	Farmer's Income Difference (%)
	-9131784,91	-14,177	95	0.000	31,498

Source: Primary data processing results, 2022

Based on Table 10. above, it is obtained that farmer income has a t value of -14.177, greater than t table 1.9852; referring to the test criteria, it can be concluded that Ho rejects, which means that farmer income is higher with an increase in revenue of 31.498% when the program is compatible or if seen from the results of Sig. (2-sided p) is 0.000 less than 0.05, in line with research (ST Wulandari et al., 2022) that there were differences in farmer income before and during the match program in Tanjung Lago District, Banyuasin Regency. There was an increase in revenue during the match program due to reduced production costs that had to be incurred by farmers because of assistance from the match program, in line with research (Berliana & Fitri, 2022) which showed that rice farming was carried out by farmers while participating in the match program in Braja Selebah District, East Lampung Regency profitable because the ratio of revenue to total costs is greater than 1.00.

In addition, the increase in farmer income is due to increased farming revenue due to an increase in rice and corn production in each planting season (Chand, 2017) suggests that by reducing production costs incurred and offset by increased production, farmers' income will be higher. In addition, the selling price obtained by farmers per planting season is relatively the same and still higher than the selling price set by the government. This is consistent with the results of research (Salam et al., 2019), which states that the factors that have a significant effect on the income of lowland rice farming farmers in Maros Regency, South Sulawesi Province of Indonesia are productivity, selling prices, and production costs of rice farming.

CONCLUSION

The results showed that (1) the land cultivation index was higher when the program was compatible with an increase of 20.1728%, (2) the productivity of rice farming MT I was higher when the program was compatible with an increase of 12.981%, the productivity of rice farming MT-II was higher when the program compatible with an increase of 8.267%, the productivity of corn farming is higher when the program is compatible with an increase of 7.248%. (3) Farmers' income from rice and corn farming is higher when the program is compatible, with an increase of 31.498%. In the future, it is hoped that the government can follow up on the sustainability of the Serasi Program because it is very effective in increasing income and food production, especially domestic rice and corn.

REFERENCES

Alihamsyah, T. (2002). Optimalisasi pendayagunaan lahan rawa pasang surut. *Seminar Nasional Optimalisasi Pendayagunaan Sumberdaya Lahan Di Cisarua*, 6–7.

Alwi, M. (2014). Prospek lahan rawa pasang surut untuk tanaman padi. *Prosiding Seminar Nasional Inovasi Teknologi Pertanian Spesifik Lokasi*, *3*(2), 45–59.

Amaliyanti, N. (2012). Analisis Pengaruh Peningkatan Indeks Pertanaman Lahan Usahatani Pasang Surut Terhadap Tingkat Kesejahteraan Petani dan Strategi Pengembangannya di Desa Banyu Urip Kabupaten Banyuasin. *Skripsi. Indralaya: Universitas Sriwijaya*.

Anggrainy, W. (2022). *Pelaksanaan Program Serasi Dan Pengaruhnya Terhadap Produktivitas Dan Pendapatan Usahatani Padi Rawa Lebak Di Desa Tanjung Baru Kabupaten Muara Enim*. Universitas Sriwijaya.

Anwar, K. (n.d.). *Inovasi teknologi pengelolaan air dan hara terpadu lahan rawa berpirit untuk peningkatan produktivitas tanaman pangan*. IAARD Press.

Arsyad, D. M. (2014). Pengembangan inovasi pertanian di lahan rawa pasang surut mendukung kedaulatan pangan. *Pengembangan Inovasi Pertanian*, *7*(4), 169–176.

Berliana, D., & Fitri, A. (2022). Analysis Food Security of Rice Farmers Through Efforts Optimization of Swamp Land in East Lampung Regency. *IOP Conference Series: Earth and Environmental Science*, *1012*(1), 12058.

Chand, R. (2017). Presidential Address: Doubling Farmers' Income: Strategy and Prospects. *Indian Journal of Agricultural Economics*, *71*(1), 1–23.

Fahmi, A., & Khairullah, I. (n.d.). *Ameliorasi Tanah Sulfat Masam Untuk Budidaya PadI*.

Fusilawati, R., Adriani, D., & Wildayana, E. (2021). Identifikasi Faktor Sosial Yang Mempengaruhi Efisiensi Produksi Padi Pasang Surut Di Kecamatan Tanjung Lago. *Publikasi Penelitian Terapan Dan Kebijakan*, *4*(2), 105–111.

Girsang, S. S., & Raharjo, B. (2021). Factors affecting rice yield productivity in tidal swamp of South Sumatra. *IOP Conference Series: Earth and Environmental Science*, *648*(1), 12164.

Hidayanto, M, Fiana, Y., Amin, M., & Sujalu, A. P. (2021). Assessing the production of the new superior rice varieties in tidal swampland in Bulungan Regency, North Kalimantan. *IOP Conference Series: Earth and Environmental Science*, *648*(1), 12078.

Hidayanto, Muhamad, Noor, M., Fiana, Y., & Witardoyo, D. (n.d.). *Pengkajian Budidaya Padi Melalui Pengelolaan Lahan dan Air di Lahan Rawa Pasang Surut*. BPTP Kaltim.

Hutapea, Y., & Irsan, F. (2021). Innovative Technology Added Value in Reducing Rice Yield Gap in Tidal Land. *E3S Web of Conferences*, *316*, 3018.

Khairullah, I., Saleh, M., & Alwi, M. (2021). Increasing productivity of rice through iron toxicity control in acid sulfate soils of tidal swampland. *IOP Conference Series: Earth and Environmental Science*, *648*(1), 12151.

Manyamsari, I., & Mujiburrahmad, M. (2014). Karakteristik Petani Dan Hubungannya Dengan Kompetensi Petani Lahan Sempit (Kasus: Di Desa Sinar Sari Kecamatan Dramaga Kab. Bogor Jawa Barat). *Jurnal Agrisep*, *15*(2), 58–74.

Noor, M., & Jumberi, A. (2008). Potensi, kendala, dan peluang pengembangan teknologi budi daya padi di lahan rawa pasang surut, hlm. 223-244. *Dalam AA Daradjat, A. Setyono, AK Makarim, A. Hasanuddin (Ed.). Padi, Inovasi Teknologi Produksi. Buku*, *2*.

Nopiana, P. D. (2017). *Pengaruh Faktor Sosial Ekonomi Dan Kelembagaan Dalam Persepsi Petani Padi Terhadap Asuransi Pertanian Di Desa Mangunrejo, Kecamatan Kepanjen, Kabupaten Malang*. Universitas Brawijaya.

Ratmini, N. P. S., & Irsan, F. (2021). Climate change mitigation through superior varieties use to increase rice production in tidal swamp land. *IOP Conference Series: Earth and Environmental Science*, *824*(1), 12019.

Rusdiana, S., & Maesya, A. (2017). Pertumbuhan ekonomi dan kebutuhan pangan di Indonesia. *Agriekonomika*, *6*(1), 12–25.

Salam, M., Sari, A. N., Bakri, R., Arsyad, M., Jamil, M. H., Tenriawaru, A. N., & Muslim, A. I. (2019). Determinant factors affecting farmers' income of rice farming in Indonesia. *IOP Conference Series: Earth and Environmental Science*, *343*(1), 12115.

Silvia, M. (2018). *Implementasi indeks pertanaman (IP) padi sawah di Desa Rias Kecamatan Toboali Kabupaten Bangka Selatan*. Universitas Bangka Belitung.

Simanungkalit, R. D. M., Suriadikarta, D. A., Saraswati, R., Setyorini, D., & Hartatik, W. (2006). *Pupuk organik dan pupuk hayati*. Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian.

Sitepu, R. B. (2013). *Pemanfaatan Jerami Padi sebagai Pupuk Organik untuk Meningkatkan Pertumbuhan dan Produksi Padi (Oryza sativa)*.

Subur, A. (n.d.). *Keragaan VUB Inpari 32 di Lahan Rawa Pasang Surut Tipe C di Kabupaten Tanah Laut*.

Suriadikarta, D. A. (2012). Teknologi pengelolaan lahan rawa berkelanjutan: studi kasus kawasan ex plg kalimantan tengah. *Jurnal Sumberdaya Lahan*, *6*(1).

Wulandari, L. (2021). The Influence Of Extension Worker Characteristics, Motivation And Organizational Climate On Performance Of Agricultural Extension Worker On Implementation Of Serasi Program In Tanjung Lago Subdistrict Regency Of Banyuasin South Sumatra, Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences*.

Wulandari, S. T., Wildayana, E., & Aryani, D. (2022). Farmers'perceptions Of The Role Of Gapoktan In The Implementation Of Serasi Program In Tanjung Lago District, Banyuasin Regency. *Agrisocionomics: Jurnal Sosial Ekonomi Pertanian*, *6*(1), 9–22.