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#### **Abstract**

The People's Oil Palm Rejuvenation Program (PSR) is a National Strategic Program as an effort by the Government to increase the productivity of oil palm plantations. One important factor that determines the success of replanting activities is the participation of farmers, where without the participation of farmers, rejuvenation activities will not be successful, due to the role of farmers as the main actors in agricultural development programs. The purpose of this study was to determine the level of farmer participation and the factors that are significantly related to the implementation of People's Oil Palm Rejuvenation (PSR) in Sungaiselan District, Central Bangka Regency. The study of Gapoktan Melabun Permai in Sungaiselan Subdistrict, Central Bangka Regency was carried out from May to June 2023. The sample in this study was Gapoktan Melabun Permai, Sungaiselan District in Central Bangka Regency, totaling 59, the sampling technique of this study was non-probability sampling using consecutive sampling method, data collection used a questionnaire that had been tested for validity and reliability. Methods of data analysis to determine the participation of Gapoktan Melabun Permai in PSR using multiple linear regression analysis. The results of the study found that the participation of Gapoktan Melabun Permai in the implementation of the People's Palm Oil Rejuvenation (PSR) program in Sungaiselan District, Central Bangka Regency, was in the very high category with a percentage of 91.58%. After conducting multiple linear regression analysis, there is a significant relationship between the factors of land area, motivation,

Keywords: Participation, Gapoktan Melabun Permai, People's Oil Palm Rejuvenation Program

#### 1. INTRODUCTION

The People's Oil Palm Rejuvenation Program (PSR) is one of the National Strategic Programs as an effort by the Government to increase the productivity of oil palm plantations, by maintaining land area, so that oil palm plantations can be used optimally, as well as to resolve land legality issues.(Haryo Limanseto, 2021). Indonesia has an area of oil palm plantations reaching 15,081,021 hectares spread across 34 provinces by 2021 according to the Ministry of Agriculture in the 2019-2021 National Leading Plantation Statistics book.(Haryo Limanseto, 2021). In 2021 the Bangka Balitung Islands Province has an area of oil palm plantations reaching 23,934.01 Ha(Bangka Belitung Province Archipelago Agriculture Service, 2021). Central Bangka Regency has oil palm plantations with an area of 2,074.89 Ha(Bangka Belitung Province Archipelago Agriculture Service, 2021). Central Bangka Regency produces 25,253.95 tonnes/year, with an average palm productivity of up to 18-20 tonnes/ha/year(Department of Agriculture of Bangka Tangah Regency, 2021)

The oil palm plant is one of the plants that will experience a decrease in production after exceeding a certain age. Therefore, it is necessary to replant oil palm plantations. Oil palm rejuvenation is a cultivation practice in the management of annual crops to maximize and stabilize income over time(Corwin, n.d.). The process of rejuvenating oil palm plantations is by replacing oil palm trees that are 20-25 years old with new oil palm trees because oil palm trees that are 20-25 years old are no longer productive and are decreasing every month. The purpose of rejuvenating oil palm is to increase the productivity of plants that have decreased by rejuvenating the plants,

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thereby increasing the productivity of the fruit. (Muhammad Arif Yusuf, 2016) Preparations for replanting oil palm for smallholders need to be carried out, where farmers must have other plans as an alternative to meeting economic needs in daily life. Before rejuvenating oil palm is confirmed, oil palm farmers must consider the economic needs of their household during rejuvenation of oil palm. (Muhammad Arif Yusuf, 2016)

In the process of rejuvenating oil palm, assistance is needed, where assistance in agriculture is interrelated with agricultural extension. According to the Presidential Regulation of the Republic of Indonesia Number 35 of 2022 concerning Strengthening the Agricultural Extension Function.(RI Cabinet Secretariat, 2022). One important factor that determines the success of replanting activities is the participation of farmers who take part in these rejuvenation activities. Without the participation of farmers, replanting activities will not be successful, due to the role of farmers as the main actors in agricultural development programs. The participation of farmers is emphasized so that farmers feel they have a responsibility to always be active in replanting activities starting from the planning, implementation and evaluation stages, to enjoying the results. In addition, participation will foster a sense of independence in farmers who are actively involved in replanting activities. So that later farmers can increase their income and welfare(Wibowo & Junaedi, 2017).

#### 2. IMPLEMENTATION METHOD

#### Place and time of research

This research was conducted at the Melabun Permai Gapoktan in Sungaiselan Village, Central Bangka Regency. This research was conducted from March to June 2021.

#### **Research Techniques and Determination of Respondents**

This research is an analytic survey research using cross sectional method. Respondents in this study Gapoktan Melabun Permai used the Yamane formula so that a total of 60 farmers were obtained. The sampling technique for this study was non-probability sampling using consecutive sampling methods, using inclusion and exclusion criteria(Hidayat, 2014).

#### **Analysis Techniques**

The data collection method in this study used a questionnaire method. In this study using a questionnaire that has been tested for validity and reliability with a total of 22 questionnaires on the farmer participation questionnaire and 10 on the questionnaire on the dependent variable. The analytical method used in this study is multiple linear regression analysis. This regression analysis aims to obtain a comprehensive picture of the influence of the independent variables and the dependent variable on the performance of each company either partially or simultaneously. Before carrying out multiple linear tests, the method requires to perform a classic assumption test in order to get the best results(Ghozali, 2013). The purpose of fulfilling this classical assumption is that the independent variable as an estimator of the dependent variable is not biased(Ismulhadi & Hermaya Rukka, 2017).



#### 3. RESULTS AND DISCUSSION

#### **Farmer Participation Level**

The results of the analysis of the participation of Gapoktan Melabun Permai in the oil palm rejuvenation program at Gapoktan Melabun Permai, Sungaiselan District, Central Bangka Regency were measured using primary data. Based on the value of the questionnaire which includes the stages of farmer participation where the overall score of farmer participation is added up and then divided by the highest/maximum score and multiplied by one hundred percent, the value of farmer participation in the oil palm rejuvenation program is 2,737 for the score obtained divided by the maximum score of 3,000 and multiplied by 100 percent, the percentage of farmers participating in the oil palm rejuvenation program is 91.23%. The level of farmer participation is in the strongly agree category because this is the first time this oil palm rejuvenation has been carried out by the Central Bangka Agricultural Service, especially for farmers in Sungaiselan District. This is in accordance with the theory(Arnstein, 1969), that where the level of participation of Gapoktan Melabun Permai farmers is very high, namely 91.23 with a very high percentage of participation values between 66-100.

#### Analysis of Factors Influencing the Participation of Gapoktan Melabun Permai in PSR

#### Normality test

The normality test aims to test the confounding or residual variables that have a normal distribution. Based on the Kolmogorov-Smirnov obtained a significance value of 0.576. Because the results of a significance of 0.000 > 0.05 it can be concluded that the data distribution in this study is normal.(Ghozali, 2013).

 Table 1. One-Sample Kolmogrov-Smirnov Test

	Unstandardized
	Residuals
N	60
Normal Parameter Means	0.00000
std. Deviation	2.15239308
Most Extreme Absolute	0.101
Positive	0.101
Negative	-0.070
Kolmogorov-Smirnov Z	0.781
asymp. Sig (2-tailed	0.576

#### **Multicollinearity Test**

This test is intended to see whether there are two or more independent variables that are linearly correlated. If this situation occurs, it will be difficult for us to distinguish the effect of each independent variable on the dependent variable. To detect the presence of multicollinearity symptoms in the research model, it can be seen from the tolerance value or the Variance Inflation Factor (VIF) value. Tolerance limit > 0.10 and VIF limit < 10.00, so it can be concluded that there is no multicollinearity between the independent variables. In table 3, the tolerance value is obtained for the variable land area, income. , motivation and experience are 0.822, 0.875, 0.714, and 0.684 where > 0.100 and the VIF value < 10.00, so that in these variables there are no symptoms of multicollinearity.

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Table 2. Multiconerity Test

Unstandardized Coefficients		Standardized Coefficients	4	Sig	Collinearity Statistics		
Model	В	Std Error	Betas	ι	Sig	tolerance	VF
(Constant)	14,894	4,713		3,160	0.003		
X1	0.207	0.135	0.160	1,533	0.131	0.872	1.217
X2	-0.127	0.103	-0.125	-1.235	0.222	0.875	1.142
X3	0.885	0.151	0.655	5,855	0.000	0.714	1,400
X4	0.029	0.095	0.034	0.300	0.766	0.684	1,461

#### **Heteroscedasticity Test**

The heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from one residual observation to another. If the variance from the residual from one observation to another observation remains, it is called homoscedasticity and if it is different it is called heteroscedasticity. A good regression model is a model that does not have heteroscedasticity(Ghozali, 2013).

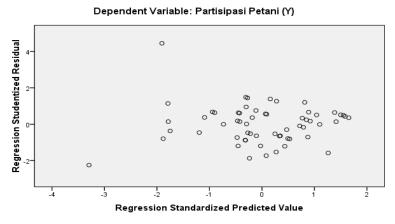


Figure 1. Scatter Plot Heteroscedasticity Test

In figure 1 of the scatterplot graph above, it can be seen that the points spread randomly, and are scattered both above and below the number 0 (zero) on the Y axis. It can be concluded that there are no symptoms of heteroscedasticity in the regression model used.

#### **Autocorrelation Test**

The autocorrelation test is to see whether there is a correlation between a period t and the previous period (t -1). In simple terms, the regression analysis is to see the effect of the independent variables on the dependent variable, so there should be no correlation between observations and previous observation data. A good regression model is a regression that is free from autocorrelation or autocorrelation does not occur. To find out by comparing the DW value with the d value from the DurbinWatson table:

- 1. If DW < dL or DW > 4 dL, it can be concluded that the data has autocorrelation.
- 2. If dU < DW < 4 dU, it can be concluded that there is no autocorrelation in the data.
- 3. No conclusion if:  $dL \le DW \le dU$  or  $4 dU \le DW \le 4 dL$



If the results of the Durbin-Waston test cannot be concluded whether there is autocorrelation or not, then proceed with the run test. The results of the autocorrelation test in this study are shown in table 3 below:

 Table 3. Autocorrelation Test

Model	R	R Square	Adjusted R Squared	std. Error of The Estimate	Durbin- Watsons
1	0.713	0.509	0.473	2,229	1,552

Based on the table above, the DW value can be known to be 1.552, this value will be compared with the significance table value of 5%, with a sample size of 60 (n) and a number of independent variables of 4 (k=4), then a du value of 1.7274 is obtained, and the DW value of 1.552 is smaller than the upper limit (du) which is 1.7274 and less than (4-du) or 4 - 1.7274 = 2.2726 . So it can be concluded that there are no symptoms of autocorrelation.

#### **Multiple Linear Regression Test**

Analysis of the factors influencing farmer participation in the oil palm rejuvenation program in this study included the variables of land area, income, motivation and experience using multiple linear regression tests using the SPSS 16 program with a confidence level of 95% (a = 0.05). The results of the analysis of the factors that influence farmer decision making in the oil palm rejuvenation program are presented in table in table 4.

**Table 4.** Analysis of Factors Influencing Farmer Participation

Model	R	R Square	Adjusted R Square	std. Error Of The Estimates
Dimension 1	0.713	0.509	0.473	2,229

Based on table 4. the regression model can be explained using the coefficient of determination R Square x 100%, the RSquare value is 0.509, the coefficient of determination obtained is 50.9%. This shows that the variable x (land area, income, motivation and experience) has a contribution effect of 50.9% on farmer participation in the oil palm rejuvenation program. Means 49.1% is influenced by other factors outside the x variable. Besides that, the R value which is the symbol of the correlation coefficient is obtained at 0.713. This value is interpreted that the relationship between variable x and variable y in this study is in the strong category. Furthermore, to answer the second objective of this study, namely to determine the factors that influence farmer participation in the oil palm rejuvenation program in Bangka Regency, an F test and a T test were carried out.

#### **Simultaneous Influence Test (Test F)**

The F test is used to determine whether the independent variable (X) simultaneously affects the variable (Y). The results of the F test are presented in the table below:

**Table 5.** Simultaneous Test Results for Variable X

Model	Sum of Square	df	MeanSquare	F	Sig.
1 Regression	282,848	4	70,712	14,229	0.000
residual	273,335	55	4,970		
Total	556,183	59			

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From the table above it can be seen that the Fcount value is 14,229 to find out whether the x variable has a simultaneous effect on the y variable, so Fcount must be > Ftable and the significance value is <a (0.05). To find out the Ftable value, the following calculations are carried out:

```
Ftable = (k; n - k)
Ftable = 4; 60-4
Ftable = 4; 56 = 2.525
```

Based on table 48, it is known that the Fcount value (14,229) > Ftable 2.525 and a significance value of 0.000 <0.050 then H0 is rejected H1 is accepted. This means that the x variable simultaneously has a significant influence on the y variable. The second hypothesis states that the factors of land area, income, motivation and experience have a significant effect on farmer participation in the oil palm rejuvenation program in Sungaiselan District, Central Bangka Regency.

#### **Partial Effect Test (T Test)**

T-test was used to determine the effect of variable x (land area, income, motivation and experience) partially (alone) on variable y (farmer participation). The results of the T test obtained were obtained using the SPSS 16 program. Based on table 6 it is known that the regression equation obtained is as follows:

```
Y = a + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4

Y = 14.894 + 0.207 X 1 + -0.127 X 2 + 0.885 X 3 + 0.029 X 4
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The effect of each variable on farmer participation can be determined by comparing Tcount with Ttable at a certain error rate, and also by comparing the level of significance, if the value of Tcount>Ttable and its significance is <0.05 then there is a partially real effect of variable x on variable y. The ttable value can be known by:

```
ttable = t(a/2; nk-1)
= t(0.05/2; 60-4-1)
= 0.025; 55 \text{ Ttable} = 2.004
```

The results of these equations can be explained in detail as follows:

- 1. The constant value (a) is 14,894 meaning that if all the x variables have a value of 0 then the value of farmer participation is 14,894.
- 2. The value of the regression coefficient of the age variable ( $\beta$ 1) is 0.207 and is positive, meaning that each variable area of land increases by 1 value, the value of farmer participation will increase by 0.207 assuming the value of the other x variables is constant.
- 3. The value of the regression coefficient of the income variable (β2) is 0.127 and is negative, meaning that each income variable increases by 1 value, then farmer participation will decrease by 0.127 assuming the value of the other x variables is constant. The coefficient is negative, meaning that there is an inverse relationship between variable x and variable y.



- 4. The value of the regression coefficient of the motivational variable ( $\beta$ 3) is 0.885 and is positive, meaning that each motivational variable increases by 1 value, then farmer participation will increase by 0.885 assuming the value of the other x variables is fixed.
- 5. The regression coefficient value of the experience variable ( $\beta 4$ ) is 0.029 and is positive, meaning that each income variable increases by 1 value, then farmer participation will increase by 0.029 assuming the value of the other x variables is constant.

The results of the t-test obtained inform that partially the variable land area (X1), motivation (X3) and experience variable (X4) have a significant effect on farmer participation in the PSR program, while the income variable (X2) has no significant effect on farmer participation. This means that to answer the next objective, it can be seen that the factors that influence the participation of farmers in the oil palm rejuvenation program are land area, motivation and experience of farmers in farming.

Model _		dardized icients	Standardized Coefficients	t	Sig
	В	Std Error	Betas		
1 (Constant)	14,894	4,713		3,160	0.003
Land area	0.207	0.135	0.160	1,533	0.031
Income	-0.127	0.103	-0.125	-1,235	0.222
Motivation	0.885	0.151	0.655	5,855	0.000
Experience	0.029	0.095	0.034	3 300	0.006

**Table 6.** Partial Test Results for Variable X

### The Effect of Land Area on the Participation of Gapoktan Melabun Permai in the Implementation of the People's Oil Palm Rejuvenation Program (PSR) in Central Bangka Regency

The results of statistical analysis showed that the value of Tcount (-1.135) < Ttable (2.004) with a significance level of 0.222 > 0.050, that farmer income had no significant effect on farmer participation in PSR. This is because the oil palm rejuvenation program is a central government program regulated in Minister of Agriculture Number 3 of 2022 concerning Human Resource Development, Research and Development, Rejuvenation, as well as Oil Palm Plantation Facilities and Infrastructure which has been socialized by Agricultural Extension Officers of the Agriculture and Food Security Office. Central Bangka Regency, to the farmers that there is a Funding Framework from the BPDPKS that can be used for the PSR Program in supporting plantation management and development.

Income also has no direct effect on participation because the average income of Gapoktan Melabun Permai is in the range of > Rp. 2,000,000 - < Rp. 4,000,000 / month, with the average member of Gapoktan Melabun Permai having another income in the form of oil palm agricultural land with more than 1 plantation for replanting oil palm, so the farmers have anticipated the income that will be obtained during the PSR program. This is in line with opinion(Arman & Achmad, 2018)which states that work or source of income affects the form of participation of farmers to participate in PSR because the source of income is related to the free time and income that a person earns. So farmers who have a livelihood or source of income from oil palm plantations will give more free time to participate in activities that can support their source of income. In addition, PSR has never been carried out at Gapoktan Melabun Permai in Sungaiselan District, Central Bangka Regency, so there are no real examples and illustrations that farmers who participate in PSR will have higher income results than before participating in the oil palm rejuvenation program.

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## The Effect of Motivation on the Participation of Gapoktan Melabun Permai in the Implementation of the People's Oil Palm Rejuvenation Program (PSR) in Central Bangka Regency

Based on the results of statistical analysis, the value of Tcount (5.855) > Ttable (2.004) with a significance level of 0.000 <0.050 indicates that the motivational variable has a significant effect on farmer participation. According to(I Komang Ardana, 2012)stated that the motivation for maintaining involvement in agricultural institutions and so on was to gain self-recognition and increase income. Where do you know that motivation is an impulse that can make someone to make a decision or do something. So this motivation is very important, because farmers need to take an action or decision. So that from Suprayino's explanation above it is in line, that the high motivation possessed by Gapoktan Melabun Permai in participating in participating in the activities of the People's Oil Palm Rejuvenation (PSR) program is on the grounds that this PSR is carried out as a whole by members of Gapoktan Melabun Permai, besides that it can also increase a sense of solidarity among people farmers, there is awareness among farmers that rejuvenation needs to be done and it is time for their oil palm plants to be rejuvenated because the oil palm plants are old and the origin of the seeds is unclear, so the productivity results are unsatisfactory.

In addition, the motivation of farmers to participate in PSR is due to the capital assistance provided by the government as a solution to ease the burden on farmers who face capital problems. This causes Gapoktan Melabun Permai to be motivated to participate in the PSR Program because there will be grants from the government through the BPDPKS institution of Rp. Technical Recommendations from the Directorate General of Plantation, Ministry of Agriculture. In addition, the costs that will be received by farmers in carrying out rejuvenation are in the form of grants. This means that farmers have no obligation to return the financial assistance provided by the government but still with proper data collection and monitoring.(Oil Palm Plantation Fund Management Agency, 2018).

This is in accordance with Siti Kurniasih's research in the title Farmers' Motivation for Rejuvenating Oil Palm Plants in Sungai Bahar District, Muaro Jambi Regency, that the external motivation of farmers who have carried out rejuvenation is classified in the high category of 63.4%, as well as those who have not carried out rejuvenation classified as the high category is 62.6%. This is due to assistance from the Government in managing the oil palm rejuvenation program in Sungai Bahar District, Muaro Jambi Regency, where agricultural extension officers will carry out observations and evaluations during the PSR.(Kurniasih et al., 2022).

### The Effect of Experience on the Participation of Gapoktan Melabun Permai in the Implementation of the People's Oil Palm Rejuvenation Program (PSR) in Central Bangka Regency

The results of the statistical analysis showed that the value of Tcount (3,300) > Ttable (2,004) with a significance level of 0.006 <0.050, indicates that experience has a significant effect on farmer participation. Based on the results of the interviews, the experience of the farmers of Gapoktan Melabun Permai that the productivity of palm oil has decreased due to the age of old palms and unclear oil palm seeds, so from this experience farmers want to participate in PSR. In addition, farmers want to add new information and experience in the technical implementation of PSR. In addition, this experience will become useful knowledge in the future in increasing palm oil productivity.



The reasons explained by Gapoktan Melabun Permai are in line with research. This is in accordance with the opinion of Daputra, et al (2017) which states that the decreasing oil palm production due to the age of the plants that are no longer productive makes farmers aware that their oil palm plants must be rejuvenated. Therefore, to obtain further information about oil palm rejuvenation, farmers participate in participating in discussion forums for oil palm rejuvenation planning so that they can share experiences and thoughts with other farmers to make decisions and make good plans so that they run smoothly as expected.(Daputra, I, 2017). This is in accordance with the theory According to(I Komang Ardana, 2012), said that the longer a farmer tries to farm, the more experience he will gain and vice versa. So that the experience of Gapoktan Melabun Permai in participating in PSR is to add information and methods or farming techniques that are better and more profitable for the welfare of farmers.

### The Influence of Factors Influencing Farmer Participation on the Implementation of the People's Palm Oil Rejuvenation Program (PSR) in Central Bangka Regency

It was found that farmer participation in the oil palm rejuvenation program showed 91.23%, namely at the level of strongly agreeing to participate in the PSR program. The results of the analysis of the factors that influence farmer decision making in the oil palm rejuvenation program using the coefficient of determination R Square x 100%, the RSquare value is 0.713, the coefficient of determination obtained is 71.3%. This shows that the variable x (land area, income, motivation and experience) has a contribution effect of 71.3% on farmer participation in the oil palm rejuvenation program. Means 28.7% is influenced by other factors outside the x variable. Based on the results of the relationship between the factors that influence participation, the F test and T test are carried out. The F test is used to determine whether the independent variable (X) simultaneously affects the variable (Y). it is known that the Fcount value is (14,229) > Ftable 2.525 and a significance value of 0.000 <0.050 then H0 is rejected H1 is accepted. This means that the x variable simultaneously has a significant influence on the y variable. The second hypothesis states that factors, land area, income, motivation and experience have a significant effect on farmer participation in the oil palm rejuvenation program in Sungaiselan District, Central Bangka Regency.

The results of the T test obtained inform that partially the variable land area (X1), motivation (X3) and experience variable (X4) have a significant effect on farmer participation in PSR. While the income variable (X2) has no significant effect on farmer participation. This means that to answer the second objective it can be seen that the factors that influence the participation of farmers in the oil palm rejuvenation program are land area, motivation and farming experience. So it can be concluded that the factors that influence farmer participation are land area, income, motivation and experience. However, the factors that significantly influence each other are land area, motivation and experience, while income does not significantly influence farmer participation in PSR. This is in line with Miftah Aulia's title Farmer Participation in the Implementation of the People's Palm Oil Rejuvenation Program (PSR) in the Prestasi District, Langkat Regency. Spearman by comparing the value of tcount > ttable shows that there is a significant relationship between the factors of land area, income, motivation, experience, capital assistance and the availability of production facilities with the level of farmer participation(Aulia, 2019).

And in line with Arman and Achmad Fauzi's research in 2018 with the title Analysis of Farmer Decision Making in the Oil Palm Rejuvenation Program in Dolok Masihul District, Serdang Bedagai Regency where the variables are age, education, farming area, experience, income, social environment, economic environment, and extension activities there is a significant

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influence on farmers' decision making in PSR. Partially, the variables that have a significant effect on farmer decision making in the oil palm rejuvenation program in Dolok Masihul District, Serdang Bedagai Regency, North Sumatra Province are farming area and experience.(Arman & Achmad, 2018).

#### 4. CONCLUSION

Based on the results of the analysis and discussion of the study of farmer participation in the implementation of the People's Palm Oil Rejuvenation (PSR) program in Sungaiselan District, Central Bangka Regency, it can be concluded that:

- 1. The level of participation of farmers in the implementation of the People's Oil Palm Rejuvenation (PSR) program in Sungaiselan District, Central Bangka Regency is in the very high category with a percentage of 91.23%, and
- 2. There is a significant influence between the factors of land area, motivation, and experience on farmer participation in the implementation of the People's Oil Palm Rejuvenation (PSR) program in Sungaiselan District, Central Bangka Regency, while what does not affect the participation of Gapoktan Melabun Permai in this PSR is the income factor.

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