

# Rejuvenation; Influencing Factors That Farmers Should Consider

DOI: <https://doi.org/10.47175/rielsj.v5i1.831>

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## ABSTRACT

*One of the impacts of the replanting program is the cessation of production, which has implications for the loss of farmers' household sources of income. The production cycle in the business of annual crops greatly affects the profit that will be obtained by the farmer. More complicated challenges are faced by perennials than annuals because the time between investment, production, cost, and receipt of farming takes a long time in its implementation. This cross-sectional survey research aims to analyze the problems and socio-economic factors that determine the decision of oil palm farmers to participate in the rejuvenation of oil palm plantations in Jambi Province. This research was carried out in several villages which centered of smallholder oil palm plantations with a sample of 257 oil palm farmers who had old or damaged oil palm plants that had not been replanted or had been replanted. The respondents were selected by using the multistage sampling method. The instrument used is an open-ended questionnaire. The results showed that the farmer's level of readiness, assets, family size, dependency burden, sex ratio, and perception have a significant influence on the farmer's decision to replant oil palm.*

## KEYWORDS

*farmer; palm oil; rejuvenation; sustainability*

## INTRODUCTION

Palm oil is a plantation commodity that contributes to the country's largest foreign exchange, which has a high economic value compared to other plantation commodities. The development of oil palm crops began to creep to an area of 200,000 Ha in the early 1980s, but until now the area of oil palm plantations reached 14.72 million Ha in 2019 (BPS, 2020). From an area of 5.8 million Ha of smallholder oil palm land nationally (41% of the total area) there are 2.4 million Ha of which need to be rejuvenated. The government's commitment to replant smallholders' palm oil through The Indonesian Oil Palm Plantations Fund Management Agency (BPDPKS) by allocating funds of Rp. 5,567 trillion to fulfill the target of smallholder oil palm replanting in 2021, covering an area of 180,000 Ha throughout Indonesia (Haryo Limanseto, 2021). This was done because there was an inequality between the targets launched in replanting smallholder oil palm and the realization of achievements. Of the 180,000 hectares declared for rejuvenation, only 58,000 hectares have been realized throughout Indonesia in the last five years (Alika, 2020).

With the black campaign on oil palm plantations, many parties have stated that oil palm plantations are not environmentally friendly because they cause deforestation of forests because so far the increase in Indonesia's palm oil production has been carried out by

expanding oil palm plantation land (extensification). This extensibility activity will be limited in the future because, in addition to the increasingly limited availability of land, this activity also incurs social and ecological costs so it is not sustainable anymore. However, oil palm is a perennial crop with a > 25-year life cycle and an exceptionally low land footprint compared to annual oilseed crops (Faeid et al., 2020; Murphy et al., 2021). Two strategies to increase palm oil productivity nationally carried out by the government in addition to extensification are two kinds of intensifications, namely by improving the technical culture of the plantation and replacing old plants or rejuvenating with new high-yielding varieties. Through the implementation of these two things, it is hoped that it will increase not only the oil palm productivity but also its quality.

In 2020, oil palm replanting became part of the plantation sector policy in Jambi Province with the target land area of oil palm replanting was 24,800 ha which realized by 30% (7,433 ha). In 2019 the number of targets launched by the government was 18,251 ha and was realized by  $\pm 50\%$  (9,283 ha), this figure increased from 2018 when the government targeted 15,737 ha and was realized 1,351,000 ha (Disbun, 2020). Meanwhile, overall the number of land with old/damaged oil palm plants spread across Jambi Province amounts to 96,595 Ha with the largest area taken by Muaro Jambi Regency with an area of 31,754 Ha followed by Merangin Regency (Disbun, 2020). In 2021, the number of oil palm farmers was recorded at 221,711 people (BPS. Badan Pusat Statistik, 2021). Many farmers that had the land and already should be rejuvenated but it not yet be done, besides many farmers had done it. The condition of oil palm with old age or already unproductive results in a decrease in palm oil production and productivity so it is not optimal for cultivation. The main problem faced by farmers is low productivity (Suroso et al., 2020). The palm oil price factor also influences farmers to replant their oil palm plantations. The development of the price of fresh fruit bunches fluctuates greatly, in 2011 the price of FFB was Rp. 1,563,-/kg, there was a decrease in price in 2015 so it touched the figure of Rp.1,000,-/kg. at the beginning of 2021, there was an increase in price up to Rp. 1,598,-/kg. This shows that there is a lot of dependence on farmers' lives (Ahmad et al., 2020; Mariyah et al., 2018) on oil palm.

One of the impacts of the replanting program is the cessation of production, which has implications for the loss of farmers' household sources of income. The production cycle in the business of annual crops greatly affects the profit that will be obtained by the farmer. More complicated challenges are faced by perennials than annuals because the time between investment, production, cost, and receipt of farming takes a long time in its implementation (Ahmad et al., 2020; Mariyah et al., 2018; Tabe-Ojong et al., 2023). The operation of oil palm plantations starting from land preparation, providing facilities and infrastructure, maintenance, to marketing, requires large costs to run well. Not only that, the financing model must also be able to support the development of oil palm plantations (Fauzi et al., 2012). (Chalil et al., 2019) stated that certified smallholder farmers have better perception and implementation of the environment, economic, and social aspects, enjoy higher productivity and selling prices, maintain the quality of natural resources, are more resilient in overcoming fluctuations in production and prices, and are better prepared to replant. This paper is carried out to analyze socioeconomic factors that determine the decision of the family of oil palm farmers to participate in the rejuvenation of oil palm plantations in Jambi Province.

## **RESEARCH METHODS**

This research was conducted using a cross-sectional survey method. This research had been carried out in several villages which as the central villages of smallholder oil palm

plantations in Jambi Province. The population in this study was oil palm farmers who had old or damaged oil palm plants that had not yet replanted or replanted and who had rejuvenated were the population in this study. The sampling technique used in this research was by using the Multistage Sampling method (Siregar, 2015). The first stage, namely the determination of the district area selection, was carried out by Purposive Sampling with the consideration that the district was the district with the largest area of old/damaged people's oil palm land so three districts were obtained. The second stage, namely the sub-district selection stage of each district, was carried out by Purposive Sampling, considering that in the sub-district there was a population of farmers who had old plants or damaged plants that had not been rejuvenated so that two sub-districts from each district were obtained. In the last stage, selected sample farmers use the technique of choice or (non-probability Sampling). This technique was chosen to avoid the same participants chosen and only those who were included in the criteria needed by the researcher. The number of samples in this study was 257 people.

The instrument used in this research is an open-ended questionnaire. The researcher trained eleven (11) enumerators to gather data. The questionnaire was asked by the enumerators face to face. The collected data were collected first and tabulated and concentrated, the data was taken qualitatively and quantitatively, followed by analyzing the gathered data using logit regression analysis and a t-test to see the effect of each independent variable (level of readiness, land area, proportion of oil palm land ready for rejuvenation, income, main occupation, savings, assets, family size, burden of dependence, sex ratio, perception and attitude and age of the head of the family) on farmers' decisions to rejuvenate their oil palm plantations.

## RESULTS AND DISCUSSION

### *Profile of the Respondents*

#### *a. Age*

The age of farmers influences their physical ability to manage their farming business, be it in the production process or processing of agricultural land. In the higher age of farmers, the physical ability of farmers to work on their farming land is relatively decreased, because in general farmers only rely on physical strength or energy in carrying out their activities. More details on the distribution of farmer frequency by age group in the research area can be seen in Table 1 below:

**Table 1.** Farmer Frequency Distribution by Age Group in 2022

Age group (years)	Frekuensi (people)	Persentase (%)
29-34	12	4,67
35-40	53	20,62
41-46	34	13,23
<b>47-52</b>	<b>67</b>	<b>26,07</b>
53-58	56	21,79
59-64	27	10,51
65-70	6	2,33
71-76	1	0,39
77-82	1	0,39
<b>Total</b>	<b>257</b>	<b>100</b>

*Source : Data Processing Results (2021)*

Based on Table 1, it was known that farmers were generally at a productive age. The age group of 15-64 years is productive. The age of the most sample farmers at the age class interval of 47-52 years was 67 persons or 26.07%, and the lowest frequency of farmers was at both intervals of the age class i.e. 71-76 years and 77-82 years which one person only or 0.39%. Meanwhile, the average age of farmers in the study area was 48.5 years. This means that the farmer's workability was in a productive condition to manage his farm. (Jha & Gupta, 2021) found that key socioeconomic variables such as farmer age, gender, household size, education level, off-farm income, and farm size influenced farmers' adaptation decisions. Meanwhile, (Tsani et al., 2018) stated that the age of farmers and the location of agricultural land negatively affect the decision to convert agricultural land functions, the level of education and the number of family members have a positive effect, and the area of agricultural land and income do not have a significant effect on the decision to convert agricultural land functions.

***b. Education Level***

Education is all efforts to make society able to develop human potential to have spiritual power, self-control, personality, intelligence, a noble character, and have the necessary skills as a member of society and a citizen. Education can shape personality through environmental education, both intentional and unlearned. Higher education can improve a person's abilities, insights, skills, status, and expectations in accepting changes in the development of science and technology. If farmers can read, it is hoped that farmers will be able to read various writings related to farming, such as new technology, price changes, and more efficient marketing methods. In this study, the level of education of farmers was measured based on the level of formal education they had participated in. The level of formal education of farmers can be seen in Table 2.

**Table 2.** Farmer Frequency Distribution by Education Level in 2022

<b>Education level</b>	<b>Frekuensi (people)</b>	<b>Persentase (%)</b>
TS	5	1,3
TTSD	29	11,2
SD	39	15,1
SMP	33	12,8
<b>SLTA</b>	<b>130</b>	<b>50,5</b>
PT	21	8,2
<b>Total</b>	<b>257</b>	<b>100</b>

*Source: Data Processing Results (2021)*

Based on Table 2 above, it can be seen that the level of education of farmers was starting from those who did not go to school with universities. A large percentage of farmers were at the highest level of education, namely graduating from high school as many as 130 people or 50.5%, for the lowest level of education taken by farmers, namely not going to school as many as 5 people or 1.3%. For farmers who had high education in university, there were only 21 people or 8.2%. The overall level of farmers' education is said to be relatively low.

The low level of education of farmers will affect planning in the management of their farming business, this will affect the level of production produced by these farmers. Stated that the higher the level of education of farmers, the ability of farmers to improve the management of their farming business will be better, especially in terms of adaptation to

the use of new technology, understanding farming, and marketing. To overcome this situation, the farmer can also get education through non-formal channels such as courses or counseling. (Tatis Diaz et al., 2021) stated that the main socio-economic factors, level of education, agricultural income, credit accessibility, and level of members' participation play a decisive role in sustainable practices. (Ginting et al., 2020) showed that education had a positive and significant effect on economic growth. (Ariyanto et al., 2020; Pham et al., 2021) state that to promote the implementation of sustainable agricultural practices, we advise enhancing collaboration across peers, farmer groups, and extension agents.

### *c. Family size*

The family size is one of the factors that affect the success of farming, the more the number of family members, the more needs that will be met by farmers. In addition, the family size is closely related to labor from within the family, because it can help in the management of the garden so that there is no need to spend labor costs from outside the family. This can result in small costs incurred and make family income greater because it does not incur costs for the use of labor from outside the family. Family members consist of wives and children. For more details on the distribution of sample farmers based on the number of dependents, see in Table 3.

**Table 3.** Farmer Frequency Distribution Based on the Family size in 2022

<b>Family size (people)</b>	<b>Frekuensi (people)</b>	<b>Persentase (%)</b>
0	4	1,6
1	3	1,2
2	46	17,6
<b>3</b>	<b>96</b>	<b>37,4</b>
4	84	32,7
5	22	8,6
6	2	0,8
<b>Total</b>	<b>257</b>	<b>100</b>

*Source: Data Processing Results (2021)*

From Table 3 above, it could be explained that the farmers who had the largest family members were 3 people, namely 96 people or 37.4%. The number of farmers with the lowest number of members was 6 people, namely 2 people or 0.8%. Meanwhile, the average number of dependents of farmers was 3 people. Family size also affects the children's education levels as the stated that children from larger size family had lower educational attainments and were less likely to be enrolled in school, with greater effect on rural, poor, and low-caste families as well as for families with illiterate mothers. Similarly, the opinion showed that education, farming experience, family size, and tractor ownership were significantly related to climate change adaptation. In line with the opinion by Abdullah et al. (2019) shows that the gender of the head of the household, age, number of family members assisting in agriculture, household size, vocational training and farmers as Landlords and farm sizes are the main determinants of market participation. Farmers' welfare depends on whether farmers participate in rice yield markets

### *d. Farming Experience*

The experience of farming is meant by the length of time farmers in trying to farm oil palm, expressed in years. The experience of farming plays a role in adjusting farming to be

in line with the progress and development of farming technology. In general, farmers who have experience in farming will be more skilled in managing their farming business. For more details on the distribution of farmer frequency based on experience in farming palm oil can be seen in Table 4.

**Table 4.** Farmer Frequency Distribution Based on Farming Experience in 2022

Farming experience (years)	Frekuensi (people)	Persentase (%)
15	4	1,6
19	3	1,2
23	46	17,6
<b>27</b>	<b>96</b>	<b>37,4</b>
31	84	32,7
35	22	8,6
39	2	0,8
43	0	0
47	0	0
<b>Total</b>	<b>257</b>	<b>100</b>

*Source : Data Processing Results (2021)*

Based on Table 4 above, it could be seen that the experience of farmers in farming, the largest was 27 years of experience, namely 96 people or 37.4% while the experience of farmers in farming the smallest was 39 years of experience, namely 2 people or 0.8%. Average experience farming farmers was 31 years. From the data above, it could be said that farmers in the research area already had a long experience in managing oil palm farming, so it could be useful to increase production and develop oil palm farming in the future. Whereas (Yu & Luo, 2022) stated that the farming experience is used reasonably, for example, by expanding the social networks of farmers and urging them to form decision-making methods that comprehensively utilize agricultural experience and social networks.

### **Overview of Palm Oil Farming Activities in the Research Area**

The oil palm crop is a farming business that has long been cultivated in Jambi Province and is one of the declining businesses. Currently, palm oil farming is the main source of livelihood for the community. All of the farmers have their own land.

Oil palm plants can produce after 4-5 years of age. The cultivated oil palm are the Marehat and Dura varieties, farmers used a planting distance system of 8 x 8 m so that there were relatively few fruits produced. The recommended distance from the Agriculture Office for planting distance is 8 x 9 m.

Fertilization is carried out after the plant approximately 6 months after planting, namely with chemical fertilizers (NPK) because this fertilizer already includes all contents in a ratio of 1: 1:1 the next fertilization is carried out according to the wishes of the land owner, average fertilization is carried out 3 times a year.

The administration of chemical input is carried out to clean the weeds around the oil palm plant. The herbicide commonly used was the Roundup type. The administration of these drugs was carried out once a year with an average application of drugs of 0.30 liters/Ha/year.

The labor force in the oil palm farming business in the study area was majority come from outside the family. This was done to provide workers for those who lacked workers or the owner was no longer able to do himself anymore. These activities started with land

processing, treatment, and spraying pests once again harvesting oil palm fruit. After that, the oil palm fruit was weighed by the collector or the head of the farmer group and then transported to the factory.

**Analysis of Factors Influencing Farmers' Decision to Rejuvenate Palm Oil**

Replanting activities are aimed at replacing oil palm plants that are no longer productive, namely at the age of >20 years, if not carried out the oil palm plant will no longer provide great benefits to its owner because it is unproductive and the results are small (Saputri, 2018). The results of the study were obtained from 257 respondents as many as 68% of respondents did not agree to replant and the remaining 32% agreed.

This study aimed to determine the influencing factors of farmers' decisions to replant oil palm crops in Jambi Province. The factors analyzed were Level of readiness, Land Area, Proportion of oil palm land ready for rejuvenation, Income, Main occupation, Savings, Assets, Family size, Burden of dependence, Sex ratio, Perception and Attitude, and Age of the head of the family. Abera et al., (2020) stated that policies and programs targeted at persuading farmers to embrace more land management techniques to boost sustainable agricultural output should take into account their unique socioeconomic situations, the agroecological conditions of the land, and institutional considerations. Based on logit regression analysis in the SPSS application, the following results were obtained:

**Cox and Snell R<sup>2</sup> and Nagelkerke R<sup>2</sup> tests**

The coefficient of determination in logistic regression is seen from Nagelkerke R Square, because the value of Nagelkerke R Square can be interpreted like the value of R Square in multiple regressions. Nagelkerke R Square is a modification of the coefficients cox and snell to ensure that the value will vary from 0 (zero) to 1 (one). The value of Nagelkerke R Square close to zero indicates that the ability of the variables in explaining the dependent variable is very limited, while the value of Nagelkarke R Square close to one indicates that the independent variable is able to provide all the information needed to predict the variability of the dependent variable (Ghozali, 2018).

**Table 5.** Cox and Snell R Square, Nagelkerke R Square

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
37.14 <sup>a</sup>	0.668	0.937

*Source : Data Processing Results (2021)*

The result of the R Square nagelkerke produced on this model was 93.7%. This showed that the respondents' decision to replant oil palm crops can be explained by the free variables in the model of 93.7%, namely the level of readiness, land area, the proportion of oil palm land ready for rejuvenation, income, main occupation, savings, assets, family size, dependency burden, sex ratio, perception and attitude and age of the head of the family while the remaining 6.3% were influenced by variables outside the equation model.

**BG test (Simultaneous significance testing)**

The regression model feasibility test was assessed using Hosmer and Lemeshow's as measured by chi square values. This model is to test the null hypothesis that whether the empirical data corresponds to the model (there is no difference between the model and the data so the model can be said to be fit) (Ghozali, 2018). The hypothesis is as follows:

1. If the probability value (P-Value)  $\leq 0.05$  (significance value) then null hypothesis is rejected, meaning that there is a significant difference between the model and its observation value. So the Goodness of Fit Test cannot predict the value of the observation.
2. If the probability value (P-Value)  $\geq 0.05$  (significance value) then  $H_0$  is accepted, meaning that the model corresponds to its observation value. So that the Goodness of Fit Test can predict the value of the observation.

**Tabel 6.** Hosmer and Lemeshow Test

Chi-square	Df	Sig.
1.825	8	0.986

Source : Data Processing Results (2021)

Based on the output results in the table above, it could be seen that the value of  $X_2 = 1.825$  with a value of  $p = 0.986$  was greater than the degree of significance of  $\alpha = 0.05$  ( $p > 0.05$ ) then it could be concluded that the model used was in accordance with the observation of actual data. So it could be concluded that this model was feasible to use to predict farmers' decisions to rejuvenate oil palm crops.

### Individual Significance Test

This binary logistic regression analysis is performed by individual testing of each predictor variable. This test is used to determine the effect of each predictor variable on the response variable individually. The test statistics used are the Wald test. Test the hypothesis was as follows :

$H_0$  : The level of readiness, land area, the proportion of oil palm land ready for rejuvenation, income, main occupation, savings, assets, family size, dependence burden, sex ratio, perception and attitude and age of the head of the family had no influence on the decision of farmers to replant their oil palm.

$H_1$  : The level of readiness, land area, the proportion of oil palm land ready for rejuvenation, income, main occupation, savings, assets, family size, dependence burden, sex ratio, perception and attitude as well as the age of the head of the family had an influence on the decision of farmers to replant their oil palm.

With a significance level ( $\alpha$ ) of 0.05, the conclusions that could be drawn be:

1. If the p-value (in this case it is a sig -2 tailed)  $> 0.05$  null hypothesis received means the level of readiness, land area, proportion of oil palm land ready to be rejuvenated, income, main occupation, savings, assets, family size, dependency burden, sex ratio, perception and attitude and age of the head of the family had no effect on the farmer's decision to replant.
2. If the p-value (in this case sig -2 tailed )  $< 0.05$   $H_0$  rejected means the level of readiness, land area, proportion of oil palm land ready for rejuvenation, income, main occupation, savings, assets, family size, dependency burden, sex ratio, perception and attitude and age of the head of the family affected the farmer's decision to replant.

**Tabel 7.** Results of Logistic Regression Estimates on Farmers' Decisions to Rejuvenate Oil Palm Crops.

Variable	Coefficient	Sig	Exp (β)	Description
Constanta	-72.030	0.997	0.000	-
The level of readiness	0.898	0.000	2.455	HighlySignificant****
Land area	-0.428	0.328	0.805	Non Significant
Proportion of oil palm land ready to be rejuvenated	-0.216	0.999	0.979	Non Significant
Income,	-0.021	0.618	5.462	Non Significant
Main occupation	1.698	0.316	4.877	Non Significant
Savings	-0.126	0.463	0.882	Non Significant
Asset	-0.156	0.061	0.856	Significant**
Family size	0.691	0.242	1.997	Significant*
Dependency burden	0.022	0.207	1.022	Significant*
Sex Rasio	-0.024	0.017	0.976	Significant***
perception	5.849	0.000	346.894	highly Significant****
Attitude	-0.901	0.558	0.406	Non Significant
Age of the head of the family	-0.010	0.836	0.990	Non Significant

Source : Data Processing Results (2021)

Note: \*) significant to 30%; \*\*) significant up to 10%; \*\*\*) significant up to 5%; \*\*\*\*) Highly significant up to 1%.

Based on the values in the table above, the logistics equations in this study are:

$$\ln = -72.030 + 0.898X_1 - 0.428X_2 - 0.216X_3 - 0.021X_4 + 1.698X_5 - 0.126X_6 - 0.156X_7 + 0.691 X_8 + 0.022X_9 - 0.024X_{10} + 5.849X_{11} - 0.901X_{12} - 0.010X_{13}$$

In this model, the variable that had a highly significant influence (significant in  $\alpha$  1%) was the level of readiness and perception of farmers, while for the sex ratio variable, it had a significantly effect on the  $\alpha$  5%. For variable assets, the family size and the burden of dependence had a noticeable effect on the  $\alpha$  30%. Furthermore, the variable land area, the proportion of oil palm land that was ready to be rejuvenated, income, main occupation, savings, attitude and age of the head of the family had non-significant effect on the decision of farmers to replant oil palm crops.

The farmer readiness level variable had a significant figure of 0.000 (p value < 0.01) which means that this variable had a highly significant effect on the decision of farmers to replant oil palm at the level of  $\alpha$  (1 percent). The value of the marked coefficient (+) means that the higher the level of readiness of farmers, the sooner they would decide to replant oil palm. The Exp value ( $\beta$ ) for the readiness level variable with a value of 2,455, which means that farmers who had a high level of readiness are willing 2,455 times to rejuvenate their oil palm crops. The readiness carried out by each farmer was certainly different because indeed the garden that would be used belongs to the farmer independently, not owned by the company or any party. The decision to be ready or not ready for replanting was an individual decision of the oil palm plantation owner. (Pham et al., 2021) identify four factors influencing specific decisions to implement sustainable agricultural practices; socioeconomic factors of the household, plot characteristics, resource limitations, and social capital. (Hutasoit et al., 2015) stated that the readiness of farmers is needed to minimize obstacles that are expected to hinder the smooth implementation of oil palm replanting. By planning measurable preparations such as setting aside some of the

proceeds from the sale of funding, increasing knowledge and information about palm oil production technology, collaborate with superior oil palm seed sources.

The variable farmers perception has a significant effect as it is 0.000 statistical significance ( $p$ -value  $< 0.01$ ) which means that this variable has a highly significant effect on the decision of farmers to replant oil palm at the level of  $\alpha = 1\%$ . The positive mark of the coefficient means that the farmers' perception of oil palm replanting is good. Finally they will decide to do palm oil replanting. (Khumalo et al., 2020) recommended that the government should increase more amount of extension workers to expand extension frequent for them, so that there will be increased sharing of information to the farmers about the best agricultural practices. (Jha & Gupta, 2021) found that key socioeconomic variables such as farmer age, gender, household size, education level, off-farm income, and farm size influenced farmers' adaptation decisions. This finding will help identify critical household characteristics that can be integrated into the formulation and implementation of future policies to integrate into future policy formulation and future successful adaptation.

Sex ratio variable has a significant effect of 0.000 ( $p$  value  $< 0.05$ ) which means that this variable has a significant effect on the farmers decision to replant oil palm. The negative mark of sex ratio coefficient indicate that the male will give less to decide for replanting. The Exp value ( $\beta$ ) for Sex ratio variable with a value of -0,976. (Olumide Ilesanmi & Atanda Afolabi, 2020) stated that At a significance level of 5%, variables that positively and significantly influence the adoption of enhanced cocoa technology include gender, education level, axisting of information sources and extension agents.

Dependence burden variable has a statistical significant of 0.000 ( $p$  value  $< 0.3$ ) which means that this variable has a significant effect on the decision of farmers to replant oil palm. The value of the marked coefficient as 1,022 which means that farmers who has high dependence burden will make the rejuvenation decide higher. (Ginting et al., 2020) shows that the dependency ratio has a negative and significant effect on economic growth and has a positive and significant effect on poverty.

The asset variable had a significant figure of 0.061 ( $p$  value  $< 0.1$ ) which means that this variable had a significant effect on the decision of farmers to be willing to replant oil palm at the level of  $\alpha$  (10 percent). The value of the coefficient marked (-) means that the smaller the assets of smallholder farmers, the less willing farmers were to replant oil palm. The Value of Exp ( $\beta$ ) for the asset variable was 0.856, which means that farmers who had more assets are willing to replant their oil palm crops 0.856 times. (Liu et al., 2021) found that changes in natural assets, human assets, and physical assets affect farmers' financial assets, while social assets are influenced by financial assets and human assets. (Kuang et al., 2020) stated that social, natural and physical assets have a significant and positive effect on the adoption of farmers' adaptation strategies, while human and financial assets have a relatively weak influence. (Li et al., 2019) states that human assets, social assets, and physical assets of non-agricultural households are more valuable than concurrent household assets and pure farmers. Purebred farmers have a larger amount of assets especially medium and low, while non-agricultural households have some higher assets. The level of livelihood assets is closely related to livelihood activities. Farmers' human, financial, and social resources might lessen the risks associated with their livelihood in agricultural production (Kuang et al., 2020).

The family size variable has a statistical significant of 0.24 ( $p$  value  $< 0.3$ ) which means that this variable has a significant effect on the decision of farmers to be willing to replant oil palm. The positive coefficient means that the bigger the family size of smallholder farmers, the sooner they will also willing to replant oil palm higher. The Value of Exp ( $\beta$ ) for the family size variable is 1.997. (Jara-Rojas et al., 2012) stated family size represents a

larger-forcing occupation, therefore, the probability of applying a set of practices at the agricultural level increases. In this case, argues that small-scale family farms use more labor and have more capacity to create jobs than any other source of employment. In general, family size found varies 1 to 8. He believed that the size of the family in most cases is considered a burden when it comes to fundamental needs (Handavu et al., 2019). In line with (Olumide Ilesanmi & Atanda Afolabi, 2020) stated that the age of cocoa farmers; The size of the family and the size of the farm were nonsignificant and had a negative coefficient which means an increase in these factors would reduce the likelihood of cocoa farmers adopting improved techniques.

## CONCLUSION

The analysis showed that the level of farmer readiness, assets, family size, dependence burden, sex ratio and perception had a significant effect on the decision of farmers to rejuvenate oil palm. Since this study is only limited to using questionnaires, for future research should be conducted in-depth interviews in order to get more comprehensive data

## ACKNOWLEDGEMENT

This work was supported by University of Batanghari's Doctoral grant

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