

# How to Predict the Impact of the Smallholder Oil Palm Replanting Program on Households and Regional Economy?

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**ABSTRACT** : The aim of the research to estimate the temporary impact of the smallholder oil palm replanting (SOPR) programs on the households and regional economy. The research survey on 3 (three) smallholder oil palm plantation centers that will enter a period of rejuvenation, namely Dataran Kempas, Purwodadi, and Sungai Keruh villages in Tebing Tinggi District, West Tanjung Jabung Regency, Jambi Province, Indonesia. The selection of 152 households as the unit of analysis was carried out using multistage cluster random sampling with an equal allocation of the number of households in each village. The results showed that the impact of the SOPR program on household and regional economies was different and related to the level of dependence on oil palm commodities. At the micro-level, temporary income loss is related to the dependence of household income on oil palm plantations, namely the proportion of income from oil palm to total income and variations in household income sources. These micro factors are accumulated with factors at the macro level such as the proportion of oil palm households, the diversity of plant ages, and the average area and proportion of plantation land that will be replanted. Based on this description, it can be concluded that the impact of the SOPR program on the household and regional economy is interrelated and relatively large in plantation center areas.

**Keywords:** households, oil palm; region; replanting; temporary loss income

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## 1. INTRODUCTION

The Smallholder Palm Oil Replanting (SOPR) program is an effort to develop plantations by replacing old /unproductive plants with new plants, either in whole or in stages [1]. This program will become the new foundation for smallholder oil palm plantations in Indonesia because it is not only replanting old trees but also fixing many things [2]. Through the SOPR, many things can be addressed from plantations. smallholder palm oil which has been proven to be the support of the regional economy [3]. The main actor of the SOPR is the household, so their participation is a key factor and the results of the research show that economic factors are one of the causes for the low participation rate of replanting [4]. Furthermore, there is a significant relationship between the factors of knowledge, access to information, extension activities, capital, income, and farming experience on oil palm replanting [5]. Since 2017, the Government of Indonesia (Gol) has started the SOPR Program by Presiden launched directly in Banyuasin (South Sumatra) was intended to increase the productivity of smallholder palm oil, which is still low.

According to data from the Ministry of Agriculture, the realization of oil palm replanting in 2017-2018 has only reached 4,223 Ha, which is still far from the technical recommendations for SOPR as a condition for obtaining funding from the Plantation Fund Management Agency (PFMA) of 14,792 Ha, as well as last year's SOPR program target of 20,780 Ha [6]. The Indonesian Palm Oil Farmers Association hopes that increased productivity through the program can be supported by easy procedures for farmers and asks that one or two conditions be made easier [7]. To accelerate the realization of the SOPR program, the Gol has again relaxed the procedures or requirements from the current eight (previously 14) to be simplified again to only two requirements [8]. The government is targeting the SOPR program to target 500 thousand hectares (ha) of smallholder oil palm plantations in the next three years (2020-2022) and expected that the productivity of smallholder oil palm plantations will increase significantly.

One of the obstacles felt in the SOPR program is the technical problems of the bureaucracy which are regulated in the Decree of the Director-General of Plantation No. 29/KPTS/KB.120 /3/2017 [7]. The question arises "is it just a bureaucratic technical obstacle?" because in reality there are economic uncertainties that will be faced during the SOPR period. Is it true that a structured empowerment program is not needed to develop alternative sources of income to increase household economic readiness in facing the SOPR program?. The replanting program, among others, has an impact on the existence of non-productive periods which cause plantations to be cut off, factory continuity is not maintained due to reduced supply of FFB, and even opportunities for the plundering of land are quite vulnerable [9]. The temporary loss of income is one of the consequences of the SOPR due to production cessation so that the palm oil household's income will be lost until the replanting plants can produce an estimated 3-4 years (Novra and Suparjo, 2020). So far, the non-productive (income) period or the interruption of plantation income has not been the focus of attention of many parties even though it has had a broad impact on the success and sustainability of the SOPR program.

A household is defined by the U.S. Census Bureau as all the people who occupy a single housing unit, regardless of their relationship to one another [10]. The household, rather than the individual, is commonly adopted as the basic unit of analysis when considering the economic situation of society (though data for individuals may be collected separately). In an agricultural context, it is adopted by the FAO as the foundation for its System of Economic Accounts for Food and Agriculture (SEAFA), intended for use by countries at all levels of economic development [11]. In the United States, incomes for farm occupier households are calculated by the US Department of Agriculture's Agriculture Resources Management Survey (ARMS) on the forerunner of which was the Farm Costs and Returns Survey. For the system, a household may be defined as a small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth, and who consume certain types of goods and services collectively, mainly housing and food [12]. A central feature of the household is that there is a high degree of pooling of income and expenditure. This means that assessment at the level of the household is more meaningful in representing the potential command over goods and services than would be the case if the incomes of the individual members were treated separately. This is not to deny that, for example, farmer's wives may have some source of income which they regard as their own (such as from providing bed-and-breakfast accommodation in the farmhouse). That the pocket money which a farmer spends is the result of a collective decision and is approved as a necessary line of expenditure by the household. In many countries spouses work off the farm operation at a wide variety of occupations and commonly report that their earnings go to increase the overall household income.

The relationship between the economic impact of temporary loss of income and the achievement of the SOPR program productivity target is briefly presented in Figure 1.

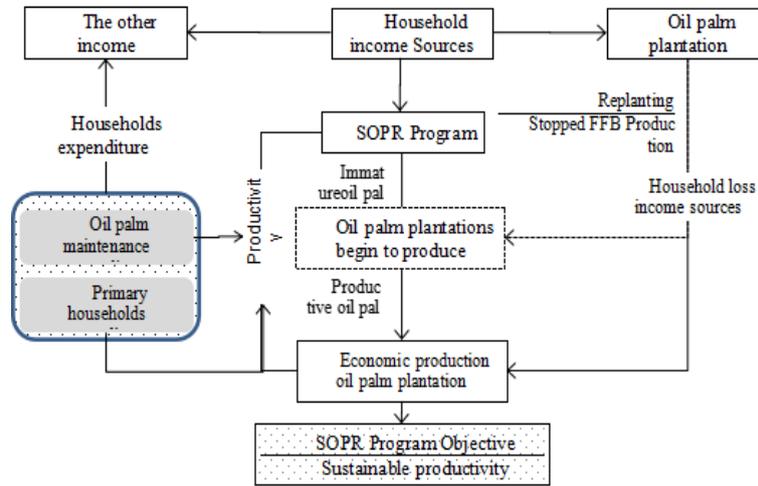


Figure 1. Relationship economic impact and SOPR targeting

Agricultural households need income not only for consumption needs but also as capital to finance the maintenance of replanting oil palm trees. The use of income to fulfill consumption needs becomes a priority and if it is met, it will be used for savings and capital. The majority of oil palm farmers are monocultures so that when the production of fresh fruit bunches stops and this implies the loss of a large proportion of household income. Limited capital due to low or loss of the main source of income will reduce the intensity of plant maintenance such as fertilization and pest control. The impact of this condition will cause the main objective of the SOPR program to increase the productivity of oil palm plants is not achieved. The SOPR program's target for the welfare of farmers will lead to a higher poverty rate. For this reason, anticipatory and responsive action from policymakers is needed to empower affected households. The effectiveness and intensity of a policy will be closely related to the ability to understand field conditions and one of them is the magnitude of the impact on the target community for the policy.

For analysts to set things right, understanding the complexities of oil palm will provide a useful starting point for developing a rich contextual understanding of the rapidly changing palm oil sector [13]. Free-market conditions have influenced the orientation of nationalization of those enterprises that created the transnational conglomerate movement in the case of palm oil plantations in Indonesia [14]. The GoI has recently reinforced the ISPO system, which has now become mandatory for all growers including smallholders not only to help secure land tenure for smallholders but also to incentivize them to adopt sustainable practices [15]. Smallholder farmers are defined as those with farms smaller than 25 Ha (62 acres) dan noting that Indonesia's 2.67 million smallholder farmers manage a combined 40% of the total oil palm plantation area or the equivalent 5.8 million Ha (14 million acres) of land [16]. The ability of local policy to influence distributional patterns is implied to the extent that local action can facilitate variable growth rates of targeted economic sectors [17]. A critical aspect of rural research is carefully defining and describing the rural context, because different definitions of rural may influence resource allocation, grant funding eligibility, and/or research findings [18]. Based on the description above as the first step in program acceleration through increasing the readiness of households and regions in facing replanting, it is necessary to research the impact of the SOPR program. This research, which generally aims to estimate the negative impact of the SOPR program on the household and regional economy, is expected to be useful for policymakers, especially in the policy of developing household empowerment programs.

## 2. Methods

Research using a survey method was carried out for 6 (six) months with the analysis unit was 152 households in 3 central oil palm plantation villages in Tanjung Jabung Barat Regency, Jambi. The selection of the three central villages, namely Purwodadi, Dataran Kempas, and Sungai Keruh in Tebing Tinggi District was carried out by using purposive sampling technique, namely the village centers for smallholder oil palm plantations which were the targets of the Desa Makmur Peduli Api (Prosperous Village Cares about Fire) program of Industrial

Plantation Forest (IPF) companies. PT. Wira Karya Sakti initiated by Sinar Mas Pulp and Paper. The household sampling technique was carried out using three-stage cluster random sampling (3-CRS) with the distribution of samples for each village using an equal allocation.

The step-by-step framework for analyzing the impact of the SOPR Program on household and local economies is briefly presented in Figure 2.

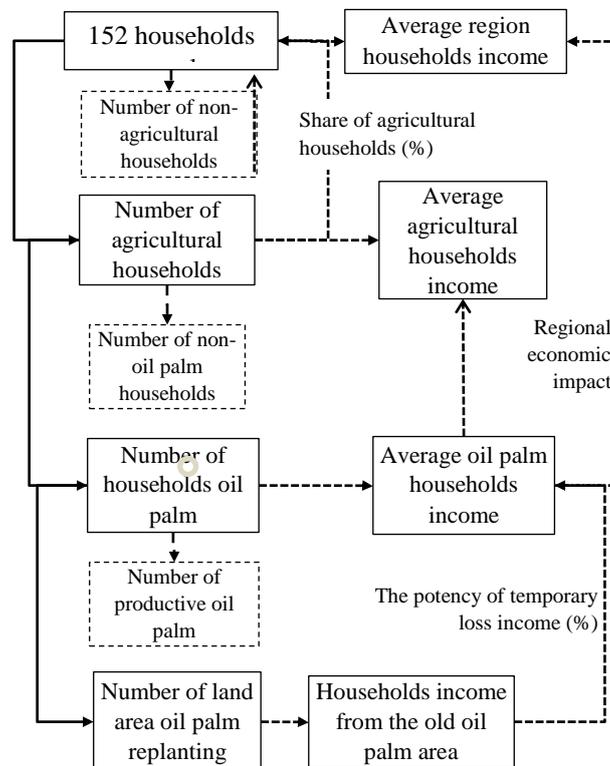


Figure 2. The brief framework for analyzing the impact of the SOPR Program

### 3. Result and discussion

The prediction of the impact of the smallholder oil palm replanting program on the household economy, the agricultural sector, and the region is carried out through three stages, namely first, determining the household structure or the proportion of potential oil palm households that will carry out oil palm replanting, second determining the amount of potential temporary loss of income that will occur. , and third or lastly to determine the relative impact on the household economy of oil palm farmers, the decline in the contribution of the agricultural sector, and the regional economy. Discussion and examples of calculations for each stage are explained as follows;

#### The households structure

The terms household and family should have different terminology but are often used interchangeably. The household, rather than the individual, is commonly adopted as the basic unit of analysis when considering the economic situation of society (though data for individuals may be collected separately). Recommended by the Canberra Group of experts for use in studying income distributions and is the basic unit in household budget surveys, the main purpose of which is to assist in the creation of retail price indices (cost-of-living indices). A household consists of one or more people living in the same place and they may or may not be related to each other, whereas a family has two or more members who live in the same house and are related by birth, marriage, or adoption [16] or as all the people who occupy a single housing unit, regardless of their relationship to one another [20]. As a system, the household may be defined as a small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth, and who consume certain types of goods and services collectively, mainly housing and food [11]. A central feature of the household is that there is a high degree of pooling of income and expenditure. The UN guidelines

recommendation on the population and housing censuses for the World Programme of Agricultural, the concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either a one-person who makes provision for his or her food or other essentials for living without combining with any other person to form part of a household or a multi-person household, that a group of two or more persons living together who make common provision for food or other essentials for a living [10].

Agricultural households are those whose main income comes from agriculture both as food producers, farmers in non-food agriculture, and workers in agriculture [21]. There are three main sources of household income, namely income earned, investment income, and government assistance [12]. In developing countries, where agriculture plays an important role, nonfarm economies also play an important role in household income systems based on returns (agricultural returns vs. nonfarm returns). Agriculture refers to the number of crops, livestock, and other agriculture-related goods and services [22], Small-scale agriculture is the main source of income and employment in rural areas, but households tend to diversify sources of income to manage risks, securing a stable income stream. smoothly, allocation of surplus labor, facing various market failures and coping strategies [23], [24] and [25]. Some research results show that the income sources of rural households change every day, and non-agricultural income is the main source of income in rural areas [26] but there is no evidence of differences between households in different regions in terms of transitioning to non-income based strategies. -agriculture [27]

Based on the various definitions described, the household structure in each smallholder oil palm plantation center village is presented in Figure 1.

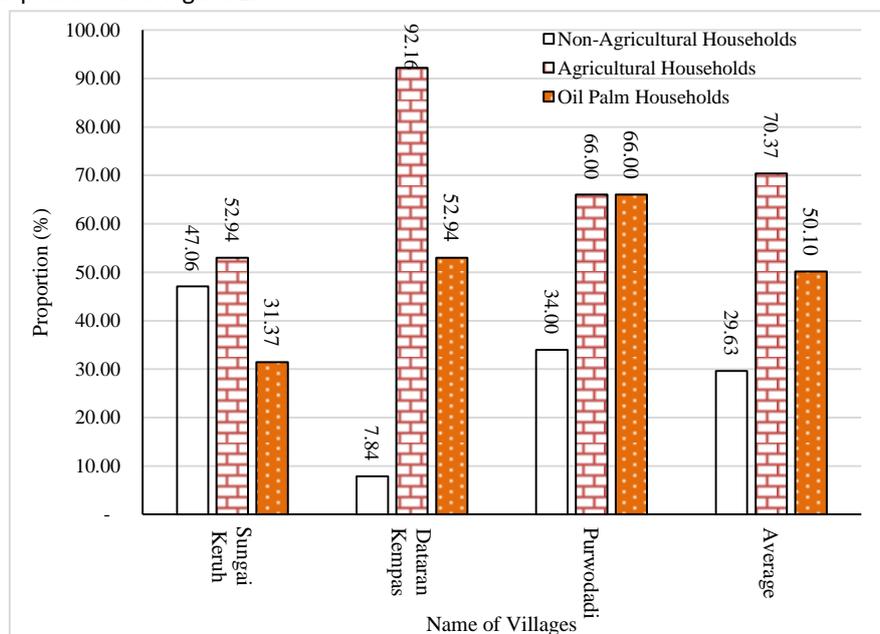


Figure 1. The households structure

Generally, the three villages are agricultural areas, especially Dataran Kempas Village which is dominated by (92.16%) households related to the agricultural sector. Palm oil is a commodity that is the main choice for agricultural households, especially in Purwodadi Village, where almost all households are oil palm farmer households. This does not necessarily indicate that there are no other cultivated crop commodities because it only indicates that almost all agricultural households own oil palm plantations. Another indication that can be stated is that farming in Purwodadi Village is more specialized and tends to be a monoculture, making it more vulnerable to issues related to oil palm commodities including changes in FFB prices and the impact of the SOPR program.

The level of readiness and resilience of the household economy to the negative impacts of the SOPR Program will also be determined by the size and pattern of plantation land ownership and its diversity in the three plantation center villages presented in Table 1.

Table 1 shows that the majority of household oil palm plantation land ownership is single (one lot) with an average area of 2.30 Ha except for households in Purwodadi Village. The historical differences between the three villages are thought to be a factor in the variation in ownership of oil palm plantations. Purwodadi Village is an ex-transmigrant village that was later divided into two villages, namely Purwodadi and Dataran Kempas, while Sungai Keruh Village is a traditional village or native of Jambi Province. The general phenomenon of people in transmigration areas in Indonesia, especially Sumatra, is that not all households can survive, and some return to their original areas. When they return to this area, they sell their plantation land, resulting in a transfer of ownership and usually the buyers are fellow transmigrants who remain. This is also a factor that causes the average land area for Purwodadi Village to be higher than the other two villages.

Table 1. The area and pattern of the oil palm households land ownership

No	Variable	Villages			Average
		SK	DK	PR	
1	Owner oil palm plots (%)				
	a. Single plots	23.53	41.18	30.00	31.57
	b. Multiple plots	7.84	11.76	36.00	18.54
2	Area of ownership of oil palm plantation (Ha)				
	a. First oil palm area	2.04	1.76	2.14	1.98
	b. Second oil palm area	0.21	0.21	0.45	0.29
	c. Third oil palm area	-	-	0.08	0.03
3	Oil palm plantation ownership				
	Average area	2.25	1.97	2.67	2.30

Note: SK = Sungai Keruh, DK = Dataran Kempas, PR = Purwodadi

### The role of oil palm in household and regional socio-economics

Not all oil palm farming households are potential participants of the SOPR program because it is closely related to the age and productivity of the oil palm plants they cultivate. Oil palm plantations with native seeds reach a maximum production level (> 30 tons/ha/year) at the age of 7-12 years, and after that, it begins to decline until it reaches a production level of <20 tons/ha/year at a planting age of 20 years [28]. The different conditions for smallholder oil palm plantations, some of which use fake seeds, where the maximum production is only ±15 tons/ha/year and at the age of 20 years, they are only able to produce under 10 tons/ha/year. Oil palm plantations > 25 years old have experienced a decline in productivity with a production level of 12 tons/ha/year, so replanting is necessary so that production can return to normal. The age of oil palm not only affects production but will also affect the selling price of FFB, and the increase in age will be followed by an increase in the average weight of bunches and vice versa the number of bunches decreases but has a different rate of change. The average weight of bunches experienced a positive growth that was greater than the rate of decline in the number of bunches so that productivity would change from year to year but with a trend that varied according to age. The grouping of plants into 4 age groups, namely young (3 - 8 years), juvenile (9 - 13 years), mature (14 - 20 years), and old (> 20 years) is related, among others, to oil yield, production, ratio of male flowers. and females (Nasihin, 2012). The productivity of oil palm plantations will increase after reaching the age of 9 years, stabilize until the age of 13 years, and begin to decrease after the age of 14 years until the non-productive period (25 years). The effect of prices causing a pattern of changes in productivity was not directly followed by a pattern of changes in household income of palm oil (Novra, 2019).

The age of the oil palm plant will not only affect production but will also affect the selling price of FFB were Increasing the age of oil palm plants will be followed by an increase in the average weight of bunches and vice versa the number of bunches will decrease but have a different rate of change. The average weight of bunches experienced a positive growth greater than the rate of decrease in the number of bunches. The implication is that oil palm productivity will change from year to year but with a trend that varies according to age. The grouping of oil palm plants into 4 age groups, namely young (3 - 8 years), juvenile (9 - 13 years), mature (14 - 20 years), and old (> 20 years) is related, among others, to oil yield, production, comparison male and female

flowers [29]. The productivity of oil palm plants will increase after reaching the age of 9 years, then until the age of 13 years will be stable, and begin to decrease after the age of 14 years until the non-productive period. (25 years). This pattern of productivity movement was not directly followed by the income pattern of the palm oil palm due to the price factor [30]. For example, the FFB price in Riau Province for the period June 2 - 8<sup>th</sup> 2021 ranges from IDR 1,875.15 (age 3 years) to IDR 2,527.97 (age 10 - 20 years), while for those aged over 20 years, it is presented in Table 2.

Table 2. Prices of FFB plant age above 20 years in Riau Province period June 2<sup>nd</sup> - 8<sup>th</sup>, 2021

No	Oil palm ages	Prices (IDR/kg FFB)
1	10 - 20 years	2.527,97
2	21 years	2.422,64
3	22 years	2.410,72
4	23 years	2.400,78
5	24 years	2.301,42
6	>25 years	2.246,77

Sources: Palm Oil Farmers Union [31]

FFB prices tend to decrease so that the decline in household income after oil palm plantations is over 20 years is an accumulation of decreased productivity and FFB prices. Based on this phenomenon with the assumption that the economic life of oil palm plants is 10 years, it can be determined the ideal age to carry out a replanting program as shown in Figure 2.

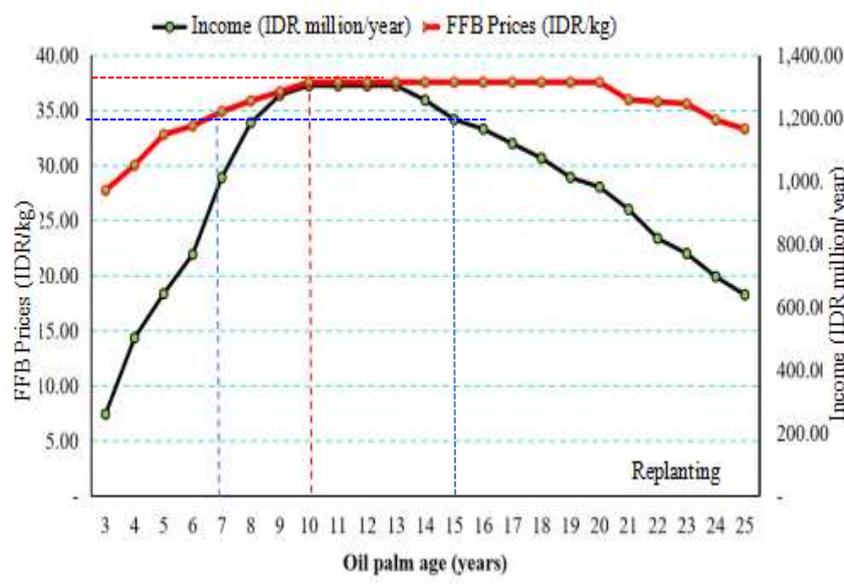


Figure 2. Relationship between Price and Oil Palm Households Income

Figure 2 shows that the peak of oil palm production occurs at the age of 10 years and after that tends to decrease but household income remains relatively stable until the age of the plant is 20 years. The decline in productivity after reaching peak production can be covered by FFB prices which tend to increase so that household incomes remain stable. That is, with the assumption that there is no fluctuation in the FFB market price, during 10 - 20 years, the household economy of oil palm tends to be stable. The ability of FFB prices to cover the decline in productivity begins to decrease after the age of the plant reaches 20 years and this is a kind of warning that households have to start preparing to rejuvenate their oil palm plantations with a tolerance period of 5 years or until the age of the plant is 25 years. Based on the descriptive analysis, the household potential of the SOPR program is presented in Table 3.

Table 3. Household Potential for Smallholder Oil Palm Replanting Program (%)

No	Variable	Villages			Ave rage
		SK	DK	PR	
1	Households Structure				
	a. Agricultural Households	52.94	92.16	66.00	70.39
	b. Non-Agricultural Households	47.06	7.84	34.00	29.61
	c. Oil Palm Households	27.45	31.37	40.00	32.89
2	The proportion of Oil Palm Replanting Households to				
	a. Total households	11.76	13.73	36.00	20.39
	b. Agricultural Households	22.22	14.89	54.55	28.97
	c. Oil Palm Households	42.86	43.75	90.00	62.00

Note: SK = Sungai Keruh, DK = Dataran Kempas, PR = Purwodadi

Generally, Table 3 does not only explain the economic structure of the village but also explains many things, including the level of dependence of the regional economy and the agricultural sector on oil palm commodities and the age distribution of oil palm plantations in the area. A comparison between villages shows that the highest dependence on the agricultural sector is Dataran Kempas Village, but it is not dominated by oil palm commodities. This is different from Purwodadi Village, although dependence on the agricultural sector is lower but is dominated by oil palm commodities. The SOPR program is estimated to have the greatest impact on Purwodadi village because the proportion of potential oil palm households to participate in the SOPR program reaches 90.00%. To strengthen this argument, we present the average age of the plant and the area of potential oil palm for replanting (Table 4).

Table 4. Composition of Smallholder Oil Palm Plantation Land by Age and Year of Cultivation

No	Variable	Villages			Ave rage
		SK	DK	PR	
1	A potential area for replanting				
	a. Year of oil palm planting	1,998	1,996	1,995	1,996
	b. Age of oil palm plantations	22.17	23.91	25.11	23.73
	c. Area oil palm plantations	2.75	3.71	2.49	2.98
2	Total areas oil plantations (Ha)	31.50	47.30	64.05	47.62
	a. Potential areas for replanting	16.50	26.00	44.75	29.08
	b. Non-potential to replanting	15.00	21.30	19.30	18.53
3	Proportion areas (%)				
	a. Potential areas for replanting	52.38	54.97	69.87	59.07
	b. Non-potential to replanting	47.62	45.03	30.13	40.93

Note: SK = Sungai Keruh, DK = Dataran Kempas, PR = Purwodadi

The proportion of oil palm plantations with potential for replanting also explains the level of uniformity in the year of planting or the age of the plant, as well as the pattern of land expansion by the community. The three villages were originally one village, namely Purwodadi Village which was later divided into 3 villages. As the parent village, the planting of oil palm in Purwodadi Village is earlier than the other two expansion villages, namely Dataran Kempas and Sungai Keruh. The difference in the three villages is then expected to be a determining factor in the magnitude of the impact of the SOPR Program on the household economy, the agricultural sector, and the region.

### The Impact of SOPR Program

The final step taken to predict the impact of the SOPR program on the three economic indicators (household economy, agricultural sector, and region) is to determine each value based on household income. In the previous discussion, there were 3 groups of households, namely households in general (region), agriculture, and oil palm with the average income for each village is presented in Figure 3.

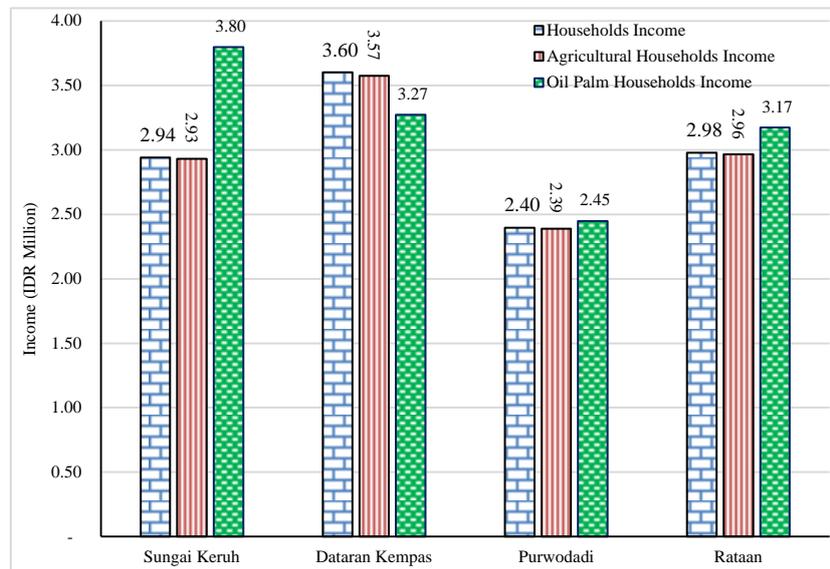


Figure 3. Average regional, agriculture sector, and oil palm households income

The higher average household income of oil palm farmers indicates that this commodity is the main choice of income source for better welfare. This is confirmed by the comparison between village areas, in Sungai Keruh Village where the majority of oil palm plantations are still in productive age, the income level is much higher than the other two villages whose oil palm plantations have entered old and unproductive age. The household income of oil palm farmers is partly sourced from old oil palm plantations (already entering the age of replanting) whose value is determined by the area, productivity level, and FFB price as presented in Table 5.

Table 5. Household Income of Oil Palm Farmers from Old Palm Oil Plants

No	Variable	Villages			Ave rage
		SK	DK	PR	
1	FFB Price from old oil palm (IDR/kg)				
	. Higest	1,533.33	1,441.11	1,510.53	1,494.99
	. Lowest	833.33	752.22	671.05	752.20
	. Average	1,183.33	1,096.67	1,090.79	1,123.60
2	FFB Production (kg/month)	2,418.31	1,640.28	2,230.88	2,096.49
3	Revenue from old oil palm (IDR/month)	2,861,667	1,798,841	2,433,424	2,364,644
4	Total oil palm households income (IDR/month)	3,797,381	3,271,029	2,447,364	3,171,925
5	Proportion of old oil palm income (%)	75.36	54.99	99.43	74.55

Note: SK = Sungai Keruh, DK = Dataran Kempas, PR = Purwodadi

As it is known that the impacts of replanting include the unproductive period of the plant which causes the production of FFB to be cut off, the continuity of the factory cannot be maintained because the supply of FFB is reduced, even the opportunity for land encroachment is quite vulnerable [32]. If it is assumed that replanting is carried out at that time, then FFB production from old oil palm plantations will stop and this means that the source of household income for oil palm farmers will be lost. This loss of income will be temporary until the replanted plants produce FFB again and is estimated to be around 3 years after replanting, so it is called temporary loss income (TLI) [33]. The high relative value of TLI with the indicator of the proportion of income from old oil palm plantations indicates a trend towards single-commodity or monoculture farming patterns in the three villages, especially Purwodadi Village. TLI is the impact of the SOPR program on the household economy of oil palm farmers (microeconomics) and then by aggregating it, the macroeconomic impact can be predicted. Predicted macro impacts are classified into sectoral impacts, namely on the agricultural sector, and regional impacts, namely impacts on the village economy as a whole. Using data and information on the economic structure of households, and the average income of each household group, it is possible to predict the impact of the SOPR program on the agricultural sector and regions (see Table 6).

Table 6. The potential TLI, agricultural sector, and regional income due the SOPR program impact

No	Variable	Villages			Average
		SK	DK	PR	
1	The proportion of households (%)				
	a. General households	100.00	100.00	100.00	100.00
	b. Agricultural households	52.94	92.16	66.00	70.37
	c. Oil palm households	27.45	31.37	40.00	32.94
	d. Oil palm SOPR Program	11.76	13.73	36.00	20.50
2	Average Income (IDR/month)				
	a. General households	2,939,796	3,600,000	2,395,100	2,978,299
	b. Agricultural households	2,929,310	3,573,684	2,387,900	2,963,632
	c. Oil palm households	3,797,381	3,271,029	2,447,364	3,171,925
	d. Temporary Loss Income	2,861,667	1,798,841	2,433,424	2,364,644
3	Income agregation (IDR)				
	a. General households	2,939,796	3,600,000	2,395,100	2,978,299
	b. Agricultural households	1,550,811	3,293,395	1,576,014	2,085,389
	c. Oil palm households	1,042,418	1,026,205	978,946	1,044,869
	d. Temporary Loss Income	336,667	246,900	876,033	484,675
4	Potential loss income of SOPR program (%)				
	a. Regional economic	11.45	6.86	36.58	18.30
	b. Agricultural sector	21.71	7.50	55.59	28.26
	c. Oil palm households	32.30	24.06	89.49	48.61

Note: SK = Sungai Keruh, DK = Dataran Kempas, PR = Purwodadi

The estimation results again confirm that the greater the dependence of a region on oil palm commodities, the greater the potential impact of the SOPR program on the sectoral and regional economy. The proportion of oil palm households, especially mature oil palms, and the cultivation pattern that is increasingly leading to monoculture, the greater the potential for sectoral and regional income losses. However, the accuracy of this prediction will depend on the data collection technique, especially concerning the household sample selection technique. The use of probability sampling and a structured randomization system is highly recommended, as well as the level of accuracy and completeness of the question items in the questionnaire. The main weakness in predicting the impact of the SOPR Program is that it is still static and has not been able to capture changes in income due to changes in FFB prices and crop productivity, as well as the diversity of household perceptions about the appropriate age for replanting. Nevertheless, this method can be used as a guide for policymakers in determining strategic policy steps in dealing with this negative impact on the economy.

#### 4. Conclusion

Based on the results of the study, it can be concluded that the estimation of the impact of the SOPR program can be carried out simply and gradually. The simplification of the stages of calculating the economic impact of the SOPR program on the household economy, the agricultural sector, and the region is summarized in Appendix 1. The socio-economic diversity of households in an area and the level of linkage to oil palm commodities are factors that determine the magnitude of the impact of the SOPR program. In areas with uniform oil palm plantations, and farming households that tend to be monocultures (single commodity), the impact of the SOPR program will be even greater. The estimation method is not dynamic yet and its accuracy is highly dependent on the data collection process including the sampling technique used and the depth of the questionnaire in digging up the required data and information. Nevertheless, this method is expected to be

one of the considerations in making strategic policies, especially in community empowerment policies to prepare households for the SOPR program.

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