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The Impact of Small-Scale Oil Palm Plantation Development on the Economy Multiplier Effect and Rural Communities Welfare

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ABSTRACT

This research aims to analyze the multiplier effect of small-scale oil palm plantations and the welfare of the community in rural areas during the first cycle. This developmental research conducted in Indonesia's largest oil plantation area, the Riau Province. Data were collected from farmers using the rapid rural appraisal technique through participatory approach. The data was analyzed to determine the regional economic multiplier number and the social welfare growth index. The results showed the magnitude of the multiplier effect index impacts the welfare index of rural communities. Oil palm farmers in rural areas have a more stable economy, and their consumption style follows the urban communities in creating an attitude of pride. The average family income of small-scale oil palm was more than five times bigger than non-oil palm farmers. In an effort to accelerate the economy in rural areas, especially in oil palm-producing areas in Indonesia, government policies related to pricing at the farm level are urgently needed to have an impact on increasing the income of small-scale farmers in rural areas.

1. INTRODUCTION

The development of the agricultural sector is rapid in Indonesia, specifically the plantation sub-sector in Sumatra and Kalimantan, where the community and business entities widely cultivate palm. The development of oil palm plantations aims to eliminate poverty and backwardness, especially in rural areas. On the other side, it also creates equity in economic development. Plantation-based agricultural development aims to improve the welfare of the community so that a change occurs in the lifestyle of the surrounding community. The successful development of oil palm agribusiness-based plantations is expected to reduce income inequality between community groups and between regions.

The 2020 Sumatra Ecoregion Development Control Center research showed that in terms of oil palm plantations, Riau occupies ±4,170,482 ha or about 46% of the total land area, as shown in Figure 1. This province contributed 24.66% or 8.72 tons to the overall palm production in Indonesia. The proportion of large and communities' plantations are 795,485 ha (19.1%) and 3,374,996 ha (80.9%), respectively. Farmers prefer oil palm because it is more profitable than other plantation crops, which creates a very high public interest.

Oil palm plantations in the Riau region have contributed to the economy regionally and nationally since the 1980s. Generally, it is between 25 to 30 years in Riau Province, while the optimal age in Indonesia is only 25 years. Based on data from the Riau Province Plantation Service, the area of oil palm plantations in terms of planting year and the potential for rejuvenation from 2021 to 2030 is 687,562 ha, with the assumption that the optimal age is 25 years. The gardens that will be rejuvenated in Riau Province are spread over ten districts/cities. The development of oil palm has entered the second cycle, meaning that the next 25-30 years should be planned for the form of rejuvenation and development by considering sustainability.

Oil palm plantation activity is an agribusiness concept that is able to provide added value and accelerate the regional economy. The development of agribusiness-based agriculture in rural areas should be able to reduce inequality between villages and cities. Syahza et al. [1] stated that the development of oil palm plantations in the Riau region has a double impact on the regional economy, specifically in creating job opportunities within and in the surrounding community. The bigger the development, the more impact it will have on the plantation sector and its derivatives workforce, as seen from the increase in the income of the farming community, thereby increasing the purchasing power of rural communities for primary and secondary needs [1]. The growth of oil palm plantations has accidentally created an entrepreneurial spirit in rural communities, eventually giving rise to traditional markets and increasing income. On the other hand, it also increases consumption patterns and public education [2].

Plantations in rural areas have opened up job opportunities for communities because companies' livelihoods are no longer limited to the primary sector but have expanded to the tertiary sector. It also contributes to several sources of income, such as traders, employees, home industries, manual laborers, fishermen, wood seekers, and carpenters [3]. The plantation business has been an alternative to changing the family

economy for the community in rural areas due to the increase in the public interest.

Previous research showed that oil palm plantations in Riau significantly impact rural economic activities, where farmers' incomes range from UD$ 4,633.37 to UD$ 5,500.32 per year. In addition, it accelerates poverty alleviation through economic development in rural areas [4]. In line with the results of research by Benedek et al. [5], local commodities have a multiplier effect on the economy in rural areas. The development of regional superior commodities can increase the welfare index of rural communities [5].

Oil palm plantations have reduced income inequality between groups of rural communities in Riau because it is one of the successful programs in empowering rural communities [6]. It is necessary to develop the concept of palm oil-based agroestate to spur economic growth and increase the economic multiplier effect [7]. Oil palm plantation activities in rural areas have an impact on accelerating the economy in a region [8].

Several research have been conducted on developing oil palm plantations and institutions. Institutional arrangement for regional economic acceleration, specifically for superior commodity farming, is expected to be able to formulate a model that can create added value for plantation business actors and produce derivative products [9]. Plantation in the future will no longer only spur added value but is also able to create sustainable development [3, 10, 11]. Therefore, this sector needs consistently licensed activities to maintain sustainable development [12]. The results of previous research comprehensively and specifically review regional economic empowerment through institutional arrangements and sustainable-based plantation [13-16]. Various research have also been carried out on institutional regulatory strategies [17-22]. Developing the concept of agriculture-based entrepreneurship in villages is a strategy to improve the rural economy [23]. Sustainable agricultural development is a concept of green energy development and climate change [24]. Therefore, to accelerate the economy, it is necessary to create downstream industries from various commodities, inseparable from land resources [25-34].

It is imperative to note that plantation commodities are Indonesia's mainstay of non-oil exports, specifically palm oil [35]. Therefore, a form of policy is needed to face the second cycle of oil palm development without ignoring environmental balance, specifically in peatland areas. Plantation activities promote increased value produced by farmers, specifically communities on peatlands, through agribusiness. Companies and local governments have empowered rural community economic institutions and organizations by developing productive business activities based on sustainability. The results of previous research, for the future the development of oil palm must prioritize institutional arrangements at the farmer level, especially the development of the downstream industry of palm oil and its derivative products. The policy is to encourage increased economic added value and efforts to accelerate community economic development [36]. Development of oil palm for the second generation must consider the concept of sustainable development in the plantation sector [37].

However, there are still small-scale plantations that have not been identified, specifically ownership of less than 10 ha. This is in accordance with the age of oil palm plantations ranging from 25 to 30 years, which will require a fairly high investment in the future. For this reason, it is necessary to analyze preparation for rejuvenation in the next cycle. Based on the potential and area of replanting of oil palm, this study aims to predict the economic multiplier effect and the level of welfare of people in rural areas.

These results are in accordance with the creation of small-scale oil palm plantations, which are expected to formulate a model capable of creating added value for plantation business actors to produce derivative products with high economic value. Therefore, plantation development in the future will no longer only spur added value but also create sustainability.

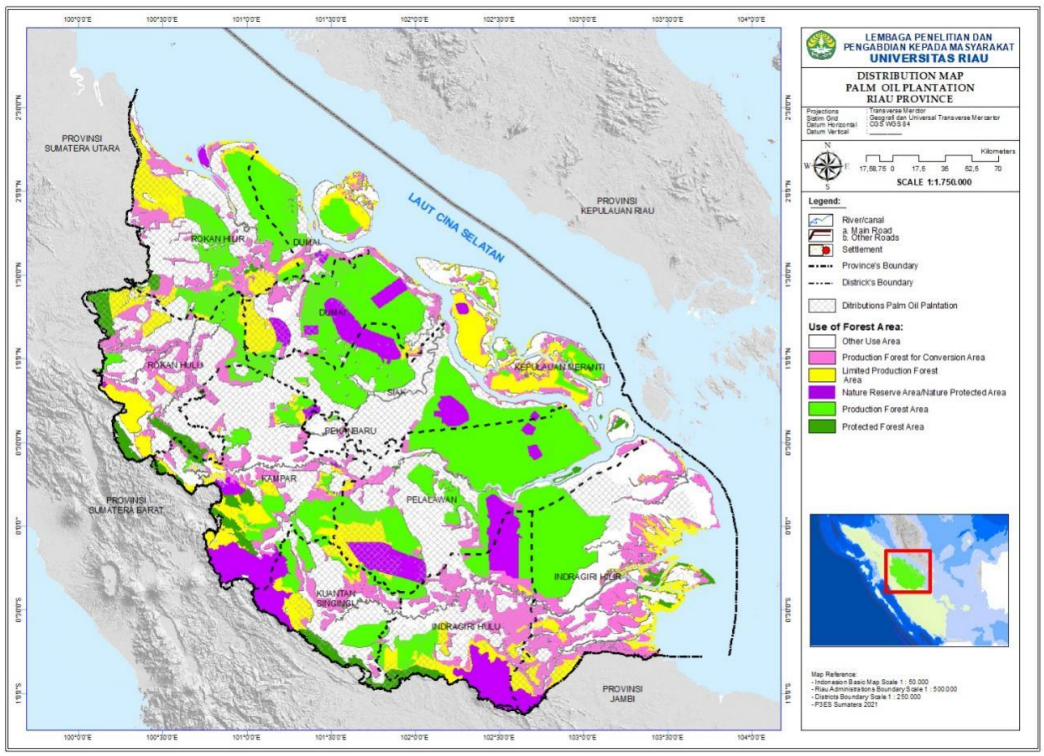

Figure 1. Reconciliation map of oil palm plantation coverage in Riau Province

2. RESEARCH METHODS

This is developmental research with data collected through the survey method. Developmental research is to investigate patterns and sequences of growth or change as a result of development policies. The data needed are primary and secondary data. Primary data comes from small-scale farmers and palm oil business actors. Information from oil palm farmers was obtained using a list of questions that had been prepared based on research needs. Secondary data were obtained from related agencies and from palm oil companies. The information needed is in the form of policies by local governments and plantation companies.

This research was carried out in two locations, namely the mainland and coastal Riau regions. The mainland or western part comprises Kampar, Rokan Hulu, and Kuantan Singingi Regencies. Meanwhile, the coastal or eastern part includes Pelalawan, Siak, Bengkalis, Indragiri Hilir, Indragiri Hulu, and Rokan Hilir Regencies.

The rapid rural appraisal (RRA) method designed by Alam and Ihsan [38] and McCracken et al. [39] to obtain general information and assessment in the field within a limited time was used in this research. The information collected using this method is limited to the research objectives. A preliminary analysis was also carried out by conducting interviews with respondents. When an error is found due to misinterpretation, the source of information is confirmed to obtain a complete analysis. Confirmation of errors is carried out on the existence of data and information that deviates from the research target. Furthermore, re-interpretation is carried out to correct this biased information.

The approach to creating a multiplier effect on the development of oil palm plantations is carried out using the following formula [35].

$$K = \frac{1}{1-(MPC \times PSY)} \quad (1)$$

Note: K denotes the regional economic or multiplier effect. MPC is the proportion of farmers' income spent in the area, and PSY represents the share of farmers' expenditures that generate income in the area or the percentage of the needs for oil palm plantation activities that the local area can meet. The higher the multiplier effect of oil palm plantation activities, the greater the velocity of money in rural areas.

In order to determine the welfare level of rural communities, specifically around the development of oil palm plantations, testing is carried out using the following formula [6].

$$G = w_1 g_1 + w_2 g_2 + \cdots + w_i g_i \quad (2)$$

where, G denotes the social welfare growth index, g_i is the i^{th} quantile social growth rate, and w_i is the welfare weight of the quantile group.

The increase in the welfare of rural communities due to the oil palm plantations development in the Riau region is indicated by the increasing value of the welfare growth index (G) from one period to another.

3. RESULTS AND DISCUSSION

3.1 Palm oil as the main commodity

Of the 16.3 million ha of plantations covering Indonesia, 6.72 million ha are owned by farmers, large private estates 8.68 million hectares and large national companies covering 0.98 million hectares [40]. This country produces 51 million tons of national CPO and generates a foreign exchange of US$22.97 billion. It also contributes positively to GDP with 16.2 million direct and indirect workers as well as 2.4 million farming families. The existence of plantations has provided job opportunities and business opportunities for the surrounding community, therefore, oil palm plantations deserve to be a superior national commodity.

Riau Province has the largest oil palm plantation in Indonesia, reaching 4.2 million ha, 20.6% of the total area, followed by North Sumatra, West Kalimantan, Central Kalimantan, etc. The Riau Provincial Government has developed the agricultural sector, specifically the plantation sub-sector, as an alternative to rural economic development by manufacturing oil palm as the primary commodity. There are several reasons why the Riau Regional Government prioritizes oil palm [11]. Firstly, from a physical and environmental point of view, the Riau condition allows for the development of oil palm plantations. Secondly, the soil conditions allow for higher productivity than in other areas. Thirdly, from a marketing perspective, this province is strategically located in Singapore's international market. Fourthly, Riau is a development area for Western Indonesia with the cooperation between Indonesia Malaysia Singapore Growth Triangle (IMS-GT) and Indonesia Malaysia Thailand Growth Triangle (IMT-GT), thereby creating more profitable market opportunities. Fifthly, based on the results that have been achieved, oil palm provides higher income to farmers than other plantation crops.

The development of oil palm plantations in Riau brought significant changes to the rural communities, such as an increase in migrants because the plantation was initially associated with the transmigration program. In addition, this sector also stimulates the growth of processing industries whose raw materials are palm oil, and it is one of the causes of high population mobility in Riau [36].

Palm oil is one of the important and strategic commodities due to its large role in encouraging the communities' economy, specifically for plantation farmers. This is because most of Indonesia's territory is suitable for plantation agricultural development. Widiati et al. [10] stated that farmers prefer oil palm because it is more profitable than other plantation crops, thereby creating a high public interest in this commodity.

The development of oil palm plantations significantly impacts the regional economy, particularly in creating employment opportunities. For instance, it has provided a trickle-down effect, which has positively affected the workforce of the surrounding community. This impact can be seen from the increase in the farming community income, with the rise in the purchasing power of rural communities, both for primary and secondary needs.

The potential of the plantation sub-sector, specifically oil palm, to become a future mainstay of exports and a source of foreign exchange is feasible. The only prerequisite required is improving and refining its business climate and market structure from the upstream to downstream sectors. This is because export performance cannot be better when production activities in the upstream sector, trade patterns, and distribution of domestic plantation commodities are still experiencing many obstacles and price distortions.

The most effective and efficient way to empower the community economy is to develop activities that are the

economic life foundation of the majority, such as agribusiness. National economic development prioritizes agribusiness development due to its importance in empowering the community and the national economy. In Indonesia, this sector allows other market commodities to compete with it in the era of free trade. The government policies on the agribusiness sector development at the macro level need to be accompanied by micro efforts, hence, its benefits can be enjoyed by the community. Past experience has shown that the large contribution of the agribusiness sector to the national economy has not been followed by an adequate increase in farmers' income. In an effort to empower the people's economy, support for the development of the agribusiness sector nationally needs to be accompanied by a mechanism that guarantees that the benefits of development can be enjoyed by the people.

The success of oil palm plantation activities in rural and surrounding areas will further develop other aspects of activities such as 1) market, 2) services, 3) cooperatives, 4) transportation, 5) education and health facilities, 6) service function facilities, and 7) organizations and institutions. In addition, the increase in farmers' income due to success in a plantation will increase community purchasing power, thereby stimulating the growth of other activities. The increase in farmers' income will increase their awareness, specifically regarding the importance of environmental sustainability, thereby ensuring the balance of ecosystems sustainably.

3.2 Economic multiplier effect analysis and famer welfare index

The development of the plantation sub-sector in Riau leads to an increase in the economy of rural communities, followed by a rise in purchasing power and consumption patterns. Components of expenditure for farmers' living are basic needs, such as transportation, recreation, and education. Transportation costs in coastal areas, are relatively high because it is mostly by water. In contrast, education cost increases due to farmers' awareness of the importance of sending their children to school.

All forms of expenditure by farmers, whether routine or for garden maintenance, can be obtained from district and village markets, shops, cooperatives, and vendors. Production facilities' generally use tools produced in home industries, thereby leading to an increase in money circulation in rural areas. The calculation of the welfare index and the multiplier effect (ME) of several plantation commodities in coastal areas are presented in Table 1.

Table 1. Welfare index and economic multiplier effect (ME) of some leading commodities in rural areas

Description		Years			
		2016	2018	2020	2022
Welfare Index		0.38	0.26	0.24	0.56
Economic Multiplier Effect	Palm oil	2.82	1.93	1.87	2.11
	Rubber	0.43	0.51	0.54	-
	Coconut	2.07	1.42	1.48	-
	Cocoa	1.53	1.70	1.82	-
	Coffee	1.46	1.62	1.70	-
	Sago	1.72	2.28	2.33	-

Source: Syahza et al. [35] (2018), Result (2022)

The ME index for palm oil from 2016 to 2020 has a downward trend, meaning that the economic acceleration in rural areas is slower even though the ME figure is more significant than one. In 2020 the ME index was 1.87, meaning that for every $1 investment, the money supply was $1.87 due to government policies prohibiting the opening of new plantations. Meanwhile, in 2022, the economic multiplier effect in rural areas increased to 2.11, while the welfare index for rural communities was 56%. This condition raised the money supply in rural areas and increased the community purchasing power. It also impacts the community's purchasing power, thereby increasing the mobility of goods due to the implementation impact of the oil palm plantations' rejuvenation.

Table 1 shows that the welfare index of rural communities is always positive, with commodities at 38% (0.38), 24% (0.24), and 56% (0.56) in 2016, 2018-2020, and 2020-2022, respectively. According to Domański and Gwosdz [41], the multiplier effect figure provides an overview of the success of both regional and national development.

The economy of oil palm farmers is well established, therefore, their consumption patterns have followed the style of the urban community, with the emergence of a demonstration effect. This is in line with the theory proposed by Friedmann and Douglass to change rural areas by introducing urban elements, which discourages villagers from migrating to cities. Investing in rural areas suppresses urbanization and changes rural settlements into a mixed form called agropolis or cities in the fields. According to Syahza and Asmit, the effective use of an existing workforce by directing resource development efforts in each agropolitan district increases agricultural yields [11].

The development of oil palm plantations has created entrepreneurial abilities for farmers who utilize business opportunities in the agricultural sector, specifically the plantation sub-sector. This is evidenced by developing a market-oriented modern farmer character with an entrepreneurial spirit capable of analyzing future opportunities. Asmit and Koesrindartoto [2] stated that oil palm farmers who have already developed farming are 1) growth-oriented, 2) innovative, 3) self-confident, 4) have a sense of personal control of the business, 5) risk-takers, and 6) cooperative.

Oil palm plantation has increased the money supply in rural areas, leading to the need for communities to establish an institution that handles the welfare of those directly or indirectly involved in this activity and help save their money. Banking institutions in the research area serve the public in terms of finance, saving, and borrowing money. The institutions formed were credit banks (BPR), village unit banks in the form of Bank Rakyat Indonesia (BRI), and unit banks in district capitals or sub-branches of other government banks such as Bank Riau Kepri, Bank BNI, Bank Mandiri. According to Mehsen et al. [42], security risk management techniques is needed when building economic institutions in rural areas to increase the chances of success. Security risk management is advantageous for institutions as it sets specific risk objectives based on achieving economic success in rural areas.

Employment and business opportunities that are increasingly expanding with the development of plantations are also the cause of the banks' existence, therefore, entrepreneurs or the community, in general, can borrow money to manage their businesses. Cooperatives are one of the economic institutions in rural areas that the community increasingly needs. This is evident in Riau Province, specifically in the plantation area and the center of economic growth. The main function of cooperatives in rural areas is to provide and distribute agricultural production facilities,

community consumption needs, savings, loans, and transportation. The various activities that have been and are being carried out by these cooperatives can develop and improve cooperatives, which are marked by their increasing assets and finances. Results of research by Harto, stated that business development in rural areas needs support from the government through communication networks which will lead to community participation [43].

Oil palm plantation activities require direct unskilled labor and technical personnel in their management. The workforce recruited from the surrounding community, such as technical workers, is taken from the village community around the plantation development to help absorb a lot of direct labor because it is generally carried out manually.

Preparation for plantation development, specifically the procurement of infrastructure facilities, will lead to higher community activity and mobility. These activities also impact the construction of a road network capable of increasing community mobility and assisting in marketing their agricultural products. Moreover, the needs of the community living in rural areas can be met by agricultural products. Cooperation with local communities in procuring plantations is one of the positive impacts on increasing business opportunities for the surrounding community.

The early stages of plantation development require direct labor and management personnel. Gradually, the need for energy every year continues to increase in line with the development activities. Agricultural development in rural areas, with other sector activities that involve much labor and relatively large investments, is expected to positively stimulate, to grow and create jobs and business fields through economic activities that produce goods and services needed during the development (backward linkages) and post-development (forward linkages) processes.

Based on the scope/package of work planned, backward linkages expected to emerge include construction and transportation services, trade in food and clothing, as well as work equipment and materials. Meanwhile, forward linkages that are expected to appear are transportation and trade services.

When analyzing the cost structure of plantation activities, where the technical operations are designed to use more manual techniques, the costs related to direct labor and technical personnel in the field have a fairly large portion of 76% of the total annual financing. This money circulation in the long term is expected to stimulate economic growth in this region with the rise in trade and services. This means that it provides a multiplier effect, specifically in providing employment and business fields.

3.3 Development of FFB prices and welfare of oil palm farmers

The acceptance of oil palm farmers is highly dependent on the age of the plant. The higher the age of the plant (optimum age 10-25 years) indicates the higher content of palm oil and palm kernel, namely 21.87% for palm oil and 5.10% for palm kernel. The high content of palm oil produced by farmers will affect the price of fresh fruit bunches (FFB) received by farmers.

The price of FFB set by the nucleus company or the palm oil mill is guided by CPO in the international market. It is based on a mutual agreement determined by the Team for the Assessment and Determination of the Purchase Price of FFB (ADPP-FFB) for Riau Province Farmers' Production. This team consists of representatives from each company, oil palm farmer associations, smallholders, and government.

Table 2 shows the average price of FFB per semester based on the prices set by the ADPP-FFB Team. The table shows the price level received by farmers based on the age of the oil palm plantations. Therefore, the determination of the price set by the team directly impacts the acceptance of oil palm farmers, specifically those participating in plasma from four large plantation companies.

Table 2. Average FFB price development during 2020-2021 based on FFB pricing team at provincial level (in IDR)

Month	2020			2021		
	Sumut	Riau	Kalbar	Sumut	Riau	Kalbar
January	2,100.58	2,152.96	1,972.91	2,225.35	2,223.22	2,170.10
February	1,877.19	1,915.42	1,962.76	2,200.73	2,175.79	2,097.23
March	1,660.20	1,676.48	1,587.91	2,366.50	2,338.33	2,193.99
April	1,729.20	1,816.18	1,636.47	2,396.58	2,369.00	2,226.48
May	1,431.49	1,488.66	1,416.38	2,538.11	2,589.32	2,393.35
June	1,634.76	1,519.04	1,333.13	2,278.41	2,388.01	2,361.09
July	1,655.57	1,626.79	1,493.54	2,348.83	2,321.60	2,113.63
August	1,935.08	1,968.29	1,772.73	2,800.65	2,721.42	2,563.23
September	1,776.36	1,810.48	1,907.88	2,831.57	2,799.02	2,677.40
October	2,009.35	2,021.83	1,965.02	2,890.67	2,944.33	2,734.27
November	2,115.74	2,124.86	2,050.45	3,194.52	3,123.39	2,931.94
December	2,161.89	2,180.09	2,101.23	3,119.15	3,063.36	3,006.91

Table 3 shows the analysis results of oil palm farming revenues from the survey in 2022. The calculation indicates that the average income of plasma and independent smallholder families at a monthly rate of IDR 5,730,398 (85.39%) and IDR 980,272 (14.61%) comes from oil and non-oil palms, respectively. Therefore, the total monthly income of oil palm farmers is IDR 6,710.670 or IDR 80,528.040 per year. It is assumed that the exchange rate of the rupiah against the dollar is UD $ 1 = IDR 14,000, then the income of a farmer's family is UD $ 5,592 per year.

In 2018, the income of plasma farmers was higher than independent smallholders. The factors causing the high-level income of oil palm farmers in 2022 include their dependence on their gardens, as proven by the contribution of oil palm income to the family by 85.39%. Secondly, farmers are partners in product processing companies, which makes them always receive guidance from the core company regarding plantation management. Thirdly, the price received by plasma farmers is quite high compared to the independent smallholder level.

Table 3. Comparison of oil palm farming income of plasma with independent smallholders at optimum age (Rp) in 2022

Description	Plasma Farmer		Independent Smallholders		Average	
	Plasma (IDR)	%	Independent (IDR)	%	Income (IDR)	%
Palm Income	4,606,564	87.23	6,854,233	84.20	5,730,398	85.39
Non-Palm Income	674,488	12.77	1,286,056	15.80	980,272	14.61
Total income	5,281,051	100.00	8,140,289	100.00	6,710,670	100.00
Expenditure	3,136,374	59.39	3,507,804	43.09	3,322,089	49.50
Savings	2,144,677	40.61	4,632,485	56.91	3,388,581	50.50
Average ownership (ha)	2.27		3.09		2.64	
Productivity	964.47		1,024		996.33	
Income per year	63,372,614		97,683,465		80,528,040	
Income per hectare	2,329,075		2,637,387		2,506,814	
Assuming $1=IDR 14,400	4,401		6,784		5,592	

However, with the Minister of Agriculture's pricing policy since 2018, the FFB price at the independent smallholder level is relatively the same for plasma farmers. This is because 1) independent smallholders use superior seeds, 2) farmers utilize organic fertilizers, which are relatively low and sustainable, 3) farmers' productivity has increased due to the seriousness of garden maintenance, and 4) the involvement of independent smallholders in the pricing team. The development of the average FFB price per semester from 2018 to 2022 is shown in Figure 2.

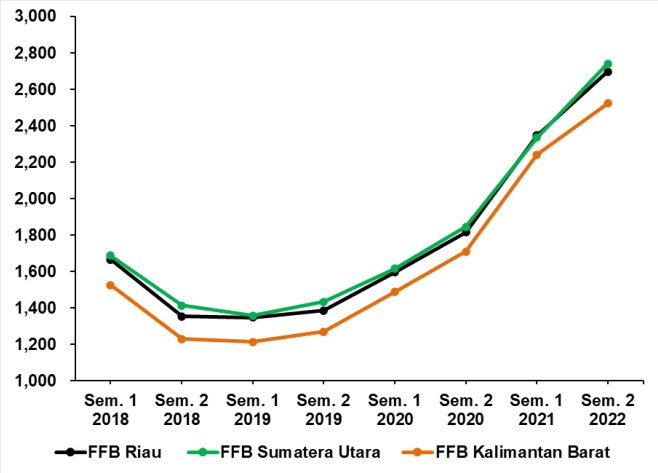

Figure 2. Development of average FFB prices per semester for the year 2018-2022

The development of plantations in rural areas has opened up job opportunities for the inherent communities, thereby preventing their livelihood from being limited to the primary sector in meeting the needs of families. Several sources of income contribute to this expansion, namely traders of daily goods, such as rubber, transportation tickets, and ice sellers, as well as employees, teachers, and village government. Others include home industries comprising tofu, bread, and tile printing industries, manual labor, fishermen, woodworkers, and carpenters.

According to Muda and colleagues, the progress of business entities in rural areas needs to be supported by the participation of the community and their members to avoid obstacles and ineffective lending strategies [44]. Results of research by Abdullaev et al. [45], stated that developing business entities and economic institutions in rural areas is essential to provide digital services. Furthermore, the government must support the introduction of information technology to provide electronic services for rural communities, specifically commercial organizations, to increase time and cost efficiency. Results of research by Febryani et al. [46], reported that rural economic institutions have succeeded in having a positive impact on improving the village economy and community welfare. Moreover, institutional activities impact the decreasing level of the consumptive community, thereby increasing the productive community.

In general, it can be stated that the existence of plantation areas has led to the emergence of new varied sources of income. Previously, the income sources of the community were relatively homogeneous and depended on the primary sector for their lives while using available natural resources without significant technology. Field data revealed that the community lives in the agricultural sector as farmers of food crops and plantations, such as rubber. In the community around the river, their daily livelihoods are generally fishermen and wood seekers in the forest who use old and monotonous technology. The business orientation is also limited to meeting family needs for the next one or two days without a clear development plan. The increasing price of FFB motivates garden maintenance and impacts garden productivity.

Plantation development activities have resulted in high population mobility in the surrounding areas with the emergence of centers of economic growth in the countryside. This condition causes an increase in the purchasing power of rural communities, specifically for routine household and oil palm plantation facilities. The results of previous research by Faizal and Ateeb [47], stated that oil palm farming provides a new energy source for human life because the market potential is very open.

When examined from the cost structure of oil palm plantations whose operational technicalities are designed to use more manual techniques, the costs of direct labor and technical personnel in the field are fairly large. Therefore, the money circulation in the long term is expected to stimulate economic growth in this region with the rise in trade and services. This means that the associated activities in rural areas create a multiplier effect, specifically in employment and business opportunities. The high multiplier effect index in rural areas also contributes to FFB prices at the farm level.

Oil palm plantation development involves many workers and relatively large investments for the downstream industry, and it is expected to stimulate, grow, and create employment and business opportunities. Therefore, activities such as construction, farm labor, transportation, food, and clothing, as well as trade-in work equipment and materials are needed. Post-harvest economic activities and the production process will have forward linkages, which are expected to emerge in the service sector, such as transportation, hotels, cooperatives, banks, trade, and small rural industries that produce agricultural equipment.

Table 4. Calculation of the welfare index for oil palm farmers in the Riau Region in 2016, 2018, and 2022

Income Group	2016[1]		2018[1]		2022[2]	
	w	g	w	g	w	g
Lowest 20%	0.1098	0.0029	0.1019	0.0079	0.0986	-0.0033
Second lowest, 20%	0.1387	0.0160	0.1563	0.0176	0.1267	-0.0296
The third lowest, 20%	0.1802	0.0039	0.1770	0.0032	0.1908	0.0138
Fourth lowest 20%	0.2265	0.0068	0.2138	0.0127	0.2265	0.0127
20% of the highest income	0.3448	0.0160	0.3410	0.0038	0.3573	0.0163
Welfare Growth Index	0.38		0.26		0.73	

Sources: 1) Syahza et al., 2018; 2) Survey Results, 2022

Table 4 shows the calculation of the oil palm farmers' welfare in rural areas since 2016, with a 0.8 growth in Riau, which is a 0.38% rise from the previous period. The Welfare Index increased by 0.38, 0.26, and 0.73 in 2016, 2018, and 2021, respectively, and is always positive, meaning that developing oil palm plantations in rural areas provides prosperity regularly. However, there has been a decline for those in the 40% low-income group, meaning that small-scale farmers lack capital for their farming development, specifically related to garden treatment and care. On the other hand, 60% of the highest-income group experienced a relatively high increase in welfare, which is supported by plantation productivity and relatively high prices.

The price of FFB at the farmer level increased from IDR 2,000 to 3,000 in 2022 due to the growth in the welfare index of oil palm farmers by 0.73 (73%). This growth was only enjoyed by the highest 60% group income of 113.37%, while the remaining 40% experienced a decrease of 40.69%.

According to observations, oil palm plantation development has a positive and beneficial external effect on the surrounding area. These include 1) Expanding employment and business opportunities, 2) Improving the welfare of the surrounding community, and 3) Contributing to regional development. Indonesia is an agrarian country with oil palm plantation commodities that produce vegetable oil, main food, and energy sources as economic added value [47].

Some of the activities that directly impact the components of the rural economy and the culture of the surrounding community include: 1) Village resource development, 2) design of infrastructure facilities such as roads, 3) Absorption of local labor, 4) Extension of agriculture, health, and education, and 5) Payment of the company's obligations to the state, such as taxes and other compensation costs. In the long term, Indonesia's plantation sub-sector strongly impacts national and local income [48]. This benefits the country's fiscal revenue and a regular income stream for many large and small-scale farmers [49]. This sector also contributes to the national economy by supporting the livelihoods of rural communities because it has a more secure market potential than other crops [35].

4. CONCLUSION

The Riau Provincial Government is developing the agricultural sector, especially the plantation sub-sector, as an alternative for rural economic development. The commodity being developed is palm oil as the main commodity. Palm oil commodity is a leading and strategic commodity for the rural economy in Riau Province. Oil palm farming plays a significant role in encouraging the community economy, specifically for small-scale farmers. The development of oil palm plantations has provided a trickle-down effect for accelerating the rural economy. In addition, oil palm farming activities in rural areas have opened up job opportunities for associated communities, hence, the livelihoods of the locals are no longer limited to the primary sector but have expanded to the tertiary sector.

Oil palm plantation activities directly influence the socio-economic and cultural components of the surrounding community. Providing positive or beneficial external influences on the surrounding area. This influence can be seen in: increasing the welfare of the surrounding community, expanding employment opportunities, creating business opportunities, and contributing to regional development

The novelty of this research is the evidence that plantation development and oil palm farming activities can accelerate the economy of rural communities both regionally and nationally. Therefore, oil palm has provided welfare for small-scale farmers in rural areas. The success of the first generation of farming became a lesson for the development of oil palm in the second generation, namely prioritizing the concept of sustainable development in the plantation sector.

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