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MITIGATION OF FARMERS' HOUSEHOLD ECONOMIC PROBLEMS DURING THE PALM OIL REPLANTING PERIOD

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ABSTRACT

This research aimed to analyze the readiness of oil palm farmer households in the context of mitigating potential economic problems during the oil palm replanting period. This research used a qualitative approach. The method used is a combination of field experiments and surveys using the Community Based Participatory Action Research (CB-PAR) approach. Participants were oil palm farmers in Dataran Kempas Village. Data collection used a questionnaire, interviews and observations were carried out to strengthen the analysis of the questionnaire results. Analysis of the questionnaire data used descriptive analysis. Data triangulation used to validate the research result. The research results showed mitigation of potential economic problems, especially the decline or loss of family income during the oil palm replanting period. Most farmers do not have a side income other than oil palm. Some farmers also stated that they are ready to carry out the oil palm replanting process, but they still have potential problems with funding sources if they do it independently. Community empowerment programs and strengthening business groups need to be carried out through collaboration with the government, universities, and companies. This program will impact the availability of job opportunities, increase village economic activity, and increase BUMDES activities. Other benefits can also be obtained by the village, including encouraging the creation of organic agricultural cultivation, increasing environmental awareness.

KEY WORDS

Farmers, mitigation, economy, palm oil, household.

The agricultural sector is the only sector that does not experience contraction during the 2020 pandemic in Indonesia. Although it has decreased compared to 2020, in 2021, the agricultural sector has a strategic role in the Indonesian economy. Agriculture is the second biggest pillar as the engine that drives the Indonesian economy. Throughout 2021, the GDP of the agricultural sector grew by 1.84% at constant prices compared to the previous year. This growth is still lower than before the Covid 19 pandemic (Ministry of Agriculture, 2022). However, this sector is still more substantial than other sectors in facing the turmoil of changing economic conditions during the pandemic. The agricultural sector remains a recession cushion while still showing positive growth.

In Jambi Province, the economic structure is still dominated by the primary sector, namely the agricultural sector and the mining sector. During the 2016 to 2020 period, Jambi Province's economy grew an average of 4.66% at current prices or 3.22% at constant prices (BPS Jambi Province, 2021). The agricultural sector still provides the largest contribution and

continues to increase even in 2020 when other sectors experience contraction. In the agricultural sector, the sub-sectors that contributed the most to the GRDP of the agricultural sector in 2020 were plantation crops (62.97%), followed by horticultural crops (11.76%), fisheries (8.2%), food crops (7.09%), and livestock (4.53%) (Ministry of Agriculture, 2022).

Palm oil has become the flagship for the agricultural sector of plantation crops for the last few years. However, oil palm governance still has various problems, one of which can be seen from the farmers' point of view. Oil palm farmers, especially smallholder farmers, face the problem of potential loss of income when oil palm has entered the age of no longer productive. This period usually occurs when the oil palm has reached the age of 20-25 years. At this time, the level of oil palm productivity has decreased. This decrease is indicated by the yield of fresh fruit bunches is no longer as much as in the productive period. In this condition, farmers are faced with deciding to replant oil palm plantations or maintain less productive oil palm plantations.

Oil palm replanting for smallholders can potentially eliminate the source of household income for oil palm farmers due to the cessation of fresh fruit bunches (FFB) production. However, the temporary loss of income can last for several years. This period can occur between 3-4 years, calculated from the preparation period for planting until the oil palm enters the early harvest period.

During the oil palm replanting period, farmers also face the risk of losing a source of feed for their livestock. Oil palm plantation land that has been a grazing area and a source of forage for animal feed will be lost because land clearing and replanting will cause changes in the land ecosystem. Young oil palm land cannot be used as grazing land because it is still vulnerable to damage. Sources of animal feed originating from young oil palm fronds also cannot be as intensive as productive palm trees. Forage sources for animal feed are becoming less and less. This also has the potential to reduce livestock income.

Therefore, it is necessary to mitigate alternative sources of income for farming families. Alternative substitutes can be from the agricultural or non-agricultural sectors. The development of business opportunities in the agricultural sector is a priority, mainly seasonal crops such as food and horticulture, vegetables, and non-plant commodities such as livestock and fisheries. This is related to rural household life, which is dominant in the agricultural sector so that adaptation will be easier, and related to efforts to utilize land resources between plantations resulting from replanting and a fairly large yard of land.

This article aims to analyze and explores strategies for oil palm farmers to mitigate the decline in family income during the oil palm replanting period. This mitigation is very important because almost all oil palm smallholders, especially smallholders, will face the same potential problems. Various mitigation programs need to be considered to strengthen the economy of smallholder families during the oil palm replanting period.

LITERATURE REVIEW

Agroindustry or the agricultural industry affects many local and international economic sectors, from farmers to supermarkets and restaurants, so it is important to understand what is happening in these industries and how it will affect food production and distribution (Team Linchpin, 2022). The agroindustry also absorbs a significant workforce in Indonesia. However, the agricultural sector is still faced with various problems and challenges at the micro and macro levels. At the micro-level in the form of land tenure and capital limitations, inefficiency in the use of other production facilities, low levels of innovation adoption, limited human resources, and agricultural institutions in the field. These problems and challenges at the micro-level have an impact on the low productivity of certain agricultural commodities, including several leading commodities in the agricultural sector. At the macro level, the problems and challenges faced are environmental impact claims caused by the expansion of agricultural commodities, product competitiveness in national and global markets, and barriers to product trade.

The global agricultural industry is facing its greatest changes post-war, from shifting consumer preferences to technology-enabled productivity gains to domestic and international

market turmoil (Djanian and Ferreira, 2020). The development of this agroindustry business increases the added value of agricultural products and is also expected to create food self-sufficiency and spread development widely to every household so that it can overcome the turmoil of poverty, which tends to continue to increase (Arifin, 2016). To realize the development of agroindustry in each agricultural center village, serious efforts are needed to design and realize it gradually. Competitiveness in achieving business performance is influenced by the effectiveness of value chain management (Nurimansyah, 2011) and even becomes the key to competitive advantage in an industry. Kaplinsky and Morris (2002) explain that the value chain can be described as the totality of activities required to bring goods or services from the design site, through the various phases of production (involving physical transformation and inputs from various service providers), delivery to the final consumer, and recycling after use. Agroindustry entrepreneurs must develop ecopreneurship to be able to deal with these changes. Kaplinsky and Morris (2002) explain that the value chain can be described as the totality of activities required to bring goods or services from the design site, through the various phases of production (involving physical transformation and inputs from various service providers), delivery to the final consumer, and recycling after use. Agroindustry entrepreneurs must develop ecopreneurship to be able to deal with these changes. Kaplinsky and Morris (2002) explain that the value chain can be described as the totality of activities required to bring goods or services from the design site, through the various phases of production (involving physical transformation and inputs from various service providers), delivery to the final consumer, and recycling after use. Agroindustry entrepreneurs must develop ecopreneurship to be able to deal with these changes.

Ecopreneurship is "an existential form of business behavior committed to environmental sustainability." Ecopreneurship can be interpreted as one way of the final form of existentialism, an effort to deal with the tremendous environmental losses caused by the high level of human consumption of limited resources. (Isaak, 2016). Ecopreneurship comes from the combination of two words, namely Eco and Entrepreneur. Eco comes from the word ecological, which means studying the reciprocal relationship between living things and their environment (Resosodarmo et al., 1986). Preneur comes from entrepreneurship, namely entrepreneurship, which means creator opportunity and business manager. Ecopreneurs are entrepreneurs who innovate in creating and selling environmentally friendly products or services, for example, Farming and organic food, recycling to green construction. Entrepreneurship is not only related to business activities. Saragih (2017) explains that entrepreneurship reflects the ability and willingness to be innovative, creative, and adaptive in facing change challenges.

The existence of ecopreneurs is trying to contribute to and support the industry to create a healthier and more comfortable environment for sustainable development in the long term (Kainrath, 2011). The central concept of ecopreneurship is to change the paradigm of business actors from doing economic business that is oriented only on profit to the orientation towards environmentally-friendly goals by trying to change the market, industrial, and social arrangements to become more environmentally friendly so that they can be run in the long term. Ecopreneurs, in their business products, carry out four main principles, namely Reduce (reduce), Reuse (Reuse), Recycle (recycle), and Upcycle (give new benefits). Ecopreneurs are also adaptive to important issues currently developing, including the use of water resources,

Environmentally oriented entrepreneurship (ecopreneurship) is a crucial step to reducing pollution and preserving nature. Ecopreneurship also supports the Green Growth Program, which has become the commitment of the Indonesian government. Ecopreneurs are entrepreneurs who innovate in creating and selling environmentally friendly products or services, for example, cultivation and organic food, recycling to green construction (Isaak, 2016). Organic-based Smart Agriculture can be said as a form of implementing ecopreneurship.

Smart agriculture is technology-based agriculture, and the farmer's decision to adopt is not dependent on socio-demographic characteristics but rather on the perceived benefits of

the new technology, a key factor (Takagi et al., 2020). Another form is to implement a mixed farming system, such as the pattern of intercropping and intercropping when oil palm is still not productive. When palm oil is produced and is no longer disturbed by the presence of livestock, the integration system of oil palm and livestock is also an alternative to increase income for smallholder oil palm farmers. Based on this classification, according to the regional development strategy, it is hoped that new livestock growth centers will be created.

METHODS OF RESEARCH

This article was written based on superior and innovative postgraduate research results at Jambi University, which is multidisciplinary. The activity location is Dataran Kempas Village, Tebing Tinggi District, Tanjung Jabung Barat Regency, Jambi Province, which is about 20 km from the capital of Tebing Tinggi District, 130 km from Kuala Tungkal (district capital), and 140 km from Jambi City (provincial capital). The method used is Community Based Participatory Action Research approach, known as CB-PAR (Community Based Participatory Action Research). CB-PAR is a collaborative research approach involving all stakeholders throughout the research process, from setting research questions and developing data collection tools to analyzing and disseminating findings (Burns et al., 2011). CB-PAR is a research framework that aims to address people's practical problems in a community and fundamentally change the role of the researcher and who is being researched.

The data collected in the study consisted of primary data obtained through field experiments, institutional socio-economic surveys, and secondary data obtained from the exploration of group and village records. The institutional socio-economic survey uses a questionnaire. The questionnaire was designed according to the need to explore the household economic readiness of oil palm smallholders. Closed questions are designed in three choices, namely (1) "yes" and "no" answers; (2) answers using a five-point Likert scale ranging from "strongly disagree" to "strongly agree," and (3) answers that are adapted to statements about implementation that must be chosen with five choices such as "never" to "always". The team also conducted interviews with oil palm farmers, the manager of the farmer group and the village apparatus. The results of the interviews were used to strengthen the analysis of the processed questionnaire results. Interviews were conducted during the process of field experiments and surveys.

The stages of data analysis carried out by the team were (1) all the data that had been collected were tabulated using the excel program; (2) the tabulation results are seen from the distribution and average values for each question indicator; (3) the meaning and analysis of the processed quantitative data; (4) analyze the relationship between the processed data and the results of the interview; (5) determine the theme of the results of the analysis that will be used as sub-chapters in the presentation and (6) presentation of the results of research and discussion. The data source triangulation mechanism was used in this study to assess the validity of the data. Rahayu et al, (2022) stated that the triangulation method is a simple and easy way to assess the reliability of the data.

RESULTS AND DISCUSSION

Description of Research Participants

The research participants who filled out the questionnaire were 47 family heads in Dataran Kempas Village. This village is one of the central villages for oil palm plantations in Tanjung Jabung Barat Regency, Jambi. The selection of Dataran Kempas Village in Tebing Tinggi District was carried out using a purposive sampling technique, namely the village center for smallholder oil palm plantations which is often an economic empowerment program from companies, and local governments, and universities.

The socio-economic characteristics of the smallholder oil palm plantation center area have quite varied differences from the results of interviews with household information sources, as presented in Table 1.

Table 1 – Personal Characteristics of Participants

No	Characteristics of Participants	Average
1	Age (years)	40.27
2	Gender (%)	
	A. Men	82.35
	B. Woman	17.65
3	Household members (%)	
	A. Children (<15 years)	1.16
	- Man	0.55
	- Woman	0.61
	B. Productive (15 - 60 years)	2.35
	- Man	1.33
	- Woman	1.02
	C. Old (> 60 years)	0.22
	- Man	0.12
	- Woman	0.1
4	Household productive age (%)	
	Proportion (%)	63.16
5	Education (%)	
	A. No school	3.92
	B. Did not finish elementary school	1.96
	C. elementary school	27.45
	D. junior high school	21.57
	E. high school	33.33
	F. Bachelor/Diploma	11.77

Source: Primary data processing, 2021.

Most of the sources of information are the productive age population with the male gender and upper secondary education (SLTA). The proportion of information sources with a high level of education (university and diploma) is still relatively low. The educational structure of this information source will be closely related to their attitudes and information towards various programs that have been and are currently taking place in their village area.

The population with male gender is more than female—proportion of family members of productive age (63.16%). Productive age will be a factor supporting the palm oil replanting process. The reduction in productivity at older ages is powerful when problem-solving, learning, and speed is essential. In contrast, older individuals maintain relatively high levels of productivity in work tasks where experience and verbal skills are more important. The conditions of the primary and secondary types of work for the community in Dataran Kempas Village are presented in Table 2.

Table 2 – Types of Main Occupations of Participants

No	Type of work	Average (%)
1	The main job	
	A. on the farm	39.22
	B. Off-farm	17.65
	C. Non-agricultural	43.14
2	Side job	
	A. on the farm	19.61
	B. Off-farm	15.69
	C. Non-agricultural	5.88
	D. Don't have	58.82
3	Total	
	A. on the farm	58.82
	B. Off-farm	33.33
	C. Farmer	92.16

Source: Primary data processing, 2021.

The main occupation of research participants in this village is agriculture, namely plantation, with a rate of 39.22%. Based on the interviews, the main job outside of agriculture is also related to the agricultural sector, such as being a laborer in farm gardens but not having gardens. Agriculture is still the second main occupation for the village community. Agriculture is a field that is very well known to the people of this village. Therefore, this field

can be used as an alternative to be improved as the main business during the oil palm replanting program. Community empowerment programs to mitigate the loss of family income for oil palm farmers are becoming increasingly important because an average of 58.82% of participants who become research respondents do not have side jobs.

Policy debates still tend to equate agricultural income with rural income and rural/urban relations with agricultural/non-agricultural relations (FAO, 1995). Thus, policymakers see the country's efforts to combat rural poverty as a policy taken to increase agricultural productivity. Most of the official reports produced by governments and multilateral institutions such as the World Bank, as well as others that have shaped the agricultural policy agenda, have focused almost exclusively on agricultural development as a way to reduce rural poverty and achieve sustainable economic growth in rural areas (Escobal, 2001).

The composition of occupations shows that most of the households in Dataran Kempas Village are agricultural households, with the main occupation being landowners. Apart from being the main job, working in the agricultural sector is also a side job, both on-farm and off-farm. Assuming the composition of the main and secondary sources of income, oil palm replanting will have an impact on the household economy and the regional or village economy.

Is Late Palm Oil Replanting done?

Age is one of the indicators to determine the time of oil palm replanting. The age indicator in the oil palm replanting program was responded to differently by households, as shown in their perception of existing oil palm plantations. The community's perception of the replanting time of their oil palm plantations is presented in Table 3.

Table 3 – Household Perceptions of the Planned Palm Oil Replanting Program

No	Household perception	Average
1	It's too late than it should be	
	a. The proportion of households (%)	10.00
	b. remaining productive life of palm oil (years)	2.00
2	It's not too late to be productive	
	a. The proportion of households (%)	90.00
	b. remaining productive life of palm oil (years)	2.83

Source: Primary data processing, 2021.

The proportion of households that stated that it was not too late to plant oil palm was greater than the proportion of households that stated it was too late even though they were over 20 years old. Participants stated that the existing oil palm plantations still have the potential to be cultivated in the next 2-3 years because they can still provide an adequate source of income. This is supported by the tendency of their oil palm plantations which are still stable and circulating; some even tend to increase. Only a small number of households feel that their oil palm plantations have decreased productivity. Based on the results of interviews, the strategies adopted by farmers to maintain the level of productivity of their oil palms include regularly providing fertilizer and better garden maintenance.

Participants also stated that price is one of the factors considered for farmers to delay oil palm replanting. In 2020, fluctuations in production were also followed by fluctuations in the price of FFB received by farmers and even tended to decrease. However, starting mid-2021, the price of FFB received by farmers varies greatly, with the difference between the highest and lowest prices being very contrasting but tends to increase even to more than Rp. 3,000.00 per Kg. This price increase is also a separate consideration for farmers to participate in the land replanting program. Although farmers are also aware of the timing and generality of oil palm trees, they cannot avoid replanting. Oil palm farmers in the plains of Kempas 100% said they were ready and very ready.

One of the impacts of the oil palm replanting program is the cessation of production, which has implications for the loss of income sources for farmers' households. This loss of

income can occur from land clearing until replanted oil palm trees can produce fresh fruit bunches again. The first step in estimating the impact of oil palm replanting on the local (village) economy and smallholder households is to identify the distribution pattern of land ownership for oil palm cultivation and the income received, as presented in Table 4.

Table 4 – Patterns of Land Ownership and Income of Oil Palm Household Farming

No	Land Owner Pattern	Average
1	The proportion of landowners	52.94
	A. Sole proprietorship	41.18
	B. Double ownership	11.76
2	Owned and area (Ha)	
	A. First field	1.76
	B. Second field	0.21
	C. Third field	-
	Total area (Ha)	1.97
3	Average Age of Palm Oil (years)	16.94
4	Monthly Income (Rp)	3,600,000

Source: Primary data processing, 2021

The proportion of land-owning households in the village of Dataran Kempas varies with the number of gardening plots more than one. Assuming that if a smallholder oil palm replanting program is carried out at the time of the study, the potential loss of temporary income is presented in Table 5.

Table 5 – Results of the Estimated Rate of Temporary Income Loss of the Replanting Program

No	Indicator	Average
1	household income	
	A. Village Household (Rp)	3,600,000
	B. Palm Oil Households (Rp)	3,271,029
	C. Proportion of Oil Palm Farmer Households (%)	52.94
	D. Palm Oil Business Contribution (%)	48.10
2	Potential replanting program	
	A. Oil palm households (%)	13.73
	B. Oil palm area (%)	29.63
3	Estimated Income Loss	
	A. Palm oil revenue (Rp)	3,271,029
	B. Loss of palm oil revenue (Rp)	1,798,841
4	Temporary Income	
	A. Household economy (%)	54.99
	B. Regional economy (%)	26.45

Source: Primary data processing, 2021.

The contribution of oil palm farming in the village is relatively large, both social (household) and economic value. The more significant the contribution to the socio-economic life of the community and followed by the higher the area of the plant and the age of the plant, the greater the potential impact on villages and households. However, this village has taken anticipatory steps by shifting some households to get alternative sources of income outside of oil palm plantations. This is supported by the condition of the town, which has experienced rapid growth due to the heyday of oil palm, so the service sector is also developing well.

Household Economic Readiness and Commodity Choice

In this sub-section, the economic readiness of oil palm farmer households in facing oil palm replanting will be discussed. The level of readiness of farmers is presented in Table 6.

Oil palm farmers in Dataran Kempas Village are ready to carry out oil palm replanting even though the general average of palm oil is still approaching 17 years, not yet 20 years. This readiness is proven by 81.82% of participants stating that they are ready and very ready to carry out oil palm replanting. This readiness has not been supported by the availability of funds owned by the participants. Participants who said they were ready still planned to get their source of funds from selling some assets or part of the existing oil palm plantations or waiting for cooperation from existing investors. The most dominant participants expect

assistance or oil palm replanting programs from the government. This condition illustrates the potential that, so far, oil palm farmers have not gotten used to managing strategies and good financial planning to anticipate the need for independent oil palm replanting.

Table 6 – Household Perceptions of Palm Oil Replanting Readiness

No	Land Replanting Plan	Average (%)
1	Ready to Join the Palm Oil Replanting Program	
	Very ready	63.64
	Ready	18.18
	Don't know	0.00
	Not ready	9.09
	Not ready	9.09
2	If you are planning to replant palm oil, you will do it independently	
	If Yes, Are the Funds Sufficient	14.29
	Enough Funds, but There Are Other Obstacles	14.29
	If Yes, Insufficient Funds	57.14
	Not planning to do it independently	14.28
3	Current Source of Independent Palm Oil Replanting Funds	
	Selling Part of the Land to Finance Palm Plant Replanting	14.29
	Selling Assets Owned to Finance Plant Replanting	0.00
	Seeking Loans to Other Parties Such as Banking	0.00
	Offering Cooperation With Those Who Have Funds (Investors)	33.33
	Waiting for Assistance or Programs from the Government or Other Parties	52.38
	Other	0.00
4	If you are waiting for a program from the government, has there been any socialization of the program?	
	Already	16.67
	Not yet	66.66
	Don't know	16.67
5	Have You Participated in the Socialization of the Program?	
	Already	16.67
	Not yet	8.33
	Don't know	75

Source: Primary data processing, 2021.

Alternative Choice Commodities for Land Replanting

The replanting of oil palm plantations has alternative commodities that farmers can choose from. Participants' perceptions of these alternatives are presented in Table 7.

Table 7 – Household Perceptions of Alternative Palm Oil Replanting Programs

No	Commodity Choice Plan for Land Improvement	Average (%)
1	Land of Old Palm Oil Plants That Are No Longer Productive	
	Replanting	84.62
	Handing Over Management to Other Parties	15.38
	Just leave it first or not processed	0.00
	Selling or releasing to others	0.00
2	If Planting Or Reprocessing Is Done	
	Replanting With Palm	100.00
	Replanting With Other Commodities	0.00
3	If Planted with Other Types of Plants	
	Plantation crops	14.29
	Vegetable Plant	28.57
	Crops	0.00
	Horticultural Plants	57.14
4	If it is for use outside of agricultural land	
	Livestock Cultivation	14.29
	Building Settlements	14.29
	Aquaculture	57.13
	Other Cultivation	14.29

Source: Primary data processing, 2021.

Most of the participants in Dataran Kempas Village chose to continue replanting oil palm land to be rejuvenated. Participants in this village chose to hand over their management to other parties with an average of 15.38%. Participants still intend to rejuvenate the land by planting oil palms. However, the community has chosen several other

types of plants, with the most dominant choice being horticultural crops. For options outside of agricultural land, the dominant participant chose aquaculture.

Empowerment and Institutional Roles for Oil Palm Smallholders

Empowerment and innovation programs are urgently needed to maintain household economic stability and increase household readiness to face oil palm replanting. The selection of types and commodities is very important to take advantage of vacant land between oil palm plantations and other marginal lands, including yards. On the other hand, the loss of the main source of income will decrease household purchasing power for capital goods, including for the procurement of production facilities and infrastructure such as fertilizer, which is the largest cost component in plant cultivation. For this reason, the farming model developed is a "low external input" farming business, or the level of dependence on external inputs is low so that it is more efficient and profitable.

Organic agriculture is the main choice for maximizing the use of local resources available in the village area. The organic fertilizer or compost industry managed by farmer groups with an installed capacity of tens of thousands of tons per month can be a significant supporter in developing low-cost organic agriculture, input independence, and farming sustainability.

The people's compost industry that develops uses 30% of raw materials derived from solid waste from cattle sheds, so the existence of a cattle business needs to be maintained to support Organic Farming. Loss of grazing area and forage sources requires the introduction of feed technology because there will be a transformation of the cattle rearing system from semi-intensive to more intensive. Cattle-breeding households will need more energy to meet the needs of cattle feed consumption. The utilization of plant and palm oil mill waste will be a priority option and increase the area for forage development. Food crop waste, vegetables, and horticulture that are developed have the potential to be a substitute for forage sources for cattle feed. However, they are not 100% full and are not continuous or tend to be seasonal. For this reason, it is necessary to introduce technology to preserve feed, both wet (fermentation) and dry (hay), and provide it as cattle feed. Developing these two groups of organic crop and cattle agricultural commodities is integrated with a sustainable agriculture concept.

Sustainable agriculture aims to balance economic, environmental, and social aspects, creating a resilient agricultural system in the long term. The integrated farming system is an efficient and environmentally friendly agricultural system, utilizing technology in participatory sustainable agricultural development based on local wisdom (Ansar and Fathurrahman, 2018). The LEISA (Low External Input Sustainability Agriculture) system can be a strategy for sustainable agriculture because it seeks to minimize environmental pollution (Fadilah et al., 2020) and is an important part of an integrated system where livestock manure, both solid and liquid, can be utilized to support the provision of organic inputs. . On the other hand, plant wastes such as palm fronds and cakes can be used as a source of animal feed (Novra and Suparjo, 2019).

Organic Farming is not only related to human health but also to the environment. In contrast, smart Farming focuses on simplifying production by combining smart and vertical farming solutions with technological infrastructures like artificial intelligence and IoT (ForFarming, 2020). Smart Agriculture and Organic Farming are two closely related trends that can go hand in hand to increase the competitiveness of small producers (Libelium, 2016). It is undeniable that the rapid development of technology can impact every aspect of life because it is not only included in the marketing and governance system but also has an impact on the conventional system because it is considered more efficient and effective. Smart Farming that relies on machines is often associated with plant care so that it can provide new insights into organic farming practices (Mtech, 2020). Technology can make complicated methods in conventional systems simpler so that technology in digital systems can be accepted by various groups. Smart Farming is a platform application connected to technological devices, such as tablets or mobile phones, to collect important information during agricultural cultivation, such as humidity, weather conditions, or soil. Smart Farming

enables farmers to work more efficiently, scalable, and integrated (Reviza, 2021).

The advantages of SO-Farming, in addition to financial and ethical aspects, also provide many benefits for the environment, including reducing pesticide and chemical pollution, increasing land fertility, overcoming the effects of global warming, supporting the conservation and health of water resources, and preventing the development of algae (Chait, 2019). Farmers are more likely to adopt new technology if it is suitable for their farm, easy to learn and use, and is expected to increase yields and incomes (Takagi et al., 2020).

Institutional farmers are one of the requirements as potential recipients or participants of the government's oil palm replanting program and proof of land ownership. Household participation in village economic institutions, specifically in agriculture (farmer groups) and in general (cooperatives), is relatively high, although still below 50%, especially in cooperatives. Based on interviews with village officials, household participation in Dataran Kempas Village is relatively higher than in other villages.

One of the factors that motivate and drive the involvement of participants and the community is the participation, transparency, and accountability of business groups. The most dominant business groups are BUMDES and Farmers Groups. BUMDES is a legal entity established by the village and/or with villages to manage businesses, utilize assets, develop investment and productivity, provide services, and/or provide other types of businesses for the greatest welfare of the village community. Farmer group activities develop with the guidance and cooperation of various parties such as companies, local governments, and universities. Companies around the village buy compost from the business group. Community participation in Dataran Kempas Village in business groups and BUMDES is already high at more than 50 percent. The transparency of business group activities is also good. This transparency is essential to increase the trust (Rahayu et al., 2022) of members of the business group.

The business group with a high contribution to the farmer's economy is BUMDES. Empowerment programs can improve the economy of oil palm farmers and rural communities. Empowerment programs and business groups are very important for the people of Dataran Kempas Village because they impact the availability of jobs, have a positive effect on village economic activities, and increase BUMDES activities.

The impact of the empowerment program is not only on the economy. Still, it can also impact other things, such as encouraging the development of organic agriculture, increasing public awareness of the environment, opening new businesses, and improving the governance system for agriculture, business groups, and livestock. Many aspects of learning can be generated from the empowerment program. Dataran Kempas Village obtains other benefits besides economic benefits, including encouraging the creation of organic agricultural cultivation, increasing environmental awareness, developing livestock, and increasing the reputation and good name of the village. The various benefits obtained by farmers from the empowerment program will increase the readiness of oil palm farmers in particular and village communities in general, to participate in oil palm replanting.

CONCLUSION

Oil palm replanting must be carried out by oil palm farmers when they are of unproductive age. Some farmers tend to maintain less productive oil palm plantations, one of which is for reasons of declining or lost income. In addition, most farmers do not have the funds to carry out oil palm replanting. Smallholder oil palm farmers still expect a palm oil replanting program from the government. Planning and financial management strategies for smallholder families still need to be optimized. Oil palm farmers do not yet have an excellent plan to provide funds for oil palm replanting. Therefore, economic mitigation for farmer households is significant because many farmers do not have side jobs.

Empowerment and coaching programs from the government, universities, and companies must be improved. Institutional strengthening of business groups also needs to be done so that farmers can synergize with each other in preparing themselves for oil palm replanting. Empowerment programs and business groups are essential for the people of

Dataran Kempas Village because they impact the availability of jobs, have a positive effect on village economic activities, and increase BUMDES activities. Dataran Kempas Village obtains other benefits besides economic benefits, including encouraging the creation of organic agricultural cultivation, increasing environmental awareness, developing livestock, and increasing the reputation and good name of the village.

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