Farmers' Income During Palm Oil Replanting In Siak Regency: Finding An Alternative Sources

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Abstract— The study aimed to find a model of farmers' income sources during palm oil replanting by breeding livestock and horticulture plants, so that farmer households still obtained a source of income during palm oil replanting. Farmers must be able to use land appropriately to earn income. This study uses a survey method, sampling by purposive sampling, which sampled farmers who do integrated farming when palm oil replanting. The data obtained calculates combined farming income. Primary data is obtained directly from farmers, and secondary information is collected from agencies and services related to this research. The analysis is done by finding an integrated farming model and farmers' income. The results of this study show an integrated agricultural income model when palm oil is replanting Z = 6.837.600 X1 + 10.444.000 X2 + 1.250.000 X3 resulting to the results that can still be added for optimal livestock income and optimal income horticultural crops to be Rp.14.257.780. Integrated farming can become an excellent source of income: a. Palm oil and livestock breeding, b. Palm oil and cattle breeding, c. Palm oil and goats, d. Palm oil and fish, e. palm oil and horticulture plants.

Keywords --- model, integrated agriculture, income, replanting.

1 INTRODUCTION

Riau Province is currently supposed to have palm oil plantations that have replanted because the 25 years of age palm oil will usually be replaced with new plants. After replanting, farmers are reduced financially or do not have a source of income. To maintain their lives, usually, farmers cultivate their crops to make them as a source of family income. Since 2013, 53 percent of the total palm oil plantation area in Riau is still waiting to be replanted (Sawit News, 2013 in Manurung et al. 2014). Replanting is often delayed due to various problems experienced by smallholders. Farmers are generally faced with capital problems in replanting. Farmers do not prepare funds for replanting, so they have to look for loan funds. Another obstacle faced by farmers is that farmers' income will decline or have no income at all. Additionally, farmers are less aware of the efficient and effective way of replanting from funding, labour, time and more. Central Bureau of Statistics (2017) stated 134 thousand hectares palm oil in Riau had been replanted as much as 53 percent. Therefore, most of these palm oil plants have now entered the final stage of the production cycle, so replanting activities need to be carried out.[1][2][3]

When palm oil replanting farmers need a source of income for their families, farmers apply integrated farming. Integrated agriculture is an agricultural system that integrates the agricultural sub-sector (plants, livestock, fish) to increase the productivity of land resources, independence, and the welfare of farmers in a sustainable manner. Siswati & Rini (2014) states that integrated agriculture can increase the income and welfare of farmers with horticulture and livestock crop patterns.[4] [5]

The research objective was to find an integrated agricultural model of farmers' income sources when palm oil was replanted.[6]

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2. METHODOLOGY

This research was conducted in Siak Regency. This location determination is done purposively. The location of this study was chosen because in the village of Delima Jaya, Kerinci Kanan Subdistrict, and the village of Keranji Guguh, Koto Gasip Subdistrict, Siak Regency, there are palm oil farmers replanting. The time of this study was carried out for seven months, from March to October 2018.

Sampled farmers are those who have palm oil plants aged 20 to 25 years who are implementing replanting in the village of Delima Jaya, Kerinci Kanan Subdistrict and the village of Keranji Guguh, Koto Gasip Subdistrict, Siak Regency, numbering 110 households. The method used is purposive sampling, which farmers who carry out integrated farming when replanting palm oil are the respondents.

The data taken includes primary data and secondary data and uses purposive sampling techniques. Primary data was obtained from direct interviews with replanting farmers. Secondary data is data obtained from institutions and agencies related to this research. [7]

3. RESULT AND DISCUSSION

Integrated farming model.

Integrated farming carried out by respondents consisted of palm oil plantations, cattle, poultry, fish ponds, and horticulture plants. Characteristics of respondents can be seen in table 1.

Table 1. Characteristics of Respondents

No.	Description	Respondent	
		Person	%
1.1	Age (year)		
	25-35	8	7,27
	36-45	14	12,73
	46- 55	29	26,36
	56-65	49	44,55
	66-75	8	7,27
	76-85	2	1,82
	Total	110	100
2	Education Level		
	SD	65	59,09
	SLTP	29	26,36
	SLTA	12	10,91
	Diploma	3	2,73
	Bachelor	1	0,91
	Total	110	100
22	Farming Experience		
	<10	6	5,45
	15-Oct	7	6,37
	16- 20	18	16,37
	21-25	34	30,91
	26-30	25	22,73
	31- 35	12	10,90
	36-40	7	6,36
	>40	1	0,91
	Total	110	100

Source: Processed 2018 Data

Integrated farming is carried out by farmers when replanting palm oil is a source of income for families to raise livestock and plantation crops as well as horticulture plants. According to Iyai & Yaku (2015)[8], "integrated farming systems that can be identified in coastal agroecology areas are coconut-based cattle farming systems (cocobeef) and agricultural crops (crops and residual beef farming systems), cocogoat, coco and residuals, kitchen and pig-based crops besides the backyard of the poultry chicken farming system. In lowland areas, the systems developed are cattle-palm farming system, pig palm farming system, goat farming system, poultry farming system and livestock crops farming system. In the highland agroecology area, the system developed is the crop pig farming system, the poultry farming system and the backyard cattle farming system. Lowland agroecology areas have relatively many variations about the carrying capacity of the land and the development of agricultural areas".

Integrated farming carried out by farmers when palm oil replanting in Siak Regency has several types of businesses as a source of family income, namely:

1)Palm oil and chicken breeding, 33 farmers
2)Palm oil and cattle breeding,13 farmers
3)Palm oil and goats, five farmers
4)Palm oil and fish, 17 farmers
5)Palm oil and horticulture plants, 33 farmers
6)Daily casual workers, eight people

At most 98 respondents (89.09%) still planted palm oil in other locations when the palm replanted. This was due to the fact that the respondent farmers had prepared and realized that since palm oil replanting reduces family income or no family income, before that they started planting new palm oil in the vicinity of the house or buy another land to plant new palm oil again so that when the palm oil is replanted, the new palm oil that has been planted three years earlier has begun to bear fruit so that it can become a source of income for the family even if it is not productive enough to finance the family's everyday life. Furthermore, According to Hilimire (2011), "crop-livestock integration can improve soil quality, increase yields, produce diverse food and improve the efficiency of land use. The benefits of integrating livestock and fish plants can be synthesized through (1) agronomic aspects, namely increasing land capacity to produce, (2) economic aspects namely product diversification, higher yields and quality, and lower costs, (3) ecological aspects namely reducing ham attacks and pesticide use, and erosion control, and (4) social aspects namely more equitable income distribution" (Aryanto & Effendi, 2015).

Palm oil and chicken breeding are also carried out by many respondent farmers because breeding chickens do not require a large amount of money, and native chickens usually can find their food around the house. Those who do palm oil plantation business and raise chickens are 33 people (30%). From breeding chickens, eggs can be obtained for family food sources and chickens can be cooked when there is no family income from selling them.

Integrated farming Cattle farming and palm oil are also carried out by 13 respondent farmers as much as 11.8%. Because cow manure can be used as fertilizer for palm oil, palm leaf is made into cattle feed so that it can reduce fertilizer costs for palm oil and reduce cattle feed costs, integration of palm oil plantations and cattle can increase farmers' income, cattle business can be a saviour for farmers when palm oil prices are low.

For farmers who carry out integrated farming of palm oil and cattle, when palm oil cannot produce, with cattle livestock farmers can obtain fertilizer from cow manure to be used as fertilizer for palm oil which can reduce the cost of buying fertilizers, sell cattle for sources of income, and cattle feed can be obtained from plants under palm oil and palm oil leaves. Thus, all these can increase farmers' income. According to Karyasa (2017), "the use of manure (organic) in the system of integrating livestock plants has been proven to be able to increase farmers' productivity and income, and reduce production costs. On the other hand, organic agricultural products have a brighter market prospect compared to agricultural products loaded with inorganic ingredients."

Moreover, Utomo & Widjaya (2013), mentioned "the integration of palm-cattle breeding raises three integrated activities at once, namely the provision of feed (industry), cattle breeding business (cow/calf operation), and cattle fattening. Each activity contributes to each other and can increase efficiency and productivity, including the production of palm oil. Economically these activities are beneficial and socially acceptable to the community. This integration model is feasible to be applied in the area of palm oil plantation development."

The pattern of integration of palm oil and beef cattle can be increased on a small scale to a larger scale. It needs serious handling for the government in providing capital, a low-interest credit ceiling and easy access. Other driving factors are the availability of sufficient feed for cattle, the desire of farmers to have cattle; the government provides cattle assistance, smallholder farmers who face the replanting period

still have a small number of cattle. Winaso (2013) and Burhansyah (2012) stated that "the system of integrating plants and livestock is a pattern of agribusiness development that is optimised for plant and livestock resources. The existing integration system consists of 3 types: in situ integration systems of maize and beef cattle, ex situ integration systems of maize and chicken, and systems integration pepper, pinto and aracis beef."

Another type of integrated farming is palm oil and horticultural crops, which is done by 33 people (30%) because horticulture crops can be harvested and sold in a relatively shorter time than palm oil so that when there is no palm oil income, the crops can be a source of income. Farmers who do horticulture and livestock farming can reduce the cost of feed and fertilizer for horticulture crops, increase income source when replanting oil palm, and use the vacant land to be productive According to Nizar (2012), "agricultural integrated horticulture plants and cattle can increase farmers' income, and they can also utilize the vacant land to be productive."

Integrated farmer income during palm oil replanting

The results of this study indicate the integrated agricultural income model when palm oil replanting, the results of data processing can be a mathematical model of the objective function

Z = 6,837,600 X1 + 10,444,000 X2 + 1,250,000 X3

From the data, the results that can still be added for optimal livestock income and optimal income horticultural crops is Rp.14.257.780.

From the above models, livestock and horticulture plants can still be added. Farmers' income when palm oil is replanted with integrated agriculture can be seen below :

Table 2. Respondent farmer income when oil palm replanting

Description	Income (Rp)	Total Income (Rp/month)
1. Palm oil and chicken	5.862.755+1.965.303	6.028.058,-
2. Palm oil and cow	5.862.755+3.980.769	9.843524,-
3. Palm oil and goat	5.862.755+833.333	6.696.088,-
4. Palm oil and fish	5.862.755+2.245.833	8.108.588,-
5. Palm oil and horticulture	5.862.755+1.100.000,-	6.962.755,-
6. Others (workers)		1.131.000,-

Source: Result of 2018 Research

The biggest income is obtained from palm oil plants and cattle, amounting to Rp.29,747,370,- per month. This is very promising since large income means farmers do not feel lack of income every month. Furthermore, integrated farming of palm oil and fish livestock is Rp.8,108,588,- per month. After that oil palm and horticulture crops amounted to Rp 6,962,755,- per month, then palm oil and goat livestock amounted to Rp.6,696,088,- per month, for palm oil plantations and chicken livestock Rp.6,028,058,- per month from four farms integrated can give income greater than Riau UMP (Provincial Minimum Wage) in 2018 amounting to Rp.2,464,000,- per month, while other businesses are workers as casual daily labourers of Rp.1,131,000,- per month. The average ownership of oil palm is 4.7 ha cattle 7.6 units of livestock, 34 chicken livestock, 602 fish livestock and horticultural plant area 0.8 ha.

Overall integrated agriculture can increase farmers' income because they provide a source of income for the family, though replanting palm oil requires an additional source of income for the family of farmers whereas palm oil and dairy cattle can increase income according to Siswati & Rizal (2017), "average ownership of 2 ha oil palm plantations, 4-5 dairy cows. Farmers' income from smallholder oil palm plantations and dairy cows is IDR 8,419,500. Benefit-Cost Ratio is 1.57."

4. CONCLUSION

Several things can be concluded from this research:

1. Integrated farming model when oil palm replanting Z = 6,837,600 X1 + 10,444,000 X2 + 1,250,000 X3, optimal livestock income and optimal income horticultural crops Rp.14,257,780.
2. Integrated farming as a source of income:

a.Palm oil and raising chickens
b.Palm oil and cattle raising
c.Palm oil and goats
d.Palm oil and fish
e.Palm oil and horticulture plants

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