

Independent Oil Palm Smallholder Farmers; Household Income, Consumption, and Sustainability Challenges

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Abstract

Riau Province is the largest producer of palm oil in Indonesia, with more than 2.4 million hectares of land used for oil palm plantation. The province of Riau is the largest producer of palm oil in Indonesia, with more than 2.4 million hectares of land used for palm oil plantations. In 2017, 792,970 farmers were involved in an oil palm plantation, which played a significant role in economic growth in rural areas of the Riau Province. Independent Smallholder plantations account for 56.84% of total oil palm plantation areas. However, issues related to unsustainable production including environmental, social, and legal issues are still the most pressing issues to access the global market. The objective of this study is to analyze the household and consumption of Independent Smallholder Farmers and their challenges for sustainability issues. The population of this study is independent oil palm smallholder farmers in Riau Province. The sample size was 270 farmers and chosen randomly from 27 subdistricts from 3 Districts in Riau Province (30 farmers for each subdistrict respectively). The study found that 59.36 percent of the farmer's Households were from oil palm plantation and 48.71 percent of the farmer's consumption monthly expenditure was for foods. The sustainability challenges faced by the Independent Smallholders Farmer were Uncertified seed, Land legalities, no farmers group, and no management and environmental monitoring make it difficult for independent smallholders farmers to meet ISPO standards. To improve farmer's capacity to meet and comply with the ISPO standards, external supports from the government and private sectors are needed.

Keywords: independent smallholders, oil palm, household income, consumption, sustainability

I INTRODUCTION

In 2017, the area of smallholder oil palm farmers reached 40.01% of the total Indonesian oil palm area (14,030,573 hectares). However, the production of oil palm smallholder farmers was only 33.64% of the total Indonesian production of 37,812,628 tons of CPO. This condition illustrates the low productivity of smallholder oil palm plantations. Hadi et al (2006) in Hadi et al (2018) stated that most of the independent smallholder oil palm plantations did not use superior seeds with minimal maintenance. FFB productivity is only 4.1 - 11 tons of FFB / hectare / year or 23 - 44% of its potential. The low productivity is due to the selection of seedlings that are mostly not superior, lack of knowledge about caring for oil palm plants, lack of fertilization, age of plants that have aged and need replanting (replanting), lack of capital and

technological mastery, there is no plan to replace plants according to age plants (Daim, 2003 in Mustofa. R, 2016).

In 2018 the area of oil palm plantations in Riau Province reached 2,489,957 hectares, of which 1,434,213 hectares were independent smallholders farmers and 1,075,744 ha were managed by national and private plantation companies with a total production of 7,683,535 tons (DISBUN RIAU, 2019). The oil palm plantations are spread over twelve regencies and cities in Riau Province. The number of farmer households working as independent smallholder farmers in Riau Province reached 531,539 households (DISBUN RIAU, 2019). As a province is the largest area of oil palm plantations in Indonesia, the condition of independent oil palm farmers in Riau Province is considered to represent the situation of independent smallholders' oil palm farmers in Indonesia.

There are a few studies that link household income, consumption, and the challenges of sustainability in oil palm farmers. Therefore, the study on "Household income, consumption, and the challenges of the sustainability that specifically on the Independent Smallholder Oil Palm Farmers" becomes interesting to do. Some of the problems faced by independent oil palm farmers or smallholders in implementing ISPO certification include a) very complex land legality issues; b) problematic seed legality, because the seed does not come from a certified seed producer; and c) the problem of environmental management knowledge which is still very limited by smallholders (Purnomo et al., 2017)

This research aims to find at the structure of the household income of independent oil palm farmers, then see how their food and non-food consumption patterns are. The sustainability challenges of independent oil palm farming are seen from Land Legalities, Farmers Organization, Environmental and Management Monitoring, and Continuous business improvement (used of superior seeds, land productivity) as part of the ISPO principles and criteria for Independent smallholder oil palm farmers.

II. METHODS

The structured questionnaire was used to obtain data through direct interviews with independent smallholder oil palm farmers in Riau Province during March - June 2019. The representative area sampling method used Multistage Area Sampling. Three regencies were selected, namely Rokan Hilir, Kampar, and Rokan Hulu as

Representative Study Areas due to these three regencies were the largest areas of oil palm trees producing both old and damaged palm oil plants. The area of smallholder oil palm plantations in the three sample districts covers 43.97% of the total smallholder oil palm plantations in Riau Province (DISBUN RIAU, 2018). Each regency was taken 3 representative districts, and each district was taken in 3 villages as Sample Location. The study population was independent smallholders farmers who have a lawn with self-owned oil palm plantations criteria. The number of the respondent from each village as many as 10 samples, so the number of respondents that have been surveyed were 270 samples.

To calculate income derived from oil palm farming was using a formula that refers to a farming analysis by Soekartawi (2005). The net income of farming was obtained by using the formula:

$$\Pi = TR - TC$$

$$\Pi = (Y \cdot Py) - (TVC + TFC)$$

Where :

Π	= Oil palm farming income (IDR/month)
TR	= Total income (IDR/month)
TC	= Total production cost (IDR/month)
Y	= The amount of oil palm FFB production (kg)
Py	= Selling price of oil palm FFB (IDR/month)
TFC	= Total fixed cost (IDR/month)
TVC	= Total variable cost (IDR/month)

In this study, household income is classified into farm income and non-farm income. The income from farming is divided into income from oil palm farming, outside of oil palm farming, other farming, and other income. Referring to the analysis of income structure by Widodo (1990), it can be formulated an analysis of the household income structure of oil palm farmers in Riau Province as follows:

$$Y_{Tot} = Y_F + Y_{NF}$$

$$Y_{Tot} = (A_1 + A_2 + A_3) + Y_F$$

Where :

Y_{Tot}	= Total Household Income (IDR/month)
Y_F	= Farming Income (IDR/month)
Y_{NF}	= Non-farming income (IDR/month)
A_1	= Oil Palm Farming Income (IDR/month)
A_2	= Others farming income (IDR/month)
A_3	= Others income outside the farming sector (IDR/month)

The consumption pattern of a household can be seen from the proportion of household food and non-food consumption. The proportion of food consumption (PFC) is a comparison of food expenditure with total consumption expenditure (Prasetyoningrum et.al, 2016) with the formula:

$$\text{PFC} = \frac{\text{FC}}{\text{FC} + \text{NFC}} \times 100\%$$

Where :

- PKP = Proportion of Food Consumption
- FC = Food Consumption Expenditure
- NFC = Non Food Consumption Expenditure

While the Proportion of Non-Food Consumption (PNFC) is a comparison of non-food expenditure with total consumption expenditure with the formula:

$$\text{PNFC} = \frac{\text{NFC}}{\text{FC} + \text{NFC}} \times 100\%$$

Where :

- PKP = Proportion of Food Consumption
- FC = Food Consumption Expenditure
- NFC = Non Food Consumption Expenditure

The sustainability challenges of independent smallholder oil palm farmers are seen from the abilities of Independent Smallholder Oil Palm Farmers to meet Indonesia Sustainability Palm Oil (ISPO) standard, based on *Peraturan Menteri Pertanian Republik Indonesia Nomor 11/Permentan/OT.140/3/2015*. The ISPO principles and criteria for Independent smallholder oil palm farmers consist of:

- a. Land Legalities
- b. Farmers Organization
- c. Environmental and Management Monitoring.
- d. Continuous business improvement

III Results and Discussion

Respondent Characteristics

Table 2 shows the characteristics of the respondent farmers. Age is one of the factors that affect work productivity. Economically productive age is divided into 3 groups, namely the unproductive age group (0-14 years), the productive age group (15-65 years), and the no longer productive age group (> 65 years). Respondents are in the productive age, with an average age of independent farmers of 49.02 years. This means

that the respondents have enough potential to carry out their farming activities in a sustainable manner. Respondents have a low level of education, with an average length of education for independent farmers of 9.32 years. This indicates that the respondents do not know about sustainable agriculture from formal education. Most of the respondents' sources of income are from oil palm farming. The average income of independent smallholders from oil palm is 61.59 percent. Additional sources of income for independent smallholders are rubber farming, shop or shop trade, fishermen, company employees, and casual daily laborers.

Table 2 also shows the average oil palm area of independent smallholders is 4.20 hectares. The average yield from independent smallholders is 11.46 tonnes/ha/year. This confirms Hadi et al. (2018) stated that FFB productivity of independent smallholder farmers is only 4.1 - 11 tons of FFB / hectare/year or 23 - 44% of its potential so that independent smallholders work on this by expanding land. All of the respondents' gardens were recorded as producing plants (TM). The average age distribution for independent smallholders of oil palm trees is 17.88 years. This shows that independent smallholder respondents own oil palm at an economic age (less than 25 years) but have low productivity.

Table 2: Respondent Characteristic of Independent Smallholder Oil Palm Farmers

Characteristic	Unit	Mean	SD
Age	Year	49.02	11.31
Education	Year	9.32	3.65
Oil Palm Farming Experience	Year	18.62	7.11
Oil Palm Land Owned	Hectares	4.20	3.25
Oil Palm Planting Age	Year	17.66	4.75
FFB Production	ton/ha/year	11.46	2.61
Income Source From Oil Palm	%	61.59	0.27

Source: Processed data

$\alpha=0.05\%$

Income of Independent Smallholder Oil Palm Farming

Farming income is the total production value of agricultural commodities (Rahim, A and Hastuti, DRD. 2007). The income of independent smallholder oil palm farming in this study was calculated as the average income per month. Most of the income ranges were in the range IDR. 349,308.33 - IDR. 1,500,000.00 per month as many as 100 people or 37.04percent, followed by an income range of IDR. 1,501,000.00 - IDR.3,000,000.00 per month as many as 88 people or 32.59percent, then

income IDR. 3,001,000 – IDR. 4,500,000.00 per month as many as 47 people or 17.41percent (Table 3).

Tabel 3. Average Income Per Month of Independent Oil Palm Farmers from Oil Palm Farming in Riau Province (IDR per month)

No.	IDR per Month	Frequency	%
1	349,308.33 - 1,500,000.00	100	37.04
2	1,501,000.00 - 3,000,000.00	88	32.59
3	3,001,000.00 - 4,500,000.00	47	17.41
4	4,501,000.00 - 6,000,000.00	15	5.56
5	6,001,000.00 - 7,500,000.00	8	2.96
6	7,501,000.00 - 9,000,000.00	7	2.59
7	9,001,000.00 - 10,500,000.00	1	0.37
8	10,501,000.00 - 12,000,000.00	2	0.74
9	12,001,000.00 - 14,574,225.69	2	0.74
Total		270	100.00

Source: Processed data, 2019

The distribution of farmers according to their average monthly income can also be seen in Figure 1. The average income received by independent oil palm farmers is IDR. 2,653,602.43 per month. Where the majority of independent oil palm farmers have less than Rp. 5,000,000.00 per month. This research finding is in line with surveys by SPKS (2018), where the income of independent smallholders was between IDR. 2,000,000.00 - IDR. 5,000,000.00 per month. The use of uncertified seeds, lack of fertilization which is not appropriate in terms of both quantity and intensity, non-intensive care, and low productivity determine the majority of income independent palm oil farming is less than IDR. 5,000,000 per month. Besides, the selling price of oil palm farming commodities, namely fresh fruit bunches (FFB), is always fluctuating, and there is a difference in selling prices between FFB plasma farmers and independent smallholder FFB. The average selling price for FFB for 1 year obtained in this study was IDR. 1,065 per kg.

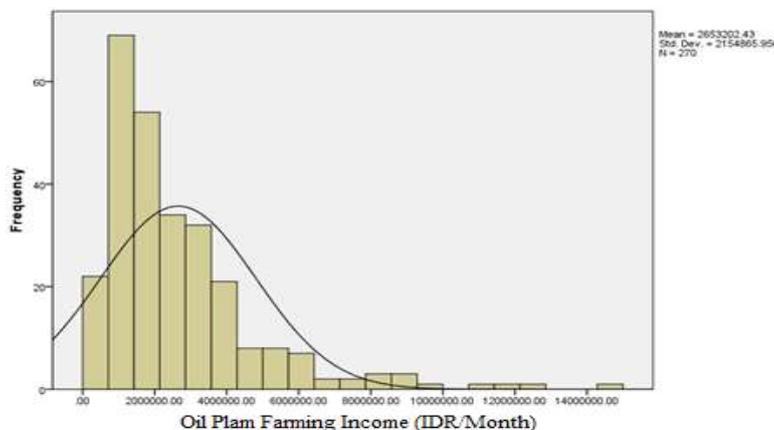


Figure. 1 Average Income of Independent Smallholder Oil Palm Farming (IDR/Month)

Income Structure of Independent Smallholder Farmer Household

Household income is income received by the household concerned whether it comes from the income of the head of household or the income of household members. Household income was able to come from the remuneration of factors of labor production (wages and salaries, profits, bonuses, etc.), remuneration for capital (interest, profit sharing, etc.), and income from other parties or transfers (BPS, 2015). In this study, the total household income of independent oil palm farmers is the sum of income derived from work and non-work income. Work income which includes independent oil palm and other farming, other farming, and non-agricultural income. Determine the amount of oil palm farm income is by calculating all revenues from oil palm production then subtracting all farming costs incurred. Farmer income derived from other farms, non-farm income, and non-work income is calculated based on information provided by farmers. Total income is the total amount of farmers' income from various sources. Table 4 shows the average total family income from each income source in 2018.

No.	Source of Income	Average Income (IDR/Month)	percent
1	Oil Palm Farming Income	2.846.882,82	59,36
2	Other Farming Income	331.481,48	6,91
3	Non-farming income	1.583.540,74	33,02
4	Non-work income	33.888,89	0,71
Total		4.795.793,93	100,00

Source: Processed data, 2019

Based on Table 1 the average total household income of independent oil palm farmers in Riau Province was IDR. 4,795,793.93 /month. The biggest source of income for family farmers comes from oil palm farming income, which is IDR. 2.846.882,82 per month, contributes 59.36 percent of total household income. Other Farming Income is IDR. 331,341.48 per month, contributes 6.91 percent of total household income. Other farming in this study were rubber and food farming and/or crops. The non-farming income is IDR. 1,583,540.74 per month or contributes 33.02 percent of total household income. This non-farming income earns from trading businesses, construction workers, casual daily laborers, temporary teachers, motorcycle taxis, motorcycle workshops, and fishermen. Furthermore, the average non-work income is IDR. 33,888.89 per month, contributed 0.71 percent of total household income farmers.

This non-work income comes from retired civil servants, rent houses or shops, and giving money from the children of these farmers. Overall it can be stated that the contribution of oil palm farming income to total farm household income is greater than other agricultural income, both non-agricultural income and non-work income.

The majority of independent oil palm farmers own less than 4 ha of land (Table 5). The income composition is dominated by income from oil palm at 59.36 percent. While 61.59 percent of independent oil palm farmers still rely on oil palm as their only source of income (Table 2). If ISPO certification is extended to independent oil palm farmers, it would raise oil palm farming costs and decreased revenue from oil palm. There is also no guarantee that Fresh Fruit Bunch (FFB) prices will rise and stable if independent smallholders apply the ISPO requirement, causing doubts for farmers to adopt them. The decreased revenue from oil palm farming would also shift the composition of independent smallholder farmers' household intake in both food and non-food consumption trends. When income declines, farmers prefer to favor the fulfillment of food relative to non-food

Tabel 5. Number of Independent Oil Palm Smallholder Farmer By Land Area Owned (Ha)

No.	Land Owned (Ha)	Respondents	%
1	0.5 - 2	99	36.67%
2	2.1 - 4	82	30.37%
3	4.1 - 6	48	17.78%
4	6.1 - 8	21	7.78%
5	8.1 - 10	10	3.70%
6	> 10	10	3.70%
Total		270	100.00%

Source: Processed data, 2019

4.4. Consumption Pattern Of Independent Oil Palm Smallholder Farmer Household

The consumption pattern is reflected in the proportion of farm household expenditure. Household expenses are costs incurred for the consumption of all household members. Household expenditure is classified as food expenditure and non-food expenditure. The proportion of food expenditure and the proportion of non-food expenditure can be seen in Table 6. The average farm household's food expenditure is IDR 1,219,756.11 per month with a percentage of 48.71 percent of the total farm household expenditure.

Table 6. Average Expenditure for Food and Non-Food (IDR/ Month) of Independent Smallholder Farmers in Riau Province

No.	Expenditure Component	Average Expenditure (IDR/ Month)	%
A	Foods	1.219.756,11	48.71
1	Cereals	293.757,41	24.08
2	fish/shrimp/squid/shellfish	130.148,15	10.67
3	Egg and milk	85.881,57	7.04
4	Meat	128.262,96	10.52
5	Tubers	19.897,59	1.63
6	Oil and fat	59.444,44	4.87
7	nuts / processed products,	41.626,67	3.41
8	Beverages	55.320,37	4.54
9	Vegetables	92.080,93	7.55
10	Fruits	53.931,48	4.42
11	Seasoning	25.164,17	2.06
12	Instant noodle, wet noodle, rice noodle	33.258,89	2.73
13	Processed foods and drinks	39.385,19	3.23
14	Tobacco and betel	161.596,30	13.25
B	Non Food	1.284.286,03	51.29
1	Home	147.385,43	11.48
2	Education	477.442,28	37.18
3	Health	130.466,42	10.16
4	Home renovation	259.776,73	20.23
5	Social	163.549,12	12.73
6	Recreation	105.666,05	8.23
Total		2.504.042,14	100.00

Source: Processed data, 2019

While the average non-food expenditure is IDR 1,284,286.03 /month with a percentage of 51.29 percent of the total farm household expenses. Farmer household food expenditure in this study consisted of grains, fish/shrimp/squid/shellfish, eggs and milk, meat, tubers, oils and fats, nuts / processed products, beverage ingredients, vegetables, fruits, spices, others (instant noodles, wet noodles, vermicelli), processed foods and drinks (bread, cakes, fried foods), tobacco and betel.

The gap booth food and non-food consumption is only 2.58 percent. Based on Table 7 related to 270 independent smallholder farmers households sampled, as many as 132 farm households or 48.89 percent have more food expenditure than non-food. The remaining 138 independent oil palm farmer households or 51.11 percent have more food expenditure than non-food.

Tabel 7. Comparison of Household Food and Non-Food Expenditures of Independent Smallholder Oil Palm Farmer in Riau Province.

No.	Expenditure	Respondents	%
1	Food > Non Food	132	48.89
2	Food < Non Food	138	51.11
Total		270	100.00

Source: Processed data, 2019

Sustainability Challenges

The Legality of Independent Plantation Farming

Proof of land ownership is legal or official evidence that confirms that the farmer is the legal owner of the land. The results showed that independent oil palm farmers have proof of ownership of their land in the form of a Certificate of Ownership (SHM) as many as 106 respondents or 39.26 percent of the total respondents. For other proof of ownership in the form of a Surat Keterangan Tanah (SKT) of 91 respondent or 33.70 percent, a Surat Keterangan Ganti Rugi (SKGR) of 63 respondent or 23.33 percent and do not have proof of ownership of 10 respondent or 3.7 percent of total respondents (Figure 2).

In compliance with ISPO requirements, the land must have evidence of ownership in the form of SHM, while the majority of independent smallholder oil palm plantations are still in the form of SKT, SKGR and some do not have it. The land is considered illegal from the viewpoint of sustainable plantation policies (ISPO). Besides, the expense of producing SHM and the amount of time it is conducted is a constraint for independent smallholder oil palm farmers. Another requirement for ISPO certification that includes The Legality of Independent Plantation Farming is *Surat Tanda Daftar Usaha Perkebunan Untuk Budidaya (STD-B)* that issued by the mayor or the regent. All of the respondents do not have it, and they just don't know why they needed it to do their farming.

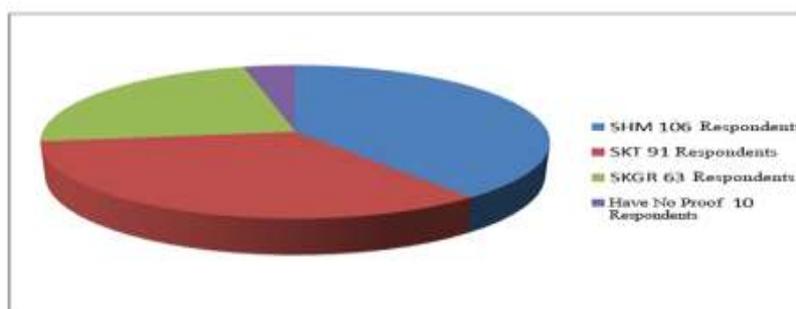


Figure 2. Proof of Land Ownership
Source: Processed data, 2019

Farmers Organizations

Farmers' group or Cooperation is mandatory for ISPO certification. Farmer's organizations are determined as Cooperation or Farmers Group. The majority of Independent Oil palm Smallholder Farmers were do not have it. Only 56 respondents or 20.74 percent that knowing has Farmers Group while the majority 214 respondents or

79.26 percent do not have or joining farmers group. It is hard to make a farmers group for independent oil palm smallholder farmers due to the farmer's land was not in the same area, so it is hard to manage in a group.

Environmental and Management Monitoring

Environmental and management monitoring needs to be assured to protect the environment, especially for freshwater sources, native animals, and plants that are protected by law. There were no environmental and management monitoring applied by independent oil palm smallholder farmers in this research. As a mandatory requirement for ISPO certification, it is hard to fulfill because farmers do not have any knowledge about it and there is no knowledge transferred by the government, private sectors, or NGOs about these to the farmers.

Sustainable Improvement

Several issues found in this research which is to prevent independent smallholder oil palm farmers from making sustainable improvement;

a. Uncertified oil palm seeds

One of the key aspects of ISPO certification is the concept of the legitimacy of certified seed or oil palm seedlings to follow environmental quality requirements and sustainable natural resources. The plantations where oil palm trees grow with uncertified seedlings are considered illegal from the viewpoint of a sustainable plantation. This research revealed that only 12 independent oil palm smallholder farmer respondents or 4.44 percent reported having proof of seed documents/certificate of seed origin, while the remaining 258 respondents or 95.56 percent did not have proof of seed documents. To fit with ISPO standard farmers should replanting their plant with certified oil palm seeds that meet ISPO standard.

b. Low Land Productivity

The results of this study indicate that the productivity of independent oil palm farmers per hectare per year owned by farmers varies, in the range of > 12 tons/ha/year as many as 109 respondent or 40.37 percent, followed by > 10-12 tons /ha /year as many as 89 respondent or 32.96 percent, > 8-10 tons /ha/year as 48 respondent or 17.78 percent, and > 6-8 tons /ha/ year as many as 19 people or 7.04 percent. Furthermore, > 4-6 tons / ha / year as many as 5 respondent or 1.85 percent and < 4 tons / ha / year as many as 0 respondents (Figure 4). But if clustered, then the majority of 59.63 percent of the productivity of independent oil palm lands is in the range > 4-12 tons /ha /year.

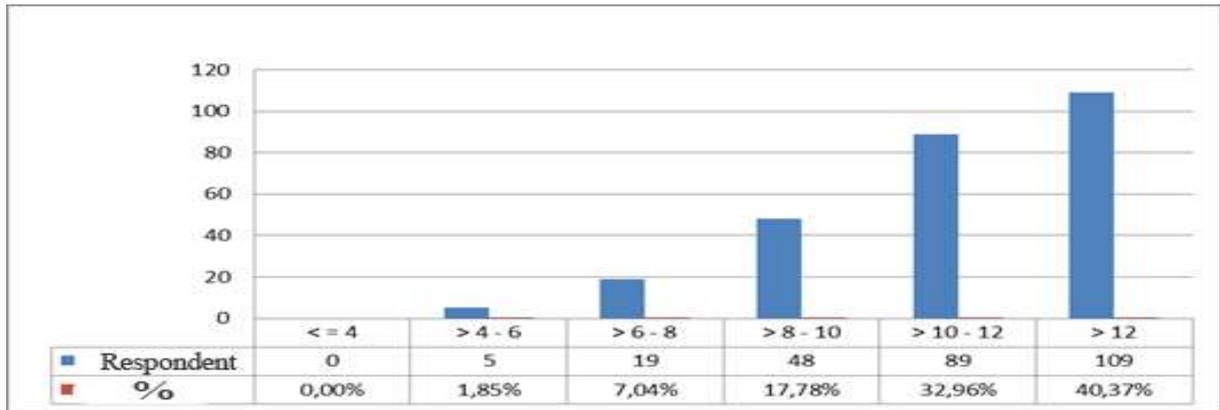


Figure 4. Land Productivity of Independent Smallholder Farmers (Ton/Ha/Year)
 Source: Processed data, 2019

The low productivity of independent smallholder oil palm is also inseparable from the use of seeds that are not superior. From the previous explanation regarding the proof/certificate of seed purchase where only 12 people or 4.44percent of the respondent farmers have proof/certificate of seed purchase, it can be said that the majority of independent oil palm farmers use seedlings whose doubt is superior. Another allegedly influential factor is the lack of care, especially fertilization, and the absence of assistance by agricultural extension workers for guidance and guidance on how to plant oil palm properly. Besides, the age of planting, which is in the range of planting years in 2000 and below, indicates that the independent oil palm plantations have entered old age and are no longer productive (Figure 5). If replanting is not carried out according to the standard of good and correct management of oil palm plantations, independent oil palm farmers will continue to experience a decline in production which will result in a decrease in farming income. This condition will make it difficult for farmers to obtain ISPO certification.

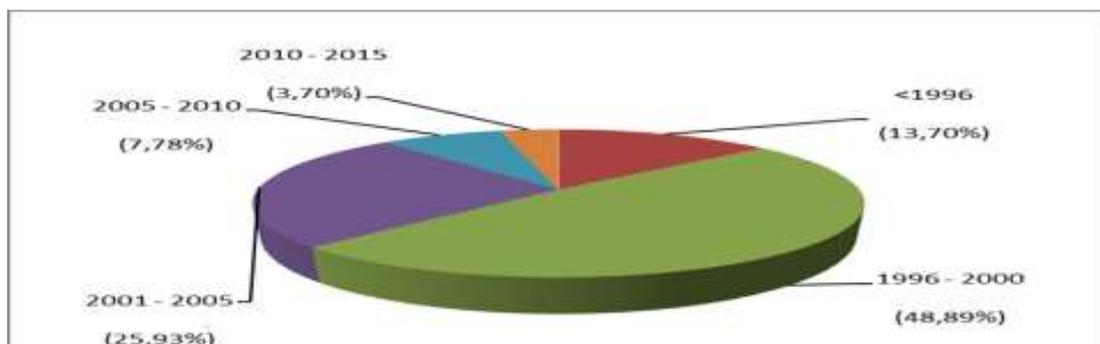


Figure 5. Year of Planting
 Source: Processed data, 2019

IV CONCLUSION

As a province with the largest area of oil palm plantations in Indonesia, the condition of independent smallholder oil palm farmers in Riau Province is considered to represent the situation of independent smallholder oil palm farmers in Indonesia. The total household income of independent smallholder oil palm growers in Riau Province was IDR. 4,795,793.93 per month. Source of outside income from oil palm farming contributed to an average of IDR. 331,341.48 per month to the total income of farmers or contribute 6.91 percent. The average non-agricultural income was IDR. 1,583,540.74 per month or contributes 33.02 percent and the average non-work income was IDR. 33,888.89 contributed 0.71. The average household consumption of independent oil palm farmers in Riau Province was IDR. 2,504,042,14. Food expenditure for farm households was IDR. 1,219,756.11 per month with a percentage of 48.71 percent of the total farm household expenses. While the average non-food expenditure was IDR 1,284,286.03 per month with a percentage of 51.29 percent of the total farm household expenses.

Independent smallholder oil palm farmers were faced with the challenge of sustainability to meet ISPO Standards. There is only 36.26 percent had SHM as their land proof of ownership. No farmers organization or Cooperation, only lack of farmers has it. No environmental and management monitoring makes it is getting harder to meet ISPO standards. Regarding the issue of sustainable improvement, independent smallholders are faced with the fact that the majority of farmers use uncertified seeds, low land productivity, and the planting age of oil palm is entering old age. Replanting that meets ISPO standard for land with old, damaged, or unproductive plant conditions must be done, the results of this study amounted to 62.59 percent of independent smallholder oil palm plantation aged more than 20 years. To improve farmer's capacity to meet and comply with the ISPO certification, external supports from the government and private sectors are needed. Especially for funding and knowledge transfers of good agricultural practice.

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