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Economic Transformation of Pepper Farmer's Households in Lampung Province

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Abstract. This study aims to analyze: (1) pepper farming income (2) income and economic transformation of pepper farmer's households. This research was conducted in 3 districts that were chosen purposively because these locations are the main black pepper producers in Lampung Province. There were 100 farmer respondents and were taken by simple random sampling method. Data collection was carried out from April to September 2020. The analytical method used was farming analysis and farmer household income. The results showed that pepper farming activities in Way Kanan, North Lampung, and East Lampung Regency were profitable to cultivate because the RC ratio was more than one, the economic income of farmer's households came from on farm pepper, on farm non pepper, non-farm and off farm.

Key word: Economic, Farmer, Pepper, Transformation

1. Introduction

Pepper is an Indonesian export commodity that generates a lot of foreign exchange for the country. In addition, pepper is also one type of spice that is very distinctive and cannot be replaced by other spices (1,2). Indonesia is the second largest pepper producing country after Vietnam with a share of 19.04 percent or 71,583 tons of total pepper production in the world. In addition, Indonesian pepper commodity is a complementary commodity for other major pepper exporting countries, namely India, China, Brazil and Vietnam in the world pepper market (3). Sumatra and Sulawesi are the centrals of pepper production in Indonesia. There are two types of pepper produced, namely black pepper and white pepper on Sumatra. Lampung is the central black pepper production and Bangka Belitung is the central of white pepper production. Lampung is the second largest central of pepper production in Indonesia after Bangka Belitung, with 44,794 ha of area and 14,830 tons/year of pepper production.

Lampung has several centrals of pepper production, including the districts of North Lampung, West Lampung, Way Kanan, Tanggamus and East Lampung. The largest pepper plantation in Lampung is located at North Lampung Regency with 11,588 ha of area with 3,950 tons of production capacity. In the second place, Way Kanan has 9,259 ha of area with 1,625 tons of production capacity (4). However, during the last decade there has been a decline in pepper productivity, Lampung black pepper productivity in 2021 was still very low at 0.43 tons/ha, far below the national average productivity of 0.78 tons/ha (5,6).

In addition to low productivity, the selling price of pepper tends to decrease (7). The dependence of Indonesian pepper on the export market is considered to be one of the causes of pepper price fluctuations (8,9). Domestic price fluctuations occur due to the following price fluctuations that occur at higher market levels. The world pepper price thus affects the pepper price in the domestic market. The existence of an integrated market results in price changes that occur in one market can affect price changes in other markets (10).

The low price of pepper will affect farmer's income. If farmers only depend on pepper for their livelihood, their needs cannot be met, so many farmers look for other sources of income outside of pepper farming (11,12). The low income of farmers will affect their welfare (13). To meet household needs, some farmers are also looking for work outside of pepper farming (14)

Without the government's attention to agribusiness, economic transformation will occur in an unstructured manner. Empirical conditions show that farmers are starting to be reluctant to cultivate pepper. In addition to internal factors such as the presence of pests and diseases, low production and prices, as well as capital, there are also external factors, namely the lack of partiality of the local government towards the welfare of pepper farmers (15). This will certainly hamper the sustainability of pepper farming in Indonesia, especially in Lampung. Based on this, the purpose of this study is to analyze the income of pepper farming and the economic transformation of pepper farmer's households in Lampung.

2. Methods

This research was conducted in Lampung. The location of this research was determined purposively with the consideration that Lampung is the second largest central of pepper production in Indonesia after Bangka Belitung. The time of the study was in April-September 2020. This study used a survey method at the location of pepper production centers in Lampung Province. The sample farmers are estimated to be 100 pepper farmers taken by simple random sampling. Data analysis used quantitative descriptive methods, namely through farm analysis and farmer household income analysis. Household income is obtained by adding up family income from farming and family income from outside farming, with the following formula:

Household Income = Farm Income + Non-Farm Income

Pepper farming analysis by calculating the income of pepper farmers is calculated by subtracting the value of commodity sales from the production costs incurred (explicit cost). In addition, income analysis will also be used to calculate other sources of income, either from non-pepper farming or non-agricultural businesses. Based on previous research and existing theories, several factors that affect farmer's income are taken into account, namely net income, variable input prices, variable input quantities, output prices, production quantities (output), and fixed costs. A farming analysis was carried out to determine farm income and its contribution to household characteristics with the level of diversity of household businesses using tabulations of all household incomes in various sectors.

3. Result and Discussion

In this section, the results of the study will be presented, including the characteristics of respondents, pepper farming cropping patterns, pepper farming income, and household income and economic transformation of pepper farmers.

3.1. Characteristics of Respondents

As many as 70% of pepper farmers are in the productive age range between 16 and 64 years. As much as 41.17% of the average education level of pepper farmers in Way Kanan Regency is high school, and when compared to other districts, the average level of education of pepper farmers in Way Kanan is higher. The average pepper farmer has 3–4 family dependents. The large number of family members can affect the availability of labor in the family, so that the use of labor outside the family

can be minimized. Pepper farmers in North Lampung have the longest farming experience compared to pepper farmers in Way Kanan and East Lampung Regencies, which is 55 years, so with this longer experience, farmers in North Lampung should be more efficient in pepper farming. The average pepper farmer in Way Kanan, North Lampung, and East Lampung regencies is not included in the smallholders because the average land area owned by the district farmers is more than 0,5 hectares. Of course, this is very influential on the income level of farmers and even the welfare of pepper farmers, because the wider the farm land, the higher the production and income.

3.2. Pepper Farming Cropping Pattern

Pepper farming in Way Kanan Regency, North Lampung Regency, and East Lampung Regency is dominated by intercropping cropping patterns, namely Way Kanan Regency by 93%, North Lampung Regency by 95%, and East Lampung Regency by 77%. Of the three regencies, Way Kanan Regency has the most varied cropping pattern with 10 combinations of intercropping plants, while East Lampung Regency has the least variation (3 combinations) and North Lampung Regency consists of 5 combinations. Way Kanan Regency is dominated by pepper and coffee intercropping, and with the most combinations of plants in one area of land, namely a combination of pepper, jengkol, coffee, rice, and bananas. North Lampung Regency is dominated by pepper intercropping with coffee and jengkol, while East Lampung Regency is dominated by pepper and banana intercropping.

Table 1. Pepper Farming Patterns in Way Kanan Regency, North Lampung Regency, and East Lampung Regency in 2020

No	Way Kanan Regency		North Lampung Regency		East Lampung Regency	
	Pattern	%	Pattern	%	Pattern	%
A	**Monoculture**	**7**	**Monoculture**	**5**	**Monoculture**	**33**
B	**Intercropping:**	**93**	**Intercropping:**	**95**	**Intercropping:**	**77**
1	Pepper, Coffee	38	Pepper, Coffee	20	Pepper, Banana	17
2	Pepper, Rubber	3	Pepper, Jengkol	25	Pepper, Banana, Coconut	13
3	Pepper, Jengkol	6	Pepper, Coffee, Jengkol	40	Pepper, Banana, Chocolate	47
4	Pepper, Coffee, Jengkol	21	Pepper, Jengkol, Rubber	5		
5	Pepper, Coffee, Rice	3	Pepper, Jengkol, Petai	5		
6	Pepper, Coffee, Banana	6				
7	Pepper, Coffee, Jengkol, Rubber	2				
8	Pepper, Coffee, Jengkol, Banana	6				
9	Pepper, Coffee, Banana, Chili	6				
10	Pepper, Coffee, Jengkol, Rice, Banana	2				

Source: Primary Data Processed, 2020

The reason why farmers choose monoculture farming is because they think pepper plants will produce more optimal production when planted in monocultures compared to intercropping. On the other hand, the majority of farmers choose to plant intercropping because they think that planting other crops that produce on the same land as pepper farming can increase their income. According to (16), intercropping patterns can be a solution when crop failure occurs in pepper plants, which causes a decrease in production as well as when prices fall or are unstable.

3.3. *Pepper Farming Income*

The average pepper price in Way Kanan Regency is IDR 27,352.94/kg, in North Lampung Regency it is IDR 28,250.00/kg, and in East Lampung Regency it is IDR 28,475.00/kg. Pepper production per hectare in East Lampung Regency is higher than in Way Kanan Regency and North Lampung Regency, which is 563.27kg/ha, while in Way Kanan Regency it is only 93.18kg/ha and in North Lampung Regency it is 59.38kg/ha. This is because pepper farmers in East Lampung are still quite a lot who plant cassava with a monoculture cropping pattern and intercrop with other plants, consisting

of at most 3 combinations of plants, while other districts have diverse intercropping plants in one area of land. The more combinations of plants in one field, the fewer the number of pepper plants, so that the pepper production is getting smaller. The amount of production and price determine the size of the farm's revenue (17). On average, the higher the production and unit price of pepper production, the greater the farm income. On the other hand, if the production and price are low, the revenue will be smaller (18). Revenue, costs, and income of pepper farming in Way Kanan Regency, North Lampung Regency, and East Lampung Regency can be seen in Table 2.

Table 2. Revenue, Costs, Income And R/C Of Pepper Farming In Way Kanan Regency, North Lampung Regency And East Lampung Regency In 2020

Description	Way Kanan Regency	North Lampung Regency	East Lampung Regency
	Value (IDR/ha/year)	Value (IDR/ha/year)	Value (IDR/ha/year)
1. Production	17,242,823.93	4,694,771.54	17,755,796.30
Pepper	2,548,743.79	1,677,343.75	16,039,158.95
Intercropping	14,694,080.14	3,017,427.79	1,716,637.35
2. Total Cash Cost	4,390,009.37	1,548,387.88	2,707,444.76
3. Total Calculates Cost	2,972,046.54	3,139,610.64	4,572,264.02
4. Total Cost	7,362,055.91	4,687,998.51	7,279,708.78
5. Farming Income			
Income (Cash Cost)	12,852,814.56	3,146,383.66	15,048,351.54
Income (Total Cost)	9,880,768.03	6,773.03	10,476,087.52
6. R/C (Cash Cost)	2.93	2.03	**5.56**
R/C (Total Cost)	1.34	1.00	**1.44**

Source: Primary Data Processed, 2020

Farmer's income in Way Kanan is dominated by intercropping plants, with the total revenue IDR 17,242,823.93/ha/year consisting of IDR 2,548,743.79/ha/year from pepper commodities and IDR 14,694,080.14/ha/year from intercropping. When compared with other districts, East Lampung Regency has the largest amount of pepper production, with pepper crop revenue of IDR 16,039,158.95 plus revenue from intercropping plants of IDR 1,716,637.35/ha/year, so that the total revenue from farming becomes IDR 17,755,796.30/ha/year, while North Lampung Regency received the smallest farm income.

The R/C value for cash costs and for the total cost of pepper farming in East Lampung Regency is higher than in Way Kanan Regency and North Lampung Regency, which is 5.56, which means that for every IDR 100.00 spent by farmers, farmers will get a profit of IDR 556.00. While the R/C for the total cost in East Lampung Regency is 1.44, which means that for every IDR 100.00 of the cost incurred by the farmer, the farmer will get a profit of IDR 144.00. The R/C value for cash costs and total pepper farming in Way Kanan Regency is also more than one, namely 2.93 and 1.34, but the R/C value for the total cost of North Lampung Regency is only 1.01. So it can be concluded that farming activities in Way Kanan Regency, North Lampung Regency, and East Lampung Regency are profitable to cultivate and pepper farming in East Lampung Regency is the most profitable.

3.4. Income and Economic Transformation of Pepper Farmer Households

Pepper farming in Way Kanan Regency, North Lampung Regency, and East Lampung Regency faces similar problems, namely erratic weather changes, pest and plant disease attacks, limited use of production facilities, and unstable prices. The erratic weather causes difficulty in plant care and causes plant diseases in the form of stem and leaf rot so that production decreases. Farmers tend not to treat plant diseases that arise because they do not know drugs that can overcome these diseases. The limited use of production facilities such as fertilizer is caused by several things, including limited capital, difficulty in obtaining fertilizer, and some farmers who deliberately do not use fertilizer because they

are accustomed to not using it. The constraint of pepper farming is low productivity. One of the reasons for the low productivity is that there has not been much improvement in soil fertility by means of fertilization (19). Unstable prices affect the income received by farmers (18). The existence of obstacles in farming causes farmers to seek additional income to meet household needs, including by applying intercropping patterns, farming plants other than pepper, and doing side jobs inside (off farm) and outside the agricultural sector (non-farm).

3.4.1. Household Income Structure of Pepper Farmers

Farmer household income does not only come from pepper farming owned by farmers (on farm). To meet their daily needs, farmers usually also do side jobs, both off-farm and non-farm. Farmer's household income sources are increasingly diverse and lead to off-farm activities (11,20).

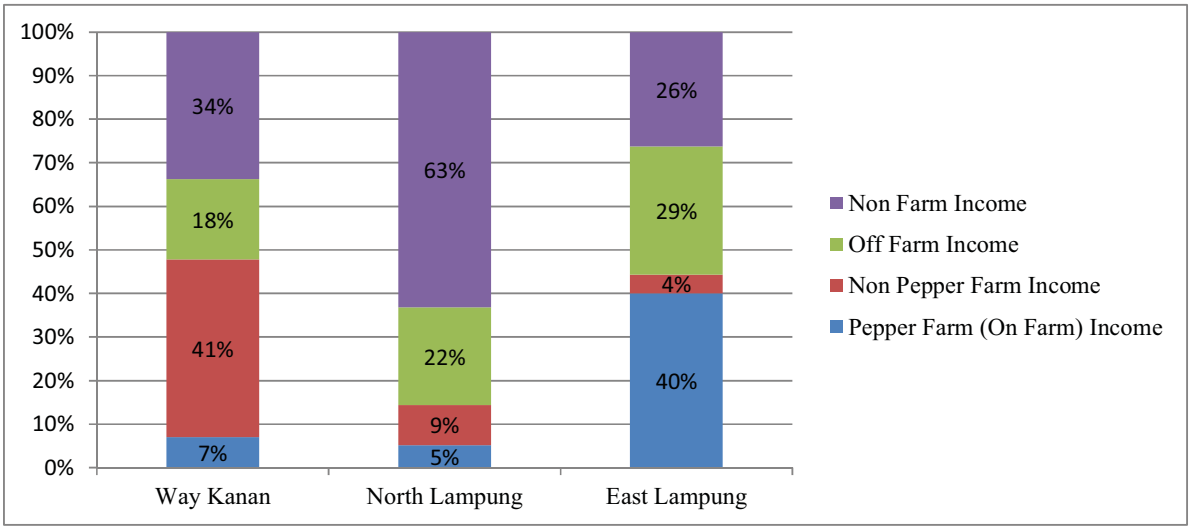

Figure 1. Household Income Structure of Pepper Farmers in Way Kanan, East Lampung Regency, and North Lampung Regency in 2020

The household income structure of pepper farmers can also be seen in Figure 1. Figure 1 shows that most of the household income of pepper farmers in Way Kanan Regency and East Lampung Regency comes from farming activities (on-farm). These results indicate that agriculture is the main source of income for pepper farmers in the two districts. However, the income of farmers in Way Kanan Regency from pepper farming is smaller than the income from non-pepper farming. Non-pepper farming is one of the farmer's efforts to overcome obstacles and uncertainties in pepper farming. Meanwhile, the dominance of farmer household income in North Lampung Regency comes from non-farm and off-farm income.

In the Table 3, pepper farmer's income based on income sources in Way Kanan Regency, North Lampung Regency, and East Lampung Regency can be seen. Table 3 shows that the household income of farmers in Way Kanan Regency is IDR 36,027,268/ha, the household income of pepper farmers in North Lampung Regency is IDR 32,732,960.40/ha, and the household income of farmers in East Lampung Regency is IDR 40,085,795.50/ha.

Table 3. Household Income of Pepper Farmers in Way Kanan Regency, North Lampung Regency, and North Lampung Regency per hectare in 2020

Description	Way Kanan		North Lampung		West Lampung	
	Value (IDR)	(%)	Value (IDR)	(%)	Value (IDR)	(%)
Pepper Farm Income	2,548,743.79	7.07	1,677,343.75	5.12	16,039,158.95	40.01
Non Pepper Farm Income	14,694,080.14	40.78	3,017,427.79	9.22	1,716,637.35	4.28
Off-farm Income	6,640,000.00	18.43	7,338,188.82	22.42	11,820,909.09	29.49
Non-farm Income	12,144,444.44	33.72	20,700,000.00	63.24	10,509,090.09	26.22
Total Household Income	36,027,268.40		32,732,960.40	100.00	40,085,795.50	100.00

Source: Primary Data Processed, 2020

The income of non-farm farming of pepper farmers in North Lampung Regency is greater than the income of the main farm, namely pepper. Based on this data, it can be seen that East Lampung Regency produces a higher average income than Way Kanan Regency and North Lampung Regency.

3.4.2. Economic Transformation of Pepper Farmer's Households

Changes in the interests of farmers in pepper farming and the movement of labor from the agricultural sector to the non-agricultural sector are a form of economic transformation. Economic transformation can occur because of the constraints faced as well as the low level of income and wages. According to (21), the level of wages or income from farming affects the decision of farmers to move from the agricultural sector to the non-agricultural/industrial sector. The existence of obstacles and uncertainties in pepper farming causes farmers in Way Kanan Regency, North Lampung Regency, and East Lampung Regency to carry out a transformation by seeking side businesses to increase income and meet household needs.

4. Conclusion

Pepper farming activities in Way Kanan, North Lampung, and East Lampung districts have been profitable. The average income of farmer households in East Lampung Regency is higher than in Way Kanan Regency and North Lampung Regency. Most of the household income of pepper farmers in Way Kanan Regency and East Lampung Regency comes from farming activities (on-farm). Meanwhile, the household income of farmers in North Lampung Regency is dominated by non-farm income. The constraints of pepper farming are low production, pests and diseases attack, limited use of production facilities, and unstable prices. Constraints and uncertainties in pepper farming have caused farmers in Way Kanan Regency, North Lampung Regency, and East Lampung Regency to transform by seeking on-farm, off-farm, and non-farm side businesses to increase household income.

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