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## PEELED CORN (*ZEA MAYS* L.) BUSINESS INCOME CONTRIBUTION TO FARMERS' HOUSEHOLD INCOME (CASE STUDY IN BANGUN REJO VILLAGE, TENGGARONG SEBERANG SUB DISTRICT, KUTAI KARTANEGARA REGENCY)

Syarifah Aida<sup>1</sup>, Mursidah<sup>2</sup>, Yusril Renaldy<sup>3</sup>

<sup>1,2,3</sup>Agribusiness Study Program, Faculty of Agriculture, Mulawarman University, Kampus Gunung Kelua, Jl. Pasir Balengkong, Samarinda, East Kalimantan, Indonesia 75123.  
Email: aidaalbaity@gmail.com; mursidah@faperta.unmul.ac.id; yusrialdy98@gmail.com

**Corresponding author:** \*Mursidah  
**Email:** mursidah@faperta.unmul.ac.id

### ABSTRACT

The purpose of the study was to determine the income, total household income of farmers, and the contribution of peeled corn farming income in Bangun Rejo Village, Tenggarong Seberang sub District, Kutai Kartanegara Regency to the total income of shelled corn farmers. The study was conducted from October 2020 to January 2021 in Bangun Rejo Village, Tenggarong Seberang sub District, Kutai Kartanegara Regency, East Kalimantan Province. Sampling using a saturated sample or census of all corn farmers as many as 45 people. The data collected includes primary data and secondary data, data analysis includes farming costs, income, farm income, household income, and the contribution of shelled corn cultivation. The results showed that (1) the average production of shelled corn farming in Bangun Rejo Village, Tenggarong Seberang sub District was  $1.433,11 \text{ kg}^{-1} \text{ mt}^{-1}$  with an average land area of  $0,79 \text{ ha}^{-1}$  so that the average total revenue is Rp 21.825.333,33 year<sup>-1</sup> with an average total farm cost of Rp 3.492.637,04 year<sup>-1</sup>, and the average total income of peeled corn farming is Rp 9.997.422,22 year<sup>-1</sup>; (2) The total household income of farmers originating from peeled corn farming, non-peeled corn farming and non-agricultural income in Bangun Rejo Village, Tenggarong Seberang sub District is an average of Rp 16.675.288,89 year<sup>-1</sup>; and (3) Peeled corn farming has a relatively high contribution to the household income of farmers in Bangun Rejo Village, Tenggarong Seberang sub District, amounting to 60%.

### KEYWORDS

Income Contribution, Peeled Corn Farming.



## I. INTRODUCTION

Corn has promising prospects for cultivation. Apart from food and feed, corn is also widely used in the food, beverage, chemical, and pharmaceutical industries. Utilization of corn as an industrial raw material such as animal feed, corn flour, and oil that will provide added value to the farming of these commodities, one of which is shelled corn. Currently, the demand for corn in Indonesia is quite large, which is more than 10 million tons of dry shells per year [1].

East Kalimantan has a large enough cultivation potential for shelled corn commodity. Corn production in East Kalimantan in 2018 was 103,155 tons. With details, Paser Regency is 15,569.59 tons, West Kutai Regency is 1,625.03 tons, Kutai Kartanegara Regency is 13,376.88 tons, East Kutai Regency is 3,488.74 tons, Berau Regency is 65,550.82 tons, North Penajam Paser Regency is 2,486.76 tons, Mahakam Ulu Regency 48.06 tons, Balikpapan City 475.18 tons, Bontang City 56.22 tons, and Samarinda City 476.10 tons [2].

Market demand for corn commodities causes the need for corn commodities to increase. This encourages corn farmers to increase their production. Corn farmers in conducting their farming are often influenced by farming characteristics such as land area, use of production facilities, and labor. Factors of production in agriculture include 4 components, namely land, capital, labor, and skills or management. Each factor has a different function and is related to each other. If one of the factors is not available then the production process will not run [3]

The high productivity of corn will affect the household income of farmers, namely farmers can meet their needs through income from corn farming, on the other hand, if the productivity is low, farmers experience losses that will affect the household income of farmers. In addition to low productivity, farmers' household income is also influenced by land area, because agricultural land is one of the production factors that can affect farmers' income results. The larger the area of land cultivated, the greater the possibility for the farmer to earn higher incomes.

Farmers' income is obtained only every planting season after harvest, while expenses are made every day according to the need to maintain life. To be able to meet their daily needs apart from depending on corn farming, farmers must look for other sources of income to meet the needs of their families outside of corn farming, such as farming of plantation commodities and horticultural commodities.

Income contribution is the percentage comparison between the total income of shelled corn farming and the total family income as a whole. Family income comes from main income and side income.

Viewed from the economic aspect, peeled corn has the potential to be cultivated or developed to meet consumer needs in fulfilling their animal feed, this makes shell corn has a fairly good market opportunity. If you look at the development of technology and techniques for cultivating peeledcorn, which will certainly facilitate the cultivation of peeledcorn.

Judging from these potentials, farmers also hope to have a sizeable income from peeledcorn farming. However, sometimes the facts in the field do not work in accordance with the existing theory so that farmers also get income that is not as expected and does not even cover production costs. This is caused by many factors, including natural factors, market prices, and unexpected production costs [4].

According to data from the Agricultural Extension Center in Bangun Rejo Village, Tenggara Seberang sub District, Kutai Kartanegara Regency, there are many food crops, one of which is peeledcorn with a land area of 45 ha and the number of farmers in Bangun Rejo Village there are 865 farmers and 45 farmers who cultivate peeledcorn production of 6.73 tons ha<sup>-1</sup> per growing season of peeled corn

## II. RESEARCH METHODS

### 2.1. Time and place

The study was conducted from October 2020 to January 2021 in Bangun Rejo Village, Tenggara Seberang sub District, Kutai Kartanegara Regency, East Kalimantan Province.

## 2.2. Method of collecting data

The data collected, namely: (a) primary data is data obtained by conducting direct observations and interviews with farmers, and (b) secondary data obtained from library research, data from village offices, research reports, scientific works related to research.

## 2.3. Sampling Method

Determination of samples for shelled corn farmers using saturated samples or census as many as 45 farmers of shelled corn. This is done because the research population is less than 100 people, so the samples taken are all of them [5].

## 2.4. Data analysis method

The data obtained are presented in tabular form and further data analysis is carried out, as follows:

### 2.4.1. Total cost

To find out the total costs incurred during the production process, the following formula is used: [6] :  $TC = TFC + TVC$

Notes : TC = Total Cost (Rp year<sup>-1</sup>); TFC = Total Fixed Cost (Rp year<sup>-1</sup>); and

$TVC = Total\ Variable\ Cost\ (Rp\ year^{-1})$ .

### 2.4.2. Revenue

Total revenue is obtained from the product of the price and the number of goods, mathematically the total revenue can be known through the following formula[7]:  $TR = P \times Q$

Notes : TR = Total Revenue (Rp year<sup>-1</sup>); P = Price (Rp year<sup>-1</sup>); Q = Quantity (kg year<sup>-1</sup>)

### 2.4.3. Total Income

Total income is obtained from total revenue minus the total cost in a production with the formula [6] as follows:  $I = TR - TC$

Notes: I = Income (Rp year<sup>-1</sup>); TR = Total Revenue (Rp year<sup>-1</sup>);

$TC = Total\ Cost\ ((Rp\ year^{-1})$ .

### 2.4.4. Household income

Farmer household income is calculated using the formula [8] as follows:  $I_{RT} = I_{JP} + I_{VL}$

Notes:  $I_{RT}$  = Household Income (Rp year<sup>-1</sup>);  $I_{JP}$  = Peeled corn farming income (Rp year<sup>-1</sup>); and  $I_{VL}$  = Non-agricultural income of peeled corn and non-agricultural income (Rp year<sup>-1</sup>).

### 2.4.5. Farm contribution

Farming contribution to farm income is calculated using the formula [9] as follows:  $K = [PI : PtRt] \times 100\%$

Notes: K = farm income contribution (%); PI = farm income (Rp year<sup>-1</sup>);

PtRt = total household income (Rp year<sup>-1</sup>).

## III. RESULTS AND DISCUSSION

### 3.1. Overview of Research Area

Bangun Rejo Village is one of the villages located in Tenggarong Seberang sub District with an area of 2,924 Ha, has a typology of plantations, livestock, mining, cultivation, rice fields, handicrafts, small industries, medium industries, large industries as well as services and trade. In detail the area use according to the Village Monograph Data are: 684.00 ha of rice fields; 135.75 ha of fields/fields; 50.00 ha of plantations; 178.00 ha of community forest; 290.00 ha of yards, 135.75 ha of settlements; 157.00 ha of wetlands; and 40.90 ha of public facilities.

In 2019, the population of Bangun Rejo Village was 8,153 people consisting of 4,349 men and 3,804 women with 2,579 household heads.

The education level of the people of Bangun Rejo Village is 762.00 people who finished elementary school (21.15%); 103 people graduated from junior high school (28.56%); 131 people graduated from high school (36.45%); 122 people graduated from diploma (3.38% and 376 graduates (10.43%). Based on the type of work, namely 865 farmers, 54 farm laborers, 107 civil servants; others worked as private employees and traders [10]

### 3.2. Characteristics of Respondents

Based on the results of interviews conducted with 45 respondents who grow shelled corn, the following is a description of the characteristics of the respondents:

#### 3.2.1. Age

According to the Manpower Act No. 13 of 2003, the productive age of the Indonesian population is between 15-64 years, the age condition of the respondents based on age, namely: 15-64 years as many as 41 people (91.00%) and > 64 years as many as 4 people (9%).

#### 3.2.2. Level of education

The level of education is an important factor for farmers in terms of skills, technology, innovation, and a more dynamic way of thinking in managing shelled corn farming. Based on the education level of the respondents, namely: 8 respondents did not finish elementary school (18%), 21 respondents graduated from elementary school (47%), 16 respondents graduated from junior high school (36%), and none of them had high school education.

#### 3.2.3. Land area

The area of agricultural land owned has an effect on agricultural income, the state of the data on the area of land owned by respondents, namely: 0.25 ha as many as 2 respondents; 0.50 ha as many as 18 respondents; 0.75 ha for 5 respondents; 1.00 ha as many as 15 respondents; 1.50 ha as many as 5 respondents. Most of the land used for farming is their own land, On land used by farmers to plant other crops when the land is not used to grow corn (farmers do crop rotation).

#### 3.2.4. The number of dependents

The number of family dependents is also one of the factors that influence the way farmers manage their farms. The condition of the respondents based on the number of dependents, namely: 0-3 dependents there are 19 respondents (42,00%); 4-6 dependents there are 26 respondents (58,00%)

### 3.3. Overview of Peeled Corn Cultivation

Based on the results of observations and interviews, in general most of the residents in Bangun Rejo Village make a living as farmers. The farmers consist of rice farmers, secondary crops farmers, and vegetable farmers. In addition to peeled corn farming activities, the farmers also carry out other farming activities, namely planting lowland rice, cassava, papaya, kale, and curly chilies. Most of the farmers cultivate peeled corn by monoculture, while others use the method of intercropping with papaya, lowland rice, and water spinach. The description of the shelled corn farming activities carried out by farmers in Bangun Rejo Village, namely as follows: preparation, land clearing, tillage, formation of beds, liming, fertilizing, planting, maintenance (thinning, weeding, hoarding, pest and disease control, harvesting) and post harvest.

### 3.4. Peeled Corn Farming Production Costs

The cost of peeled corn farming consists of variable costs and fixed costs. Variable costs are costs that depend on the scale of production. Variable costs include: seeds, fertilizers, pesticides, depreciation of equipment and labor costs. Fixed costs include depreciation costs for tools such as hoes, sickles, spray tanks, machetes, and sharpening stones. Details of total variable costs and fixed costs are presented in Table 1.

**Table 1.** Peeled Corn Farming Costs

No	Component Farming Fee	Total Usage	Cost (Rp tahun <sup>-1</sup> )	Average cost (Rp tahun <sup>-1</sup> )	Percentage (%)
1	Seed Cost	552 kg	88.080.000,00	1.957.333,33	15,00
2	Fertilizer Cost	11.050 kg	70.138.500,00	1.588.633,33	12,00
3	Pesticide Cost	202.45 liter	74.122.500,00	1.647.166,67	12,00
4	Labor costs	227,75 HOK	305.370.000,00	6.763.000,00	51,00
5	Other expenses (rental of tractor, pulverizing machine and drying oven)	495	47.625.000,00	1.058.333,33	8,00
6	Fixed costs (depreciation costs of tools)		12.177.500,01	270.611,11	2,00
Total Cost of PeeledCorn Farming			597.513.500,01	13.285.077,77	100,00

*Source: Primary data (processed),2021*

Based on Table 1 above, it shows that the variable costs and fixed costs incurred by 45 respondents for seeds, fertilizers, pesticides, labor, other costs and depreciation of equipment are Rp. 597.513.500,01year<sup>-1</sup>with an average production cost of Rp. 13.285.077,77responden<sup>-1</sup>year<sup>-1</sup>.

### 3.5. Production and Revenue

Production is the result obtained in one growing season. Each respondent has a different amount of production. Generally, all respondents have a kinship with each other so that the behavior of respondents in processing farming is usually not much different. The data on the production of peeledcorn and the acceptance of shelled corn farmers are presented in Table 2.

**Table 2.** Recapitulation of Total Production and Revenue of PeeledCorn Farming

No	Description	Total	Average
1	Production (kg)	64.490	1.433,11
2	Average price (Rp kg <sup>-1</sup> )	5.111,11	5.111,11
3	Revenue (Rp year <sup>-1</sup> )	982.140.000,00	21.825.333,33

*Source: Primary data (processed),2021*

Based on the data in Table 2 shows that the amount of production per growing season obtained from 45 respondents is 64.490 kg<sup>-1</sup> mt<sup>-1</sup> with average 1.433,11 kg<sup>-1</sup> respondent<sup>-1</sup>;The number of harvested peeledcorn is 3 times a year. Average price of Rp. 5.111,11 kg<sup>-1</sup>, so that the total revenue from 45 respondents of peeledcorn farmers is Rp.982.140.000,00 year<sup>-1</sup>or by average Rp. 21.825.333,33respondent<sup>-1</sup>year<sup>-1</sup>.

### 3.6. Characteristics of Household Income

The characteristics of income are classified into 3, namely income from shelled corn farming, non-peel corn farming income and non-agricultural income.

#### 3.6.1. Peeled Corn Farming Income

The peeledcorn farming income is the income earned by the respondents from the peeledcorn farming per planting season for 3 months. The income of shelled corn farmers in Bangun Rejo Village is obtained by calculating the difference between receipts and the total production costs that have been incurred to produce production.

**Table 3.** Recapitulation of Total Cost, Total Production, Revenue, and Income of PeeledCorn Farming

No	Description	Total (Rp mt <sup>-1</sup> )	Average (Rp mt <sup>-1</sup> )
1	Total cost (Rp mt <sup>-1</sup> )	177.418.666,67	3.492.637,04

2	Total Production (Rp mt <sup>-1</sup> )	64.490,00	1.433,11
3	Income (Rp mt <sup>-1</sup> )	327.380.000,00	21.825.333,33
4	Revenue (Rp mt <sup>-1</sup> )	149.961.333,33	9.997.422,22

*Source: Primary data (processed), 2021; mt = season of planting*

Based on the data in Table 3 shows that the income obtained by 45 respondent farmers is Rp.149.961.333,33mt<sup>-1</sup> or with an average income of Rp. 9.997.422,22 respondent<sup>-1</sup>year<sup>-1</sup>.

### 3.6.2. Non peeled-Maize Farming Income

The non-peeled corn farming income referred to in this study is the income received by the respondent for one year which is realized in rupiah. Farming income for a year is calculated by adding up the number of harvests for one year. The number of seasons for rice farming is an average of 2 planting seasons, papaya farming in a year is an average of 1 planting season, and cassava farming in a year is an average of 1 planting season, in kale farming an average of 12 times a year growing season. The breakdown of total non-peeled corn income is presented in Table 4.

**Table 4.**Total Non Peeled-Maize Farming Income

No	Description	Total (Rpyear <sup>-1</sup> )	Average (Rpyear <sup>-1</sup> )
1	Rice	219,604,000.00	10,457,333.33
2	Cassava	10,292,000.00	10,457,333.33
3	Papaya	29,568,000.00	2,112,000.00
4	Kale or water spinach	8,400,000.00	2,800,000.00
		267,864,000.00	16,398,533.33

*Source: Primary data (processed), 2021*

Based on the data in Table 4 shows that several farms other than shelled corn such as rice, cassava, papaya, and kale are part of the contribution to household income. Farming activities are carried out by the respondent farmers to meet their personal needs and are sold to meet other living needs for the survival of the respondents. The amount of non-peeled corn farming income obtained by 45 respondent farmers is Rp.267.864.000,00mt<sup>-1</sup> or with an average income of Rp. 16.398.533,22respondent<sup>-1</sup>year<sup>-1</sup>.

### 3.6.3. Non-Farm Income

Non-farming income is income earned in addition to working as a peeled corn farmer, namely income earned from outside the farm, such as working as construction workers, traders and private employees. The number and size of the average non-agricultural income can be seen in Table 5.

**Table 5.**Total Non-farm Income

No	Description	Total (Rpyear <sup>-1</sup> )	Average (Rpyear <sup>-1</sup> )
1	Private sector employee	0,00	0,00
2	Trader	24,600,000.00	12,300,000.00
3	Construction workers	8,040,000,00	2,680,000,00
		32,640,000,00	14,980,000,00

*Source: Primary data (processed), 2021*

Based on the results of the study, it was shown that out of 45 respondents who were corn farmers in BangunRejo Village, only 4 people had income outside of farming. The low non-agricultural income is because all respondents work as farmers, both main work and additional work.

In general, the size of the income obtained by respondents from shelled corn farming received by farmers is influenced by land area and selling price. In this study, the area of land planted with shelled corn by several respondents had a fairly large land area and there were respondents who had a land area that was not so large so that the production obtained was not so high, while the selling price in the market and to middlemen always changed and became one of the factors that affect the income received by shelled corn farmers. Peeled corn

farmers in BangunRejo Village are interested in running this farm on the grounds that farming is a business that can meet the needs of their families.

The income of the farmer's household as a whole is already very high. This is because household income does not only come from shelled corn farming income, but is obtained from income outside of peeledcorn farming and other businesses outside the agricultural sector. Each respondent has a different amount of income, because the source of income owned by each respondent is also different. Most of the respondents in this study only earned income by farming, after calculating the total income obtained by respondents both from shelled corn farming, non-peeled corn and non-agricultural Rp 750.388.000,00 year<sup>-1</sup> dengan rata-rata pendapatan tiap responden sebesar Rp 16.675.288,89 responden<sup>-1</sup> year<sup>-1</sup>.

As a comparison, the results of research on sweet corn in Ketapangsub District, South Lampung Regency show that the average household income of corn farmers in Ketapangsub District is Rp 25.095.304 on farm activities, on off farm activities of Rp 25.023.968, and non-farm activities Rp 19.765.720. This shows that the income from on-farm activities is categorized as high compared to farm and non-farm activities. Corn farmer households that fall into the prosperous category are 78 farmers and 15 farmers fall into the not prosperous category. The factors of land area and education level have a significant effect on the welfare level of corn farmers [11]. The results of another study of corn farming in Pancawangi Village, Pancatengah Subdistrict, Tasikmalaya Regency showed that the total cost of Rp 7.940.123,05 ha<sup>-1</sup> mt<sup>-1</sup> which consists of fixed costs of Rp 158.253,96,- and variable cost of Rp 7.779.675,47,-. Income value of Rp 12.000.000,-so that the revenue value is Rp 3.551.903,90,-. The R/C value for corn farming is 1.51. This means that for every Rp. 1,- the costs incurred will receive an income of Rp. 1.51, - and an income of Rp. 0,51 [12]

### 3.7. Contribution of Peeled Corn Farming

The contribution referred to in this study is the contribution of peeledcorn farming in Bangun Rejo Village from 45 farmer respondents who work as shelled corn farmers. Apart from shelled corn farming, some farmers also earn income from non-peeled corn and non-agricultural businesses. Household income, whether done by the head of the family or family members from other farms, is obtained from farming rice, cassava, papaya, and kale, and a small portion of curly chili. Meanwhile, non-agricultural sources are obtained from traders, and construction workers.

**Table 6.** Contribution of PeeledCorn Farming to Respondents' Total Household Income

No	Business activities	Income (Rpyear <sup>-1</sup> )	Percentage (%)
1	PeeledCorn Plant	9.997.422,22	60,00
2	Non-Corn PeeledPlants	9.997.422,22	36,00
3	Non-Agricultural Business	752.333,33	4,00
Total		16.675.288,89	

*Source: Primary data (processed), 2021*

Based on Table 6, it shows that the yield of peeledcorn farming has a contribution to the total family income by 60%, the contribution of non-peeled corn crops is 36.00% and the contribution of non-agricultural businesses is 4.00%. This situation shows that the contribution of shelled corn farming income to household income is categorized as high. Peeled corn farming provides a significant contribution to the total income of farmer households and the income is used by farmers to meet family needs such as the cost of daily meals, school fees for children, and so on. According to [13] to determine the contribution of shelled corn farming income to the total household income of farmers, namely: (a) if farming income < 25% the contribution is very low; (b) if farm income > 25%-49% low contribution; (c) if farm income > 50% - 75% high contribution; and (d) if farm income > 75% the contribution is very high. Based on these calculations, it can be stated that the shelled corn farming is categorized as successful, the shelled corn farming in BangunRejo Village provides a high contribution to the total household income of farmers, which is 60.00%. It can be stated that farmers can meet family needs such as daily food costs, children's school fees, and others.

## IV. CONCLUSIONS AND RECOMMENDATIONS

### 4.1. Conclusion

Based on the results of research and discussion, several conclusions can be drawn, namely:

1. The average production of shelled corn farming in Bangun Rejo Village, Tenggara Seberang sub District  $1.433,11 \text{ kg}^{-1} \text{ mt}^{-1}$  with an average land area of  $0,79 \text{ ha}^{-1}$  so that the average total revenue is Rp 21.825.333,33  $\text{year}^{-1}$  with an average total farm cost of Rp 3.492.637,04  $\text{year}^{-1}$ , and the average total income of peeled corn farming is Rp 9.997.422,22  $\text{year}^{-1}$
2. The total household income of farmers originating from peeled corn farming, non-peeled corn farming and non-agricultural income in Bangun Rejo Village, Tenggara Seberang sub District is an average of Rp 16.675.288,89  $\text{year}^{-1}$ .
3. Peeled corn farming has a relatively high contribution to the household income of farmers in Bangun Rejo Village, Tenggara Seberang sub District, amounting to 60%.

### 4.2. Suggestion

Based on the results of the study, several suggestions can be put forward, namely as follows:

1. Farmers are encouraged to pay attention to land conditions, climate, total production costs and the selling price of shelled corn.
2. For both provincial and district governments, it is necessary to repair roads so that agricultural production, especially peeled corn, can be easily sold to the market or to middlemen.
3. The need for more intensive guidance and counseling from the Agricultural Extension Center in Tenggara Seberang sub District, especially in Bangun Rejo Village regarding administration to farmers to get assistance with seeds, pesticides, and fertilizers. As well as more precise cultivation techniques that can optimize the use of production factors in order to obtain optimal results and income, so that the knowledge and skills of farmers can be further increased.



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