



Analysis of the Areca Nut Agroindustry Value Chain in Padang Pariaman Regency

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ABSTRACT

There are two chain structures consisting of main actors and supporting actors. The structure of the first chain is Farmers → Small Collectors, → Large Collectors → Exporters. At the same time, the second chain structure is: Farmers, → Home Industry, → Collecting agents. Areca farmers get an added value of IDR 1,647.12/kilogram with an added value ratio of 71.80%. Small collectors get an added IDR 994.46/kilogram with an added value ratio of 22.10%. Prominent collectors get an added value of IDR 702.67/kg with a value-added ratio of 13.01%. The home industry obtains an added value of IDR 16,634.07/kilogram with an added value ratio of 79.21%. Farmers get a marketing margin of IDR 1,794.19/kilogram. Small collectors earn a marketing margin of IDR 1,500/kg. Collector traders earn a large marketing margin of IDR 900/kg. The home industry earns a marketing margin of IDR 18,000/kilogram.

1. INTRODUCTION

1.1. Research Background

Indonesia, by developing advanced and strong industries and supported by resilient agriculture and vice versa, can gradually make an agrarian Indonesian society able to become a resilient agrarian society as well as an industrial society. Thus the development of agro-industry will not only be shown for the development of industrial activities but at the same time also the development of processing and marketing activities of agricultural products [1]. West Sumatra Province is one of the largest areca nut producers in Indonesia, with an area of areca palm plantations in 2022 of 12,366 hectares and a production of 8,048.12 tons of areca nut [2] Padang Pariaman Regency with a productive area in 2022 of 1,228 Ha, production of 495.71 tons [3].

For product quality to remain good and reach consumers at the right time, marketing intermediaries need treatments such as transportation, storage and sorting functions, and other activities. These treatments certainly raise marketing costs, and intermediary traders will take advantage of fees and services in marketing their commodities. This will result in prices at the

consumer level being high while the prices received by farmers are low [4].

The formulation of a marketing strategy is the most critical and difficult part of the entire marketing process. These activities will set the limits for the success of a business. When communicated to all parties involved, the marketing strategy describes the strengths to be built on and the weaknesses to be improved, and how to do this [5].

1.2. Literature Review

The supply chain is all stages or series involved, directly or indirectly, in meeting the needs of consumers, including producers, suppliers, transportation, warehouses/distributors, and retailers/sellers [6] Meanwhile, according to Ref. [7] hat supply chain is a series of processes (decision-making and implementation) and flows (materials/products, information, and money) aimed at meeting the needs of end consumers, which occur within and between different stages along the chain, from the stages production to the final consumption stage. The supply chain is a series of processes (decision-making and execution) and flows (materials/products, information, and money) aimed at meeting the needs of the final consumer, which occur within and between the different stages along the chain, from production to production. to the final consumption stage.



Supply chain management aims to obtain continuity between raw materials, raw material quality, and timeliness so that the production process becomes more effective and efficient, product quality is guaranteed, and needs in quality, quantity, and affordable prices are met [8].

The value chain is the set of activities carried out to carry a product or service from conception, through the different stages of production involving a combination of physical transformation and input from various producer services, delivery to final consumers, and final disposal after use [9]. Value chains have three or more actors, either organizational or individual or both [10].

Marketing margin is the price difference between two or more levels of the marketing chain, or between the price at the producer level and the retail price at the consumer level. The trade margin only represents the difference between the price paid by consumers and the price received by producers but does not show the total quantity of product marketing. The difference between the price at one point in the marketing chain and the price at another point is known as the gross margin or marketing margin [11].

Analysis of the added value of agricultural product processing can be done simply by calculating the added value per kilo of raw material for one production process. Analysis of added value helps estimate the remuneration received by agro-industry business actors and measure the amount of job opportunities created by agro-industrial entrepreneurs [12] that the added value is the difference between the commodity that is treated at a certain stage and the value of the sacrifice used during the process. The sources of added value are the utilization of factors such as labor, capital, human resources, and management [13].

1.3. Research Objective

Purpose of this research Analyzing the structure and activities of the areca commodity value chain in Padang Pariaman Regency. Calculating the added value obtained from each main actor in the areca nut value chain in Padang Pariaman Regency. Calculating the marketing margin between the main actors in the areca nut value chain in Padang Pariaman District.

2. MATERIALS AND METHODS

The research method used in this research is a case study. the determination of the research location was chosen intentionally or purposively sampling. This research was conducted in Padang Pariaman Regency, West Sumatra Province. This research was carried out for 2 months, from May to June 2023. In this study, sampling from a population was carried out on farmers, small collectors, large collectors, and home industries involved in the supply chain and value chain of areca nut in Padang Pariaman Regency.

The tools used in the study were questionnaires containing a list of questions, stationery, calculators, and Microsoft Excel 2010 software. The research data consisted of primary data and secondary data. Primary data were collected employing observation and direct interviews with respondents consisting of the need for raw materials, labor, other inputs, production results, data on estimated selling prices, and income. Secondary data is supporting data obtained from the literature, journals, and agencies related to research. Calculating added value using the Hayami calculation method.

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Table 1. Calculation of Value Added Based on the Hayami Method

| Variable | No | Sub Variable | Notation |
|--|----|--|---------------|
| Output, Input, and Price | 1 | Output (kilograms/year) | |
| | 2 | Raw Material Input (kilograms/year) | |
| | 3 | Labor Input (HOK/year) | |
| | 4 | Conversion Factor | (1/2) |
| | 5 | Labor Coefficient | (3/2) |
| | 6 | Output Price (IDR/kilograms) | |
| | 7 | Labor Wages (IDR/HOK) | |
| Revenue and Profit | 8 | Raw Material Price (IDR/kilograms) | |
| | 9 | Other Input Contribution (IDR/kilograms) | |
| | 10 | Output Value (IDR/kilograms) | (4*6) |
| | 11 | A. Value-added (IDR/kilograms) | (10-8-9) |
| | | B. Value-added ratio (%) | (11a/10*100) |
| | 12 | A. labor income (IDR/kilograms) | (5*7) |
| | | B. Direct Labor Department (%) | (12a/11a*100) |
| | 13 | A. Profit (IDR/kilograms) | (11a-12a) |
| Remuneration for Factors of Production | | B. Profit Rate (%) | (13a/10*100) |
| | 14 | Margin (IDR/kilograms) | (10-8) |
| | | A. Direct Labor Incam (%) | (12a/14*100) |
| | | B. Other Input Contribution (%) | (9/14*100) |
| | | C. Company Profit (%) | 13a/14x100 |

Source : [5]

Value added can be grouped into three, namely [14]:

- Low category, if the value-added ratio is <15 %
- Medium category, if the value-added ratio is 15-40%
- High category, if the value-added ratio is >40%

3. RESULT AND DISCUSSION

3.1. Supply Chain Structure

There are two chain structures consisting of main actors and supporting actors. The structure of the first chain is: Farmers → Small Collectors → Large Collectors → Exporters. While the second chain structure is: Farmers → Home Industry → Collecting agents.

3.2. Raw Material and Production Equipment

The main raw materials used by actors in the areca value chain in Padang Pariaman Regency in a year are presented in Table 2. Table 2 shows the raw materials each actor uses in the areca value chain in Padang Pariaman Regency. Minang farmers areca raw materials ready for harvest with a water content of 35,61% of 1.632,64 kg/year. Areca nut raw materials are split with a water content of 15,80% of 3.000 kg/year. Large collectors of areca nut raw materials are split betel nuts with a water content of 15,80% of 100.000 kg/year and home industries with ready-to-harvest areca nut raw materials from areca farmers of 54000 kg/year.

Table 2. Areca Raw Materials by Value Chain Actors in Padang Pariaman Regency

| Value Chain Actors | Raw material (kilograms/year) |
|-------------------------|-------------------------------|
| Farmer | 1632,64 |
| Small Collector Traders | 3000 |
| Wholesaler Collectors | 100000 |
| Home Industry | 54000 |
| Total | 158,632.64 |

Source: Primary Data 2023

Another important factor of production is labor, where each value chain actor issues labor wages. At the farmer's level, the labor wages issued amounted to Rp. 15.000/working day, small collector traders Rp. 25.000/working day, large collector traders IDR 100.000/working day, and home industries IDR 55.263,16/working day

3.3. Areca Nut Production in Value Chain Actors

Each actor in the areca nut value chain in Padang Pariaman Regency produces a different production or output value. Output values for value chain actors in Padang Pariaman Regency are presented in Table 3.

Table 3. Output values for value chain actors in Padang Pariaman Regency are presented in

| Value Chain Actors | Output (kilograms/year) |
|-------------------------|-------------------------|
| Farmer | 1248,53 |
| Small Collector Traders | 3000 |
| Wholesaler Collectors | 90000 |
| Home Industry | 27000 |
| Total | 121248,53 |

Source: Primary Data 2023

Table 3 shows the output produced by each actor in the areca value chain in Padang Pariaman Regency. Minang farmers with split areca output with a water content of 15.80% is 1248.53 kg/year. Areca nut collectors with split areca nut output with a moisture content of 15.80% of 3000 kg/year. Areca nut large collectors with an output of split areca nut with a moisture content of 8.64% of 90,000 kg/year and home industries with an output of dried sliced areca nut of 27,000 kg/year.

3.4 Cost Analysis

The costs in this study are the costs incurred by each actor in the areca nut value chain in each production process which consists of fixed costs and variable costs. Further details regarding the variable costs and fixed costs incurred by actors in the areca value chain in Padang Pariaman Regency are presented in Table 4.

Table 4. Variable costs and fixed costs incurred by actors in the areca value chain in Padang Pariaman Regency

| Value Chain Actors | Variable costs and fixed costs incurred by actors in the areca value chain in Padang Pariaman Regency | | |
|-------------------------|---|------------------------------------|---------------------|
| | Variable Costs (IDR/Year) | Fixed Costs Incurred (IDR/Year) | Total (IDR/Year) |
| Farmer | 742.360 | 74.514 | 816.874,64 |
| Small Collector Traders | 2.329.750 | 672.625 | 3.002.375 |
| Wholesaler Collectors | 399.296.000 | 15.636.500 | 414.932.500 |
| Home Industry | 111.119.766,2 | 43.640.000 | 154.759.766,2 |

Source: Primary Data 2023

Shows that the variable costs of each value chain actor include the depreciation value of tools, sack purchases, vehicle taxes, land taxes, electricity costs, other supporting equipment, and labor wages. Farmers incur variable costs of IDR 816.874,64/year, small collectors IDR 3.002.375/year, large collectors IDR 414.932.500/year, and home industries IDR 154.759.766.2/year.

3.5. Revenue

Revenue is obtained from calculating the amount of production multiplied by the selling price for each value chain actor. Income calculation can be seen in Table 5.

Table 5. Income for Each Value Chain Actor

| Value Chain Actors | Total Production (kilograms/year) | Selling Price (IDR/kilograms) | Total Receipt (IDR/year) |
|-------------------------|--------------------------------------|----------------------------------|-----------------------------|
| Farmer | 1248.53 | 3000 | 3745590 |
| Small Collector Traders | 3000 | 4500 | 13500000 |
| Wholesaler Collectors | 90000 | 6000 | 540000000 |
| Home Industry | 27000 | 42000 | 1134000000 |

Source: Primary Data 2023

Table 5 shows that the income of each actor in the areca value chain varies. Farmers' income with a total production of 1,248.53 kg/year. with a unit price of IDR 3,000/kilogram of IDR 3,745,590/year. The income of small areca collectors with a total production of 3,000 kg/year with a unit price of IDR 4,500/kilogram is IDR 13,500,000 kilograms/year. The income of

the large areca collector with a total production of 90,000 kilograms/year at a unit price of IDR 6,000/kilogram is IDR 540,000,000/year. While the income of the home industry, with a total production of 27,000 kilograms/year with a unit price of IDR 42,000/ kilogram, is IDR 1,134,000,000/year.

3.6. Income

Income is the difference between income and all costs incurred during business activities. Net income is derived from the difference between the production value and the total costs incurred by each actor in the areca value chain. The following is

the income of each actor in the areca value chain, which can be seen in Table 6.

Table 6. Income of Each Actor in the Areca Nut Value Chain in Padang Pariaman District

| Value Chain Actors | Total Receipt (IDR/year) | Total Receipts (IDR/kilograms) | Total Income (IDR/year) |
|-------------------------|--------------------------|--------------------------------|-------------------------|
| Farmer | 3,745,590 | 816,874.4 | 2,928,715.36 |
| Small Collector Traders | 13,500,000 | 3,002,375 | 10,497,625 |
| Wholesaler Collectors | 540,000,000 | 414,932,500 | 125,067,500 |
| Home Industry | 1,134,000,000 | 154,759,766.2 | 979,240,233.8 |

Source: Primary Data 2023

Table 6 shows that areca nut farmers earn Rp. 2,928,715.36/year, while small areca collector traders earn Rp. 10,497,625/year. The perpetrators of large collecting traders get an income of IDR 125,067,500/year. Meanwhile, in the marketing value chain of dried sliced areca nuts, home industries earn an income of IDR 979,240,233.8/year.

3.7 R/C Ratio of Actors in the Areca Value Chain

The R/C Ratio is the ratio of the total income of areca nut to the total cost of areca nut incurred by actors in the value chain. The R/C Ratio of areca value chain actors can be seen in Table 7.

3.8. Value-Added Analysis

Table 8 shows the calculation of added value using the Hayami method. The output value is the production of areca nut for each actor in the value chain, the value of the input or raw material, for farmers, the raw material is ready-to-harvest areca nut with a moisture content of 35.61%. For small collectors, the raw materials are collected from farmers. The value of the output and raw materials is the same, because the small collectors only play the role of collecting the harvest from the farmers who have split it. They don't do any treatment on the split areca nut. The results collected by small collectors are immediately picked up by prominent collectors for the output and input value of 3,000

kg/year with a moisture content of 15.80%. The output value at large collectors results from further drying carried out by large collectors because the value of raw materials received results from raw materials purchased from small collectors. Wholesalers dry again for 1-2 weeks to get a moisture content of 8.64%.

The output price for each actor in the areca value chain is IDR 3,000/kg for farmers, IDR 4,500/kg for small collectors and IDR 6,000/kg for large collectors. The output value obtained by the actors in the areca nut value chain is the multiplication of the conversion factor and the output price, which is IDR 2,294.19/kg for farmers, small collectors with an output value of IDR 4,500/kg and large collectors with an output value of IDR 5,400/kg.

Table 7 shows that the actors in the value chain are farmers, small collectors, large collectors, and home industries. The R/C ratio for farmers is 4.59; for small collectors, the R/C ratio is 4.50, for large collectors, the R/C ratio is 1.30, while for home industries, the R/C ratio is 7.33. So in this study, it can be seen from the results of the R/C ratio obtained that the business of the areca nut value chain actors is classified as efficient and profitable because the R/C ratio obtained is > 1 .

Table 7. R/C Ratio of Each Actor in the Areca Nut Value Chain in Padang Pariaman District

| Value Chain Actors | R/C Ratio | | |
|-------------------------|--------------------------|-----------------------------|-------|
| | Total Receipt (IDR/year) | Production Cost ((IDR/year) | Total |
| Farmer | 3,745,590 | 816,874.64 | 4.59 |
| Small Collector Traders | 13,500,000 | 3,002,375 | 4.50 |
| Wholesaler Collectors | 540,000,000 | 414,932,500 | 1.30 |
| Home Industry | 1,134,000,000 | 154,759,766.2 | 7.33 |

Source: Primary Data 2023

Table 8. Analysis of Added Value of Actors in the areca nut Value Chain in Padang district.

| Value Added Hayami Method | | | | Farmer | Small Collector Traders | Wholesaler Collectors | Home Industry |
|--|----|--|---------------|---------|-------------------------|-----------------------|---------------|
| Variable | No | Sub Variable | Notation | | | | |
| Output, Input, and Price | 1 | Output (kilograms/year) | | 1248.53 | 3000 | 90000 | 27000 |
| | 2 | Raw Material Input (kilograms/year) | | 1632.64 | 3000 | 100000 | 54000 |
| | 3 | Labor Input (HOK/year) | | 38.45 | 59.43 | 390 | 1465.71 |
| | 4 | Conversion Factor | (1/2) | 0.76 | 1 | 0.9 | 0.5 |
| | 5 | Labor Coefficient | (3/2) | 0.02 | 0.020 | 0.004 | 0.027 |
| | 6 | Output Price (IDR/kilograms) | | 3000 | 4500 | 6000 | 42000 |
| | 7 | Labor Wages (IDR/HOK) | | 15000 | 25000 | 100000 | 55263.16 |
| Revenue and Profit | 8 | Raw Material Price (IDR/kilograms) | | 500 | 3000 | 4500 | 3000 |
| | 9 | Other Input Contribution (IDR/kilograms) | | 147.07 | 505.54 | 197.33 | 1365.93 |
| | 10 | Output Value (IDR/kilograms) | (4*6) | 2294.19 | 4500 | 5400 | 21000 |
| | 11 | A. Value-added (IDR/kilograms) | (10-8-9) | 1647.12 | 994.46 | 702.67 | 16634.07 |
| | | B. Value-added ratio (%) | (11a/10*100) | 71.80 | 22.10 | 13.01 | 79.21 |
| | 12 | A. Labor Income (IDR/kilograms) | (5*7) | 353.26 | 495.25 | 390.00 | 1500.00 |
| | | B. Direct Labor Department (%) | (12a/11a*100) | 21.45 | 49.80 | 55.50 | 9.02 |
| | 13 | A. Profit (IDR/kilograms) | (11a-12a) | 1293.86 | 499.21 | 312.67 | 15134.07 |
| Remuneration for Factors of Production | | B. Profit Rate (%) | (13a/10*100) | 56.40 | 11.09 | 5.79 | 72.07 |
| | 14 | Margin (IDR/kilograms) | (10-8) | 1794.19 | 1500 | 900 | 18000 |
| | | A. Direct Labor Income (%) | (12a/14*100) | 19.69 | 33.02 | 43.33 | 8.33 |
| | | B. Other Input Contribution (%) | (9/14*100) | 8.20 | 33.70 | 21.93 | 7.59 |
| | | C. Company Profit (%) | (13a/14*100) | 72.11 | 33.28 | 34.74 | 84.08 |

Source: Primary Data 2023

The added value obtained by the areca nut value chain actors at the farmer level is IDR 1,647.12/kg, small areca collectors are IDR 994.46/kg, and large collectors are IDR 702.67/kg. The added value for farmers is higher than for other actors in the areca nut value chain because farmers are the first producers in the value chain for raw material prices, which are obtained more easily than other actors. At the level of small areca collectors, they get a higher added value than large collectors because the small collectors only serve as temporary betel nut collectors. The added value ratio for each value chain is 71.80% for farmers, this ratio is said to be high because it is > 40%. For small areca collectors, a value-added ratio of 22.10% is said to be moderate because the value-added ratio is 15% - 40%. For large collectors, the value-added ratio is 13.01%, the value-added ratio is low because it is <15%.

Home industry with dried sliced areca nut that has gone through postharvest, namely in slicing, baking, and packing in sacks. In the drying process using 3 ovens, each with a capacity of 60 kg of wet sliced areca nut. Can produce 30 kg/oven. In this study, the output from drying was 27,000 kg/year of dried sliced areca nut, with an input of 54,000 kg/year of wet sliced areca nut. Drying is carried out for 24 hours in an oven. Labor is the result of multiplying the labor needed during the drying process, namely 24 hours/day. The output price is the price of dried sliced areca nut, which is Rp. 42,000/kg, while the average wage is the conversion of the multiplication of the daily wage received multiplied by the number of workers and divided by the time needed in the drying process, which is Rp. 55,263.16/ kg.

The input price of raw materials is the purchase price of areca nuts purchased by farmers, namely Rp. 3,000/kg, other input contributions are the cost of purchasing supporting equipment, NPA, electricity, and fuel taxes used are added to the amount of raw materials, other input contributions are Rp. 1,365.93/kg. The output value is the price of areca nut iris which has gone through postharvest, which is IDR 42,000/kg, while the added value is the result of a reduction in the output price minus the contribution of other inputs and raw material prices of IDR 16,634.07/kg with a value-added ratio of 79.21 %. Labor income results from multiplying the labor coefficient by the average labor wage, which is IDR 1,500/kg, with a workforce share of 9.02%.

The profit obtained is a reduction of added value with labor income, which is IDR 15,134.07/kg with a profit rate of 72.07%. The profit margin value of IDR 18,000/kg is the result of reducing added value with the price of raw material inputs, labor income of 8.33% and the contribution of other inputs of 7.59% with company profits of 84.08%.

From the research results, the amount of added value obtained by the home industry with an output of IDR 27,000/kg/year with a value added ratio of 79.21%. The ratio of added value obtained by the home industry can be said to be high, because the ratio of added value obtained is > 40%.

4. CONCLUSION

The added value obtained by the Hayami method is the main actors in the areca nut value chain as follows: Areca farmers get an added value of IDR 745.76/kg with a value-added ratio of 56.03%. Small collectors get an added value of IDR 994.46/kg with a value-added ratio of 22.10%. Wholesalers get an added value of IDR 702.67/kg with a value-added ratio of 13.01%. The home industry obtains an added value of IDR 16,634.07/kg with an added value ratio of 79.21%. The marketing margin obtained from each value chain actor is as follows: Farmers earn a marketing margin of IDR 831.09/kg. Collectors earn a marketing margin of IDR 1,500/kg. Wholesalers earn a marketing margin of IDR 900/kg. The home industry earns a marketing margin of IDR 18,000/kg

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