



## **Production and Marketing of Kolang-Kaling as a Derivative Product of Palm Fruit (*Arenga pinnata*) in Toisapu Hamlet, Negeri Hutumuri Ambon City**

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### **ABSTRACT**

**Keywords:**

Kolang-kaling;  
Income;  
Palm fruit

This study aimed to determine the process of processing *enau* into *kolang-kaling* and analyze the income of processing *enau* into *kolang-kaling*. The research area was defined in Dusun Toisapu, Negeri Hutumuri. The research sampling used the interview method, with a research sample of 15 members of the social forestry business group. The results showed that the stages of processing *enau* into *kolang-kaling* consisted of six stages: preparation of raw materials, separation of palm fruit, boiling, cooling, peeling, and soaking—the KUPS. Aren *kolang-kaling* business income analysis in April-September 2023 amounted to IDR 1.178.118 for six months of production of 168 kg, is profitable because the ratio of total costs is IDR. 3.861.882 incurred is smaller than the total cost of revenue received IDR 5.040.000. The business can provide returns in the form of more significant income for the KUPS *kolang-kaling* marketing system, from producers to consumers.

### **INTRODUCTION**

The new paradigm in the forestry sector has viewed forests as multi-functional, including economic, ecological, and social functions. Commodities in the form of goods are benefits that can be felt directly in the form of timber and non-timber forest products. Meanwhile, commodities in the form of services mean benefits that are felt indirectly (Arief, 2001). Non-timber forest products are products that come from forests other than wood, whether in the form of vegetable objects such as Nipah, rattan, sago, sugar palm, bamboo, seeds, gums, leaves, medicines in the form of animals such as wild animals and parts of these wild animals (horns, skin) (Baharuddin & Taskirawati, 2009).

Sugar palm is one of the non-timber forest products currently widely used by communities around the forest (*Arenga pinnata*). Processed products derived from sugar palm trees are wrong; the other one is wrong. Kolang-Kaling can be consumed as a food product

even though its appearance is less attractive in color and aroma and has no taste. However, kolang-kaling has been made into sweets and jelly candy and is most often used by the public.

It is used to mix fruit, ice, and other fresh drinks (Muchtadi, 2000). Palm fruit, processed into palm fruit, is popular with the public, especially during Ramadan. Production is an activity to create or produce goods and services to meet consumer needs. Production is an activity to increase the benefits of an item or form (form utility), move places (place utility), and store (store utility). The activity of creating goods and services is called production costs. Production costs consist of fixed costs and variable costs. Exact costs are a type of cost whose size does not depend on the production size. Variable costs are costs whose size is directly related to production size (Moehar, 2002).

After being processed into palm fruit, palm fruit can be marketed. Marketing is a human activity based on fulfilling and satisfying needs and desires through an exchange process (Assauri, 2014). Marketing is one of the post-production components that is key in developing a business (Handayani & Nurlaila, 2011). Decisions taken in the marketing field must be made to determine the product, market, price, promotion, and distribution system (Pasaribu, 2012). In Toisapu Hamlet, you can find many palm trees, where this plant is still a plant that grows naturally. Based on initial observations of the palm-frond business in Toisapu Hamlet, Hutumuri Country itself, it has been running for ± 8 (eight) months; in the production process, there are 15 members of the Mayang Social Forestry Business Group (KUPS). Based on the description above, the research aims to analyze the production and marketing of palm fruit as a derivative product of palm (*Arenga pinnata*) in Toisapu Hamlet, Negeri Hutumuri, Ambon City.

## **RESEARCH METHODS**

### **Study Area**

This research will be conducted in Toisapu Hamlet, Hutumuri State, South Leitimur District, Ambon City, Maluku Province. The research was conducted from September to October 2023.

### **Research Tools and Materials**

This research uses observation techniques, such as visiting the palm fruit production house directly. Observation is a data collection technique using the five senses, including sight and hearing, to obtain information to answer research problems so researchers can find symptoms or phenomena in the research object (Rahardjo, 2017). Interviews are a communication or interaction process to collect in-depth information about an issue raised in research using questions and answers between researchers and informants or research subjects (Rahardjo, 2017). This research interviewed directly with group members involved in the palm fruit production process in Toisapu Hamlet, Negeri Hutumuri. Literature study is

collecting by studying and understanding books related to production and income through journals, mass media, and related research results.

### **Data Collection Techniques**

The data collection techniques used in this research are:

#### 1. Observation

This research uses observation techniques by visiting the palm frond production house in Toisapu Hamlet, Hutumuri Country. Observation is a data collection technique that uses the five senses, sight, and hearing, to obtain the information needed to answer research problems. This way, researchers can make observations and systematically record symptoms or phenomena that exist in objects' study (Rahardjo, 2017).

#### 2. Interview

The interview is a communication or interaction process to collect in-depth information about an issue raised in research with a question-and-answer method between researchers and informants or research subjects (Rahardjo, 2017). This research interviewed directly with member groups involved in the palm fruit production process in Toisapu Hamlet, Hutumuri Country.

#### 3. Literature Study

Literature study is collecting by studying and understanding books related to production and total income through journals, mass media, and related research results.

### **Spearman Rank Analysis**

The data analysis method used in this research is quantitative analysis. According to Suratiyah (2015), calculating total costs is a formula obtained by adding up fixed costs and variable costs:

Where,

$$\mathbf{\Pi = T.R. - T.C.}$$

Where:

$\Pi$  = Profit

TR = Total receipts

T.C. = Total cost

To find total revenue, use the formula:

$$\mathbf{T.R. = Y . P_i}$$

Where,

T.R. = Total Revenue

Y = Production Amount

$P_y$  = Selling Price

To find total costs, use the formula:

$$TC = FC + VC$$

Where,

T.C. = Total Cost

FC = Fixed Cost

V.C. = Biaya Variable

## RESULTS AND DISCUSSION

### Identify Respondent Characteristics

The characteristics of the farmers interviewed are described below, illustrating the diversity of farmers according to age, respondent education level, business status, and length of time carrying out business activities. The respondents selected in this research were members of the Mayang farmer group (KUPS), which is involved in the Hutumuri State customary forest program in collaboration with the Maluku-Papua Province Social Forestry and Environmental Partnership Center (BPSKL). Respondent characteristics are based on age, education, and business status.

### Respondent's Age

Generally, young and healthy farmers are more physically capable, have better abilities, and are more receptive to innovations than older ones. Although older farmers have lower physical strength, they have much professional experience. (Hardiwinoto, 2008). The ages of the respondents can be seen in Table 1.

Table 1. Age characteristics of the Kolang-Kaling farming group in Toisapu Hamlet

No.	Age Group (Year)	Number (People)	Percentage (%)
1	31-40	2	13.33
2	41-50	6	40.00
3	>50	7	46.67
Total		15	100

The characteristics of respondents in Table 5.4 based on age related to the palm fruit production process in Toisapu Hamlet are categorized into three general categories, namely the characteristics of respondents according to age, dominated by the age category between 31-40 years at 13.33%, followed by the age category 41-50 years at 40%. , and the age category > 50 years was 46.67%. It can be seen that the majority of respondent farmers are >50 years old. This shows that respondents are in the productive age category; farmers of productive age will accept innovation more easily and quickly. On the other hand, farmers of non-productive age will tend to find it difficult to accept innovation.

### Respondent's Education

Progress in all fields is the result of education; a low standard of living reflects a low level of education. Education is one factor that determines agricultural development to achieve the best results and the highest income and profit.

Table 2. Education of farmer groups (respondents) in Toisapu Hamlet

No.	Education Level	Number (Person)	Percentage (%)
1	SD	2	13.33
2	SLTP	1	6.67
3	SMA	10	66.67
4	Diploma	2	13.33
<b>Total</b>		<b>15</b>	<b>100</b>

Table 1 shows that the educational level of each respondent is different, with a percentage of 2 elementary school people (13.33%), one junior high school (6.67%), ten people high school (66.67%), and two people with a diploma (66.67%). 13.33%). This shows that the dominant education level of respondents from the Mayang social forestry business group is at the high school level, with a percentage of 66.67%.

### Kolang-kaling Business Status

The back-and-forth business is a relatively new business carried out by the people of Toisapu Hamlet. The percentage of respondents' business status can be seen in Table 3.

Table 3. Percentage of Business Status of your colleagues lying in Toisapu Hamlet, Hutumuri

No.	Education Level	Number (Person)	Percentage (%)
1	Main Jobs	0	0
2	Side Jobs	15	100
<b>Jumlah</b>		<b>15</b>	<b>100</b>

Based on Table 3, out of 15 respondents, entrepreneurs use the kolang kaling business as a side job in Toisapu Hamlet with a percentage of 100%. This is because the back-and-forth business is new in Toisapu Hamlet. On average, the main occupation of group members is farming. Therefore, this business is only a side job for them.

### Palm Fruit Production Process into Palm Fruit

Palm fruit is a type of fruit that can be processed into palm fruit. The raw material is semi-ripe palm fruit seeds. The production process is carried out three times during the fasting month, and outside of the fasting month, it is usually carried out twice a month. The work was carried out by 15 KUPS Mayang members together.

As for processing palm sugar into palm fruit, production activities are usually carried out from morning to evening. The process of processing raw materials into products is done in the following way:

a) Preparation of raw materials

Kolang-kaling is made from palm fruit taken from the palm tree. Each fruit string reaches 1.5-1.8 meters in length, and each cob (fruit bunch) contains 40-50 strands of fruit. Each bunch contains many fruits weighing 1–2.5 quintals. Half-ripe fruit can be made into kolang kaling. You can often find 2-to five fruit bunches on one sugar palm tree that grows somewhat simultaneously (Santoso *et al.*, 2019). Each palm fruit contains three seeds; the seed coat is brownish-black and hard. Half-ripe palm fruit, the skin of the fruit seeds is thin, soft, and yellow; The seed core (endosperm) is white, slightly translucent, and smooth. From the core of half-ripe palm fruit seeds, kolang kaling can be made (Widarawati *et al.*, 2016).

The raw materials taken are free of charge (free) because they are taken from the land of the secretary of the palm oil business group. The process of taking palm fruit from the tree is by climbing the tree and paying the person who can climb a salary of Rp. 50.000. Palm fruit is usually taken one day before making kolang-kaling. To make palm fruit, you must choose the right palm fruit, namely one that is still half ripe. Half-ripe palm fruit can be identified by its skin, which looks fresh green (Simatupang *et al.*, 2023).



Figure 1. Half-ripe sugar palm fruit

b) Separation of palm fruit

Separating the palm fruit is done the day before the boiling process. After finding the palm fruit, the fruit is separated from the stalk one by one manually, namely using a machete and the activity of separating the palm fruit from the stalk must be done with technique and caution because the sap that comes out of the palm fruit is very dangerous if it comes into contact with the skin because it will cause itching and a red rash. Then, the separated palm fruit is collected into a container for further processing (Pepadu *et al.*, 2023).



Figure 2. Palm fruit that has been separated from the stalk

c) Boiling

In KUPS. Mayang, fruit, and fronds are made by boiling, which takes approximately 3 hours. The ripeness of palm fruit can be seen from the skin, which was previously green and then changed to a slightly brownish color. The fruit's flesh (frond fruit) is soft if you peel it.



Figure 3 Boiling Palm Fruit

d) Cooling

When boiling is finished, wait until the water has cooled, at least a little, before removing it. Then, the palm fruit is sliced from the boiled water, and the fruit is cooled in an open place for approximately 1 hour so that it does not get hot during the splitting process (Pepadu *et al.*, 2023).



Figure 4. Cooling of Palm Fruit

e) Stripping

The stripping process still uses manual stripping using a knife as a stripping tool. The peeling process involves first cutting the palm fruit using a knife. If the fruit is large enough, cut it into three; if it is small, cut it in half. The palm fruit is cut open one by one, then the seeds of the palm

fruit are removed, and the palm fruit is soaked in a container filled with water. In 1 palm fruit, there are usually 2 – 3 palm fruit seeds white.



Figure 5. Peeling Palm Fruit

f) Soaking

The last thing to do is soak the peeled palm fruit seeds in plain water for 2 to 3 days, provided that the soaking water is changed every morning. This palm fruit can be called palm fruit, which we can process into a food or drink mixture.



Figure 6. Kolang-Kaling Immersion

g) Housekeeping

After soaking, the palm fruit is rewashed with clean water and drained. Next, the kolang-kaling is put into plastic packaging and weighed 1 kg per package. The process of making kolang-kaling in this research only takes one day to produce 13-15 kilos of kolang-kaling, according to the Rahman *et al.* (2024), which states that the classification of industrial sectors is based solely on the number of workers in the industry, without paying attention to whether this industry uses machine power or not. An industry is significant if it has a workforce of >100 people, a medium industry has 20-100 people, a small industry has 5-19 people, and a home industry has 1-4 people. The process of processing sugar palm into palm fruit can be briefly described in the flow chart in Figure 7.

### **Production Costs and Income of the KUPS Mayang Palm Fruit Business**

Business profits are generally strongly influenced by the components of business revenues and expenses. Therefore, to analyze business profits, the revenue and expenditure components of the palm fruit business must be identified. The cost components of the back-and-forth business in KUPS Mayang include fixed and variable costs. In the production process from palm fruit to palm fruit products, these costs include fixed costs (fixed cost) and variable costs or changing costs (variable cost). Fixed costs are costs whose use does not expire within one production period. Fixed costs in this back-and-forth business include depreciation costs.



Variable costs depend highly on the production scale and are used up within one production period (Wulantika, 2020).

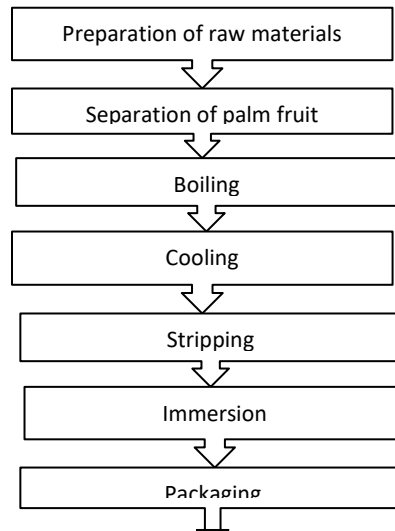


Figure 7. Flow of the Kolang-Kaling Production Process

### Production Costs of the Kolang-Kaling Business

The costs incurred by respondent farmers consist of fixed and variable costs, explained in the following description.

#### Fixed Costs

Fixed costs are costs whose total amount remains within a specific range of activity volume or costs not used up in one production process (Y, 2008). Fixed costs in this study consist of the depreciation value of tools; for more details, see Table 4.

Table 4. Fixed Costs of Palm Fruit Processing

No	Description	Unit price (IDR)	Total Price (IDR)	Wear it (Year)	Cost Shrinkage (IDR)
1.	Main Production				
	- 2 Hock stove (help)	700,000	1,400,000	3	38,888
	- 2 Saucepans 50 cm (Help)	650,000	1,300,000	3	36,111
	- Large basin (help)	30,000	30,000	3	833.33
2.	Supporting production tools				
	- Sieve	10,000	10,000	3	277.77
	- Water dipper	5,000	5,000	3	138.88
	- Machete	40,000	40,000	3	1,111
	- Stainless basin	20,000	20,000	3	555.55
<b>Total</b>			<b>2,805,000</b>		<b>77,915</b>

Table 4 shows the depreciation costs for fishing equipment in Toisapu Hamlet using several simple pieces of equipment. The total depreciation cost for one year on the back-and-forth business in Toisapu Hamlet is IDR 77,915.

## Variable Costs

Variable costs are costs that are used up in one production process. Variable costs are costs of a size that is greatly influenced by production. Variable costs in this research include: a. Raw Materials/Enau Fruits The raw material used in making palm fruit is palm fruit. The raw materials taken are still on the land owned by the head of the business group. So, the raw materials are free.

### b. Fuel/kerosene

Boiling palm fruit still uses a stove; therefore, oil is needed every time the production process is carried out. The cost of 10 liters of kerosene is Rp. 40,000.

### c. Fresh packaging/plastic

Kaling is packaged using fresh plastic packaging measuring 1 kg. PE plastic packaging purchased for IDR 10,000, size 15x30, contains 35 pcs, costs IDR 3,900.

### d. Transportation

The transportation used is public transportation; the costs incurred round trip from home to market are IDR 16,000

### e. Workforce

The Workforce in this business group is 15 people, which consists of one person (group leader), one person (secretary), and one person (treasurer). The rest are members. In managing sugar palm to become palm fruit, three people carry out production from boiling to the end of the production process together. Another person's job is only to climb palm trees and pick palm fruit that can be processed. The total costs incurred to pay the wages of 3 workers in 1 production amounting to Rp. 100,000. The person in charge of collecting palm fruit amounting to Rp. 50,000.

Table 5. Variable Costs of processing sugar palm into palm fruit in one go Production

No.	Type	Usage	Unit price (IDR)	Amount (IDR)
1.	Raw material	0	0	0
2.	Kerosene	10 liters	4.000	40.000
3.	Plastic packaging	13 pieces	300.00	3.900
4.	Transportation	-	8.000	16.000
5.	Labor wages	3 people cooker 1 person who take fruit	100.000 50.000	300.000 50.000
Total				409.900

Table 5 shows that the total variable costs are Rp. 409,900 was obtained from the price of each type of raw material used, such as the cost of raw materials for kerosene, plastic packaging, transportation, and labor wages.

### Kolang-kaling Business Income

Profit is the difference between revenue and production costs. This palm fruit business group's high or low profits are influenced by the large costs incurred and the income farmers obtain from the sale of palm fruit used in one production process (Arif Maulana Rahman *et al.*, 2024). Table 6 shows the average overall profit of respondent farmers.

Table 6. Analysis of income from processing sugar palm into palm fruit

No.	Type of costs	Amount (IDR)
1.	Total Fixed Costs (FC)	77.915
	Total Variable Costs (VC)	409.900
	Total Production Costs (TC)	487.815
2.	Production quantity (1 month)	36 kg
	Selling price per unit (IDR)	30.000
	Total Production Costs (TR)	1.080.000
	Income (TR-TC)	592.185

Based on Table 6, the results of the calculations to obtain the value. The income from processing sugar palm into palm fruit in April 2023 is IDR. 592,185. Analysis of this research data to determine the income of the Kolang-Kaling Business in (KUPS.). Mayang in Toisapu Hamlet for six months of production in April-September 2023. The results of the data analysis are known as follows:

Table 7 Net Income of the Mayang KUPS Kolang-kaling Business for April-September 2023

Description	Total Monthly Income (Rp)					
	April	May	June	July	August	September
Total Receipts (TR)	1.080.000	780.000	780.000	780.000	780.000	840.000
Total costs (TC)	487.815	487.815	487.815	487.815	487.815	487.815
<b>Revenue (TR-TC)</b>	<b>592.185</b>	<b>292.185</b>	<b>292.185</b>	<b>292.185</b>	<b>292.185</b>	<b>352.185</b>

Based on the table, the total revenue for six months is Rp. 5,040,000 Total production costs (FC + VC) of Rp. 2,926,890.

$$\text{So, } \Pi = \text{TR} - \text{TC}$$

$$\Pi = \text{Rp. } 5,040,000 - \text{Rp. } 2,926,890$$

$$= \text{Rp. } 2,113,110$$

It is known that the income of the palm-frond business at KUPS Mayang for the six months of production in April-September 2023 is 168 kilos, which is profitable because the ratio of the total costs incurred is smaller compared to the total revenue so that the business can provide returns in the form of more significant income.

## Palm Fruit Marketing

Apart from production, marketing is also an essential aspect of a business. The problem found in this research is that due to limited production capacity and limited workforce, the ability of the palm oil business to produce products is also restricted. The following is the marketing mix for back-and-forth businesses in Toisapu Hamlet, Hutumuri State:

### Product

P.S. Mayang's kolang-kaling because they pay attention to the quality of the product, including the level of ripeness of the palm fruit as a raw material, which is taken when it is still young so that the level of elasticity of the *kolang-kaling* and the color of the kolang-kaling is bright white. Kaling frond cannot be consumed directly, but various food and beverage products must be re-processed. Based on product classification, palm fruit is included in semi-finished goods. Semi-finished goods have entered the production process and are needed to complete the final product (Wulantika, 2020).

### Price

Baqiroh (2019) states that price is the value consumers trade for profit and own or use a product or service. The value is determined by buyers and sellers through negotiation by everyone at the same price. Kolang-kaling has a sales price that is by market price sales standards, for the products produced are packaged in 1 package size and sold at the same price. The price for frond fronds is in 1 packaging size, using 1 kg of plastic, and sold in 15 packs. The price of one pack is Rp. 30,000, so the total sales of 15 packs of palm fruit are Rp. 450,000.

### Distribution

According to (Salaka *et al.*, 2012), distribution is a marketing activity that seeks to expedite and facilitate the delivery of goods from producers to consumers so that their use is appropriate to the type, quantity, price, place, and time required. In this research, the distribution of palm fruit products is carried out simply without intermediaries, namely by producers, and then marketing to consumers directly.

Toisapu Hamlet's distribution of palm fronds involves selling directly to the market. Marketers and consumers can meet each other, recognize the product clearly without any intermediaries, and negotiate directly, which results in a decision to buy or not for the consumer. This is called face-to-face selling. The group secretary carries out the sale of ko lang Kaling.

Marketing Flow can be seen in the following image.

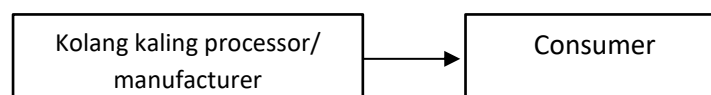


Figure 1. Marketing Flow

The marketing flow for ko lang Kaling in this study was classified as fast, around 2–3 days. This type of goods is not durable, so marketing must also be fast. This is in line with the statement by (Tarmizi, 2018) that the nature of a good that is traded or produced can limit the distribution channels or marketing channels chosen.

### **Promotion**

Promotion is an activity that informs the general public about a good or service and is accompanied by price information. The methods used are word of mouth and online through several applications that are now frequently used, such as Facebook and WhatsApp.

### **Production and Marketing Relations**

Marketing is the application of functions management creation and delivery activities of goods or services to consumers or the public to expand the market for the progress of a company or industry. By definition, management marketing analysis, planning, implementation, and supervision programs aim to generate exchanges with the target market to achieve company goals (Trihastuti, 2021). Functions Marketing Management, among others: Exchange Functions, Functions Distribution Physical, Intermediary Function, Motivation, Mentoring. Production is the implementation of managerial activities such as planning (planning), organizing (organizing), actuating (moving), and controlling (supervising) to a system–production system with the aim that production can run effectively and efficiently. Production Management functions include P = Planning (planning), O = Organizing (organizing), A = Actuating (moving), and C = Controlling (supervision) (Sofjan, 2014).

Production and marketing are the main functions of every business, and they all try to produce and market products and services to meet consumer needs. The relationship between production and marketing is in development. The product needs to find the right way so that the product offered to customers sells well and is known by many people (Salaka *et al.*, 2012).

## **CONCLUSION**

Based on the manufacturing process/stages of processing sugar palm into kolang kaling in Toisapu Hamlet, Hutumuri Country, it consists of 6 stages: preparation of raw materials, separating palm fruit, boiling, cooling, peeling, and soaking palm fruit. The palm fruit production process has limitations on labor and tools. Therefore, the products produced in this business can be categorized as less than optimal. The palm fruit-making business is classified as a small industry because it has a workforce of around 4-6 active people. Due to the busy schedule of each member, they must be able to produce kolang kaling. Based on the analysis of the income level of the KUPS. Mayang palm-frond business, namely in April-September 2023, it is IDR. 2,113,110, for six months of production of 168 kilos profitable because the total cost comparison is Rp. 2,926,890 spent is smaller than the total acceptance fee received of Rp. 5,040,000, so

the business can provide returns in the form of more significant income. For the marketing system for kolang kaling, KUPS. Mayang uses a direct marketing system from producers to consumers.

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