Pulu-mandoti value chain analysis in Enrekang Regency

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Abstract. Pulu-Mandoti rice is a local rice variety that has high economic value. This rice is phenomenal because it can only grow in two villages, one of which is Salukanan Village, Enrekang Regency. The distinctive aroma, texture, and taste make the demand for rice increased in the market even to foreign countries. It has an impact on the price of the Pulu-Mandoti and affects the farmer's revenue. Value chains can help find out the extent of the role of each actor especially farmers who are directly related to the benefits received. This study aims to analyze the value chain of Pulu-Mandoti rice commodities. This research was conducted in Salukanan Village, Baraka Sub-district, Enrekang District, South Sulawesi by using quantitative descriptive research methods. Sampling was done by simple random sampling with a total sample of 39 respondent farmers. The results showed that the Pulu-Mandoti farmer's margin was 47.83%, while retailers obtained the highest margin at 52.17%, this was due to retailers having strength in marketing as well as extensive information about market conditions and prices.

1. Introduction
Rice production is an important sector in Indonesia's development. The rice agricultural sector has a significant role to create food self-sufficiency, job opportunity, and to increase people’s income, especially the peasant's aroma [1]. Moreover, as rice fluctuations, the rice supply chain is important and strategic in controlling fluctuation of rice price in Indonesia [2].

One of the most expensive rice in Indonesia is glutinous rice with mandoti flavor. Mandoti glutinous rice, which is more typically called Pulu-Mandoti scented rice is a local rice variety that has high economic value. The uniqueness of Pulu-Mandoti is that it can only grow in two villages namely Salukanan and Kendenan Villages, Baraka District, Enrekang District with an altitude of 700 meters above mean sea level and a slope of 60°. Some farmers often try to plant it outside of the villages even though it thrives, but the results are not similar; it has no aroma[3].

The problem that occurs at this time is that the area of land that can be planted with mandoti scented rice is only around 150 hectares. Mandoti-scented rice production averages about 500 tons per year, because in general the rice fields of the population are planted more rice for consumption rice. Only part of the rice fields in Salukanan Village is used for the development of Pulu-Mandoti. The amount of production turned out to be insufficient to meet market needs within the District of Baraka. Since the farmers have limited information about prices and marketing systems, their bargaining position is weak in determining prices. Additionally, limited access to capital, low technological mastery and postharvest, low-quality product and value chain are detrimental for the farmers.
Value chains can help find out the extent of the role of each actor involved in it especially farmers who are directly related to the benefits received. It will help them to make steps or policies that can be taken to improve the value chain that is considered inappropriate. The high overall mandoti rice value chain and balanced with the right processing and marketing activities can provide maximum addition value. Therefore, the business in increasing the value of mandoti rice is needed. Stating in an agricultural activity needs to be considered in terms of production systems ranging from planting to maintenance then after that in the case of the harvest system then in a series of marketing value chain activities becomes an important activity to see how effective the chain is created. Later on, the margin of the price will be seen between actors in the value chain [4].

Finding in a series of value chain activities each actor who plays a role in it will get proportional benefits but farmers are less likely to get proportional results because farmers lack information about prices, marketing systems and in terms of the quality of plants produced when a series of activities is created goodwill form an efficient chain [5].

Based on the description above, this study intended to analyze the value chain of the agriculture commodities of sticky rice in Pulu-Mandoti at the farmer level in Salukanan Village, Baraka District, Enrekang Regency.

2. Methods
This research was carried out in Salukanan Village, Baraka Subdistrict, Enrekang Regency in February-March 2019. The location determination was done purposively with the consideration that the area was an area where the commodity development of Mandoti was developed. The sample in this study was 39 respondents. The data used were primary and secondary data. The research method used a quantitative descriptive. The analytical approach used in this study was a quantitative analysis approach by analyzing the number of costs, revenues, revenues, and margins obtained by each value chain actor.

In calculating the total cost, the researcher used the formula as follows:

\[ TC = TFC + TVC \]  

Information:
- \( TC \) = Total production costs (IDR)
- \( TFC \) = Total fixed costs (IDR)
- \( TVC \) = Total variable cost (IDR)

In calculating revenue, the formula used was:

\[ TR = P \times Q \]  

Information:
- \( TR \) = Total revenue (IDR)
- \( P \) = Price (IDR)
- \( Q \) = Quantity (IDR)

In calculating income, the formula used was:

\[ \pi = TR - C \]  

Information:
- \( \pi \) = Income (IDR)
- \( TR \) = Total revenue (IDR)
- \( C \) = Total cost (IDR)

In calculating the marketing margin ratio, the formula used was:
Information: $M_{ji} = $ Marketing margin at the 1st institutional level (IDR)

\[
\sum M_{ji} = $ Marketing margins at all institutional levels (IDR)
\]

In calculating revenue/cost ratio, the formula used was:

\[
R/C = TR - TC
\]

Information: $TR = $ Total revenue (IDR)

With criteria,
- R/C ratio > 1, then the business is efficient and profitable
- R/C ratio = 1, then the business is BEP
- R/C ratio < 1, then the business is inefficient or detrimental

Analysis of farmers' value chains according to Porter's Theory

Table 1. A figure of Farmer's Value Chain according to Porter's Theory

| General Administration | Human Resources Management | Research, Technology, and System Development | Buying |
|------------------------|-----------------------------|---------------------------------------------|--------|
| Inside Logistic        | Operation                   | Outside Logistic Procurement                | Marketing and Selling | Services |
| Procurement            |                             | Procurement                                 |                   |         |
| Procurement            | 58.022                      | Marketing and Selling                       |                   |         |
| Procurement            | 3,481,320,000               | Selling                                    |                   |         |
| Procurement            | 3,191,210,000               |                                           |                   |         |
| Procurement            | 6,672,530,000               |                                           |                   |         |

3. Results and discussions

3.1 Pulu-Mandoti's rice chain value and R/C ratio

Margin is the difference between the price at the producer level and the price at the end consumer level. In this case, the margin was calculated from each value chain actor seen from each value chain channel carried out by the value chain actor[6]. R/C ratio is a comparison of the total income of Pulu-Mandoti rice with the total costs incurred by the main value chain actors. The margins obtained in the form of a table from farmers can be seen in Table 1. R/C ratio of farmers in the mandoti rice chain value can be seen in table 1.

Table 2. Pulu-Mandoti rice farmers margin in Salukanan Village, Baraka District, Enrekang Regency, 2018.

| Actors in the value chain | Production (Kg) | Marginal production (IDR) | Per kg (IDR) | % Margin |
|---------------------------|-----------------|---------------------------|--------------|---------|
| Farmers                   | 58.022          | 3,191,210,000             | 55,000       | 47.83   |
| Retailer                  | 3,481,320,000   | 60,000                    | 52.17        |
| Total                     | 6,672,530,000   | 115,000                   | 100          |
Table 3. R/C Ratio of Pulu-Mandoti rice farmers in Salukanan Village, Baraka District, Enrekang Regency, 2018.

| Value chain performers | Total revenue (IDR) | Total cost (IDR) | R/C Ratio |
|------------------------|--------------------|-----------------|-----------|
| Farmers                | 3,191,210,000      | 1,297,666,500   | 2.46      |
| Retailers              | 3,481,320,000      | 3,191,210,000   | 1.09      |

3.2. Analysis of mandoti’s rice value chain farmer of Porter theory

Mandoti’s rice value chain analysis used a Porter value chain divided by two activities namely primary and supporting activities. According to Porter in ACIAR [7], the value chain separates companies into nine activities that are strategically relevant to understanding cost behavior. The following is a figure 2 analysis of the Pulu-Mandoti rice farmer’s value chain.

Table 4. Farmer’s Value Chain Analysis based on Porter’s Theory, in Salukanan Village, Baraka District, Enrekang Regency, 2018

| Supporting activities | Main activities |
|-----------------------|-----------------|
| Farming infrastructure| Operation (processing input into output) |
| (own capital, technical counselors) | Logistics (distribution of Pulu-Mandoti rice) |
| Human resource management | Exit (distribution of Pulu-Mandoti rice) |
| (job assignments, remuneration) | Sales and marketing (mandoti rice) |
| Technology development | Inward logistics (reception, storage and distribution of inputs) |
| (use of mobile phones, technical irrigation, use of sprayers, mini tractors, dros) | |
| Purchasing/procurement | |
| (procurement of equipment or machinery to support land maintenance activities) | |

3.2.1. Main activities of Pulu-Mandoti rice farmers

The unsuccessful production of plants is often the result of using poor quality seeds. Besides, fertilizers and pesticides are also the sources of input in rice cultivation [5]. A total of 39 farmers use 25x25 centimeters spacing with the number of seeds needed between 25-30 kg/ha. Farmers themselves can produce the seeds. At harvest time, the quality of rice produced will be seen. If they have not a good quality of rice to be used as seeds, they will look for the other farmers who have better quality rice to buy. The price of seeds offered is IDR 15,000,-/kg. Besides seeds, there are also fertilizers and pesticides used. Fertilizers and pesticides are very easy to obtain by farmers. In Salukanan Village, they are already provided by the retailers. The selling price offered is also not much different from the prices on the market.

The local Pulu-Mandoti rice is harvested when it is 6-7 months old from September to November. Harvesting is done using technology namely ani-ani. The harvested rice is bound, dried and threshed by beating on wood and brought to the mill if it is to be used or sold. If not, the rice will be stored in a rice bran called Landa. It will be dried in the sun and ground on when it will be used. At the time of milling, farmers must pay IDR 30,000.00 per ten kilograms of milled rice.

Farmers grind grain and produce rice. They sell or distribute their mandoti rice directly to retailers in the market or to end consumers. There is no transportation or transportation costs incurred by farmers.
because the amount of mandoti rice production is still relatively low so that even local production needs cannot meet demand. The sale of farmer's products determines the price of the mandoti rice that has been adjusted to the prevailing market price so that farmers give prices to consumers or retailers following those set by farmers. The selling price of mandoti glutinous rice offered by farmers to retailers and consumers is IDR 55,000,-/kg. Retailers usually sell by increasing the selling price of IDR 60,000,-/kg.

3.2.2. Supported activities of Mandoti rice farmers. Activities in the infrastructure/administration of the rice farm in the Ketulu Pulu-Mandoti consist of capital sources and technical guidance for extension workers in the business. The source of capital used in the industry comes from their money because farming has been running for a long time and inherited. In other words, farmers only continue their parents' businesses. Farmers also receive technical guidance on mandoti rice cultivation from extension agents although it is irregularly done. However, this shows the existence of an extension from the local government.

Farmers worker of Pulu-Mandoti come from family or members of farmer groups. The nature of work ties to land maintenance is daily, weekly and sometimes erratic. Not all respondent farmers incur labor costs because the area of land drawn is still relatively low and only assisted by family members such as the children of the farmers. They are also directly involved in maintenance activities as well as guiding workers in maintaining the paddy fields that are being cultivated. In the development of technology, farmers began to use mobile phones as communication tools.

Farmers use spray assistance for spraying herbicides so that soil maintenance is increasingly controlled. There are also semi-technical irrigation channels to help the irrigation in farmers' fields. The role of the government is needed related to developing the irrigation in Salukanan Village. Since the flow of water can only be regulated, it cannot be measured following the optimal needs of rice planted. Production facilities in support of the leading agricultural activities are obtained from supporting actors, namely providers of facilities. Its sell farm equipment and machinery or tools that support planting activities in Baraka Regency such as agricultural equipment (hoes, crowbars, grinding machines, etc.).

4. Conclusion
Mandoti glutinous rice value chain was analyzed based on the quantitative analysis and the Porter concept. It was obtained from a margin from value chain actors at the farm level of IDR 55,000,-/kg or 47.83%. It is different from the margin earned by retailers, which reached 52.17% because the trader raised the selling price that was purchased from the farmers by considering the additional costs incurred to obtain the rice. The mandoti rice value chain based on the porter theory explains that farmers. In this case, the main value chain actors carry out the main activities and supporting activities even though the main actors of the value chain in supporting operations, namely technological development activities are still less organized. Also, weaknesses occur in the central business particularly in sales and marketing currently makes the mandoti rice production has not been able to meet consumer demand.

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