Behavior and Marketing Analysis of Pepper (*Piper nigrum* L.): A Comparative Study of Farmers, Trading Districts and Retailers in Southeast Sulawesi, Indonesia

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Abstract

Inefficient marketing and low production are the main obstacles in the selling of pepper and they also cause a low bargaining position for farmers in the market. Therefore, this study aims to determine the market behavior activities carried out to determine prices, as well as analyze marketing channels, profits received by participants and efficiency. Samples used in this study were 27 farmers, 4 trading districts, and 3 respondent retailers. The qualitative analysis was used to analyze the pattern of channels, the functions performed by associated agencies and the market behavior of the pepper commodity. Quantitative analysis was also carried out to evaluate the marketing margins, costs incurred by traders, profits received and efficiency. The results show that the selling price of pepper was determined by the merchant, with different payment systems including cash, initial deposit, and balance through oral cooperation in the form of an agreement on a place of sales, followed by the provision of capital to farmers. In the marketing process, 4 patterns of channels were formed, which include local markets and others outside the regency, and their efficiencies were above 50%. These results show that government need to provide pepper markets outside the province to improve the welfare of farmers and ensure they don't depend only on the local marketplace during harvest.

Keywords: market behavior; marketing efficiency pepper; pattern marketing channel; profit

INTRODUCTION

Pepper is a plantation commodity, which has been widely exported. A previous study, by Fauziyah et al. (2017) revealed that Indonesia is an exporting country with a good market share. In the spice group, pepper is the primadonna commodity (Sulaiman et al., 2020) as well as the country's highest foreign exchange earner, which indicates that it has a relatively bright prospect. Furthermore, Indonesia is one of the largest pepper producers and exporters in the last 10 years that is competing with Vietnam,

India, Brazil and Malaysia (International Pepper Community, 2019). Agricultural exports are seen as a sector with the ability to combine growth with equity or quality increment (Ariesha et al., 2019). The synergy between countries in producing products with high economic value shows the integration of trade between them, and this is known as the Global Value Chain (GVC) (Charoenrat and Pholphirul, 2020). This causes the improvement of the production process of an item. The prospect of Indonesia's export commodities faces a lot of challenges in the development process in the form of limited

government policies, low quality of production, sub-optimal volume, small capital and lack of necessary infrastructure (Fazaria et al., 2016).

Pepper agribusiness in Indonesia contributes to the national increase in farmers' income and the economy. The commodity has also been included in the spice category and has an important role in the country's economic growth (Naufal et al., 2022). The center of production of this commodity is Bangka Belitung Islands, which has the largest volume (Karmawati et al., 2020) followed by Lampung, South Sumatra, East Kalimantan and Sulawesi (Nurhayati et al., 2018). It is important to study pepper agribusiness, especially from the aspect of its farming process and marketing system to build an efficient and highly competitive smallholder plantation agribusiness system (Nurasa, 2012). Kurnianto et al. (2016) revealed that Indonesian pepper commodities are less competitive. This was evidenced by Indonesia's abundant human and natural resources, but the country has minimal technology, capital and infrastructure. Another study reported an imbalance between the supply of agricultural products and market demand (Jianwei, 2015).

Pepper is a traditional commodity with strategic economic and social opportunities. It has been also been cultivated for a long time and is widely known by rural communities (Suhaendah et al., 2016). Southeast Sulawesi is one of the provinces in Indonesia where it is cultivated by most of the inhabitants. There has also been an increase in its market share, which was indicated by the increasing demand in several regions. It is often consumed in large quantities in foreign countries and exported to various parts of the world (Ariesha et al., 2019).

The observation results in Pebaoa Village, North Kulisusu Sub-district, showed that farmers traded their products directly with district traders who came to their premises. Furthermore, this village is one of the largest pepper producers in Southeast Sulawesi Province. The number of agencies involved in the marketing process greatly determines the share of prices received by farmers, as well as those paid by consumers, thereby affecting the efficiency. The high and low price of pepper is also very dependent on the chain, where higher selling prices are obtained when it is sold directly to exporters (Kurnianto et al., 2016). Based on Sáenz-Segura et al. (2009)'s study, contracts are important in the early phase, and competitive market conditions favor

a moderate intensification process that stimulates high returns at relatively low costs for the most established producers. Sustainable practices in pepper marketing (Semuroh and Sumin, 2021) need to consider how each stakeholder runs a business without harming other parties. Therefore, a study is needed to carry out sustainable agriculture because farmers are faced with various problems including the need for capital to cover investment costs and maintenance of pepper plants, which are very susceptible to disease (Delita et al., 2015).

Long marketing chain causes differences in the prices paid by consumers. Some government agencies are also involved in carrying out activities related to marketing by incurring various costs of transportation, sorting, labor wages and packaging (Nurllah and Iswari, 2019). The longer the chain, the higher the price at the consumer level and the lesser the efficiency obtained. This is inconsistent with Fitrah (2013) stating that pepper farmers become more efficient in a long channel pattern. Furthermore, efficient and fair marketing can increase producer profits and consumer satisfaction (Beierlein et al., 2014). The government needs to help farmers create channels at affordable prices for consumers (Howlett et al., 2012).

Sustainable agriculture in marketing requires effective and efficient handling to ensure that all stakeholders get the benefits they deserve without harming any of the parties. Based on the phenomena that occur in the field, where farmers and traders negotiate to carry out commercial activities and to achieve an effective system, a study regarding market behavior is needed in the process of determining prices, channel patterns, margins, profits received by market participants and efficiency.

MATERIALS AND METHOD

This study was carried out in Pebaoa Village, which is the largest pepper producer in the Southeast Sulawesi Province of Indonesia. The selection of respondents was carried out with the purposive sampling technique with a total of 27 pepper farmers, 4 trading district members and 3 retailers. The data used in this study were analyzed using descriptive qualitative and quantitative analyses. The quantitative methods involve data in the form of numbers and the analysis was carried out statistically. Meanwhile, the qualitative methods are also

called artistic techniques because the research process is less patterned and more related to the interpretation of information found in the field (Sugiyono, 2013). In this study, the qualitative analysis aims to analyze the pattern of marketing channels, the functions performed by each agency involved in pepper marketing, and market behavior. The quantitative analysis was carried out to evaluate margins, costs incurred by traders, profits received and efficiency.

Marketing channel evaluation is the identification of an integrated and interdependent set of stakeholders in delivering a product or service to consumers (Palmatier et al., 2020). Furthermore, it was carried out qualitatively to determine the existing channels in the study as well as to determine the institutions involved in the distribution of pepper commodities from farmers (producers) to the final consumers. The marketing process that occurs, which is passed on by the commodity to consumers can be used as the basis for describing the pattern of the channels, which can affect the costs, margins and profits received by each trading system.

Marketing margin is categorized based on several functions, namely the difference between retail and farmer's price from the product sales, which is intended to measure the cost of providing services. It is also affected by shifts in supply and demand as well as input prices. The profit of the middleman, the economic strength of the farmers, and the efficiency of the system can be determine through analysis of the margins (Loconto et al., 2016) using Equation 1.

$$Mji = Psi - Pbi, \text{ or } Mji = bti + \pi i \qquad (1)$$

Analysis of the total marketing margin using Equation 2.

$$Mji = \Sigma \, in = 1 \, mji \text{ or } Mji = Pr - Pf \qquad (2)$$

Where: Mji = trading margin at the i-th institution (IDR kg^{-1}); Psi = selling price of the i-th marketing agent (IDR kg^{-1}); Pbi = purchase price of the-i marketing agent (IDR kg^{-1}); Bti = the-i marketing agency trading market (IDR kg^{-1}); i = profit of the-i marketing agency (IDR kg^{-1}); Mji = total marketing margin (IDR kg^{-1}); Pr = price at the consumer; Pf = price at farm level.

The measurement concept in marketing margin analysis are: (1) margin was calculated and analyzed based on the difference between the purchase and the selling prices, which were in IDR per kilogram for each agency involved in marketing pepper commodities, (2) the purchase price was determined based on the average purchase price per kilogram and (3) the selling price was calculated based on the average selling price per kilogram.

Marketing efficiency analysis was used to determine the price received by pepper farmers from the amount paid by consumers and it is expressed in percentage units. The test was performed with the concept of efficiency, which is a comparison between the total cost and the total value of the product marketed (Emhar et al., 2014). The marketing efficiency analysis formula is presented in Equation 3.

$$EP = \left[1 - \frac{M}{He}\right] \text{ x } 100\% \qquad (3)$$

Where: EP = percentage of profit sharing received by farmers from the price paid by consumers (%); M = marketing margin (IDR); He = price at trader level (IDR kg^{-1}); Condition; If Ep 50%, then the pepper marketing system is not efficient; Ep > 50%, then the pepper marketing system is efficient (Emhar et al., 2014).

RESULTS AND DISCUSSION

Market behavior

Market behavior is actions taken by business actors (Williamson, 2021) in their capacity as suppliers or buyers of goods and services to achieve goals. In this study, the focus was on sub-district and district traders, as well as local market retailers. Market behavior includes the process of determining prices when an exchange process occurs, where farmers accept the prices set by traders, and this places them in a weak position. In the process of determining the price, it is necessary to consider the profit received as well as the supply and demand. This is consistent with a previous study (Teimoury and Kazemi, 2017), where demand and supply were the major factors in determining the selling price of a commodity. It was emphasized that payment transactions occur with various options based on the agreement of both parties, which can be in the form of cash, as well as partial or later payments. This is also carried out according to the level of needs of both parties.

This study's results are in line with Abraham (2018) that the payment system can be in cash, debt and partial payments. In the marketing process, there is strong cooperation between farmers and traders (Bergquist and Dinerstein,

2020) and each farmer has regular customers, which is indicated by the large number of retailers involved (Naik and Suresh, 2018). This collaboration is driven by the provision of capital to the producers as well as an agreement on the amount of pepper to be sold (Laili et al., 2021). In contrast to Okatama's research, the market structure of cayenne pepper leads to an oligopoly market, and the behavior shows that the highest profit and income ratio were obtained by wholesalers (Putra et al., 2021). Due to these factors, prices are volatile and fluctuating (Taghizadeh-Hesary et al., 2019), the amount received by farmers and consumers tend to increase and more profits are obtained by marketing agencies (Eliyatiningsih and Mayasari, 2017).

Marketing channel

Marketing is the process by which a commodity reaches the consumers (Licsandru and Cui, 2019), and when carried out efficiently and fairly, it can increase producer profits as well as customer's satisfaction (Beierlein et al., 2014). Distributing agricultural products seamlessly across multiple tiers and multi-channels is an important way of realizing farmer-specific value goals (Zhang et al., 2016). In marketing the pepper produced, farmers in Pebaoa Village use the four channel patterns as shown in Figure 1.

Marketing channel pattern 1

Figure 1 shows that farmers sell their pepper directly to district traders. In this condition, there are no village collectors in the chain due to the absence of dealers who live in Pebaoa Village and are interested in purchasing the products. It is also caused by the lack of capital, which make the producers sell to district traders through other

farmers who transact with sub-district dealers. Furthermore, the district traders sell to retailers in North Buton, as shown in Table 1.

Based on the results, farmers who came to sub-district traders did not have collectors in the village because the distance travelled was close to adequate infrastructure facilities, which makes the sales of harvest easier. Furthermore, district traders sell pepper to retailers at Ereke and Baubau Markets. Sales are made to Baubau Market due to the established relationships in terms of supplying the needs of retailers in Baubau City and the amount purchased by retailers in Ereke Regency is small. Prices prevailing at the farm level based on production conditions with abundant harvests can cause low prices of pepper. Meanwhile, a lack of adequate production volume has an impact on increasing the amount the product is sold at the farm level. The existence of a membership pattern can facilitate relationship between the members. This is consistent with a previous study by Parvathi and Waibel (2016) that membership in a fair trade marketing system does not increase the income of organic farmers, but has a positive effect on the accumulation of small-scale producers.

The difference between prices prevailing at the farm level and those at the consumer level determines the amount of margin received by each marketing agency involved in the trading process. Margin is the difference between the amount paid by consumers and the price received by farmers. In the process of distributing a product, several marketing agencies are involved, hence, they must all be considered in the calculation. The marketing process often encounters obstacles due to the difficulty of selling the harvest. Furthermore, middlemen and traders play an important role in the pepper trade system (Delita et al., 2015).
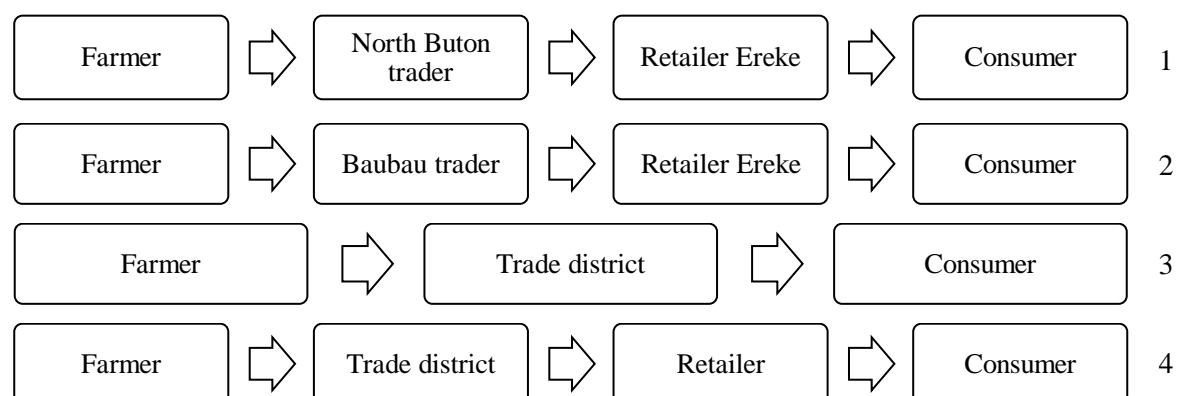

Figure 1. Marketing channels pepper

Table 1. Distribution of pepper producers by channel

Marketing	Number of people	Percentage (%)
Pattern 1 and 2	13	48.14
Pattern 3	8	29.63
Pattern 4	6	22.23
Amount	27	100.00

Table 2. Condition of respondent farmers based on pepper prices in marketing institutions

Institution	Selling price (IDR kg^{-1})	Number of people	Percentage (%)
Ped. District	75,000	13	48.14
Ped. District	75,000	6	29.63
Ped. Retailer	80,000	8	22.23
Amount		27	100.00

Based on the results, there are 4 patterns of marketing channels, but in pattern 1, there are 13 farmers who sell to district trader, after which two channels are formed, as shown in Table 2. Pepper purchased from farmers are not only sold to retailers in Ereke, but also to those in Baubau. Table 3 shows the marketing margins, costs and benefits obtained from marketing agencies involved in the pepper marketing process until it reaches the final consumer.

Marketing channel pattern 2

Information on pattern 2 shows that sub-districts traders who transact with farmers sell to retailers in Baubau City, as shown in Figure 1. Pattern 2 is a part of pattern 1, which implies that pepper is sold to the same district traders, who transact with Ereke retailers and Baubau City merchants. Furthermore, Karya Nugraha Market is the last place for transactions with consumers. The interaction that occurs between farmers and traders is a form of valuable interaction economy (Rusdiyana, 2017).

The margin obtained in marketing channel 2 when district traders sell pepper purchased from farmers to retailers in Baubau City is 35,000 IDR kg^{-1}. This value was obtained from the difference in the selling price at the trader and retailer levels, namely 90,000 IDR kg^{-1} and 125,000 IDR kg^{-1}, respectively. The large margin is due to the large costs incurred for transportation to Baubau of 670 IDR kg^{-1}, hence, the profit received was 14,330 IDR kg^{-1}. Based on the marketing pattern 1 where district traders sell pepper to Ereke retailers, the total margin was 45,000 IDR kg^{-1}. The difference in the total margin value when the produce is sold to retailers in Baubau City was 50,000 IDR kg^{-1}. The cost incurred by the retailer was 100 IDR kg^{-1} with a plastic cost of 180 IDR kg^{-1} to obtain a total of 280 IDR kg^{-1}, and the profit received by Baubau retailers of 34,720 IDR kg^{-1}. The production volume of pepper must be supported by a good marketing pattern, which have an important role in farming activities (Prasetyo, 2019). Marketing with inputs from agencies and distribution channels allow agricultural products to reach consumers.

The channel pattern 2 shows a large cost that can affect the profit received. The long distance that needs to be traveled to the market increased the costs incurred by traders. It also increased the risk on the quality of pepper, which must be in good condition during the trip. The more the activities carried out, the greater the amount spent. Furthermore, Soekartawi (2013) revealed that the costs required by market participants vary. Adeio et al. (2018) stated that the higher the amount spent on transportation by the participants, the higher the price of a commodity. The margin, cost and profit from the marketing channel pattern 2 is presented in Table 4.

Marketing channel pattern 3

Information in pattern 3 shows that farmers sell their pepper to retailers in Ereke through other farmers who serve as middlemen. The quantity purchased by the retailer is small quantities, hence, a large number of them are involved. Marketing channel pattern 3 shows that farmers sell their pepper directly to North Buton with a selling price of 80,000 IDR kg^{-1}, while it is sold for 120,000 IDR kg^{-1} at the consumer level. This is in line with Sari et al. (2017) that the shorter the marketing chain, the more effective the channel. The location of merchants, which was close to the final consumer makes prices much cheaper. The margin, costs and profits from the channel pattern 3 are presented in Table 5.

Table 3. Analysis of marketing margins, costs and profits of marketing institutions in pattern 1

Marketing agency and cost component	Price (IDR kg^{-1})	Marketing margin (IDR kg^{-1})
Farmer	75,000	
County Merchants		15,000
Purchase price	75,000	
Freight cost	100	
K whitewater	70	
A go	100	
Total cost	270	
Margin	15,000	
Profit	14,730	
Selling price	90,000	
Ereke Retailer		30,000
Purchase price	90,000	
Plastic cost	220	
Profit	29,780	
Margin	30,000	
Selling price	120,000	
Total margin amount		45,000

Table 4. Analysis of marketing margins, costs and profits of marketing agencies on channel pattern 2

Marketing agency and components cost	Price (IDR kg^{-1})	Marketing margin (IDR kg^{-1})
Farmer	75,000	
Merchant district		15,000
Purchase price	75,000	
Freight costs	500	
Bag	70	
Cost	100	
Total cost	670	
Profit	14,330	
Margin	15,000	
Selling price	90,000	
Baubau Retailer		35,000
Purchase price	90,000	
Cost	100	
Plastic	180	
Margin	35,000	
Profit	34,720	
Selling price	125,000	
Total margin		50,000

Marketing channel pattern 4

Information in Pattern 4 shows that farmers sell their pepper production directly to traders in North Buton Regency without going through village collectors. The marketing process is the same as the channel pattern 1, where farmers visit sub-district dealers who resell to retailers in Ereke Regency. District and sub-district traders already have their respective subscriptions when selling pepper to retailers at Ereke Market.

Marketing channel pattern 4 shows that farmers sell their pepper to these traders with a selling price of 70,000 to 80,000 IDR kg^{-1} and an average of 75,000 IDR kg^{-1}. Meanwhile, the produce are sold to retailer at 90,000 IDR kg^{-1}. This is in line with Ulyasniati (2016) that the selling price of sub-district and district traders is similar. The marketing margin, costs and profits from the channel pattern 4 are presented in Table 6.

Table 6 shows a marketing margin, total incurred cost by district traders and profit of 15,000 IDR kg^{-1}, 270 IDR kg^{-1} and 14,730 IDR kg^{-1}, respectively. Furthermore, the margin at the retailer level was 30,000 IDR kg^{-1}, which was obtained from the difference in the selling price

at the district and retail levels, namely 90,000 IDR kg^{-1} and 120,000 IDR kg^{-1}, respectively. The plastic cost was 220 IDR kg^{-1}, hence, the profit received by the retailer was 29,780 IDR kg^{-1}. The marketing margins in different channels can be non-uniform because the values depend on their length, the activities carried out and the expected profit by associated agencies (Rahayu et al., 2021). Chain pattern evaluation and supply chain downstream material flow analysis is often carried out to meet market logistics needs (Courtonne et al., 2015; Ongirwalu et al., 2015; Tubagus et al., 2016); price fluctuations (Djuric and Götz, 2016); value chain and fruit distribution channels (Gjokaj et al., 2017).

Marketing efficiency

Marketing efficiency is often used to assess the performance of the selling process (Indriani et al., 2020). Furthermore, a high value is not reflected by the low margin of a commodity trading system (Suwandi et al., 2019). The level of supply chain performance efficiency is measured using the cost approach (Dilana, 2013). One useful indicator used for its assessment is to compare the share received by farmers (Farmer's Share) (Mgale and Yunxian, 2020) with the price paid by the final consumer (Malak-Rawlikowska et al., 2019; Degaga, 2020). The share received by the trading system is often expressed as a percentage. The percentage value of the price part received by farmers from the amount paid by the final consumer determines the marketing efficiency (de Gorter et al., 2021). It can also be determined (Boiko et al., 2019) using the margin obtained and selling price at the consumer level (Rude, 2020). The higher the amount the produce is sold at the consumer level, the lower the efficiency value (Giri et al., 2018). Farmers' profits and losses are not determined by the size of the profit-sharing value, but are influenced by product prices and production costs incurred (Krisnadi et al., 2017). The share of prices received by farmers from the amount paid by final consumers to marketing agencies in each channel is presented in Table 7.

Table 5. Analysis of marketing margins, costs and profits of marketing institutions on channel pattern 3

Marketing agency and components cost	Price (IDR kg^{-1})	Marketing margin (IDR kg^{-1})
Farmer		
Selling price	80,000	
Trader Ereke		40,000
Selling price	120,000	
Plastic cost	220	
Profit	39,780	
Margin	40,000	

Table 6. Analysis of marketing margins, costs and profits of marketing agencies on channels pattern 4

Marketing agency and components cost	Price (IDR kg^{-1})	Marketing margin (IDR kg^{-1})
Farmer	75,000	
District merchant		15,000
Purchase price	75,000	
Transportation costs	100	
Pocket	70	
Freight cost	100	
Total cost	270	
Margin	15,000	
Profit	14,730	
Selling price	90,000	
Trader retailer Ereke		30,000
Purchase price	90,000	
Plastic cost	220	
Profit	29,780	
Margin	30,000	
Selling price	120,000	
Total margin		45,000

Table 7. Percentage share of prices received by respondent farmers from prices paid by final consumers to marketing agencies in each marketing channel

Channel marketing	Margin marketing (IDR kg^{-1})	Selling price (IDR kg^{-1})	Ep = 1-M/HeX100 %
Pattern 1	45,000	120,000	62.5
Pattern 2	50,000	125,000	60.0
Pattern 3	40,000	120,000	67.0
Pattern 4	45,000	120,000	62.5

Based on Table 7, channel pattern 1, 2, 3 and 4 in Pebaoa Village obtained marketing efficiency values of 62.5%, 60%, 67% and 62.5%, respectively, of which channel 3 has highest. These values depend on how farmers can increase the effectiveness of the available production factors to optimize the manufacturing process (Saputro et al., 2017). If the share received by farmers is more than 50%, it shows that the marketing is efficient. This is because the marketing chain in channel 3 is not long and farmers sell their products directly to retailers. Meanwhile, in patterns 1, 2 and 4, they market their pepper production through district and sub-district traders and reach consumers through retailers. Tubalawony et al. (2016) revealed that the highest share of price received by farmers was achieved when products are sold directly to retailers. This indicates that the shorter the market chain, the greater the share of prices received by farmers, which help them to cover all agriculture cost. This finding is consistent with the study by Surni (2015) which obtained similar results.

The low efficiency was due to the pepper marketing process, where the target market was Baubau City retailers who are located in North Buton Regency area and high transportation costs are required. This efficient marketing system was due to the short process, which minimized the prevailing price at the consumer level. Price efficiency emphasizes the ability of the system to allocate resources as well as coordinate all agricultural production and marketing processes to ensure that they meet the consumer needs (Putri et al., 2018).

CONCLUSIONS

Market behavior carried out by sub-district and district traders, as well as local market retailers include determining prices when an exchange occurs. Farmers accept the prices determined by traders, which places them in a weak position. During the determination, it is important to consider the profit received as well as the amount of supply and demand.

The four marketing channels in this study had extra profit and margin. Furthermore, the overall marketing system was efficient, where channels 1, 2, 3 and 4 had efficiency values of 62.5%, 60%, 67% and 62.5%, respectively. Government also needs to provide pepper markets outside the province to improve the welfare of farmers.

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