Marketing and Rubber Price Transmission
In Kampar Subdistrict of Kampar District

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Abstract: Marketing of rubber is the process of distributing rubber from farmers to last consumers through marketing institutions. Price movements at the marketing institution level are not followed by the movement of rubber prices at the farmer level. The purposes of the research are (1) analyzing channel, margin, cost, and efficiency of rubber marketing (2) Correlation and transmission of rubber price between farmer and factory. The research uses survey method, sampling of rubber farmers by purposive sampling which is rubber's age > 10 year, 70 samples of rubber farmers, sampling by snowball sampling. Research result are three marketing channels of rubber, 1) farmer - trader collector - big trader - factory (25.71%), Channel (2) is farmer - trader collector - factory (41,43%). Channel (3) is farmer - Joint Business Group - factory (32,86%). The highest cost and marketing margin is marketing channel (1), largest farmers share is marketing channel (3), marketing efficiency is channel (3). The correlation value of 0.869 means the closeness of the strong relationship between the price at factory level and the farmer. The value of price transmission elasticity (b1) 0.814 < 1 indicates weak transmission of price between farmer's market and consumer's market, so that market structure is imperfect competition market.

Keywords: Rubber, channel, marketing margin, price correlation, price transmission.

1. Introduction

National development aimed at improving community welfare in all fields, including the agricultural sector, the potential agricultural sector to be developed, one of which is the plantation sub-sector, besides coconut is also rubber. Indonesia is still the largest natural rubber producer in the world, has a very large role in economic life in general and Riau Province in particular. Riau Province in 2016 had a rubber land area of 496,878 hectares with rubber production of 376,704 tons. Rubber plantations in Riau Province have become the livelihoods of everyday people and become a mainstay commodity in which the development is inseparable from the factors of human resources as the main actors in rubber plantation development activities and plays a major role in increasing income and welfare.

One of the regencies in Riau Province is Kampar Regency, where plantation commodities are one of the rubber commodities to become strategic commodities of the present and the future. Total rubber production in 2016 is 71,833 tons with an area of 99,322 hectares. Kampar Regency has 21 sub-districts, one of which is Kampar Subdistrict, in 2016 there were 3,687 farmers with an area of 3,718 hectares of rubber plantations. Seeing this cannot be denied that the agricultural potential in rubber commodities has a considerable prospect for sources of income and also as regional development [2].

Kampar Subdistrict in Kampar Regency, the livelihood of the population as plantation farmers such as rubber, the business of smallholder rubber plantations has become entrenched in people's daily lives. Generally, small-scale farmers are cultivated by traditional systems, by marketing rubber in the form of rubber-processed materials (*bokar*) to rubber factories farmers do through institutions in the area, but not infrequently followed by falling prices, so the market has become something very hostile to farmers. Conditions of fluctuating rubber selling prices, as for the problems of farmers in marketing rubber patterns of marketing channels used, marketing costs are issued large enough, pricing is unfair because the determination of the quality of the bokar is unclear, the attachment of farmers to certain marketing institutions, and the slow price information to the farmer level where there is an increase in consumer level prices only enjoyed by traders. It is needed better handling of this marketing system. A good marketing system will provide greater benefits to farmers so that it will stimulate farmers to increase their production in terms of both quantity and quality. This study aims to 1) determine the channel, margin, cost and efficiency of rubber marketing, 2) Correlation of rubber prices received by

farmers to factory paid prices, (3) Transmission of rubber prices at the farm level with prices at the factory level in Kampar Sub District.

2. Literature Review

Rubber is a product of the process of rubber latex curing (latex) and then processed to produce rubber sheets (sheets), chunks (boxes), or crumb rubber which is the raw material of the rubber industry. Marketing in principle is the flow of goods from producers to consumers because of the existence of marketing institutions, so that there are several marketing channels that carry out marketing functions. The length of the short marketing channel will affect marketing costs, marketing margins, and marketing efficiency [7].

The results [6] showed that there are two marketing channels of rubber, a good and efficient marketing channel 2 that is rubber farmers to wholesalers and wholesalers to the factory. Total marketing cost on marketing channel I is Rp.2,914.81/kg, marketing margin value of Rp.3,350/kg and marketing efficiency of 21.59%. In channel II, the marketing margin is Rp.2,400/Kg and marketing efficiency is 15.43%.

Based on the study of [1] aims to find out the margins and analyze the price and transmission correlations of FFB prices in Kelayang Village, Kelayang District, it can be concluded that the average marketing margin of MCC to farmers during the period March 2014 to February 2015 was Rp. 420.26 per kg with the correlation value between the price level of the farmer and the price at the level of the MCC is 0.832 and the value of the price transmission elasticity (b1) is 0.69. The value of b1 < 1 indicates that the price transmission formed between farmers and the consumer market (PKS) is not a perfect competitive market, because there is monopsony or oligopsony power and the marketing system takes place inefficiently.

3. Methodology

Rubber marketing research was conducted in Kampar Sub-district of Kampar Regency. The selection of this area was based on regional considerations whose monographs were agricultural development areas, namely rubber plantations. Research was carried out by survey method. Sampling was done by purposive sampling with the provision to choose 2 dominant villages of rubber plant and age rubber plant > 10 years. As for the villages taken from Sarak Island and Batu Belah villages, the total population of rubber farmers in both villages is 674 households sampled 10% so that the number of samples is 70 households of rubber farmers. Samples of rubber traders covering collecting traders from sellers or middlemen as samples through the snowball sampling method by following the marketing channel by the sample farmer. The number of samples of marketing institutions is determined by conditions in the field.

The data taken consists of primary data and secondary data. Primary data is obtained through direct interviews with the sample using a questionnaire or questionnaire that has been prepared in advance and by conducting direct observations in the field. Primary data required include: sample identity, area of cultivated land, marketing costs, rubber sales prices, matters related to marketing. The required secondary data is obtained from the relevant agencies and other literature related to the study. Secondary data required include the potential of the research area, the condition of the population, facilities and infrastructure and supporting institutions. Data deemed necessary and relevant to this research.

Analysis of marketing costs is calculated by summing all costs that are spent during marketing functions. Marketing margin is calculated using a formula [9]:

$$MP = Pr - Pf \qquad (1)$$

Where:
MP = Margin marketing (Rp/Kg)
Pr = Prices at factory level (Rp/Kg)
Pf = The price at which the price is raised (Rp/Kg).

Marketing efficiency is calculated using:

$$Eff = TBP / TNP \times 100\% \qquad (2)$$

Where:
Eff = Marketing Efficiency (%)
TBP = Total marketing cost (Rp/kg)
TNP = Total product value ie factory purchase price (Rp/Kg).

The smaller the percentage of marketing efficiency the more efficient the marketing, and vice versa the greater the percentage of marketing efficiency, the more inefficient marketing [9]. The analysis of price transmission is measured from the price of collector merchants to know the price at farmers and factory level by using simple regression model as follows:

$$Pf = b0 + b1\ Pr \qquad (3)$$

Where:
b0 = Intersept
b1 = Coefficient of price transmission
Pr = Average factory-level price (Rp/Kg)
Pf = Average farm level (Rp/Kg).

The measurement criteria on the price transmission analysis are:
a. If b1 = 1, its marketing margin is not affected by consumer price (Factory). This means that the market faced by all marketing actors is a perfectly competitive market and the marketing system has been efficient.
b. If b1> 1, means that the rate of change in the price at the farmer level is greater than the rate of change of the price at the consumer level (Factory). This means that the market faced by marketing actors compete is not perfect.
c. If b1 <1, means that the rate of change in the price at the farm level is smaller than the rate of change in the consumer price (Factory), meaning that the market faced by the perpetrators of marketing compete imperfectly. In other words, the marketing system is inefficient.

4. Result and Discussion

4.1. Location Overview

Kampar regency is one of the regencies in Riau province with 11,289.28 hectares area. Total production of rubber in 2016 is 49,473 tons in 89,893 hectares [2].
Kampar Sub-district is one district in Kampar Regency with 143.66 km2 or 14,365.69 hectares area, has 18 villages. Geographically, Kampar Sub-district is adjacent to Rumbio Jaya and North Kampar in the north, Kampar Kiri Hilir Sub-district in the south, Regency of Kampar Timur in the east, and Bangkinang Sub-district [3]. The population in Kampar sub district in 2015 is 48,647 people consisting of 23,630 male and 23,971 female with an average population density of 363 people per km2. Kampar Sub District is geographically an agricultural area such as food crops and plantations. Food crops include rice, maize, cassava, oranges and other plantations such as rubber, by 2016 rubber production of 1,546 tons with an area of 3,718 hectares.

4.2. Profile of Respondents of Farmers and Traders

The results showed that most of the respondents were of productive age with a range of age of farmers between 23 - 68 years and an average of 44.6 years. Traders are ranged from 45 - 56 years with an average of 49 years, so it would contribute better physical ability to develop every effort, and increasing household income when compared to non-productive age farmers.
Judging from the level of education of respondents varied, the level of education of the largest respondent farmers in junior high school domination 53.28%, as well as trade education, 78.56% graduated from junior high and high school shows that most of the education respondents have taken 9 years of compulsory education as a government program, because the more the high level of one's education, the more responsive it is to absorb new innovations. The number of dependents of family
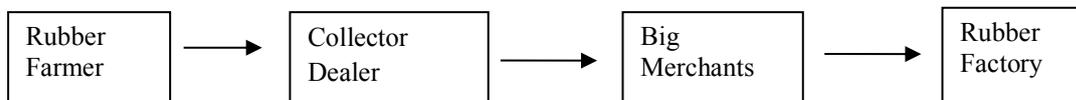
farmers and traders in general ranges from 3 to 4 souls will affect the income and expenses of living needs of farmers and traders.

The largest rubber farmer respondents experience in the range 4 – 7 year is 59.43% and there is 16.67% over 12 years having experience in farming and they know how to overcome or minimize the problem in farming. While the experience of traders working in the marketing of all traders is long (> 10 years). This shows the maturity of traders in marketing. Trading experience will affect the number of rubber farmers selling rubber to them since they have been recognized for a long time.
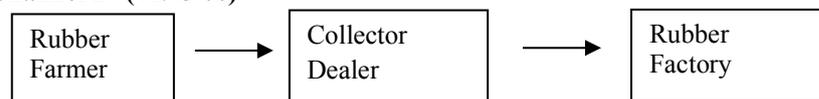
4.3. Rubber Marketing Channel in Kampar Sub District

The rubber marketing system can be illustrated from channels and marketing institutions conducted from producers to consumers to facilitate the flow of goods and services so that marketing efficiency can be achieved. The results of the study (Figure 1) show that there are three rubber marketing channels in Kampar Subdistrict. The first channel farmers sell rubber to the collection traders then sell to wholesalers and rubber factories (25.71%). The second marketing channel for rubber farmers sell to collectors and then sell the rubber to rubber factories (41.43%). The third channel, farmers sell to the Joint Business Group (KUB) of 32.86%. Buying and selling transaction activities occur in the farmer's farm or at the house of a rubber trader. Farmers may make transactions in the garden using cash payment system or bill that can be reimburse at the merchant's house.

Channel 1 (25.71 %)

Rubber Farmer → Collector Dealer → Big Merchants → Rubber Factory

Channel 2 (41.43 %)

Rubber Farmer → Collector Dealer → Rubber Factory

Channel 3 (32.86 %)

Rubber Farmer → KUB → Rubber Factory

Figure 1. Chart of Rubber Marketing Channel in Kampar District

The length of marketing channel carried out will affect the price that will be received by farmers. The task of this marketing agency is to carry out marketing functions and to fulfill the consumers' wishes to the maximum extent possible. In the first marketing channel, farmers sell rubber to collectors at an average price per kilogram of Rp. 7,455, the traders sell rubber to large traders at an average price of Rp. 8,625 per kg and wholesalers sell to rubber processing plants at prices average of Rp. 9,175 per kg. In the second marketing channel, farmers sell rubber to traders with an average price per kilogram of Rp. 7,574 per kg. The traders sell rubber to rubber processing factories with an average price of Rp. 9,248 per kg. Farmers sell crops for various reasons because of the well-relationship between farmer and trader, farmers get good services or trader gives loan if the farmer needs it at the urgent time. The payment system on channels I and II is cash payment. Cash payments are payments made directly by the collecting trader to the farmer when rubber collection point located not far from the farmer's land.

On the third marketing channel, farmers sell rubber to the Joint Business Group (KUB) at a price of Rp.8,816/Kg, KUB sells to the processing plant of Rp.9,318/Kg. We can see that price received by farmer from market rubber through KUB higher than merchant collector but cash money received 1-2 days after sale. The payment system on rubber marketing may be done by two ways, cash payment or system of bills/temporary delays. A temporary or bon payment is when KUB sells rubber to the factory and receives a payment, after that KUB pays the farmer according to the time and amount or weight of the rubber.

The results of the study also found the reluctance of other farmers not joining the KUB because the farmers did not want to be difficult and the fee for compulsory savings was Rp10,000/month and to join KUB farmers had to pay a principal deposit of Rp100,000. Farmers also do not want to join because KUB only does rubber marketing on Wednesday and the money from the sale of rubber can be received on the next day. The contrary, collecting traders are willing to buy rubber from the farmers whenever the farmer contacts them and the money from rubber sales can be directly accepted by farmers.

4.4. Cost, Margin, Farmer Share and Rubber Marketing Efficiency

Marketing costs are a number of expenditures for each marketing activity of a product in the marketing component of both producer farmers, marketing institutions, and consumers (factories). The marketing costs of rubber are borne by each marketing agency. Marketing analysis includes marketing costs, margins, profits, farmer share and marketing efficiency. Table 1 shows the costs and margins of rubber marketing.

Table 1. Total Cost and Margin of Rubber Marketing in Kampar Sub-District

Channel	Cost (Rp/Kg)	Margin (Rp/Kg)
1	1,812.84	1,562
2	1,553.68	1,317
3	1,135.12	1,034

Table 1 shows that high marketing costs incurred in the first channel, Rp. 1,812.84 per Kg. It is due to a long marketing channel compared to other channels. The total marketing costs incurred include the costs of reporting and depreciation of 5% - 8% of the weight of rubber sold, loading and unloading costs, transportation costs, costs of SPO. The deduction is determined by the trader itself according to the quality of rubber. Farmers do not have to deliver the rubber products to the collecting traders, because the collecting traders pick up the farmers' rubber products directly from each farmer's location.

Before the rubber is weighed and lifted to the car, the collection trader usually checks the quality of the rubber. Characteristics of good quality rubber that is clean, does not have *tatal* and has a low water content. If the quality of rubber is low, traders still want to buy the rubber at a very low price. Low rubber quality has characteristics mixed by wood or tatal, leaf litter and high moisture content. Therefore, it is expected that farmers will maintain the quality of the rubber so that the price received by the farmers is high and the traders feel happy to buy the rubber.

Marketing margin is the difference between the price paid by the factory and the price received by the farmers. The price difference is due to the marketing costs and benefits of each marketing agency involved in the channel. In this study, rubber marketing was ended in the final consumer i.e. the factory. In this study, the total marketing margin in the first marketing channel was Rp1,562 per kg. The margin of the second marketing channel was Rp. 1,317 per kg. The third marketing channel margin is Rp. 1,034. It appears that the longer the marketing channel the higher the marketing margin.

Based on the difference in price received by farmers with the purchase price by the rubber factory (Table 2), the lowest average price at the farmer level occurred in June 2017, i.e. position of Rp. 7,767 per kg and the highest price of Rp. 11,083 per kg in February 2017. The lowest price at the factory level is Rp. 8,042 per kg in July 2017, the highest price is Rp. 12,275 per kg in February 2017. Most of the processed rubber material (bokar) is exported in the form of raw materials, so prices are easily mocked and frequent price fluctuations in the world market. In this case, rubber farmers and tapping laborers are often disadvantaged. The average price at the farmer level during 2017 is Rp. 7,976 per Kg. The average factory level for 2017 is Rp. 9,221 per kg while the average margin is Rp. 1,245 per kg.

Price fluctuations usually occur due to unstable production and the international market for global bokar prices. Price fluctuations are often more detrimental to farmers than traders because farmers generally cannot set their sales time to get a more profitable selling price. Besides that, high price fluctuations also provide opportunities for traders to manipulate price information at the farmer level, so that the transmission of prices from the rubber factory market to farmers tends to be

asymmetrical. In the sense that if there is a price increase at the factory level, the price increase will not be passed on to farmers quickly, otherwise if there is a price decline at the factory level, it will be forwarded quickly to farmers. Traders always press prices on farmers as low as possible, so that when cheap rubber traders do not experience losses.

Table 2. Average Rubber Price at Farmer and Factory Level, Marketing Margin During Period February 2017 to January 2018 in Kampar Sub-district

No	Month	Farmer Price (Rp/Kg)	Factory Price ((Rp/Kg)	Margin (Rp/Kg)
1	February	11,083	12,275	1,192
2	March	10,525	11,859	1,334
3	April	7,758	8,967	1,209
4	May	7,383	8,533	1,150
5	June	6,767	8,050	1,283
6	July	6,783	8,042	1,259
7	August	7,250	8,583	1,333
8	September	7,625	8,850	1,225
9	October	8,042	9,317	1,275
10	November	7,700	9,025	1,325
11	December	7,558	8,750	1,192
12	January	7,233	8,392	1,159
	Total	95,707	110,643	14,936
	Average	7,976	9,221	1,245

From Table 2, the biggest margin is Rp.1.334/kg in March. The lowest margin is Rp. 1,150 per kg in May 2017. Different margin is caused by rubber price fluctuations that occurs every month. In addition, margins from traders to farmers are large, because one of the margin components is cost. Traders are charged costs that must be incurred during the distribution of rubber. In addition, traders must pay for the grade when it reaches the factory and rubber which contains water will shrink during the trip to the factory, indirectly the weight of the rubber decreases after reaching the factory. Thus, traders and wholesalers carry out the depreciation of water content in rubber purchased one of the factors that need to be considered in facilitating the flow of goods from producers to consumers. It should choose the right and efficient channels as stated by [7] that the shorter the marketing channels passed by producers to consumers can increase marketing efficiency. Consequently, farmers can obtain the price is much better or the portion that farmers receive will be greater. In Table 3 we can see farmer share and the efficiency of rubber marketing in Kampar Sub-District.

Table 3. Farmer Share and Efficiency of Rubber Marketing In Kampar Subdistrict

Channel	Farmer Share (%)	Efficiency (%)
1	81.68	19.09
2	83.12	17.56
3	93.76	14.43

We can see that the highest rubber marketing farmer share is in the third channel at 93.76%, the lowest rubber marketing share farmer in the first channel at 81.68%. The high farmer share occurred on the third channel because farmers made rubber sales through the Joint Business Group (KUB), while in the first channel the marketing channel was in addition to collecting traders through wholesalers.

The efficiency of the first marketing channel was 19.09% greater than the second marketing channel of 17.56% and the third marketing channel of 14.43%. This shows that the third marketing channel is more efficient than the first and second marketing channels. Marketing efficiency can be seen from the length of marketing channels in marketing of rubber. The longer the marketing channels that will be passed, the more inefficient. In addition, efficiency can also be seen from the margins, costs and benefits received by each marketing agency that exists within the marketing agency. In third marketing channel, there is one marketing agency (i.e. Joint Business Group (KUB)) has easy access

in delivering joy to the factory because KUB already has SPO (Letter of introduction rubber) obtained by making a direct contact with factory according to predefined validity period.

3.5. Price Transmission Analysis

Prior to conducting preliminary price transmission analysis, the correlation coefficient indicates the strength or closeness of the relationship between two or more variables that are quantitative in nature but also gives an interpretation to how far the price formation of a commodity at a market level is influenced by other markets [6]. The result of correlation analysis of price at farmer level with factory level price is the value of the coefficient of price correlation (r) at farmer level with trader level i.e. 0.869. Table 4 indicates that the correlation value close to 1. It indicates the strong relationship between the price at the factory level and the farm-level price. The correlation value of the price (r <1) means that two markets are not fully integrated.

Table 4. The Level of The Relationship in The Analysis of Correlation

Value r	Criteria of Correlation	Market Integration
0	No Correlation	Not Perfect
0-0.5	Weak Correlation	Not Perfect
>0.5-0.8	Medium Correlation	Not Perfect
>0.8-1	Strong Correlation	Not Perfect
1	Perfect	Perfect

The result of the research on price transmission is the comparison of the relative change from the retailer price with the price change at the farmer level. If the transmission elasticity is smaller than one (Et<1) it can be interpreted that a 1% price change at the merchant level will result in a change in the price of less than 1%. If the transmission elasticity is greater than one (Et>1) then a 1% price change at the merchant level will result in a price change greater than 1% at the farm level. If the transmission elasticity is equal to one (Et = 1) then a 1% price change at the retailer level will result in a price change of 1% at the farm level [9].

Based on research from the simple regression analysis result, it is obtained regression coefficient b1 equal to 0.814. It indicates the value of transmission price elasticity is smaller than one (<1). It means that if there is a change in the price of 1% at the factory level, it will result in price changes of 0.814% at the farm level. The value of price transmission elasticity (b1) of 0.814 also indicates that the price transmission formed between the farmer's market and the consumer market is weak so that the market structure is the imperfect competition market.

5. Conclusion

In Kampar Subdistrict there are 3 channels of rubber marketing. The highest marketing margin is on the first marketing channel and the lowest is on the third one. The share is highest on the first channel, while efficient marketing efficiency is the third marketing channel compared to the first and second marketing channels. The value of the transmission elasticity of the price of 0.814 means that a price change of 1% at the factory level, it will result in a change in a price of 0.814% at the farmer level. The price transmission elasticity value (b1) of 0.814 (less than one) <1 also indicates that weak transmission of price which is formed between the farmer's market and consumer so that the market structure is not perfect competition market (monopsony market).

Farmers in marketing should use KUB marketing agency so that the bargaining position of rubber price can be higher. Farmers also do not give a mixture of rubber with wood waste or similar ingredient so that the price received is higher. Traders should not freely set the price, need to negotiate in advance with the farmers. Finally, the government should make pricing policy to protect farmers from the price set by traders.

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