The Knowledge Level of Market Information by Farmers and The Influencing Factors

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Abstract. This study aims to measure the knowledge level of market information by rubber and what factors can influence it. This study also finds out whether there is a gap or the difference between the mastery at the farm level with the mastery of information at the traders level. This research was located in Sintang District which is one of rubber production center in West Kalimantan. The number of respondents was determined by 153 farmers of respondents distributed in each location. Frequency analysis, chi-square and multiple linear regression were used to answer the objectives. The results showed that the level of mastery of market information by rubber farmers is included in the medium to the high category for price indicators, form, time and place. Then the data shows that there was no gap or difference in the mastery of market information between farmers and traders in general, but for the mastery of price information obtained results, there was a gap between farmers and traders. The factors affecting the mastery of rubber farmers' market information are age, income from farming, distance from the house to the factory, electronic communication media, online communication media and utilization of information source from the internal factory (foreman/manager).

Keywords— knowledge, information, rubber, market, farmer

1. Introduction
The problems in the agricultural sector are so complex, small businesses and narrow land are old stories that everyone knows, low in capital, weak product competitiveness, and inadequate quality of human resources. This is a challenge for national agricultural development. Agricultural revitalization movement by government means returning the agricultural sector as one of the strategic sectors in national development, is the right momentum in rearranging national agricultural development policy.

As the ASEAN economic community (MEA) treats, some domestic markets are already full of imported products, this is very difficult for farmers because of intense competition. The effect of all that is the farmers are required to know the development of information especially on matters relating to its products, to develop farming and produce quality products. Currently, the need for information is considered as important as land, labor, and capital.

The rapid development in the field of communication technology causes a great influence on the dissemination of information or ideas in the field of agriculture. Someone faced many choices of communication channels to obtain the desired information. A person will tend to choose a
communication channel that provides information or knowledge about something that suits their needs [1].

Mastery of current market information by farmers is perceived as lacking, farmers’ orientation is still focused on farm and still do not much understanding about processing and marketing, including government, for providing agricultural information to farmers. Especially about the price of agricultural commodities and plantations. Most government attention is directed to such things as counseling, fertilizer or seedlings, and agricultural regulations. In fact, such a thing does not create sustainable welfare for farmers. Farmers are sufficient fertilizer, seeds, planting knowledge and also protected through regulations. However, farmers still lack the information and capabilities to know the ideal market price, determine commodity prices and take advantage of commodity sales.

Information is essential to meet potential supply and demand. This market information in addition to listing commodity prices per unit should also inform the inventory, the quality of the commodity at the market level at a particular place and time [2]. Because they do not have reliable and relevant information independently, the farmers depend on the price determined by the middlemen.

One of the weaknesses of rubber farmers is due to the weakness of market information is the quality of sap result of less good lead. Rubber materials produced by farmers still contain many impurities such as stones, sand, plastic straps, twigs, and leaves. The treatment of soaking Rubber materials in water causes the price of rubber sap rubber under the standard and multinational tire companies such as Bridgestone, Michelin, Goodyear, and others prefer rubber products of other countries [3].

In determining the price of rubber, generally, the middleman who determines the price which is then accepted by the farmers. Rubber farmers themselves barely have bargaining power against the price determined by the middleman. In the economic field, if one party to a transaction has more or better information than the other is called asymmetric information. Generally, the seller who has more information about the product than the buyer, although the opposite condition may also occur.

This study aims to measure the level of control of rubber farmers market information in Sintang District and what factors can influence it. In addition, the study also finds out whether there is a gap or a difference of information level between farmer and the traders.

2. Material And Method
Determining the location of research is done purposively (purposive sampling), that is by selecting the research location in Sintang regency which is one of rubber production center in West Kalimantan. The number of respondent farmers is determined by 153 farmers of respondents distributed in each location. The respondents of the marketing institutions involved in marketing the people's rubber to the factory were determined by snowball sampling method, ie the respondent's determination of the initial marketing institution based on the information from the respondent farmers, followed by the marketing institution appointed by the respondent farmer, and so on until the saturation of the respondent or respondents difficult to achieve. Sources of data used in this study include primary data and secondary data.

Primary data required from respondent farmers is the condition of rubber farming (the area of rubber plantation produces, not / not produces, and actual production amount), the type of rubber material quality, the way of processing, the way of payment and pricing by the trader and where the proceeds are sold. The primary data required by the marketing agency is the amount of material by rubber sold, the depreciation rate, the transportation cost, the pricing practice, and the presence or cooperation of the traders. Secondary data required from Crumb Rubber Company (rubber refinery factory), which is export quality rubber, export price, and other information.

The first objective is to know the mastery of information by rubber farmers used frequency table analysis and chi-square test. To calculate the score on the mastery of farmer information by calculating the hypothetical average value, the standard deviation of hypothetical [6]. The data is then discussed descriptively.

To analyze the factors that influence the mastery of market information, multiple regression analysis with linear function is used to connect the control of market information as dependent
variable and with independent variable of farmer age, formal education level, non-formal education level, number of trees, duration of rubber farming, distance from home to factory, farm income, out-of-farm business income, utilization of communication media, farmer group and information source with the following model, Ljung box is presented:

\[
Y = \beta_0 + \beta_1U + \beta_2TF + \beta_3TN + \beta_4JP + \beta_5LB + \beta_6JRK + \beta_7PT + \beta_8PL \delta_1DMK1 + \delta_2DMK2 + \delta_3DMK3 + \delta_4DKT + \delta_5DSI1 + \delta_6DSI2 + \delta_7DSI3 + \delta_8DSI4 + \epsilon
\]

where:

- \(Y\) = PI information scores;
- \(\alpha\) = Intercept;
- \(\beta_1 - \beta_8\) = Regression coefficient;
- \(\delta_1 - \delta_8\) = Koefisien dummy;
- \(U\) = Farmer's age (year);
- \(TF\) = The level of formal education (year);
- \(TN\) = Level of non-formal education (year);
- \(JP\) = Number of Trees (ha);
- \(LB\) = Old farmed rubber (year);
- \(JRK\) = Distance from house to factory (km);
- \(PT\) = Revenue farming (Rp);
- \(PL\) = Outside income of farming (Rp);
- \(DMK1\) = dummy utilization of communication medium (DMK1 = 1, print media; DMK1 = 0, other);
- \(DMK2\) = dummy utilization of communication medium (DMK2 = 1, electronic media; DMK2 = 0, other);
- \(DMK3\) = dummy utilization of communication medium (DMK3 = 1, online media; DMK3 = 0, others);
- \(DKT\) = dummy farmer group (DKT = 1, member; DKT = 0, not member);
- \(DSI1\) = dummy source of information (DSI1 = 1, trader/middleman; DSI1 = 0, others);
- \(DSI2\) = dummy source of information (DSI2 = 1, foreman/factory; DSI2 = 0, other);
- \(DSI3\) = dummy source of information (DSI3 = 1, extension; DSI3 = 0, other);
- \(DSI4\) = dummy information source (DSI4 = 1, friend/farmer; DSI4 = 0, other)

### 3. Result and Discussion

This study aims to see and compare the mastery of information related to price, form, time, quality and place between rubber farmers and traders. Data are presented in a histogram which can be seen as below. Mastery of price information is presented in Graphic 1.

![Graphic 1. Mastery of price information between Farmers and Traders](source: Primary data, 2017)

Based on graphic 1 presented above, it can be seen that there is an imbalance between the peasants' mastery of prices with traders. The majority of rubber farmers do not know about the price information as much as 55.6%, while the majority of traders know as much as 66.7% and very know 26.7%. This shows that there is asymmetric information that occurs. While on the graphic 2 can be seen inequality between the mastery of farmers about the form with traders, but not too real. It is seen that the majority of rubber farmers know less about form information is as much as 55.3%, while the
majority of traders also less know as much as 53.3%. Mastery of rubber form information is presented in Graphic 2.

Graph. 2. Mastery of rubber form information between Farmers and Traders
Source: Primary data, 2017

On the other hand, on graphic 3 can be seen an imbalance between the control of peasants about time with traders, but the farmers more control over information about time. It is seen that the majority of rubber farmers know about the time information is as much as 81.7%, while the majority of traders know less as much as 46.7%. It can be understood that farmers are in the field more knowing the time of productive rubber trees.

Based on graphic 4 presented below, there can be an imbalance between controlling the farmers about quality with the traders. It is seen that the majority of rubber farmers do not know about quality information is as much as 73.9%, while the majority of traders are also known as much as 46.7%. The facts encountered in the study sites are that with farmers who do not know the quality then the price will be equalized between good quality and low quality. Then the trader when selling the material rubber, will sell it by sorting the quality, so the trader will get the selling price to the factory with more profit.
Graph. 4. Mastery of quality information between Farmers and Traders
Source: Primary data, 2017

On graphic 5 again can be seen inequality between the control of farmers in places with traders, farmers lack control of information about the place. It is seen that the majority of rubber farmers know less about the place information is as much as 81%, while the majority of traders tend to know the market information related places. It is understandable that traders do indeed know where farmers, traders, and factory locations.

Graph. 5. Mastery of quality information between Farmers and Traders
Source: Primary data, 2017

Average Value Analysis of Market Information Mastery
From the results of Table 1 below, it can be concluded that the control of market information by 153 rubber farmers who are sampled in this study is categorized as a medium to high for price indicators, form, time and place. As for the indicators of entry in the low category.

Table 1. The average value of Farmer Market Farmer Information Mastery

| Variables  | N | Range     | Average   | Rate Scores | Category |
|------------|---|-----------|-----------|-------------|----------|
|            |   | Theoretical | Actual    | Theoretical | Actual   |           |
| Price      | 153| 5 – 30    | 5 – 24    | 17          | 15.2     | 2.54      | Medium    |
| Form       | 153| 5 – 15    | 5 – 15    | 15          | 9.02     | 3.01      | Medium    |
| Time       | 153| 5 – 10    | 5 – 10    | 10          | 7.54     | 3.77      | High      |
| Quality    | 153| 5 – 25    | 5 – 25    | 15          | 10.6     | 2.14      | Low       |
| place      | 153| 5 – 15    | 5 – 15    | 10          | 9.03     | 3.01      | Medium    |

Source: Primary data, 2017
The purpose of this difference test is to know the difference of market information mastery level between rubber farmers and traders. In this analysis, the trader data obtained is the data of the whole intermediary trader that is the collecting trader and the wholesaler. The results of chi-square analysis can be seen in Table 2.

Table 2. Results of Chi-Square Test of Information Mastery between Farmers and Traders

| Chi-Square Tests                      | Value  | df  | Asymp. Sig. (2-sided) |
|---------------------------------------|--------|-----|-----------------------|
| Pearson Chi-Square                    | 15.000 | 12  | 0.241                 |
| Likelihood Ratio                      | 13.322 | 12  | 0.346                 |
| Linear-by-Linear Association          | 3.521  | 1   | 0.061                 |
| N of Valid Cases                      | 168    |     |                       |

a. 20 cells (100.0%) have expected count less than 5. The minimum expected count is .20.

Source: Primary data, 2016

From the above results in the Pearson Chi-Square seen the Asymp value. Sig. of 0.241 > 0.05, it can be concluded that there is no gap or difference in the mastery of market information between farmers and traders. This is consistent with previous findings that rubber farmers have good information (moderate), which does not result in significant information gaps with traders.

Table 3. Results of Multiple Linear Regression Test

| Coefficients* | Unstandardized Coefficients | Standardized Coefficients | t     | Sig. |
|---------------|-----------------------------|---------------------------|-------|------|
| Variables     | B                           | Std. Error                | Beta  |      |
| (Constant)    | 27.770***                   | 10.401                    |       |      |
| Age           | -.144***                    | .039                      | -.198 | -3.630 | .006 |
| experience    | .029                        | .056                      | .053  | .523  | .602 |
| Farm income   | 2.312E-7**                  | .000                      | .365  | 2.836 | .019 |
| Out-of-farm income | 5.711E-8                  | .000                      | .022  | .249  | .804 |
| Distance from house to the factory | .040**                   | .017                      | .255  | 2.320 | .022 |
| Number of Trees | .000                      | .001                      | .081  | .413  | .680 |
| utilization of print media | -1.015                   | 1.170                     | -.066 | -.867 | .387 |
| utilization of electronic media | 1.390**                   | .948                      | .311  | 1.467 | .045 |
| utilization of online media | 1.468**                   | .105                      | .298  | 2.828 | .016 |
| farmer group  | .389                        | .949                      | .033  | .409  | .683 |
| source of trader gathering information | 4.589                   | 5.244                     | .358  | .875  | .383 |
| factory foreman information | 5.568**                   | .215                      | .728  | 3.068 | .017 |
| information resources extension | 4.258                   | 5.239                     | .307  | .813  | .418 |
| sources of information | 4.879                    | 5.227                     | .352  | .933  | .352 |
| Age           | -.871                      | 1.621                     | -.045 | -.537 | .592 |
| experience    | -.089                      | .115                      | -.063 | -.772 | .442 |

a. Dependent Variable: PI
Source: Data processed, 2017
*** = significant at the error level α = 1%
** = significant at the error rate α = 5%
Factors Affecting Rubber Farmers in the Control of Market Information

Based on the results of the classical assumption test that has been done, it is known that the regression model in this study is feasible to be used because it has been free from the problem of data normality, no multicollinearity, heterokedastitas, and autocorrelation. The next step is to do multiple linear regression analysis. Based on the regression result, it can be concluded that the independent variables affecting the control of market information are U (age), PT (income from farming), JRK (distance from home to factory), electronic communication media, online communication media and utilization source of information from internal factories (foreman/manager). The regression model in this study has a constant value of 27,770 and has a significant influence on 99% confidence level, it states that if the age of the farmer, the level of formal education, the level of non-formal education, the number of trees, the duration of rubber farming, the distance from house to factory, income from farming, out-of-farm income, utilization of communication media, farmer group and of zero source of information hence the level of mastery of market information of rubber farmers is 27,770.

The result of the partial test (t-test) found that age variable (U) with 99% confidence level significantly influence negatively to the control of market information (PI). The coefficient of regression of age variable equal to \(-0.144\) meaning if the age of farmer increase 1 year then will decrease mastery of market information equal to 0.144. It can be understood that if the age of farmers grows, the desire to keep abreast of market information will decrease. Results on farmers' profiles in the study area that most of the farmers are still in the productive age population (aged 15 to 64 years), which is 92.81%. Meanwhile, 7.19% were categorized as farmers with a non-productive age range (> 64 years). This is in accordance with [4] opinion, that younger farmers have poorer experience and skills than older farmers but have a more progressive attitude toward new information and innovation.

Analysis of income variable from farming (PT) showed that with 99% confidence level of income from farming have a significantly positive effect on the control of market information. The coefficient of variable income regression from farming equal to 0.00000023 mean if income from farming increase 1 rupiah hence will increase mastery of market information by farmer equal to 0.00000023. Farmers who have an increasing income from rubber plantations tend to be more diligent and actively to get new information about rubber from offline and online sources, this is because by knowing the information it will be useful for him such as information price developments, quality desired consumers, and places or locations where traders are willing to buy bokar at a higher price than anywhere else.

Furthermore, the analysis of JRK variables (distance from home to factory) shows that with a 95% confidence level the distance from the house to the factory has a significantly positive effect on the mastery of market information. The regression coefficient of variable distance from the house to the factory is 0.040 means that if the distance from the house to the factory increases 1 kilometer it will increase the mastery of market information by farmers by 0.040. It can be understood that when the distance from the farmhouse to the consumer (factory) is far away, the market information from the nearest region will be very difficult to obtain so that the farmer will have a high curiosity towards the market. They will start searching online and electronically for the factories that are the markets of rubber farmers, this curiosity will lead to massive information search and result in increased levels of knowledge of the rubber market information by farmers.

Analysis of variable utilization of electronic communication media (DMK2) shows that with 95% confidence level of utilization of electronic communication media have a significant influence positively on the mastery of market information. This can be interpreted that the mastery of information rubber farmers who use electronic communication media is better than farmers who do not use it. Electronic media is information or data created, distributed, and accessed using an electronic form, electromechanical energy, or other means used in electronic communications. Included in the electronic media including television, radio, computers, mobile phones, and other tools that send and receive information using electronic [5]. With the electronic media, everyone can get the latest news and information, both from domestic and foreign countries. In addition to easy to obtain, all this information can also be accessed quickly so that makes the community in the modern world becomes more up to date. including, in this case, is information about rubber that proved to have a significant effect on the control of market information of rubber farmers responder.
Analysis of variable utilization of online communication media (DMK3) shows that with 95% confidence level of utilization of online communication media have a significant positive influence on the mastery of market information. This can be interpreted that the mastery of information rubber farmers who use online communication media is better than farmers who do not use it. Understanding of online media in general, ie all types of media formats that can only be accessed via the Internet contains text, photos, video, and sound. In this general sense, online media can also be interpreted as a means of communication online. The function of an online media for rubber farmers is not much different from the function of a mass media shown as a source of rubber information, socialization, motivation for rubber farming, discussion and debate about rubber policy, but the reason for the ease of using and searching it online media is very popular with information seekers, especially rubber farmers.

The analysis of variable of information source from factory mandor (DSI2) shows that with 95% confidence level the source of information from factory foreman significantly influences positively to the control of market information. This could mean that the mastery of rubber farmers’ information using the source of information from the plant foreman is better than the farmers who do not have access to information from the plant foreman. Although the distance from the factory is relatively far the relationship between farmers and the internal factory is very close, this is evidenced by the statement of 26.7% of farmers have good communication relation which is related to rubber information from the factory. On the contrary, it has been several times that the factory with the relevant extension agents carried out the extension and advisory activities related to the way of cultivation, caring for the plants, how to tap the good so that there is a relationship between the farmer and the factory supervisor. however, this is certainly different from farmers who are not actively involved in counseling and absorbing information from factory foremen.

CONCLUSION
The level of mastery of market information by rubber farmers is in the medium to the high category for price indicators, form, time and place. As for the indicators of entry in the low category. There is no gap or difference in the mastery of market information between farmers and traders in general, but for the mastery of price information obtained results, there is a gap between farmers and traders. The factors that influence the mastery of rubber farmers’ market information are age, income from farming, distance from home to factory, electronic communication media, the utilization of online communication medium and utilization of internal information source from the factory.

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