Effect of Market Structure on Integration of Rice and Paddy Prices and Its Impact on Income of Farmers’ Family in Kroya District, Indramayu Regency, Indonesia

Yogi Makbul¹, Sudrajati Ratnaningtyas², Pringgo Dwiyantoro³

Abstract

This study is one step of a larger research scheme of poverty reduction through improved market structure. Poverty alleviation is one of the goals to be achieved in the Millennium Development Goals. Poverty occurs mostly on subsistence rice farmers who own small plots of land. If the income of this group can be increased, it will significantly contribute to the poverty alleviation.

One attempt to increase farmers’ income is by increasing the price of rice. It is based on the assumption that the increase in the price of rice will subsequently increase the price of paddy, which, in turn, will increase the income of the rice farmers. This assumption is valid when there is integration between the price of rice and that of paddy; such integration occurs in a competitive market structure.

This study aims to find evidence that the market is not "perfect competitive" but "monopsony", in which increases in rice prices will not increase the income of farmers with small lands. This is an important scientific finding and also a suggestion for the government in determining the policy of the prices of rice.

The results showed that only large and medium farms are not "monopsony"; in this case the increase in rice prices will affect the increased income of the farmer’s families. The farmers with small farms have a market structure that tended to be a "monopsony", meaning there is no significant effect of rice price increases on income of the farmers’ family.

Keywords: Market Structure, Rice Price, farmer

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INTRODUCTION

Poverty alleviation is one of the main objectives of the Millennium Development Goals (MDG) which is a joint commitment of 189 countries that are members of the United Nations. Indonesia is one of the countries that must also be committed to it. Indonesia aims to reduce the amount of extreme poverty by 50 percent and decrease by half the number of population suffering starvation (http://www.targetmdgs.org). If you look at the site of the Central Bureau of Statistics (http://www.bps.go.id), in 2010 the percentage of poverty in urban areas was 9.87 per cent and 16.56 per cent in rural areas. Thus, rural areas had higher percentage of poverty than in urban areas. The main livelihood of the majority of people in the rural areas is farming. Thus, if there is a study on how to alleviate farmers' poverty, it will be very helpful in the process of poverty reduction in Indonesia.

One of the policies to help increase farmers' income is by raising the price of farm produces; one of these farm produces is paddy. It is expected that increases in the price of paddy will increase the farmers' income as the result of their agricultural business. Increase of rice price can go along with the rising prices of rice, but this also leads to a dilemma. If the price of rice is increased to up the price of paddy, consumers will suffer the consequences. The contradiction between the policy of low rice price and the increase of the farmers' income is indeed a dilemma. When the price of rice is low, it will undermine the efforts to increase the farmers' income; however, when the rice price increases, it will disrupt the lives of the consumers.

The assumption is that the rise of rice price will raise the farmers' income if the percentage of the increase in the price of rice is proportional to the increase of the price of paddy at the farmer level. It happens when the market at the farmer's level is a perfectly competitive one. If the market is not competitive, or especially monopsony, rice prices will not proportionally increase the price of paddy at the farmer's level, but instead it is the trader and institutions participating in the rice trading system that will enjoy the advantage.

LITERATURE REVIEW

Market prices affect one another. The theory that states this is the "Law of One Price". This theory states that "under certain conditions all prices within a market are uniform, after taking into account the cost of adding place, time, and form utility to products within the market". Such interpretation of law states that under certain conditions all prices in a market is uniform/equal following additional costs for place, time and utility. The term "under certain conditions" as mentioned in the law is, according to Kohls & Uhls (1980), a condition where there is no dominant large seller or buyer, trading restraints, manipulated prices as the result of the imperfection of the buyers or sellers' knowledge about costs and prices, lack of information, and other obstacles found in trading. In a perfect competitive market, the percentage of the price increases in a market will be followed by comparable percentage of price increases in other markets. On the other hand, in a market that is not perfectly competitive, especially monopsony in this case, the increase of price percentage in a market will not be the same as the increase of price percentage in other markets. To explain these, Figure 1 illustrates the price increases in a consumer market and its influence on the rising prices at the farmer level in a perfectly competitive market.
This picture is a simplification of the effect of price rises on traders and farmers. In the perfectly competitive market, price increases at the consumer level is $P_0$ to $P_1$ to be followed by the same percentage on traders and farmers. This happens because of absence of market barrier. Profits of farm business rises from rectangular ABCD into rectangular EFGH. But if the market is a monopsony, as seen in Figure 2, the percentage of the increase of price at the consumer level will not be proportional.

In the monopsony market, as traders are dominant, they will buy paddy from the farmers at farmer's AC (Average Cost). As traders buy paddy at the price equal to that of AC, the farmers do not make any profit. When prices rise, farmers do not get any profit. Price increase is equal to the increase in costs for improving production output. In addition, the increase in consumer prices is not proportional to the increase in prices at the farmer's level. For farmers who are in a monopsony market, rice prices will not increase the profits.
generated from rice farming. In fact, the family's living expenses will increase as the rising price of rice that is supposed to be their consumption.

Many studies have proved the existence of price integration between markets. Research conducted by Jian Yang et. al. (2000), J. Dawson and P. K. Dey. (2002), Baulch, Bob et. al. (2002) “Zanias (1993) Gordon, Hobs & Kerr (1986), Dahlgram & Blank (1992) etc. These studies conclude that there is price integration between interrelated markets, and therefore changes of prices in a market will affect the other market prices. In a perfect competition the price integration will be perfect, hence changes in prices in a market will be followed by proportional increases of prices in a perfect market. In an imperfect market competition, especially monopsony market or monopoly, there is no market integration. In fact there is actually no absolute perfect competitive market nor monopoly/monopsony; all can be found only in theoretical studies. Yet, there are markets that are nearing perfect competitive markets and those that are nearing monopsony/monopoly. In markets that are almost perfect competitive markets, increases of price will be followed by nearly proportional increases of the other markets. As for monopoly/monopsony markets, price increases will not be proportionally followed.

In terms of increases of rice prices and paddy prices at the farmer level, both are interrelated markets. If the market at the farmer’s level is a competitive one, the rice price increases will affect the paddy price increases proportionally. This resulted in increases in the price of rice that will subsequently increase the income of the rice farming. But if the structure of the market is approaching monopsony, rice price increases will not proportionally raise the prices of paddy at the farmer’s level. In Figure 2 it is explained that in the monopsony market, rice price increases will not affect the profits of rice farming.

According to Mubyarto (1995) among paddy farmers there is an agricultural problem that is the "gestation period". This situation occurs when there is a gap between the revenues obtained only at the time of harvest and expenditure that should be paid every day. Among large farmers, because of their high revenues, this does not seem to be a problem. On the contrary, for farmers with small lands, revenues from their harvest is not sufficient even for financing their cost of living prior to harvest time. According to Mubyarto (1995) this leads farmers to go to money lenders, making contracts with traders to sell their produce even before the harvest time arrives. Under these conditions the farmers will be in a monopsony structure.

According to Firdaus (2008) "the changes of the basic price of paddy into the main cost of buying GPP (Government Purchase Price) followed by policy reformation that stipulates that Bulog (Badan Urusan Logistik/Logistics Bureau Affair) is no longer a price stabilizer, pushing the market structure to oligopsony. This happens because strong investors take the opportunity to take over the position of Bulog." Furthermore, Firdaus (2008) states "(a) Some businessmen dominant in trading rice, the paddy peeler machine owner or large traders, in addition to conducting inter-regional trade, also perform vertical integration starting from farming business or paddy peeler machine to rice trade, (b) among the dominant businessman, horizontal integration occurs, i.e. they know each other or even have kinship relations among themselves, (c) ownership of large business facilities, especially warehouses, allows them to perform paddy/rice hoarding. Bulog’s role has been changing basic prices into Government Purchase Prices since 2003. The fundamental difference between the basic prices and that of GPP is, at basic prices, the government is obliged to purchase paddy at the farmer level in accordance with the basic prices. At GPP, the government buys paddy from
farmers in accordance with the needs of the domestic procurement price of GPP in Bulog warehouse, and no longer at the farmer level (Firdaus, 2008).

The next assumption is the increase in revenue from rice farming exceeds expenditure of family consumption, which in turn increases the income of the farmers’ family. This happens when the income of the farming family mostly comes from the farming business and the percentage of expenditure for rice consumption is small.

The results of research by Arifin et. Al. (2001) in Bustanul Arifin (2004) concludes that small farmers use 90 percent of the production for the consumption of their family, leaving only 10 percent to be sold to the market. If the rice sold is 10 percent, the increase in the income from farming is 10 percent.

According to Syafaat (2005), citing a report by BPS 1998, the share of the income from farming business of the income of the farmers’ family is 26.2 percent for small farmers. As for farmers who own lands from 0.5 to 1 ha it is 32.8 percent and farmers with lands over one hectare it is 34.5 percent. Thus, for small farmers, the increase of the farmers’ family income is 10 x 26.2 percent = 2.6 percent.

According to Krisnamukti (2006), based on the agricultural census of 2003, the number of farming households is 25.4 million, with the proportion of small farmers in Indonesia amounting to 56.5 percent, whereas in Java it is 74.9 percent. The majority of rice farmers reside in the island of Java, and therefore the majority of rice farmers will enjoy only 2.6 percent increases of family income from rice price increases.

According to Zeigler (2005) poor population spend 70 percent of their income on food, especially on rice. Small farmers belong to the poor category. Thus the increase in expenses for the purchase of rice is 70 percent. Among small farmers, the rice consumption is largely taken from rice reserves not sold to the market. Research on what percentage small farmers have to spend on buying rice from the market needs to be conducted.

Assumption that high rice prices will increase the income of the farmers’ family need to be proven empirically. If proven true, which groups of farmers? Is it among the majority of farmers or only farmers with large lands, or even among farmers with small lands? The proportion of the number of small farmers, the majority producing rice in Java is of 74.9 percent. There is a possibility that the increase in rice price would likely lower the income of the small farmers instead of increasing it. According to Tampubolon (2002) the family of farmers who have a small plot of rice farming land may probably experience rice deficit, i.e. the amount of consumption is greater than the amount of paddy they produce. Thus, for the family of landless farmers, rice price increases are not profitable.

RESEARCH OBJECTIVES

The purpose of this study is to analyze the market structure at the level of rice farmers. If the result of the market structure research was close to perfect competitive market, the result of this study would suggest to maintain high prices of rice to help paddy farmers. If the results showed that market structure at the farmer level was near monopsony, the policy for high pricing should be re-examined. Next is to analyze whether the rise in the price of rice would increase the income of the farmers’ family, all farmers, or just large farmers? Respondents in this study would be divided into farmers with small lands, i.e. those who own lands less than 0.4 Ha., medium farmers with lands between 0.4 – 1 Ha., and large farmers with lands more than 1 Ha.

The advantage of this research is to assist the government in terms of the pricing policy of rice, whether setting high rice prices will increase the income of the majority of the farmers’ family or not: whether this policy will increase or decrease the family’s income of the small farmers. To test these assumptions it is important to conduct a study about the effect
of the increase of rice price on the increase of the income of the paddy farmers. Results of this study will provide information on whether these assumptions are correct and empirically proven or not. This research will be useful for the government in formulating the pricing policy of rice.

RESEARCH METHODS

Research methods and objects

The method used was a survey method with small farmers, medium farmer and large farmer as the objects of the study. The research was conducted in Kroya sub-district, Indramayu regency, West Java. The argument for choosing this province is the fact that it is the largest rice producer in Indonesia.

Sampling Techniques

In Kroya sub-district there are 16,120 farmers: small farmers with land under 0.4 ha are 7,587; Medium farmers with lands of 0.4 to 1 Ha are 6,110. Large farmer with lands above 1 Ha is 2,423 (Indramayu dalam Angka, 2010). The standard deviation for the number of small farmers in every sub-district of Indramayu Regency is 277.10, for medium lands 737.79, and large land 392.29. Of the total number of farmers in the sub-district Kroja, number of respondents with a proportional stratified random sampling was taken. The number of farmers taken was obtained through this formula:

\[ n = \frac{NZ^2 \sum N_h S_h^2}{N^2 G^2 + Z^2 \sum N_h S_h^2} \]

\[ n_i = \frac{N_i}{N} \times n \]

thus

\[ N = 16 \, 120 \]
\[ Z = 1.96 \text{ (Z-score at the 99 percent confidence level)} \]
\[ N1 = 7,587 \text{ Small Farmers} \]
\[ N2 = 6,110 \text{ Medium farmers} \]
\[ N3 = 2,423 \text{ Large Farmers} \]
\[ S1 = 277.10 \text{ (Standard deviation of the number of small farmers)} \]
\[ S2 = 737.79 \text{ (Standard deviation of the number of medium farmers)} \]
\[ S3 = 392.29 \text{ (Standard deviation of large farmers)} \]
\[ G = 100 \text{ (thoroughness of 16120 farmers)} \]
Samples of farmers with small lands:
The number of samples of farmers with small lands is 48.

Medium Farmers are rounded up to 39 farmers

Samples of farmers with medium size of lands are rounded up to 39 farmers

Samples of farmers with large size lands.

Rounded up to 16 large farmers.

Model Analysis

To analyze whether the market structure at the farm level is a competitive market or a monopsony, it is measured through the integration of prices. Theoretical sizes of a perfect competitive market such as high number of sellers and merchants, homogeneous products, free entry and exit, resource mobility, and perfect information are difficult to measure. Yet, according to the theory of "Law of One Price", the size is determined in this scheme: if the price increase in the market is followed by a proportional increase in prices in other markets, the market is a perfect competitive market.

The analysis tool is the price elasticity, i.e. changes in the prices of paddy at the farmer level due to changes in the prices of rice at the consumer level. If the elasticity is close to one, it can be concluded that the market at the farmer level is a perfect competitive market. If it does not approach one, the market at the farmer level is not a perfect competitive market. The analysis technique is through regression analysis.

Elasticity models used is:

\[ Y = b_0 + b_1 X + e^a \]

\( Y \) = price of paddy at the farmer level
\( b_0 \) = constant
\( X \) = price of rice at the consumer level
\( b_1 \) = elasticity value at the farmer level due to changes in the price of rice
\( e^a \) = Residual Variables

To examine the effect of statistical hypotheses used

\( H_0: b_1 = 0 \)
\( H_1: b_1 \neq 0 \)

\( H_0 \) is rejected if \( t_{\text{score}} \) is smaller than \( t_{0.025, \text{two-tail}} \) if \( H_0 \) is rejected, \( H_1 \) is accepted with the conclusion that the rice price affects the price of paddy at the farmer level.
The analysis would be performed on the small, medium and large farmers. Subsequently, an unpaired difference test would be performed on the elasticity coefficient value of the price changes among farmers with small, medium, and large lands.

To test whether the increase of rice price decreases the farmers' income, paired different test was performed.

The statistical hypothesis is as follows:

\[ H_0: X_1 = X_2 \]
\[ H_1: X_2 > X_1 \]

\( X_1 \) = increase of income of farmers’ family due to the rising paddy prices.
\( X_2 \) = increase of expenditure of farmers’ family due to the rising prices of rice.

\( H_0 \) is rejected if \( t_{\text{score}} \) is smaller than \( t_{0.05} \), (one-tail) if \( H_0 \) is rejected, \( H_1 \) is accepted, meaning the income of the farmers’ family, when the price of rice is low, is higher than when the rice price is high. The data of changes were taken from the related agencies. All analyses used statistic program tools, i.e. E views and SPSS.

**RESEARCH RESULTS**

**Effects of the Price of Rice on Price of Paddy at Farmer Level**

**Large Farmers**

The data used in this analysis is those of paddy sold by farmers, to be compared to the data of the rice prices in the same area on the same day. Analysis was performed using simple regression processed using the program E views. Results of analysis for farmers with large lands can be seen in the following table.

<table>
<thead>
<tr>
<th>Table 1 Regression Analysis Results for large farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Y</td>
</tr>
<tr>
<td>Method: Least Squares</td>
</tr>
<tr>
<td>Date: 10/20/13  Time: 14:18</td>
</tr>
<tr>
<td>Sample: 1 16</td>
</tr>
<tr>
<td>Included observations: 16</td>
</tr>
<tr>
<td>Y=C(1)+C(2)*X</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>C(1)</td>
</tr>
<tr>
<td>C(2)</td>
</tr>
</tbody>
</table>

\( R^2 = 0.916672 \)
\( \text{Mean dependent var} = 3859.375 \)
\( \text{Adjusted R}^2 = 0.910720 \)
\( \text{S.D. dependent var} = 201.0131 \)
\( \text{S.E. of regression} = 60.06235 \)
\( \text{Akaike info criterion} = 11.14511 \)
\( \text{Sum squared resid} = 50504.81 \)
\( \text{Schwarz criterion} = 11.24169 \)
\( \text{Log likelihood} = -87.16090 \)
\( \text{Durbin-Watson stat} = 1.322983 \)

The analysis shows that rice prices significantly affect the prices of paddy with the regression coefficient equal to one. This suggests that for farmers with large lands, rice price...
increases proportionally affect the prices of paddy. Thus, the market structure of farmers with large lands is not monopsony, where farmers have equal bargaining power with traders.

**Farmers with Medium Lands**

Using data on sales of paddy on a given day that is compared to the price of rice in the area, the results of the regression analysis are showed in the following table.

**Table 2 Regression Analysis Results for Medium Farmers.**

<table>
<thead>
<tr>
<th>Dependent Variable: Y</th>
<th>Method: Least Squares</th>
<th>Date: 10/20/13 Time: 14:41</th>
<th>Sample: 1 39</th>
<th>Included observations: 39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y=C(1)+C(2)*X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C(1)</td>
<td>-865.3846</td>
<td>1306.975</td>
<td>-0.662128</td>
</tr>
<tr>
<td>C(2)</td>
<td>0.626106</td>
<td>0.173433</td>
<td>3.610070</td>
</tr>
</tbody>
</table>

R-squared: 0.260482  
Adjusted R-squared: 0.240495  
S.E. of regression: 212.8830  
Sum squared resid: 1676809.  
Log likelihood: -263.3810  
Durbin-Watson stat: 1.844785  

The results of the analysis show that rice prices significantly affect the prices of paddy, but not proportionally. The value of the regression is 0.62, which means with an increase of one unit of the rice price, the price increase received by farmers from their paddy sales is approximately 60 percent. Thus, it shows that the bargaining power of traders is higher than that of the farmers.

**Farmers with Small Lands**

To see the effect of rice prices on the selling price of paddy of farmers with small lands, the selling price of their dried paddy on a given day is compared to the selling price of the rice at the same area on the same day. From the results of the regression analysis using the program E Views the following results can be seen.

**Table 3 Regression Analysis Results for Farmers with Small Lands**

<table>
<thead>
<tr>
<th>Dependent Variable: Y</th>
<th>Method: Least Squares</th>
<th>Date: 10/20/13 Time: 14:50</th>
<th>Sample: 1 48</th>
<th>Included observations: 48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y=C(1)+C(2)*X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C(1)</td>
<td>-263.3810</td>
<td>Durbin-Watson stat</td>
<td>1.844785</td>
</tr>
<tr>
<td>C(2)</td>
<td>0.626106</td>
<td>0.173433</td>
<td>3.610070</td>
</tr>
</tbody>
</table>

The results of the analysis show that rice prices significantly affect the prices of paddy, but not proportionally. The value of the regression is 0.62, which means with an increase of one unit of the rice price, the price increase received by farmers from their paddy sales is approximately 60 percent. Thus, it shows that the bargaining power of traders is higher than that of the farmers.
From the analysis using the program E views it can be seen that there is no significant effect of rice prices on the selling price of paddy. This suggests that the market structure of farmers with small lands is almost monopsony, meaning traders set the price according to their wishes.

**Effect of Rice Price Increases on Income of Farmers’ Family**

To analyze the effect, the focus is on the increase of the rice price that may increase the consumption of the farmers’ family and the increase of the selling prices of dried paddy harvest that may subsequently increase farmers' revenues. This is done because of the large variability of income beside farming business and variability of farmers’ spending beside rice consumption. The data used are the paddy and rice prices in mid-July 2012 and prices in the next six months to mid-January 2013. This six month period is used because farmers produce paddy twice in one year. Although the rice cultivation takes only four months, the harvest is performed twice a year because the general planting pattern is Paddy - Paddy - Off. In mid-July 2012 the paddy price was Rp. 4.200/Kg and the rice price was Rp. 7.400/Kg, while in mid-January 2013 the price of rice was Rp. 4.300/Kg and the rice price was Rp. 7.800/Kg. This analysis will be shared between farmers with large, medium, and small lands.

**Farmers with Large Lands**

For farmers with large lands the increase in the price of paddy is proportionally received 100% because the bargaining power of farmers is equal to the bargaining power of traders. Comparison between the increase in revenue due to the increase in the price of paddy and the increase of rice consumption expenditure due to the rice price can be seen in the following table.

<table>
<thead>
<tr>
<th>Type</th>
<th>Average Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total paddy production (kg)</td>
<td>15698.13</td>
</tr>
<tr>
<td>Stored (kg)</td>
<td>431.19</td>
</tr>
<tr>
<td>Sale (Kg)</td>
<td>15266.94</td>
</tr>
<tr>
<td>The addition of paddy price increases revenues (Rp)</td>
<td>1,526,693.75</td>
</tr>
<tr>
<td>Consumption of rice per month (Kg)</td>
<td>29.94</td>
</tr>
<tr>
<td>Six months of rice consumption (kg)</td>
<td>179.63</td>
</tr>
<tr>
<td>Addition of spending due to rising price of rice (Rp)</td>
<td>71850.00</td>
</tr>
</tbody>
</table>

The table shows that the addition into the revenue due to the rising paddy prices is greater than the increase in spending due to the rising prices of rice. When statistically tested, the differences are as shown in the following table.
Table 5 Test Statistics table of area landowners

| Paired Samples Test | Paired Differences |  |  |  |  |  |  |
|---------------------|--------------------|---|---|---|---|---|
|                     | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t   | df | Sig. (2-tailed) |
|                     | Lower             | Upper          |                 |                                             |     |    |                |
| Pair 1              | additional income of paddy price increases - additional expenditure of rice price increases | 1454843.75000 | 1645570.94852 | 411392.73713 | 577980.88740 | 2331706.61260 | 3.536 | 15 | .003 |

The table shows that the increase in the rice price leads to the rise in the price of paddy produced by farmers, and at the same time, to increase in the expenditure on rice consumption. Increased revenue derived from the increase in paddy prices is higher than the increase in the expenditure due to the rising prices of rice. This difference is significant at 95 percent of confidence level. It can be concluded that the rise in the price of rice increases the income of the farmers’ families.

Farmers with Medium lands

Medium farmers generally have a lower bargaining power than traders. From the analysis of the effect of the rising paddy prices due to the prices of rice, farmers with medium lands get only 62 per cent of increase proportion of the general rise of paddy prices in the area. A comparison between the increases in revenue due to the higher price of paddy the farmers sold and the increase in the expenditure of the farmers’ family as the result of the increase of the rice price can be seen in the following table.

Table 6 Comparison of Rice Price Increase and Consumption for Medium Farmers

<table>
<thead>
<tr>
<th>Type</th>
<th>Average Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total paddy production ( kg )</td>
<td>5220.51</td>
</tr>
<tr>
<td>Stored ( kg )</td>
<td>1 510.13</td>
</tr>
<tr>
<td>Sold ( kg )</td>
<td>3710.38</td>
</tr>
<tr>
<td>The addition of paddy price increases revenues ( Rp )</td>
<td>230,043.85</td>
</tr>
<tr>
<td>Consumption of rice per month ( Kg )</td>
<td>35.10</td>
</tr>
<tr>
<td>Six months of rice consumption ( kg )</td>
<td>210.62</td>
</tr>
<tr>
<td>Addition of spending due to rising price of rice ( Rp )</td>
<td>4246.15</td>
</tr>
</tbody>
</table>

The table shows that the addition in the revenue due to the higher selling price of paddy is higher than the increase of expenditure due to the increase of rice the farmers’ family have to pay. Results of test whether this difference is real can be seen in the following table.

Table 7 Test Statistics of Medium Farmers

| Paired Samples Test | Paired Differences |  |  |  |  |  |  |
|---------------------|--------------------|---|---|---|---|---|
|                     | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t   | df | Sig. (2-tailed) |
|                     | Lower             | Upper          |                 |                                             |     |    |                |
| Pair 1              | additional income of paddy price increases - additional expenditure of rice price increases | 145797.69231 | 70090.59795 | 11225.44341 | 123077.01958 | 168518.36504 | 12.990 | 38 | .000 |

The table shows that this difference is significant at 95 percent confidence level. It can be concluded that the increase in the rice price has a positive effect on the income of the farmers’ family.
Farmers with Small Lands

Farmers with small lands have a lower bargaining power than those with large and medium farm lands. From the analysis of the proportion of the selling price due to the increase of the selling prices of dry paddy yields in general, farmers with small lands received only 56 percent. This affects the amount of the additional revenues of the small farmers, while the increase in their expenditure due to the rising price of rice is equal to that of other farmers. The effect of the rice price increase on the income of the farmers’ family is shown in the following table.

Table 8 Comparison of Rice Price Increase and Consumption of Small Farmers

<table>
<thead>
<tr>
<th>Type</th>
<th>Average Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total paddy production ( kg )</td>
<td>2109.85</td>
</tr>
<tr>
<td>Stored ( kg )</td>
<td>521.35</td>
</tr>
<tr>
<td>Sold ( kg )</td>
<td>1588.50</td>
</tr>
<tr>
<td>The addition of paddy price increases revenues ( Rp.)</td>
<td>88956.00</td>
</tr>
<tr>
<td>Consumption of rice per month ( Kg )</td>
<td>34.15</td>
</tr>
<tr>
<td>Six months of rice consumption ( kg )</td>
<td>204.88</td>
</tr>
<tr>
<td>Addition of spending due to rising price of rice ( Rp )</td>
<td>81950.00</td>
</tr>
</tbody>
</table>

The table shows that the increase in the revenue from the increase in the selling price of paddy yields is almost equal to the increase in expenditure due to the price increase of rice. To prove it, it is necessary to perform an analysis on difference test, as shown in the following table.

Table 9 Test Statistics for Small Farmers

<table>
<thead>
<tr>
<th>Paired Samples Test</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
<td>Lower</td>
</tr>
<tr>
<td>Pair 1 additional income of paddy price increase- Additional expenditure of rice price increase</td>
<td>7006.0000</td>
<td>44447.39796</td>
<td>6415.42929</td>
<td>-5900.17902</td>
</tr>
</tbody>
</table>

The table shows that at 95 percent confidence level, no significant difference between the additional revenue from the increase in paddy prices and the additional expense due to the higher rice price can be found. It can be concluded that the increase in rice price does not significantly affect the income of the farmers’ family.

Results

The results achieved from this research are the findings that can be briefly described as follows.

1. There is integration of the rice prices and the prices of paddy among large farmers. This is demonstrated by the significant increase in the rice price, proportional to the selling price of dried paddy yields of the large farmers. The effect of the proportional price is an indicator that the market structure of farmers with large lands is not monopsony, but a balanced bargaining power between the farmers and the traders instead.

2. There is insufficient integration between the price of rice and that of paddy among farmers with medium lands. This is demonstrated by the significant increase in rice prices, but not proportional to the selling price of dried paddy yields of the farmers.
with medium lands. The effects of disproportionate prices is an indicator of a market structure that is rather monopsonistic, in which traders’ bargaining power is higher than that of the farmers.

3. There is no integration between the rice price and the price of paddy among farmers with small lands. This is indicated by the increase in the price of rice that does not significantly affect the selling price of paddy of the small farmers. This is an indicator of monopsony market where traders set prices as they wish without being affected by the rising price of rice.

4. The increase in the rice price affects the family’s income of the farmers with medium and large lands. Thus, if the government increases the price of rice, this will support the income of their family.

5. The increase in rice price does not significantly affect the income of the family of small farmers. Thus, efforts to improve the welfare of small farmers cannot be achieved through the policy of increasing the price of rice.

The findings as the results of this study should be completed with similar research at different time, analysis and places. This must be done because of the variability of the prices of rice and paddy that keep changing at any given time; it is possible that if it is done at different times, different findings will be produced. Likewise, with different research methods, it is possible that there will be different results because each analysis has its own advantages and disadvantages. Different places can also produce different findings. This study was conducted at the paddy centers that is the largest rice producer in Indonesia.

The research was conducted at the paddy central area and therefore farmers in the study area are generally experienced, hence very knowledgeable about farming businesses. This is evident from the productivity that is higher than the average productivity of the nation. Thus, judging the condition of the respondents, the farmers in this area have higher income from their farming business than other farmers in Indonesia.

The results show that an increase in the rice prices affects the income of farmers with large and medium lands, but has no effect on small farmers. The results may be different if the research is done in the area that is not the rice center. It is possible that for medium farmers the rising rice prices have no effect on the income of the farmers’ family, and for farmers with small lands, the effect is negative. Thus, we need another similar study conducted in other areas.

CONCLUSIONS AND RECOMMENDATIONS
Conclusion
From the research conducted, it can be concluded that:

1. For large farmers, there is price integration. It is shown by the significant increase in the rice price that is proportional to the selling price of paddy.

2. For medium farmers, there is price integration but not balanced. It is shown by the significant increase in the rice price, but not proportional.

3. For small farmers, price integration does not happen. This is shown by the increase in the rice price that does not significantly affect the selling price of paddy.

4. For large farmers, the rice price increase has a positive effect on the income of their family. This shows an increase in the revenues due to the higher rice price that is greater than the increase in the rice consumption.
5. For medium farmers, the rice price also has a positive effect on the income of their family. It shows the same result as that of large farmers.

6. For small farmers, the increasing rice price does not significantly affect the income of their family. This indicates an increase in the revenue due to the higher rice price, equal to the increase of the expenditure for the rice consumption.

**Suggestions**

Suggestions that should be mentioned are the need for similar research conducted in other areas, especially those that are not rice production centers. In this study conducted in the central areas of paddy producers, the rice prices affect the income of the farmers’ family, both large and medium farmers, but not the small farmers. How about areas that are not paddy producing center?

If the results show similarity, we can conclude that it is generally prevailing. Suggestion for the government is the need for sufficient rice price policy to increase the income of the paddy farmers.

If the results are different, some more research in other areas are deemed necessary. It is important to give the right suggestion to the government in determining the policy of the price of rice.

**REFERENCES**


Dahlgram, Roger A & Steven C. Blank. 1992. Evaluating the Integration of Continuous Discontinuous Markets, American Journal of Agricultural Economics, Volume 74, Number 2, May 1992, Baltimore, Maryland, USA


