COMPETITIVE AND COMPARATIVE ADVANTAGES ANALYSIS OF ORGANIC RICE FARMING IN KARANGANYAR REGENCY,

CENTRAL JAVA PROVINCE

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***ABSTRACT***

In era of the free trade which increasingly competitive, understanding the competitiveness of foodstuff commodity becames important to be understood by every country. Public awareness of the health hazards and adverse environmental impacts as well as the trend of consumers choosing safe foodstuffs led to a shift to the cultivation of organic systems. This paper uses the analysis of Policy Analysis Matrix (PAM) to determine whether rice farming system has a comparative and competitive advantage when produced with organic farming practices. The purpose of this paper to (1) Analyze the financial and economic advantages of organic rice farming in Karanganyar. (2) Analyze the competitiveness of organic rice in Karanganyar Regency viewed from competitive advantage and comparative advantage. Based on the results of data analysis showed that the organic rice farming in Karanganyar Regency has a competitive advantage and comparative advantage indicated by the value of PCR and DRC that is less than one. The competitive advantage of organic rice in Karanganyar Regency is greater than comparative advantage. PCR coefficient amount of 0.74 and DRC coefficient amount of 0.56. Thus organic rice farming in Karanganyar Regency worth developing and has good competitiveness in the domestic market as well as international market.

Keywords: Organic Rice, Competitive Advantage, Comparative Advantage, Policy Analysis Matrix (PAM)

**INTRODUCTION**

Trade liberalization more strengthened provide new opportunities at that time give new challenges that must be faced. In terms of market demand, trade liberalization provides new opportunities as a result of the broader market in line elimination of trade barriers between countries. However, trade liberalization also pose serious problems if commodities produced locally are not able to competed in world markets. The existence of the free flow of goods and services forcing manufacturers to focus on the quality of agricultural products. The problems in the aspect of competitiveness of agricultural products include: a) demands standardization of products and processes, b) demands food that does not contain hazardous materials, c) demands the integration of supply chain management, and d) improving the quality of food quality and safety. To answer the challenges of food commodities development began in earnest with environmental friendly farming methods using organic farming input (Willer, 2010). Agricultural products should be able to compete and provide a positive value that can be perceived by consumers both nationally and globally. Agricultural products won’t be able to compete if the farming system is not capable producing agricultural products quality and safety in accordance with the demands of consumers. In the era of free markets, agricultural products getting required to be able to compete not only in the international market but also in the domestic market (Mayrowani, 2012)

One agricultural products traded International market is rice. Although until now Indonesia still imports rice but does not close the potential of Indonesia as a rice exporter. Indonesia is able to export rice in particular, that is high quality rice, flavorful and distinctive taste rice and organic rice. Conditions of rice exported by Trade Minister Regulation No.19/M-DAG/PER/3/2014 one of which is rice produced through organic farming systems with a breakage rate of 25%.  Organic rice is used as a commodity to maintain sustainable agriculture without damaging the environment or the natural biota. Organic rice market increased by 5 percent per year with sales reaching 11 billion in 2013. The increase is due to the world market demand of organic farming. The world organic trade reach USD $ 72 billion in 2013 (IFOAM 2015). The demand is there, Indonesia face prior competitors to export, that is Thailand and Vietnam. Both of these countries are exporting countries highest on organic rice (IFOAM 2015).

Table 1 Exports of rice Indonesia, Thailand, and Vietnam Year 2012-2014

|  |  |  |  |
| --- | --- | --- | --- |
| Period | Export Indonesia | Export Vietnam | Export Thailand |
| 2012 | 1.186 | 3.673.654 | 4.632.270 |
| 2013 | 1.191 | 1.673.955 | 4.429.582 |
| 2014 |  759 | 1.800.000 | 5.400.000 |

Source: Food and Agriculture Organization (FAO) in 2015

One area that consistently applying organic farming to the cultivation of rice is Karanganyar Regency. To develop this commodity, obstacles and problems have to be solved. The problem faced is how rice can become the main export that can compete in terms of comparative and competitive advantages. Both of these advantages in terms of quality, quantity, and level of efficiency of production factors. The purpose of this study was to analyze the level of financial and economic advantages of organic rice farming as well as the competitiveness viewed from competitive and comparative advantages of organic rice farming in Karanganyar Regency.

**RESEARCH METHODS**

**Method of Collecting Data**

The data collected includes primary and secondary data. The primary data collection conducted by interview with organic rice farmers, while secondary data drawn from agencies that are directly related to the research such as the Department of Agriculture, the Central Bureau of Statistics and the official website of the relevant departments, libraries, and other institutions that can help to data availability. In this paper, budget data (output, sales revenues and input costs) valued in hectare for the year 2015 were used to represent typical organic rice farms.

**Sampling Method**

The research location is determined intentionally (purposive sampling) is in Karanganyar consideration of the location is the center of rice production and organic farming systems to be consistent and have obtained organic certification from the LSO LESOS. Samples taken from these Regency intentionally (purposive sampling) with the consideration that the area with the largest harvested area and most consistently applying organic farming. District that made ​​the study site is Karanganyar. The selected villages are Jungke village. Respondent conducted using purposive sampling with criteria selected respondents are farmers who farm rice organically. The selected sample selected from farmer groups PERNIK totaling 30 respondents.

Table 2. Organic Rice Planting Area in Karanganyar 2014

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Village | Harvested Area (Ha) | Production, (Ton) | Productivity (Ton/Ha) | Number of Farmers (Person) |
| 1. | Lalung | 55,70 | 418,76 | 7,52 | 47 |
| 2. | Bolong | 40,12 | 314,64 | 7,84 | 25 |
| 3. | Jantiharjo | 32,18 | 246,99 | 7,68 | 19 |
| 4. | Tegalgede | 13,40 | 101,82 | 7,60 | 8 |
| 5. | Jungke | 70,60 | 547,15 | 7,75 | 63 |
|  | Total | 212,00 | 1.629,36 | 38,38 | 162 |
|  | Average | 42,40 | 325,872 | 7,68 | 32 |

Source: Department of food crops and horticulture Karanganyar Regency 2015

**Data Analysis Method**

Analysis of the data used is descriptive analysis method and policy analysis matrix. The method of analysis Policy Analysis Matrix (PAM) consists of two identity calculations that is profitability identity and divergences identity, but in this study analysis used is limited only count private profits, social benefits, competitiveness with the analysis of comparative and competitive advantage.

Table 3. Policy Analysis Matrix (PAM)

|  |  |  |  |
| --- | --- | --- | --- |
| Elucidation | Revenue(Output) | Input costs | Profit |
| Tradable | Non tradable |
| Privat Price | A | B | C | D |
| Social prices | E | F | G | H |

Source: Monke and Pearson 1989

From the data in the PAM table above, then can be analyzed by a variety of indicators as follows:

1. Analysis financial Profitability or Private Profitability

(PP) : D = A – (B + C);

Note: D = Profit or advantage based on the actual price (Private Profits / financial).

A = Revenue (at actual price). Revenue obtained by multiplying the average amount of production per hectare (kg/ha) multiplied by selling price (Rp).

B = Input Costs traded (Tradable) based on the actual price.

C = The cost of domestic factors (Input Costs of non-tradable) based on the actual price. If the negative private profit (D<0), the farmers suffered a loss or not worth the effort. Otherwise, D>0 means organic rice farming feasible to be developed for has an advantage over zero.

1. Analysis of the Profitability economic or social Profitability

(SP): H = E – (F + G);

Note: H = Profit or advantage based on social price.

E = Revenue (at social price). Revenue obtained by multiplying the average amount of production per hectare multiplied by the social price of organic rice.

F = Cost of inputs that are traded in the international market.

G = Cost factor (non-tradable input costs) based on social price. If H <0 then the farm is said to be inefficient. Otherwise, if if H> 0 indicates that the farm more efficient and have a high comparative advantage. In general, the concept of efficiency was approached from two sides of the approach of the use of inputs and approaches of the output produced (Coelli, 2005)

1. Financial efficiency (Competitive Advantage) with indicators of *Private Cost Ratio :* PCR = C /(A -B) ; Farming have competitive advantage if the value of PCR <1. The smaller PCR value means more competitive.
2. Analysis of economic efficiency or comparative advantage indicators *Domestic Resource Cost:* DRC = G / (E - F); DRC <1 indicates organic rice farming efficiently or economically viable in the utilization of domestic resources and if DRC > 1 indicates the activity is not efficient.

The steps are performed in data analysis consists of two stages. The first step is the determination of the input and output as well as input into the identification of the components of tradable inputs are inputs that are traded in the international market both in exports and in imports and the identification of non-tradable inputs are inputs generated in the domestic market and are not internationally traded. The second step is the price of private and shadow prices of input and output, then the tabulation and analysis of indicators resulting PAM. The interpretation of all entries in the matrices such as private profit, social profit, output, tradable inputs, and domestic factors and ratio indicators are discussed in the forthcoming section.

**RESULTS AND DISCUSSION**

1. Identification of Input and Output and Input Components Grouping Domestic Tradable.

Input included in the non-tradable (domestic) in organic rice farming in Karanganyar Regency is seeds, land, labor, organic fertilizers and organic pesticides. While included in tradable input is fuel and the depreciation of the tools.

Table 4. Identification Component Input Domestic and Foreign

|  |  |  |
| --- | --- | --- |
| Component | Domestic | Foreign |
| Seed | 100% | 0% |
| Organic fertilizer | 100% | 0% |
| Organic pesticides | 100% | 0% |
| Labor costs | 100% | 0% |
| Commerce costs | 80% | 20% |
| Fuel | 70% | 30% |
| Depreciation Tools | 70% | 30% |

Source: \* Data Export and Import BPS 2015

1. Pricing Shadow
	1. Domestic Input shadow price
	2. Land lease

Rental cost of farmland per year (3 planting) at the study site was Rp 24.958.624,42.- per hectare. Based on the statement Gittinger (1986) which states that the determination of a shadow price of production factors of land is equal to the value of the rent, then the shadow price of agricultural land in the study site per hectare within one is Rp 24,958,624.42.

* 1. Labor

Labor shadow price used is based on the assumption of social labor price that is adjusted with the unemployment rate at the sites. Average unemployment in the study site is 20 percent. Thus, the shadow price of labor is 80 percent of the actual labor costs (private).

* 1. Organic Fertilizer & Pesticide Organic

In the organic rice cultivation inputs of fertilizer used is dung, Bokashi fertilizer and liquid organic fertilizer produced by farmers who are members of a group of farmers or purchased from manufacturers around the study site. The shadow price of fertilizer used by farmer of organic rice equal to financial price (the price in the market). Organic pesticides shadow price equal to the price of financial (the price in the market).

* 1. Shadow Price of Tradable Input

The equipment used by farmers is a hoe, scythe, Hand Sprayer, Sacks, sorok and water pump. The shadow price of equipment is based on the depreciation per hectare per year. Depreciation value is obtained from the actual price of foreign component / (1 ​​+ import tax) and then divided by the economic time. Import tax on imported goods was 10 percent. (Squire and Van der Tak, 1975). Furthermore, the shadow price of fuel is based on private prices, then calculated the ratio of the increase in fuel prices and the highest retail price plus the cost of distribution to the study site (Manalu, 2015).

* 1. Shadow Price Currency Exchange Rates

Determination of the exchange rate is based on the development of the dollar exchange rate. Equilibrium exchange rate can be approximated by using Standard Conversion Factor (SCF) as a correction factor to the official exchange rate applicable (Rosegrant et al. 1987) .To determine the shadow price of the exchange rate used a formula that has been formulated by a Squire and Van Der Tak in Gittinger (1986),

 SCF t  = $\frac{M t + X t}{\left(M t + TM t\right) + (X t - TX t)}$

Based on the 2015 state budget report issued by BPS, explained the value of imports amounted to Rp. 142.694.804.223 and an export value of Rp. 150.283.682.737. Government revenue through import duties of Rp. 37.204 billion and government revenue through export tax of Rp. 14.3 billion. The exchange rate of the dollar against the rupiah in 2015 amounted to Rp. 13.864. Once known the value of the SCF, then the SER values ​​obtained with the following formula:

 SERT = $\frac{OERT}{SCFT}$

From the calculation, the obtained value of the standard conversion factor of 2015 (SCF) is 0.927, so that the value of SER used is Rp. 14.947,83.

* 1. Price Shadow Output

The shadow price of rice is obtained by subtracting the f.o.b (*free on board)* price in rupiah with transportation costs, handling costs, and insurance. The fob price for rice is US $ 0.73 per kilogram, then converted with the shadow exchange rate (SER) is Rp. 14.947.83. Therefore, the final results for the output shadow price is Rp. 10.046 per kilogram.

1. Revenue and Cost Structure of Organic Rice Farming

Marketing of organic rice output is handled directly by the groups farmers PERNIK.  Farmer groups PERNIK accommodate all organic rice yields by buying Rp. 4.500, up to 5.000, - per dry paddy . With the cooperation of farmer groups, farmers have bargaining power over the sales price of organic rice products. The cooperation is based on the purchase price for one kilogram of organic rice menthik wangi variety Rp. 9.000, -. The high price of organic rice due to greater use of inputs, limited number of output and quality of rice. Conditions of sale of rice is pure white, had higher levels of 25 % broken, oval-shaped and the width of the size of normal rice.

  Total production for organic rice menthik wangi variety in one hectare reached 14.885,19 kilograms of rice per year. Average percentage yield research area by 64%. Organic rice farmers plant rice three times in one year. In one season rice (100-110 days) produces 7.8 tons of paddy per hectare. The production of organic is higher than conventional rice production.

Total revenues in one year for organic rice menthik wangi variety is Rp. 133,966,681.6 per hectare. Total revenue earned from one hectare of organic rice cultivation reached Rp. 34,204,340.18 per year. Furthermore, in the organic paddy farming can be seen the proportion of the cost of input use in organic rice farming. In Table 4. it can be seen the highest cost components are additional costs up to 41.53%. The high cost of such others due to the high opportunity costs of land use that is Rp.24.958.624,42.

Table 5. Proportion of Use of Organic Rice Farming Inputs

|  |  |
| --- | --- |
| Cost Component Type | Value (%) |
| Cost of production  | 24.56 |
| Labor costs | 23.80 |
| Post harvest costs | 8.34 |
| Cost of depreciation | 1.77 |
| Additional Costs | 41.53 |
| Total | 100 |

Source: Primary Data Analysis 2016

1. Competitiveness Analysis of Organic Rice

Preparation of PAM is based on data on revenues, costs of production, labor cost, post harvest cost, cost of depretiation and additional costs are calculated with the price of a financial (financial analysis) and the shadow prices (social analysis). The results of the analysis in the form of social and financial data on revenues and costs *(*tradable and non-tradable).

Table 6. Policy Analysis Matrix (PAM) Organic Rice Farming in Karanganyar Regency (Rp / ha).

|  |  |  |  |
| --- | --- | --- | --- |
| Elucidation | Revenue | Input Costs | Profit |
| Tradable | Non Tradable |  |
| Privat Price | 133.966.681,6 | 2.286.648,69 | 97.475.553,35  | 34.204.479,63 |
| Social prices | 149.536.587,5 | 3.455.637,02 | 81.909.032,90  | 64.171.917,20 |

Source: Primary Data Analysis 2016

Reception output for organic rice at social prices is greater than private counterparts. So are the costs incurred both tradable and non-tradable higher social price. So that the financial benefits of organic rice farming in Karanganyar amount of Rp. 34.204.479,63 and economic profit amount of Rp. 64.171.917,20. From the matrix of policy analysis in Table 6 and then do the calculations that will yield certain values. Those values ​​will be an indicator of the competitiveness of organic rice that is a competitive advantage and comparative advantage.

Table 7. Value Competitive Advantage and Comparative Organic Rice Farming in Karanganyar

|  |  |  |
| --- | --- | --- |
| Elucidation | Unit | Value |
| Competitive advantagePrivate profits |  |  |
| Rp/ ha | 34,204,479.63 |
| Private Cost Ratio (PCR) |  | 0.74 |
| Comparative Advantagesocial advantages |  |  |
| Rp / ha | 64,171,917.20 |
| Domestic Resource Cost Ratio (DRC) |  | 0.56 |

Source: Primary Data Analysis 2016

The competitive advantage of a commodity is determined by the value of private profit (KP) and the Private Cost Ratio (PCR). The prices used in this analysis is the actual price in the market, where prices have been affected by government intervention. The PCR value of organic rice farming in Karanganyar is 0.74, meaning that organic rice farming in Karanganyar has a competitive advantage (PCR <1). Kapaj et al. (2010) said that the value of PCR <1 indicates that the manufacturer has the advantage finasial (private) positive or have a competitive advantage. PCR value of 0.74 indicates that in order to get value added output of organic rice farming in Karanganyar regency of one unit in private, the necessary additional domestic factor costs less than one unit is equal to 0.74.  The competitive advantage will increase if domestic factor costs can be minimized or maximize the added value output (Rooyen IM, JF et al 2001).

Indicators of comparative advantage is the value of social benefits (KS) and the DRC value of organic rice farming in Karanganyar Regency generated by PAM is 0.56.That is, to produce organic rice in Karanganyar Regency requires a fee of 0.56 percent. Organic rice produced in Karanganyar Regency has competitiveness because it has a comparative advantage. This means that organic rice farming activities have been streamlined review of aspects of the utilization of domestic resources available if produced domestically. The smaller the value of the DRC, the higher the comparative advantage of the commodity. PCR and DRC value less than one indicates the organic rice cultivation has comparative and competitive advantages. This means that to produce one unit of value-added output in the social price and private price is only required less than one unit cost of domestic resources.

**CONCLUSIONS AND RECOMMENDATIONS**

1. **CONCLUSION**
	1. Organic rice farming in Karanganyar Regency profitable financially and economically with the financial benefits of Rp. 34,204,479.63 and economic profit of Rp.64,171,917.20.
	2. Organic rice farming in Karanganyar Regency competitiveness both competitive and comparative advantage because it is efficient in production. The competitive advantage seen from the PCR (Private Cost Ratio) of less than one that is 0.74. Comparative advantages seen from the DRC *(Domestic Resources Cost Ratio)* is smaller than one that is 0.56.
2. **SUGGESTION**
	1. Farmers should play an active role in the development of organic rice while improving the quantity and quality of organic rice production due to the increasing market share of organic rice exports in some countries and for organic rice has a comparative and competitive advantage.
	2. The government should continue to support organic rice farming is export-oriented by implementing effective policies for organic rice cultivation. During this time the organic fertilizer subsidy policies are misdirected so the highest retail price (HET) organic fertilizer does not reach the farmers in Karanganyar Regency so that the necessary oversight and mentoring constantly by the extension. Additionally p he Government should provide subsidies certified organic land to farmers. Costs of organic certification so expensive becomes an obstacle for the development of organic farming in Karanganyar Regency.

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