



Factors Affecting Income Generated From Key Agricultural Sectors in the Irrigation Areas of Nganjuk Regency, Indonesia

Kanti Kristini, Budi Setiawan, Iwan Nugroho, and Jaelania Husein
Faculty of Agriculture, University of Brawijaya, Malang, Indonesia

Received 05 June, 2015; Accepted 10 June, 2015 © The author(s) 2015. Published with open access at www.questjournals.org

ABSTRACT:- Indonesia is a country with very large business in agricultural commodities. Development in the agricultural sector, in addition to increasing production and income earned by farmers as producers. In areas in East Java Province, one of which is Nganjuk Regency, agriculture is the leading sector for the development in this area. Within the framework of the national economy. The aim of this research is to analyze the factors that affect the income earned by farmers generated from leading commodities in Nganjuk Regency. This research was conducted in Nganjuk Regency, particularly in Gondang District with a sample of 176 farmers. There were seven variables, namely the role of the government (X1), the role of cooperatives (X2), the role of the community (X3), other factors (X4), the income earned by corn farmers (Y1), the income earned by rice farmers (Y2), the income earned by soybean farmers (Y3), and the income earned by red onion farmers (Y4). Other factors (X4) which affect the income earned by farmers consist of land area, labor (HOK), fertilizers, and pesticides. The result show the role of the government, cooperatives and the community as well as other factors (land, labor, fertilizers, pesticides, capital availability) bring positive effects on the increasing income earned by farmers of those four leading commodities in Nganjuk Regency, the role the government plays affects the level of income earned by the farmers of the four leading commodities, Cooperatives play a quite significant role in increasing the income earned from the agricultural sector, especially in the sectors of rice and red onions.

Keywords:- Corn, Rice, Soybeans, Red Onion, Role of Government, Role of Cooperatives, Role of Community, Nganjuk

I. INTRODUCTION

In Indonesia, the agricultural sector is a sector which provides a fairly significant contribution to the development of the national economy (Syafa'at, 2000). Indonesia is a country with very large business in agricultural commodities. For Indonesia, agriculture is one of the main income-generating sources. The strategic agricultural commodities which always become the major issue of the agricultural development and the special concern of the government is rice. This commodity is so closely related to the lives of many people that the various problems associated with it are very prone to politization (Hardinsyah, 2006). The classic problem of this rice commodity stems from two goals which need to be achieved at the same time but which sometimes tend to be contrary, i.e. maintaining the right price at the producer level which is also at the same time reasonable for consumers. The issue gets more and more complicated as this type of commodity is grown simultaneously in a particular season leading to oversupply at harvest time and scarcity of supply during the famine which have always occurred every year.

Development in the agricultural sector, in addition to increasing production and income earned by farmers as producers, is also aimed at self-sufficiency, exports, employment opportunities and equal distribution as well as optimal and sustainable utilization of natural resources. Efforts to utilize natural resources are made using technologies that are technically easy to implement by farmers, economically profitable and socially responsible. These efforts are intended to improve the prosperity of the general public (Soekartawi, 2003).

Soekartawi (1995) mentions three reasons why development in Indonesia's agricultural sector should be sustainable. First, as an agricultural country, the role of this sector in the national economic system is still dominant. The contribution of this sector to the gross domestic product is about 20% and it provides employment for more than 50% of the labor in the countryside. Second, as an agricultural country, agribusiness and agro-industries have a very vital role in supporting the development of other sectors. Lastly, as an agricultural country, sustainable development in the agricultural sector is a prerequisite for the existing natural resources to continue to be used for a relatively long period. This agricultural sector will continue to have a major role in supporting the sustainable development of Indonesia.

In areas in East Java Province, one of which is Nganjuk Regency, agriculture is the leading sector for the development in this area. Within the framework of the national economy, this province has its own unique characteristics. It is an agricultural area serving as a center for the development of plantation and horticulture on the one hand and on the other hand it is also a center for the industrial development. This is because of the potential of its natural resources and ecosystem characteristics which are indeed highly conducive to economic development both at the regional level and at the national level. Nganjuk Regency has special characteristics, namely two main agricultural sectors, which are food and horticulture.

Realities in the field related to the actual problems which occur in Nganjuk Regency have something to do with commodity prices and marketing. The standard price which has been determined by the National Food Logistics Agency called Bulog is rice with the standard moisture content ranging from 12% to 13%. On the other hand, farmers in an attempt to meet this standard also encounter a number of problems. They claim that they do not have drying floor facilities to meet the standard water content with a minimum of 12% (Bulog, 2013). In addition to the issue related to the price, the capital aspect also becomes the major focus in the development of the agricultural sector in Nganjuk Regency. Many of them lack capital support. One of the alternative solutions offered by the government is the selling delay program through food security by providing soft loans with an interest rate of about 4% per year (Department of Agriculture of Nganjuk Regency, 2014).

The leading commodity in the horticultural sector is red onions, the price mechanism is identical to that of the rice, still controlled by middlemen. This happens because of the absence of representative storage areas, resulting in decreases in the quality of the commodity. Farmers are unable to focus on food crops as the difference in the income is sharp although the risk is too great. They expect that the government will provide agricultural insurance for farmers.

The above phenomena also indicate less optimal agricultural products in Nganjuk Regency. Ideally, if it is associated with the goals of the development in the agricultural sector, in addition to increasing production and income earned by farmers as producers, the development in the agricultural sector is also aimed at self-sufficiency, exports, employment opportunities and equal distribution as well as optimal and sustainable utilization of natural resources, so that it is necessary to make the most of agricultural commodities in Nganjuk Regency. Based on the foregoing, this research aims to analyze the factors that affect the income earned by farmers generated from leading commodities in Nganjuk Regency.

II. LITERATURE REVIEW

Farming science is an applied science which explains or studies how to make or use resources efficiently for business in agriculture, fisheries and farming. According to Soekartawi (2002), farming is essentially a company, therefore a farmer or producer prior to running their farming business will consider the costs and the income by allocating existing resources effectively and efficiently in order to obtain high profits at a certain period. It is considered effective if that farmer or producer can allocate their resources effectively and efficient if the utilization of these resources produces output which exceeds the input. To analyze this farming system, one can do it according to the objectives of why the analysis is done. In many cases, farming analyses carried out by farmers or producers are intended for the purposes of finding out or researching (Soekartawi, 2002):

- a) comparative advantage
- b) low of diminishing returns
- c) substitution effect
- d) farm expenditure
- e) opportunity cost
- f) good trade off

Agriculture is the utilization of biological resources by humans to produce food, raw materials for industries and other sources of energy, as well as to manage the environment. The utilization of biological resources included in the agricultural sector is usually defined as cultivation and livestock rearing, although it can also cover the use of microorganisms and bio enzymes in the advanced processing of the products, such as the manufacture of cheese and tempe (solid fermented soybeans), or just a mere extraction, such as fish catching or forest exploitation.

Farming management refers to the ability of farmers to determine, organize and coordinate the production factors under their control as well as possible and to meet the expected level of agricultural production. The successful management is indicated by the productivity of each sector and the business. Thus, the complete introduction of the factors owned and the factors that can be controlled will greatly determine the success of the management.

Approaches and strategies developed in this model of sustainable agriculture are done by encouraging the growth of the income sources of farmer families in rural areas using the agribusiness and agro-industry approach. The agribusiness strategies that have been developed include two aspects of activities, namely on-farm and off-farm activities. The on-farm model developed does not necessarily have to go back to the traditional model which has already been used since a long time ago, rather it needs to be adjusted to the situation of the changing environment and the needs (food and economy) which keep on increasing. The principles of sustainable agricultural management are multicultural, value biodiversity and local wisdom, utilize local resources, do not rely on resources from external

parties, do not exploit the nature and suit the culture and choice as well as the ability of the farmers. These principles foster the development of a great number of sustainable agriculture models in many parts of the world.

The concept of agricultural development tends to go towards modern agriculture with the development of science and technology in the field of agricultural technology and management supported by the rapid development of communication technology. The history of the world economy has shown that the role of agriculture is increasingly important to improve national prosperity and national security. Programs to empower farmer are intended to increase the their ability in order to attain independence and competitiveness with equal bargaining power through a system of business partnerships. The rapid development of trade globalization affects the role of communication in agricultural development to improve productivity and quality of competitive production and to improve the prosperity of farmers.

III. RESEARCH METHOD

This research was conducted in Nganjuk Regency, particularly in Gondang District with a sample of 176 farmers. There were seven variables, namely the role of the government (X1), the role of cooperatives (X2), the role of the community (X3), other factors (X4), the income earned by corn farmers (Y1), the income earned by rice farmers (Y2), the income earned by soybean farmers (Y3), and the income earned by red onion farmers (Y4). Other factors (X4) which affect the income earned by farmers consist of land area, labor (HOK), fertilizers, and pesticides. To examine the effects of farming management (the role of the government, the role of cooperatives, the role of the community) on the income of corn, rice, soybean and red onion farmers, a regression analysis was performed, with four regression equation as follow:

$$Y_1 = B_{11}X_1 + B_{12}X_2 + B_{13}X_3 + B_{14}X_4 + e_1$$

$$Y_2 = B_{21}X_1 + B_{22}X_2 + B_{23}X_3 + B_{24}X_4 + e_2$$

$$Y_3 = B_{31}X_1 + B_{32}X_2 + B_{33}X_3 + B_{34}X_4 + e_3$$

$$Y_4 = B_{41}X_1 + B_{42}X_2 + B_{43}X_3 + B_{44}X_4 + e_4$$

Dependent Variables: the income earned by corn farmers (Y1), the income earned by rice farmers (Y2), the income earned by soybean farmers (Y3), and the income earned by red onion farmers (Y4)

Independent Variables: the role of the government (X1), the role of cooperatives (X2), the role of the community (X3), other factors (X4)

Error models: e_1 , e_2 , e_3 , and e_4 .

IV. RESULTS AND DISCUSSION

4.1. Description of Research Variables

This research aims to analyze the effects of the factors such as the role of the government, cooperatives, the community and other factors such as labor, land, and the use of pesticides on the income earned by farmers of leading commodities in Nganjuk Regency. The complete regression analysis results for all the four equations are presented in Table 1 and Figure 1 below:

In general, the role of the government, cooperatives and the community as well as other factors (land, labor, fertilizers, pesticides, capital availability) bring positive effects on the increasing income earned by farmers of those four leading commodities in Nganjuk Regency. It can be seen that 77.04% of the income earned by these farmers is determined by the role of government, cooperatives, and the community as well as other factors.

Results of the regression analysis suggest that the role the government plays affects the level of income earned by the farmers of the four leading commodities, whether it is for corn, rice, soybeans, and red onions. The better the role of the government, the better the income earned by farmers of those four leading commodities. Based on the results of the descriptive analysis, it is suggested that the government needs to make improvements in a number of aspects, mainly by 1) improving food security programs, 2) controlling the harvest pricing from the hands of middlemen, 3) taking the harvest directly from farmers, 4) implementing the right price subsidy mechanism, and 5) controlling and watching prices at the farmer level.

These findings are consistent with those found by Nainggolan and Aritonang (2012) that the role of the government is necessary as the key to the successful productivity improvement of those main food crop commodities which must also be supported by several factors, namely a) efforts to increase productivity of the leading commodities through improved farming technology, b) the need for infrastructure development such as irrigation, agricultural extension agencies, and so on.

Table 1: The Complete Regression Analysis Results

Independent Variables	B	t-stat	P-value	Remark
Dependent Variable: Income of Corn Commodity (Y1)				
Regression Equation: $Y1 = 0.266X1 + 0.069X2 + 0.453X3 + 0.091X4$				
Role of Government (X1)	0.266	4.158	0.000	Significant
Role of Cooperatives (X2)	0.069	1.080	0.282	Not-significant
Role of Community (X3)	0.453	7.066	0.000	Significant
Other Factors (X4)	0.091	1.418	0.158	Not-significant
Dependent Variable: Income of Rice Commodity (Y2)				
Regression Equation: $Y2 = 0.171X1 + 0.174X2 + 0.487X3 + 0.069X4$				
Role of Government (X1)	0.171	2.685	0.008	Significant
Role of Cooperatives (X2)	0.174	2.722	0.007	Significant
Role of Community (X3)	0.487	7.609	0.000	Significant
Other Factors (X4)	0.069	1.076	0.284	Not-significant
Dependent Variable: Income of Soybeans Commodity (Y3)				
Regression Equation: $Y3 = 0.271X1 + 0.077X2 + 0.383X3 + 0.219X4$				
Role of Government (X1)	0.271	4.229	0.000	Significant
Role of Cooperatives (X2)	0.077	1.198	0.232	Not-significant
Role of Community (X3)	0.383	5.963	0.000	Significant
Other Factors (X4)	0.219	3.401	0.001	Significant
Dependent Variable: Income of Red Onions Commodity (Y4)				
Regression Equation: $Y4 = 0.206X1 + 0.166X2 + 0.431X3 + 0.199X4$				
Role of Government (X1)	0.206	3.251	0.001	Significant
Role of Cooperatives (X2)	0.166	2.628	0.009	Significant
Role of Community (X3)	0.431	6.800	0.000	Significant
Other Factors (X4)	0.199	3.135	0.002	Significant

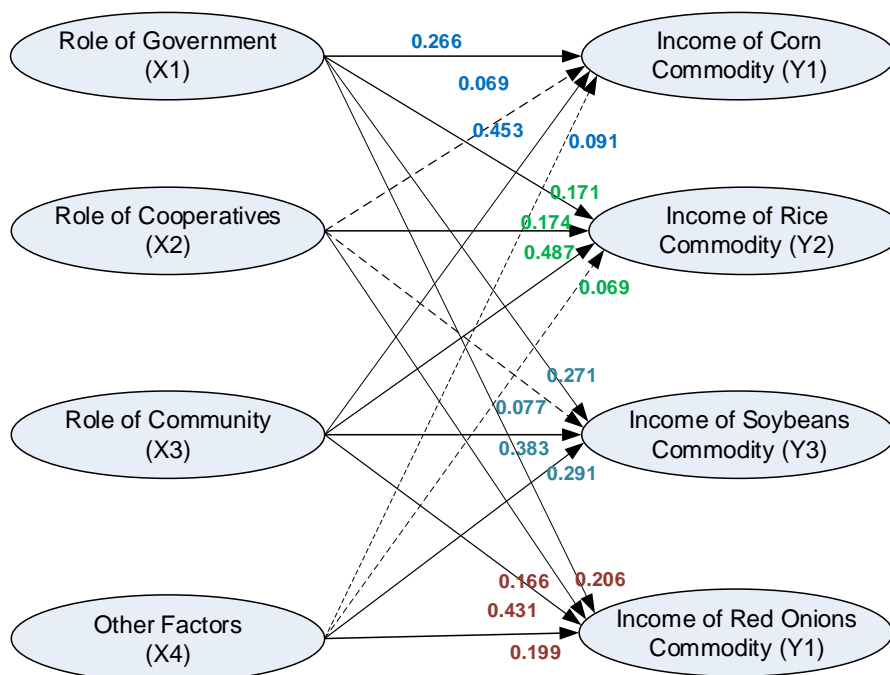


Figure 1. The Complete Regression Analysis Results

Cooperatives play a quite significant role in increasing the income earned from the agricultural sector, especially in the sectors of rice and red onions, in which these two commodities are the best combination of the optimization results (the objective no. 3). The more able cooperatives to play their role properly, the more able their ability in increasing the agricultural products in the rice and red-onion sectors. The analysis finds out that there are a number of aspects which need reviewing in terms of the role of cooperatives, they are: 1) it is expected that cooperatives play a totally active role in building partnership with farmers, 2) it is expected that the presence of cooperatives can improve the prosperity of farmers, 3) it is necessary to improve the performance of the cooperative board or to repair the internal aspects of these cooperatives, and 4) it is necessary to provide soft loans.

According to Umar (2007), the role of cooperatives in agricultural development is necessary. To accelerate the modernization of agriculture to increase productivity and economic value added, it is necessary to have a new paradigm associated with the utilization of information through professional cooperative-based agricultural development communication in accordance with the principles of cooperatives. Modernization of the agricultural sector should be able to avoid damage to the soil structure, water pollution, environmental pollution due to the use of fertilizers and pesticides and the use of agricultural machinery that is not environmentally friendly. Sustainable agriculture becomes the main option which has emerged as a sustainable-agriculture movement since the early 1990s.

The emergence of this movement was originally pioneered by environmentalists who were afraid of natural damage which occurs continuously due to the use of chemicals, as well as the consequent loss of biodiversity on earth. This movement encourages changes in farming practices. The use of chemicals (fertilizers and pesticides) is reduced, back to the traditional methods which value local potential, put farmers as the agricultural subject, manage the farm in accordance with the local culture and environment, and encourage fair trade.

The role of agricultural cooperatives which is increasingly professional is necessary for farmers in order to have competitiveness and the ability to increase added-value for farmers. To accelerate the development of agricultural cooperatives, it is necessary to set up the existing cooperatives in order to become more professional with increasing performance and capacity through the optimal utilization of available information. Thus the role of agricultural development communication and cooperative organization communication with two-way patterns using agribusiness and agro-industry system approaches, sustainable agriculture, leading commodities, appropriate technology, competitiveness and prosperity of the members becomes increasingly important.

The role of the community is a major factor in determining the level of the income earned by farmers, especially in terms of the four leading sectors in Nganjuk Regency. If the community, in this case farmers, can actively participate in managing the agricultural sector properly, this will increase the income generated from the agricultural sector, especially from the leading sectors. In accordance with the results of the previous analysis, there are several aspects which inhibit attempts to improve the role of the community/ farmers, especially in the aspects of the agricultural land management which is in conformity with the rules, appropriate capital management, soft loan request especially to cooperatives, as well as good farming management.

These findings are consistent with the theory of agricultural development (Soekartawi, 2003) that agricultural development is aimed especially at increased production and income earned by farmers. These efforts are made to improve the prosperity of the general public. On the other hand, these findings also underscore challenges in the agricultural development in Indonesia (Nuhung, 2003), how to manage farming in order to obtain maximum results, by considering the roles of decision makers in the field of agriculture, as well as the community participation itself in the form of empowerment in order to promote increased income and economic prosperity for farmers. Second, challenges in terms of ways to manage the agricultural sector with regard to environmental sustainability including agricultural resources. These are what underly the birth of sustainable agriculture as one of the implementation of the sustainable development concept. The community plays the role of empowerment, among other things.

The other factors, in this case land suitability, availability of labor, fertilizers, pesticides and capital, also affect the level of income generated from the agricultural sector, especially for the four leading sectors in Nganjuk Regency. Similar to the previously-described three roles, the higher the quality and quantity of land suitability, availability of labor, fertilizers, pesticides and capital, the higher the income generated from the agricultural sector, especially from soybeans and red onions. Behind these results, it is revealed that there are a number of shortcomings that need to be which are necessary to be repaired in conjunction with the other factors. Among others, 1) the need to improve land suitability which supports business, 2) the adequacy of labor excluding family members, 3) the availability of family labor, and 4) the need to increase the availability of fertilizers and pesticides.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis, the conclusion are (1) the role of the government, cooperatives and the community as well as other factors (land, labor, fertilizers, pesticides, capital availability) bring positive effects on the increasing income earned by farmers of those four leading commodities in Nganjuk Regency, (2) the coefficient of determination is 77.04% of the income earned by these farmers is determined by the role of government, cooperatives, and the community as well as other factors, (3) the role the government plays affects the level of income earned by the farmers of the four leading commodities, (4) Cooperatives play a quite significant role in increasing the income earned from the agricultural sector, especially in the sectors of rice and red onions.

Based on the results of the analysis and the research conclusions, the following recommendations are offered: For the government, it should be able to increase its role, especially in terms of promoting irrigation network infrastructure programs, which so far remains not optimal, running the program of the Credit for Food and Energy Security or KKPE, policies to maintain and increase the price at the farmer level, as well as promoting the role of cooperatives in helping farmers to deal with middlemen and providing capital in the form of soft loans. For the community, they should a) have good farming management to better understand the farming concepts and manage agricultural land, from the land owned, it can be used to plant 94.7% of rice, combined with 52.7% of red onions, which will provide maximum income, and b) improve their knowledge, especially related to the agricultural impacts on the environment.

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