

# Organic Rice: between Environmental Values and Economic Benefit

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**Abstract**— This paper aims to analyze the challenges and opportunities faced by farmers in participating in the program of organic rice area in Lombok Kulon Village, Wonosari Subdistrict, Bondowoso Regency. In the last decades, the discussion on how agricultural practices need to be changed has raised awareness on more sustainable products for consumer. Consumer demands for more sustainable products are increasing in the recent year. This trend encourages producers, companies, and even governments to change the way of farming practices. Bondowoso is one of the regions in East Java that has a high rate of poverty. Moreover, the majority of the society work in agricultural sector mainly rice paddy. In 2008, the district government of Bondowoso started a program to develop a region of an organic rice producing area. This program aims to improve the environmental condition and rural economy in Bondowoso. However, the environmental values is far away from the economic motive of the farmers. Applying good agricultural practices needs higher operational costs and more effort from farmers which will be difficult for them to follow.

**Keywords**—*economic benefit, environmental values, organic rice, rural development, sustainable agriculture*

## I. INTRODUCTION

Rice is a staple food for at least half of the world population and for the majority of Indonesian people [1]. The rice consumption is increasing every year due to the growth of population and economic development [2]. Therefore, rice production becomes a priority of the agricultural development of the Indonesian government as rice is not only an agricultural commodity but also a symbol of sovereignty. The agricultural commodities, mainly, rice, is still the source of life for millions of farmers in rural areas in Indonesia. However, the productivity of agricultural production is still below its potential. This is caused by technical barriers faced by farmers, such as limited access to education, sources of information and economic resources [3], [4]. In addition, Indonesia is a major importer of major staple food commodities, including rice, soybeans, and maize [5]. Despite all the importance of rice agriculture, there are many problems that need to be addressed by agricultural stakeholders.

In the last decades, many scholars and practitioners have discussed the shifting trend in agricultural farming and production. Green revolution and intensive agriculture which is aimed to increase crop yields and productivity

had created serious environmental degradation in rural areas [6]. Ecological problems such as excessive use of pesticide, unhealthy food crops, infertile soil, and pollution have resulted in consumers' anxiety about food safety and their health. Therefore, the discussion about the importance of sustainable and organic agricultural practice as the replacement of the traditional farming practice that resulted in environmental degradation and low quality of commodities is very important. Moreover, more and more consumers demand organic food and agricultural commodities.

The trend of sustainable agriculture and organic farming encourages producers, companies, and even governments to change the way of farming practice and post-harvest production in the agricultural sector. This idea would not realize and work well in the field if farmers do not understand and adopt more sustainable farming practices and the production of the organic food product. Agricultural extension is still the best option to support farmers. The agricultural extensions have a role to transfer the policy or research results from the government or research centers into farming practices using daily language which will be understood by farmers. In the era of green revolution, agricultural extension has played a significant role in realizing higher crop yields in Asia [4]. It has been a half of century when the agricultural extension is considered as an effective system to improve agricultural production in developing countries [7], [8]. The success story of extension officers was achieved when Indonesia succeeded to reach self-sufficiency in rice in the 1980s. Agricultural extension system has an educational function for farmers. Through extension, farmers could acquire technical guidance, new technology, and information to help them increase crop yields.

However, in responding to the demand for a more sustainable agricultural production, agricultural extension faced new challenges. Not only to transfer knowledge but extension officers are also responsible for changing farmers' behavior in farming. In communicating this objective, extension officers must understand the concept and possess a positive attitude toward the program that they brought [3]. They are responsible to communicate information and become a link between government and farmers. However, as extension officers serves the two worlds of expertise and practice, they faced confusions in the process of translation [9]. Moreover, sometimes extension workers need to address often conflicting interests of more than one community of practice. Besides

those factors, another thing that needs to be addressed in implementing the agricultural extension is the way of interaction with farmers. It is not an easy task for extension officers to facilitate learning for farmers in adult education perspective [10].

Many regions in Indonesia tried to respond to the need of consumers on healthier and more safety products of food and agriculture. Moreover, the governments also have heard that by farming organically, the products will have an added value that goes to farmers economically. In the end, it will improve farmers' welfare. Bondowo is a district in East Java Province which is well known for its Robusta Coffee plantation. In the past, many regions in Java Island including Bondowoso became the basis of food staple of rice due to its massive rice farming land. For the national and local governments, self-sufficiency of rice is in top priority agenda and became the indicator of the success of regional development [11]. Therefore, the regional office of agriculture and plantation in Bondowoso has an agenda to improve rice farmers' welfare and at the same time repairing environmental damage, mainly restoring soil fertility through the realization of the organic rice-producing region.

However, in many cases, adopting organic farming is not as easy as it is. Traditional farmers tend to refuse a new method or farmers find it difficult to follow organic farming practices. Moreover, farmers do not want to take the risk regarding agricultural farming. Therefore, this article aims to identify and analyze some opportunities and challenges faced by stakeholders in Bondowoso. The scope of opportunities and challenges will be elaborated from social, environmental, and economic aspects. Stakeholder here refers not only to farmers, but also the government's office, extension workers, and other actors participating in the policy of Bondowo as an organic rice-producing region.

## II. ORGANIC FARMING IN INDONESIA

Agricultural sector and its dynamics marked the history of Indonesian development. During the new order regime under President Soeharto, the Indonesian government's agenda is the development of agriculture in rural areas. This era also marked the beginning of Green Revolution which is adopted into five efforts for rice farming (In Bahasa: *Panca Usaha Tani*) [12]. This program is launched massively with the full support in financial and politics from the government. The result of this program was rice self-sufficiency in 1984 where President Soeharto received an award from the Food and Agriculture Organization (FAO) because of this success.

However, the green revolution did not only leave the success story of rice-self-sufficiency, but the worst thing is the environmental damage mainly soil infertility caused by excessive chemical inputs [13]. The serious environmental issues urged activists and non-governmental organizations to raise awareness on sustainable agriculture. According to [14], the organic farming movement in Indonesia started in 1984 with the establishment of Bina Sarana Bakti (BSB) Foundation. BSB Foundation is the first organic farming training

center in Indonesia to introduce and educate farmers and organizations about natural farming and organic agriculture [11]. Organic agriculture is considered as a solution to the problems created by the green revolution.

Organic agriculture is already well known all over the world. Organic means natural or without chemical inputs such as fertilizer and pesticide. Actually, the farming methods of our ancestors were organic when the chemical inputs industry was not established yet. Later on, organic agriculture in the modern era is defined as an agricultural system that uses natural ingredients or inputs without using chemical ingredients inputs in the farming land [13]. Organic agriculture is based on the principles of ecology, health, and fairness. It is a comprehensive system that rules from the farm until the post-harvest process. The advantages of organic farming are improving soil fertility and water quality, preventing soil erosion, improving the rural economy and its farmers [12]. For the consumer, organic products are a guarantee for healthy products and healthy environment and for the farmers, they help to have more income.

Organic agriculture also guarantees the fairness for farmers in term of price and community welfare. Organic products which generally have a higher price in the market than non-organic products can increase farmers' income. Moreover, organic agriculture is more cost-effective and cheaper at the operational cost because the farmers do not have to spend money to buy chemical inputs. The study conducted by [15] showed the cost-benefit comparison between organic and non-organic rice farming. They found that although income and yield (per acre) from organic rice is less than the yield and income from non-organic rice farm, the cost production (per acre) of organic rice was less than non-organic rice and there are more prospects in the future regarding organic rice farming system. However, the economic benefit of organic farming mentioned before may influence the direction of organic farming [13]. Farmers are more interested in the higher economic income rather than their awareness on the benefit of organic farming for environment and ecology.

The global demand for organic food and agricultural products increased in the last decade mainly from Europe and North America [16]. People are more aware of healthy products and environmental values. The trend of healthy lifestyle mainly in urban areas encouraged more people to choose organic products. Other countries in Asia such as Thailand, Vietnam, and India also apply organic agriculture in their domestic agricultural sector. While in Indonesia the demand for organic products is low, although the world demand is increasing every year [13], [17]. This could be a business opportunity for Indonesian farmers and export commodity for the government. Organic standards and certification become the need for products and consumers as this gives more legal guarantee for both actors. Once farmers have this organic certificate or label, the way they farm and handle the products are based on organic principles. Moreover, the label gives more value through its higher price, open a niche market segment, and improve farmers bargaining power in the market [14].

### III. RESEARCH METHOD

This study employs a qualitative research approach to understand the challenges and opportunities faced by the Bondowoso actors in order to realize an organic rice producing area in their region. The data collection process was undertaken in 2016 in Lombok Kulon Village, Wonosari Subdistrict, Bondowoso Regency, East Java Province, which becomes the first organic rice producing area in Bondowoso. In-depth interviews, observation, and documents analysis are the main research methods employed in this study. The informants chosen by purposive sample consist of extension workers, organic rice farmers, non-organic rice farmers, members of joint farmer groups (Gapoktan), and private actors such as Bank of Indonesia and buyers. Observation in the rice fields was done to see the organic rice farming practices by farmers. The post-harvest processing under the management of “Al Barokah” Gapoktan was also observed. During the observation, there was a study visit of students from Malang to the Amanah Gapoktan to learn about organic rice.

All the data that have been collected, then, were analyzed using the descriptive analysis method to obtain perspective about opportunities and challenges of realizing organic rice producing region in Bondowoso, East Java.

### IV. RESULTS AND DISCUSSION

#### A. *Bondowoso towards an organic rice producing region*

Bondowoso is a small town in East Java Province, Indonesia with an area of around 1500 km<sup>2</sup>. Bondowoso is a mountain area which has famous volcano mountains that attracts domestic and international tourists. The majority of Bondowoso people are Maduranese ethnic. Their main language is Madurase and Bahasa Indonesia. The majority of Bondowoso people work in the agricultural sector and about 90 percent of Bondowoso land is farming land [18]. Bondowoso is one of the regions which is known as the main rice paddy producer nationally because of its surplus production every year. In the tourism sector, many tourists know Bondowoso because this town is the most convenient gateway and starting point to climb the Ijen and Bromo volcanoes. However, volcanoes tourism could not help Bondowoso to improve its economic revenue and society welfare.

Bondowoso has a high rate of poverty among other regencies in Java provinces, which is about 14 percent [18]. There are more than 150 thousand households who are in the category of pro prosperous and among these households, 60 percent of them works in the agricultural sector [18]. Therefore, the district government of Bondowoso aimed to decrease the poverty rate by 10 percent by the end of 2018 by improving agricultural and tourism sector. In agriculture, the government focused on coffee and organic rice commodities which can be exported to support regional economy.

In 2008, the district government of Bondowoso initiated a program called Bondowoso towards an organic

rice producing area. The program aims to improve farmers’ welfare and rural economy, also to recover the environmental condition of farming land in Bondowoso. This program is part of the economic cluster program developed by the Bank of Indonesia (BI). The purpose of the economic cluster is to develop small-scale enterprises in expanding their scope into export commodities by first improving the quality of products. Bank of Indonesia, the district government of Bondowoso, rice farmer groups, and other related actors work together in partnership to support this program. Each partner plays important role in this program such as financial support from Banks, expert and policy support from the district government. Initially, the program targeted six villages which cover 160 hectares of rice paddy land, but in the implementation, only 1 area can continue the program. Lombok Kulon Village is the only area that currently becomes and is well known as an organic rice producing area.

#### B. *Opportunities from organic rice*

The program of organic rice in Lombok Kulon Village has some opportunities. In 2017, Bondowoso is finally successful in exporting organic rice to Japan, America, Hungary, and Singapore through “Al Barokah” Gapoktan in Lombok Kulon Village, Wonosari subdistrict. Moreover, organic rice produced by farmers under Al Barokah Gapoktan is also sold outside Java Island such as Kalimantan. There is three types of organic rice produced by Al Barokah Gapoktan; white rice, red rice, and black rice. When started in 2008, not many farmers were interested in participating in this program. Most of the farmers were reluctant and hesitant to change their land into an organic one.

The implementation of organic rice producing area policy is not easy, at first. However, this policy has a long-term agenda that encourage Bondowoso to move from the position as the poorest district into the more prosperous district through organic rice cultivation. Therefore, its implementation creates many opportunities for farmers. In addition to that, the important actor that articulate this policy to farmers is agricultural extension workers. Their presence is also important in succeeding the policy of making Bondowoso an organic rice producer. Extension workers are responsible to translate the principles of organic farming to a daily language that is easily understood by farmers. The district government targeted rice farmers and extension workers as the front runner of the realization of rice organic producing area. Therefore, this paper will present the opportunities for farmers and extension workers respectively.

There are some opportunities for farmers after practicing organic rice. First, farmers willing to participate in this program and adopting organic farming in their rice-paddy fields received training twice in a month. They also received financial support for operational cost until three times of the harvest periods or about a year. This financial support is given to encourage farmers to continue adopting organic farming as in the first year of changing from traditional into organic farming, farmers will experience loss in income because the farm is not productive yet. Second, organic rice farming’s operational

cost is more effective than traditional farming's. Farmers can use animal waste that is easily found in their neighborhood rather than buy expensive chemical inputs.

Third, besides adopting organic farming, farmers are encouraged to establish a joint farmer group that plays a role as a unit of post-harvest and collective selling. This joint farmer group received support from the government through training and financial support. For instance, Al Barokah Gapoktan in Lombok Kulon Village is leading in organic rice producer in Bondowoso. Moreover, Lombok Kulon Village becomes a destination for tourists and educational institute, e.g. high schools, university, to learn about organic rice cultivation, Gapoktan managements and more. Fourth, the selling price of organic rice is higher than regular rice. The Al Barokah Gapoktan sells three varieties of rice: red, brown, and black rice which are healthier and more expensive in the market because it is targeted a niche market. Fifth, the district government of Bondowoso helps to promote the products in national level and other prospective buyers. Through official guests, events, and expos, organic rice of Bondowoso is introduced to the wider public.

On the other side, there are also some opportunities gained by agricultural extension workers in Bondowoso. First, agricultural extension workers received training in organic farming. They are trained intensively so that they have enough knowledge and information about organic rice so that they can transfer it to farmers, using language that is easier to understand. Second, extension workers also received financial support in the form of incentive and rewards from the district government of Bondowoso. In the past, extension workers' welfare is not considered balanced compare to their responsibility and work to assist all farmers in the area. Consequently, some extension workers do not visit their assisted farmers due to lack of support and they feel unmotivated to work more to help farmers improve their farming land. Therefore, in organic rice program, extension workers obtain support financially if they seriously train the farmers willing to adopt organic rice farming.

### C. Challenges from organic rice

Beside opportunities, the implementation of organic rice farming in Bondowoso also created some challenges for farmers and extension workers as explained in the following.

First, the farmers' perspective is far away from the objective of organic rice. If organic rice mainly aims to improve human and environmental health, farmers could not easily follow that objective. The most important thing to farmers is their increase in income. Therefore, it is quite difficult to balance those two different perspectives. Second, farmers who are willing to participate is mainly because of the economic incentive provided by the funder, in this case, Bank of Indonesia and the district government. It becomes a big challenge for the government to make farmers understand the program. Third, the principles of organic rice are quite complex which made farmers difficult to understand. Some of the

farmers reluctant to change, a mostly old generation and traditional farmers. They find it hard to follow the instruction. Moreover, as a result of the green revolution in the New Order era, farmers are passive and prefer something instant and calculate the personal profit that they gain from the government's programs. Fourth, in the first year of practicing organic rice, farmers will lose profit and harvest. The first year is the recovery time for land and soil before it is ready to plant organically.

Agricultural extension is a frontrunner in the rural development. The goal of agricultural extension is to improve agricultural production and productivity in general. Meanwhile, agricultural extension workers are the ones who articulate the concept of "organic" and "good agricultural practices" into an understandable language and applicable practices. In the program to realize an organic rice area, extension workers play an essential role. They transfer and translate the program and the government policy to the implementation of farmers. However, in dealing with that duty they faced many challenges.

First, extension workers have to understand well about organic farming. They have to translate the principles of organic farming to farmers in a way that can be understood by farmers. Second, extension workers face difficulty to convince farmers to change their farming behavior. Last, the extension is an adult education. Therefore, the approach is different. Extension workers need to adjust their methods of extension which support the program.

## V. CONCLUSION

The policy of organic rice producing area in Bondowoso is a strategic step to improve farmers' welfare and regional economy in Bondowoso. The demand of organic products is increasing every year in line with the awareness of consumer on a healthy living and healthy food products. However, the idea of organic rice is not in line with the expectation of farmers. The economic benefit of organic rice farming cannot be received instantly because at least it needs one year to recover the soil condition which has already been damaged by the massive chemical inputs in the past. Although many farmers hesitated to participate in this program in the beginning, later on they are interested in adopting organic rice farming after seeing their neighbour's success in practicing organic rice. Balancing between organic farming which is based on environmental values and increasing the economic income is not easy. The support from the government and also financial guarantee for farmers willing to adopt organic rice farming are needed to gain trust from farmers.

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