

SRI Rice Organic Farmers' Dilemma : Between Economic Aspects and Sustainable Agriculture

D.Yadi Heryadi
Agricultural Faculty
Universitas Siliwangi
Tasikmalaya, Indonesia
heryadiday63@yahoo.co.id

Trisna Insan Noor
Agricultural Faculty
Universitas Padjadjaran
Bandung, Indonesia

Abstract—Organic Farming is the future agriculture to achieve sustainable agriculture which considers social, economic and environmental aspects. Nowadays, the performance of its development has not met expectations, particularly organic SRI rice farming in Tasikmalaya Regency. Factors that cause less encouraging performance among farmers include doubts on the economic impact of the shift of conventional farming to organic farming, the other factor is their understanding of the concepts and benefits of organic farming. This study aims to analyze the economic aspects of organic SRI rice farming and evaluate what the priority preference of farmers in the selection of organic SRI rice cultivation system. The study used qualitative design with descriptive research methods and case study techniques. It was performed in Jembar II Farmers Group in Margahayu village, sub-district of Manonjaya, Tasikmalaya Regency with the number of farmer respondents as many as 25 people. Data collection technique used direct observation, interviews, and literature. The results showed that: 1) Economically, organic SRI rice farming has not delivered the productions that meet the farmers' expectations due to until the fourth growing season, its productivity is still lower than the productivity of conventional rice and 2) the farmer's preference to grow organic SRI rice leads to economic reasons and has not shown the sustainability of the environment.

Keywords—SRI Organic, Sustainable Agriculture, Preferences, Organic farming, Conventional farming

I. INTRODUCTION

Organic farming holds an increasingly important position in today's agriculture [1]. Organic farming is being promoted and is gaining acceptance all over the world, especially in Southeast Asia, as part of the latest efforts to encourage agriculture systems that are both socially and ecologically sustainable. The system is based on minimising the use of costly external inputs, such as synthetic fertilisers and pesticides, by increasing and efficiently utilising farm-based resources [2]. Awareness of the dangers posed by the use of synthetic chemicals in farming attracts attention at both the producers and consumers. Most consumers will choose safe food ingredients for better health and it drives increased demand for organic products. Healthy, environmentally friendly life-style becomes a new trend and has been institutionalized internationally which requires assurance that

agricultural products should be safe for consumption (food safety attributes), high nutrient content (nutritional attributes) and environmentally friendly (eco-labeling attributes). Indonesia has a great potential to compete in the international market, but it should be implemented gradually. This is because of many comparative advantages, i.e. (i) there are large land areas available for organic farming; (ii) technology to support organic farming is available such as composting, no-tillage planting, biological pesticides, among others [3]. As discussed [1], changing consumer preferences towards more health and environmental awareness led to an increase in the demand for products from sustainable production.

The development of organic farming is also followed by the development of trend or organic lifestyle of society requiring the consumption of organic products [4]. In Indonesia, although the government has launched various policies on organic agriculture such as "Go Organic 2010", but the development of organic farming in the country is relatively slow [3].

One type of organic rice farmings developed in West Java province is known as the System of Rice Intensification (Organic SRI). SRI cultivation technology was introduced to find a way-out of conventional cultivation systems brought about by the green revolution. The SRI is a new system that can intensify the production, but at the same time also environmental friendly [5].

SRI developed in West Java is an organic SRI which emphasizes on the use of organic fertilizer to improve soil fertility. One of the districts in West Java, which gives priority to the development of Organic SRI and wishes to make it as a regional "icon" is Tasikmalaya Regency.

Organic rice in Tasikmalaya Regency is almost entirely produced by the GAPOKTAN SIMPATIK (Organic Farmer Group union), which is first combination of 28 farmer groups in 8 districts in Tasikmalaya Regency. Although organic farming including organic rice has been mentioned to have many benefits and positive aspects, but the performance of its development in Tasikmalaya Regency can be categorized stagnant and less encouraging. Some indicators which can be seen to indicate the progress that has not been in line with the expectations can be seen in Table 1, consisting of a decrease in the planting and harvested area, productivity and production,

the amount of exports of organic rice and the most extreme is a decrease in the number of farmers who apply organic SRI rice cultivation [6]. The low number of producers and the organic land area in Indonesia, especially among farmers, is also delivered to occur in Bogor City and Regency [4].

TABLE I. INDICATORS OF THE PERFORMANCE OF ORGANIC RICE IN TASIKMALAYA REGENCY

Year	Planting area (ha)	Harvested area (ha)	Production (ton)	Productivity (ku/ha)	The amount of exports	The number of organic farmers (person)
2005	346	346	2,587	74.77	--	--
2006	691	691	2,708	78.26	--	--
2007	1,180	1,180	12,277	75.83	--	--
2008	5,074	5,074	25,802	73.80	--	--
2009	5,472	5,472	45,631	77.20	329.2	2,333
2010	5,539	4,040	31,412	77.74	392.3	1,922
2011	8,755	8,493	67,089	78.60	105.2	438
2012	8,693	7,562	59,619	78.84	113.67	521

Gains in productivity and production of organic rice will depend among others on the role of farmers as the main actor in organic SRI rice cultivation. However, by considering the existing factual data, the number of farmers who maintain and switch back to conventional agriculture is large (see Table I). The reality is very ironic and contradictory to the opinions of experts who claim that organic farming has positive influence on the sustainability of the social, economic and environmental aspects. Organic farming is supposed to be environmentally friendly due to abandonment of external inputs such as mineral fertilizers or pesticides [7]. The objectives of environmental, social, and economic sustainability are the basics of organic farming [8]. The difference between theory and reality of organic farming practices among farmers then raises a big question for further study.

The number of farmers who maintain conventional rice farming practices is still more than the farmers of organic rice and even the many farmers who originally grow organic rice then switch back to conventional farming. One cause is that they do not economically satisfy. One of farmers' doubts economically is whether organic farming will be able to improve the production and increase their income. This doubt arises as a result of the information in field and the results of previous research that still seem obscure. Although grain yield under organic farming is often lower than under conventional farming, it is feasible to have increased rice yields under the former [9]. While some research has found that organic cropping systems are less profitable than conventional systems [10]. Some other studies have shown that returns from organic farm management are equal to, or exceed those of conventional management (11). It thus becomes a dilemma for farmers in carrying out their farming.

Study on the economic aspects and priority preference of farmers in the selection of Organic SRI rice cultivation system is interesting to study in order to find out why the number of organic farmers is low. The study is possible to be implemented on a community of organic rice farmers who have

been practicing organic farming. The study is important to perform, because if it is not done then the phenomenon of organic farming in Indonesia and particularly in the area of research will continue to be a big question. In addition, the availability of data and research reports on organic farming is still limited so that it will obstruct its development efforts and as the efforts to confirm the results of research that has been previously done as well.

II. RESEARCH PROBLEMS

Based on the background of study which has been previously explained, the research problems are as follows:

- 1) *How is the prospect of organic SRI rice farming among farmers from economic aspects?*
- 2) *What is the priority preference of farmers in the selection of Organic SRI rice cultivation system?*

III. OBJECTIVES

This study aims to analyze the economic aspects of organic SRI rice farming and evaluate what the priority preferences of farmers in the selection of Organic SRI rice cultivation in relation to sustainable agriculture.

IV. METHODOLOGY

The study design used is descriptive quantitative research, using primary and secondary data. It uses quantitative designs because this study describes the social and economic phenomena as well as using simple calculations in solving the problem.

The technique used is case study. The case study is the type of approach in a study that examines the case intensively, in-depth, detailed and comprehensively. Case study can be conducted against individuals and groups. The purpose of the case study is to conduct in-depth study on a limited case, the conclusion is only applicable in certain cases meaning that the results cannot be generalized.

The selection of study location is done intentionally (purposive) that is in Jembar II Farmers Group in Margahayu Village, sub-district of Manonjaya, Tasikmalaya regency. The considerations for selecting the study location are: 1) Margahayu Village, sub-district of Manonjaya is a village which has an organic SRI rice land area, 2) Jembar II Farmers Group is a group that has obtained organic SRI program and the members have been carrying out organic SRI rice cultivation.

Data are collected in a census of 25 respondents and some key informants related research materials by means of in-depth interviews and key informants use a questionnaire and secondary data searches. The key informants are required as a source of additional information related to the research that cannot be obtained through a questionnaire.

The main parameters to calculate the economic aspects use a Total Cost calculation consisting of fixed costs and variable costs, receipts, revenue and R/C ratio. Whereas in determining the preference of selection of organic SRI rice cultivation by farmers are: 1) price of the product, 2) profit expectation, 3) the

risk of failure, 4) acquisition of technology, 5) access to factors of production, 6) the capital requirements/production costs and 7) the level of ease of cultivation.

The data obtained from the field were analyzed descriptively and tabulation (scoring, percentage, average). Decision-making technique on preferences is done by seeing the highest total score which is the priority/preference of farmers to Organic SRI rice cultivation.

V. RESULTS AND DISCUSSION

A. Characteristics of Respondents

1) Age

The respondents in this study are farmers who cultivate rice using SRI method as many as 25 people came from the Jembar II Farmers Group. The results of interviews with respondents found that the farmers' age is mostly in the productive age ranging from 40-64 years as many as 22 people (88%), which is in accordance with the opinion of Said Rusli (12) stating that the age between 15-64 years is included in the productive age, while three respondents (12%) are in the age of > 65 years.

The age directly affects the life of the physical abilities and the response of farmers to new innovations. Farmers who are in relatively young age have better physical strength compared to elderly farmers [13]. In this study, it is still obtained respondents aged over 65 years and in practice they follow organic SRI rice farming.

2) Education

The education level affects the mindset and actions of farmers in managing their farming. The more extensive knowledge and level of education of farmers, the better they manage their farming. Farmers' education level will affect the level of decision-making to undertake an innovation, farmers with high levels of education can cause to act dynamically in selecting and applying technological innovation in order to increase the production and productivity of their farming land [14].

In this study, from the sequential respondent data there is 1 people (4%) who did not complete elementary school, 15 (60%) completed elementary school, 2 (8%) graduated from junior high school, 5 (20%) have completed senior high school and 2 (8%) graduated from S1. In this study, there are respondents who did not complete elementary school, but in practice they often follow courses, training and similar activities conducted in Farmers Group so that it is expected that their level of understanding and knowledge has also increased and can follow SRI organic rice technology being offered.

3) Family Dependent

The family dependent in question consists of his wife and children which are still the responsibility of the head of the family. The number of family dependents is closely related to the fulfillment of family life, it will affect the use of the percentage of income between the needs of consumption with the fulfillment of other necessities, including setting aside the capital for their farm activities.

In this study, there are 19 (76%) respondents who have a number of family dependents between 0-2 people and as many as 6 (24%) respondents who have a family dependents of 3-4 people. It is expected the fewer the number of dependents has far greater opportunity to improve their living standards.

B. Economic Aspects of Organic SRI Rice

The study on the economic aspects was conducted on the farmers who have implemented organic SRI rice farming in the second year (the fourth growing season). Based on the results that has been done found that the information of average total production costs for organic SRI rice per 0.21 ha is IDR 1,262,686, with revenues amounting to IDR 2,312,314. With this composition, it is obtained R/C ratio of 2.83 (Table II), it can be concluded that organic SRI rice farming implemented is viable and profitable for farmers.

TABLE II. ECONOMIC ANALYSIS OF ORGANIC SRI RICE CULTIVATION IN THE FOURTH GROWING SEASON

I. FIXED COST				
No	Detail of Cost	Volume	Unit price (IDR)	Total (IDR)
1.	Property tax	84 bata*)	14,000./year	4,664,-
2.	Rent tractor	84 bata	2,000,-/bata	168,000,-
3.	Depreciation of equipment			4,250,-
4.	Fixed cost interest			665,-
Total Fixed cost				177,579,-
II. VARIABLE COST				
1.	Sintanur seeds	1 kg	14,000,-	14,000,-
2.	Organic fertilizer	500 kg	450,-	225,000,-
3.	MOL (Local Microorganism)	4 liter	10,000,-	40,000,-
4.	Labor costs:			
	a. Seedbed	1 HKP	40,000,-	40,000,-
	b. Tillage	3 HKP	40,000,-	120,000,-
	c. Weeding	2 HKP	40,000,-	80,000,-
		1 HKW	25,000,-	25,000,-
	d. Planting	2 HKP	40,000,-	80,000,-
		2 HKW	25,000,-	50,000,-
	e. Fertilizing	4 HKP	40,000,-	160,000,-
	f. Pest & disease control	1 HKP	40,000,-	40,000,-
	g. Harvest	3 HKP	40,000,-	120,000,-
		3 HKW	25,000,-	75,000,-
	h. Post harvested	2 HKP	40,000,-	80,000,-
5.	Variable cost interest			4,107,-
Total of Variable Cost				1,085,107
III	Total Cost (IDR)			1,262,686
IV	Income : 650 kg GKG**) x IDR 5,500,-			3,575,000
V	Revenue (IDR)			2,312,314
VI	R/C Ratio			2,83

a. *) : 1 bata = 14 square meter **) GKG : dry unhusked rice

Although this calculation is favorable, but there is still dissatisfaction perceived by the farmers that the productivity achieved of 550 kg dry unhusked rice (GKG) to an area of 0.21 ha (ton/ha) is still lower than the previous conventional rice productivity by 6,0 ton/ha. Though organic SRI rice cultivation implemented has entered the fourth growing season. This is consistent with other research that during wet season, grain

yields with inorganics and Integrated Nutrient Management (INM) were near stable (5.0-5.5 t/ha) and superior to organics by 15-20% during the first two years, which improved with organics (4.8-5.4 t/ha) in the later three years to comparable levels with inorganics and INM [11]. Then, if compared to the conventional rice system, in the beginning of doing the semi and fully organic rice system the rice yield were lower about 3 – 4 tons per ha/season. However, after eight years the rice productions were relatively comparable with the conventional system [15].

The fact of a decrease in rice production in the beginning of the conversion to organic farming, that during the process of conversion to organic farming, farmers are confronted with several problems [1]. The literature identified problems such as yield reductions, higher weed, pest and disease pressure, reduced livestock performance, few marketing opportunities, no premium prices, refusal of loans or insurance for organic production and lack of legislation, subsidies and certification bodies. Therefore, until this fourth growing season the farmers are still expecting an increase in productivity exceeding conventional rice productivity.

C. Priority preference of farmers in the selection of organic SRI rice cultivation system

In implementing organic SRI rice cultivation, not all farmers in Tasikmalaya regency carry out the system. It is because the farmers also have criteria in determining the selection of farming. Based on an inventory and primary data collection as well as data analysis done in the study area of organic SRI rice cultivation, it is obtained complete results as can be seen in the following table.

TABLE III. SCORE OF FARMERS' PREFERENCE IN SELECTION OF ORGANIC SRI RICE CULTIVATION SYSTEM IN JEMBAR II FARMERS GROUP IN MARGAHAYU VILLAGE, SUB-DISTRICT MANONJAYA, TASIKMALAYA REGENCY

Aspect	Indicators	The total score obtained	Rank
Economic	Productivity	89	II
	Product Selling Price	85	III
	Production cost	81	IV
	Revenue	90	I
Social	Farm Institution	76	VI
	Participation	79	V
Environment	Soil fertility conditions	79	V
	Water Resource Conservation	75	VII
	Biodiversity	75	VII

Indicators used to determine the farmers preference in the selection of organic SRI rice cultivation refer to the sustainable agricultural component namely modified economic, social and environmental aspects based on the limitations in the research area. Based on the results (Table III) that have been carried out, it turned out that the economic aspect is the first preference that makes the farmers grow organic SRI rice with the acquisition of a score above 80, with sequential ranks for increased revenue, productivity, product

selling prices and decreased production costs. The various reasons farmers adopt organic agriculture can be grouped into five categories: financial, production, health, institutional and/or social, and environmental. Financial factors figure dominantly in motivating farmers to adopt organic agriculture, i.e., reduced production cost [16]. The farmers who adopt organic agriculture are motivated by both financial and technical reasons [17].

The increase in revenue is the main objective for farmers, this can be done by increasing productivity, premium product selling price and reduction in production costs. By all means, everyone always wishes high profits. Such benefits can be achieved through increased production coupled with a decrease in production costs and higher product prices. The average productivity obtained by farmers in the study areas is as much as 5.7 tons per hectare. The level of organic SRI rice productivity in this study areas is still lower than the average productivity in Manonjaya sub-district level of 6.771 tonnes/ha dry unhusked rice (GKG) [18].

Especially with regard to the expectation of obtaining a high/premium product price is a strong consideration for farmers respondents when implementing organic SRI farming systems, product prices will largely determine the amount of revenue and profit of farmers in their farming. This study shows that the highest price is IDR. 650,000.-/quintal dry unhusked rice (GKG) and the lowest price is IDR 550,000.-/quintal dry unhusked rice (GKG). The prices are determined based on farmers deal with the buyers. The price is also determined by the quality of rice produced and whether there is any residue which is still contained in the rice produced. Farmers planting rice with organic SRI approach is to obtain a high production and higher product price than the price of non-organic rice. Because in fact, the organic certification label has several advantages, such as: a) The bargaining power of the organic products are higher, b) the price of the organic products is higher, c) It could enter the modern market with good market response [19]. However, the farmers do not know exactly how the actual price of organic rice, because the price organic rice should be first checked the content of the residue through companies that have organic certification (IMO/SNI). Farmers cooperate with the company having IMO/SNI certifications due to the high costs of certification that are often discourage farmers to obtain organic acknowledgment letter. In addition, the validity period of the certificate is only for a period of three years. Though this certification is a way to get a higher price. Organic certification is the process to obtain the recognition that the process of organic production or process of organic products is based on existing standards and regulations [20].

The next preference when the farmers choose organic SRI cultivation system in the area of research is related social aspect which consists of the farmers' institution and farmers' participation in the group. Farmers Group institution is expected to be one of the places contributing our thoughts to exchange information among members and external parties in increasing the knowledge and skills of organic SRI rice farming. Besides, the participation of group members will largely determine the success of Farmers Group programs generally and increased incomes in particular.

The last section of the farmers' preferences in implementing organic SRI rice cultivation is environmental considerations consisting of the condition of soil fertility, water resources conservation and biodiversity. The relatively low score compared to the other aspects (score between 75-79) indicates that environmental aspects have not been made a priority considerations in planting organic SRI rice. They still believe that with any conventional rice, the environmental conditions can still be maintained properly including its biodiversity.

VI. CONCLUSION

Based on the research that has been done, it is obtained the conclusion as follows:

1) *Economically, organic SRI rice farming is profitable for farmers, but it still does not provide the productions that meet the expectations of farmers due to the fourth growing season, its productivity is still lower than conventional rice productivity.*

2) *Farmers' preference to grow organic SRI rice more dominantly leads to economic aspects and has not shown the sustainability of the social and environmental side.*

REFERENCES

- [1] Katharina Niemeyer & Jan Lombard. Identifying Problems and Potential of The Conversion To Organic Farming in South Africa . Contributed Paper Presented at the 41st Annual Conference of the Agricultural Economic Association of South Africa (AEASA), Pretoria, South Africa. October 2-3, 2003, p1-15
- [2] Chuichom,S and Yamao,M, „Comparing Opinions and Attitudes of Organic and Non-Organics Farmers Towards Prganic Rice Farming System in North-Eastern Thailand. Journal of Organic Systems. 2010, 5(1) ISSN 1177-4258. p25-35
- [3] Henny Mayrowani, The Development of Organic Agriculture in Indonesia. Forum Penelitian Agro Ekonomi Bogor. Volume 30 N0. 02. Desember 2012, p91-108.
- [4] Aero Widiarta, Soeryo Adiwibowo dan Widodo. Analysis of Sustainability Organic Farming Practise on Farmer. Sodality : Jurnal Transdisiplin Sosiologi, Komunikasi, dan Ekologi Manusia Bogor.ISSN : 1978-4333 Vol. 05 No. 01 April 2011, p71-89
- [5] Mohamad Faizal Ahmad Zaidi, Siti Norezam Othman and Noor Hidayah Abu, Technology Readiness for the System of Rice Intensification (SRI), *International Journal of Academic Research in Business and Social Sciences Jan 2016, Vol. 6, No. 1 ISSN: 2222-6990 p143-153.*
- [6] Gapoktan SIMPATIK, Laporan Gabungan Kelompok Tani SIMPATIK. Tasikmalaya. Desember 2015.unpublished
- [7] Jens Leifeld, How Sustainable is organic farming?, *Agriculture, Ecosystems and Environment* 150, 2012,p121-122]
- [8] E. A. Stockdale, N. H. Lampkin, M. Hovi et al., “Agronomic and environmental implications of organic farming systems,” *Advances in Agronomy*, vol. 70, , 2001 p261–327
- [9] Chitra L, Janaki P, Combined effect of organic wastes and inorganic nutrients on the nutrient uptake and yield of rice in kar and *pishanam* seasons. *Oryza* 36, 1999,p327-330
- [10] Dobbs TL, Smolik JD, Productivity and profitability of conventional and alternative farming systems: A Long-Term On-Farm Paired Comparisons. *Journal of Sustainable Agriculture* 9,1997, p63-79
- [11] Surekha K, Rao KV, Shobha Rani N, Latha PC, Kumar RM. Evaluation of Organic and Conventional Rice Production Systems for their Productivity, Profitability, Grain Quality and Soil Health. 2013. *Agrotechnol* S11: 006. doi:10.4172/2168-9881.S11-006
- [12] Said Rusli. Ilmu Kependudukan. UI Press. Jakarta. 1985.
- [13] Fadholi Hernanto. Ilmu Usaha Pertanian. IPB Press. Bogor. 1979
- [14] AT Mosher. Menggerakkan dan Membangun Pertanian. CV. Yasaguna. Jakarta. 1987.
- [15] Sukristiyonubowo R, Wiwik H, Sofyan A, Benito H.P and S. De Neve. *International Research Journal of Agricultural Science and Soil Science* (ISSN :2251-0044) Vol 1(5)Juli 2011,pp 172-182
- [16] Sununtar Setboonsarng and Bhim Nath Acharya, What Motivates Farmers to Adopt Organic Agriculture? A Case of Rainfed Organic Rice in Thailand , *Organic Agriculture and Post-2015 Development Goals. Building on The Comparative Advantage of Poor Farmers*, Edited by Sununtar Setboonsarng Anil Markandya, Asian Development Bank 6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines, ISBN 978-92-9254-979-4, 2015,p133-154
- [17] Padel, S., Conversion to Organic Farming: A Typical Example of the Diffusion of an Innovation. *Sociologia Ruralis*. 2001,(1). pp. 49–61.
- [18] BPP Manonjaya. Laporan Tahunan. BPP Manonjaya. Tasikmalaya. 2013.unpublished
- [19] Uji Agung Santosa. Minat Sertifikasi Organik Minim Karena Mahal. *Industri.Kontan.co.id*. 2013.
- [20] BIO-Cert.. Apa Itu Sertifikasi Organik ?. *www.biocert*. Bogor. 2014