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Organic Rice Farming For Sustainable Development in The Nurani Sejahtera Farmers Group

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Abstract. The green revolution was able to make Indonesia a food self-sufficiency country in 1984, but on the other hand there were negative impacts caused by the green revolution such as the emergence of environmental and social and health problems. Organic farming is one solution to overcome the negative impacts caused by the green revolution. Public awareness of health and environmental care encourages people to adopt a "back to nature" lifestyle that is consuming organic food even though the price is more expensive. Such conditions open opportunities for the development of organic agriculture among farmers, including in the Nurani Sejahtera Farmers Group who cultivate organic rice using the SRI method. However, in recent years there has been a trend in the extent of certified organic land in the Nurani Sejahtera Farmers Group, which has decreased as well as the number of farmers. Therefore this study aims to explore internal and external factors that influence the development of organic rice in the Nurani Sejahtera Group, by using SWOT analysis. The results show that the strategy should be taken by the Nurani Sejahtera farmer group is Hold and Maintain strategy. It's mean strategy that should be taken by farmer group is the survival and safeguard strategy through market penetration and product development. Market penetration strategy is searching for a larger market share or an increase in the market share of existing products or services through increased marketing efforts. and safeguarding, as well as market penetration through network development.

Keywords: Green revolution, market penetration, SRI

1. Introduction

The green revolution in Indonesia was able to become a food self-sufficient country in 1984, but on the other hand there were negative impacts caused by the green revolution namely environmental, social and health problems. One of solution to overcome the negative impacts caused by the green revolution is organic farming. Public awareness of health and concern for the environment encourages people to adopt the "back to nature" lifestyle which is becomes a trend in the world community. This condition shows that the community has realized that the use of chemicals is not good for health, so they change their lifestyle by consuming healthy, natural and quality food products which are then

called organic products. At present consumers not only choose food as a fulfillment of needs but also pay more attention to the effects of food on health [1, 2]

The higher the number of people who are aware of healthy lifestyles, the higher the need for organic product and the increase in available market potential. According to IFOAM (International Federation of Organic Agriculture Movements) in statistical data and organic farming trends in 2011, the market for organic agricultural products has very good prospects. Demand for organic agricultural products increases every year. Currently organic products are also available in supermarkets, so that people will not have trouble getting them even at higher prices. The upper middle class people prefer agricultural products that are free of chemicals for health even though the price is more expensive.

Demand for organic products also occurs for organic rice which this condition encourages farmers to cultivate organic rice. The interest of farmers in trying organic rice farming also occurs in West Java, such as in Tasikmalaya, Garut and Bandung Regencies. One method of cultivating rice commodities that environmentally friendly is the System of Rice Intensification (SRI) method. Rice cultivation with the SRI method is an environmentally friendly cultivation activity that takes into account the management of land, plants and water through group empowerment and local wisdom. In its cultivation activities, the SRI method does not use pesticides and chemical fertilizers.

According to [3] in East Java, the productivity of organic rice that using SRI method reached 7 tons of rice per hectare, this mean that organic rice productivity is almost balanced compared to conventional method, so that the problem of food needs can still be fulfilled but with quality of rice that is more environmentally friendly and healthy. However, recognition as organic rice cannot necessarily be obtained but must fulfill the requirements as evidenced by obtaining organic certification from organic certification institutions.

SRI method is also applied in the Nurani Sejahtera Farmer Group which was one of the farmer groups from 13 farmer groups that were members of the Harapan Jaya Farmers Group in Bojongsari Village, Bojongsoang District, Bandung Regency. This farmer group is the only farmer group in the village that has received an organic land certificate for organic rice from INOFICE (Indonesian organic farming certification) in 2014 whose funding received assistance from the government.

In its business development activities, the Nurani Sejahtera Farmers Group faces several problems in cultivating organic rice. The land which was originally 8.5 hectares in size, decreased to 4.5 hectares in the last 2 years. Land depreciation problems are caused by several factors, as follows chemical waste that can contaminate land, high operational costs, organic certification costs that are quite high (around 30 million per Ha) and differences in perspectives between individuals.

Organic rice from the Nurani Sejahtera farmer group which is sold reaches a total of 40 tons per season, which was distributed to large cities in the form of dry rice. In addition, the Nurani Sejahtera Farmer Group also sold to end consumer (door to door) in the form of packaged rice. The price to wholesalers Rp. 5000.00 per kg in the form of Dry Grain, this price is almost the same as inorganic rice, whereas the price expected by farmers was Rp. 8,000/ kg in the form of dry grain. The price in the form of rice is Rp. 16,000 per kg, whereas farmers expect the price of Rp. 17,000 per kg.

The high cost of certification is also a serious problem in the development of organic farming in the Nurani Sejahtera farmer group, because the high cost of certification is considered not balanced with the results of the sale of organic rice. With the conditions as explained above, it was necessary to develop an organic rice business strategy in the Nurani Sejahtera farmer group so that the farming business is sustainable. The special needs were as followed to explore the strengths, weaknesses, opportunities, and threaten rice organic farming established and to formulate the appropriate and effective strategies can be applied to the development of rice organic farming business in Nurani Sejahtera Farmer Group, Bojongsoang Subdistrict, Bandung Regency, West Java .

2. Literatur Review

The green revolution succeeded in driving Indonesia to be self-sufficient in rice even though it did not long lasting and only lasted for five years, between 1984-1989. There were several problems that cause rice self-sufficiency cannot long lasting, one of which is the process of degradation of

agricultural land. In addition to pollution to the soil, the continuous use of pesticides results in the presence of residues in the plants, as well as causing poisoning to farmers due to direct contact with pesticides, and if the food produced from agriculture is consumed continuously resulting in accumulation of chemicals in the body that can cause cancer and causes brain development that is not optimal in children [4]

One of the method that can be taken is to implement organic farming, namely agriculture without using chemical fertilizers or pesticides and only using natural ingredients that come from nature. According to [5] organic agriculture is one of the many ways that can support environmental conservation.

Basic principles for the growth and development of organic agriculture presented by [6]. These principles contain contributions that can be given to organic agriculture for the world, and are a vision to improve the overall aspects of agriculture globally. These principles inspire organic movements with all their diversity. Organic agriculture was based on 4 principles, as follows: 1) Health Principles, 2) Ecological Principles, 3) Principles of Justice, 4). Protection Principles. According to [7] defines organic farming as an agricultural production system that was based on biological recycling. Nutrient recycling can be through means of plant and livestock waste, as well as other wastes that can improve fertility status and soil structure and aim to provide food to plants. The philosophy is to provide food to the soil which then provides food for plants (feeding the soil that feeds the plants). Organic farming aims at improving soil fertility by providing an ideal soil system for plant growth. It improves the physical, chemical and biological properties of the soil and thus, builds up the soil health [8]. Further more [9] stated that an organic production system has the following objectives: increase soil biological activity; maintain long-term soil fertility; recycle the waste of plant and animal origin in order to return nutrients to the land; minimize the use of non-renewable resources; rely on renewable resources in locally organized agricultural systems; promote the healthy use of soil, water and water, as well as minimizing all forms of pollution that may result from agricultural practices; handle agricultural products with emphasis on careful processing methods in order to maintain the organic integrity and vital qualities of the product at all stages; established an existing farm through a period of conversion; the appropriate length of which is determined by site-specific factors such as the history of the land, and the type of crops and livestock to be produced.

Organic rice is one of the commodities cultivated by farmers using the principle of organic farming. According to [10] organic rice cultivation is basically no different from inorganic rice cultivation. The most obvious difference is in the selection of varieties, use of basic fertilizers, and irrigation.

2.1 SWOT Analysis.

The SWOT matrix is used to establish strategies based on strengths, weaknesses, opportunities, and threats. This matrix illustrates how the external opportunities and threats faced by the organization are adjusted to their internal strengths and weaknesses to obtain possible alternative strategies. Through the SWOT Matrix there will be four types of strategies, namely the SO Strategy (using internal power to take advantage of external opportunities), the WO Strategy (correcting organizational weaknesses to avoid or reduce the impact of external threats), and the WT Strategy (reducing internal weaknesses and avoiding external threats) [11, 12]

3.Methodology

The research design used was a qualitative research design, where the researcher as a key instrument with the method of observation and in-depth interviews [13]. The research technique used in this study is a case study (case study) which is a research strategy in which researchers carefully investigate a program, event, activity, process, or group of individuals.

Information or data were obtained from several informants who have rich information about organic rice farming in Bojongsari Village, especially in the Nurani Sejahtera Farmers Group. The informant was determined intentionally (purposive). The informants in this study were: Organic rice

farmers in the Nurani Sejahtera Farmers Group, Management of the Farmers Group and Extension Workers.

The data analysis technique used is the analysis of SWOT Analysis, is a form of situation analysis and also a descriptive condition as an input factor, then grouped according to their respective contributions. At this stage what must be done is determining about the strengths, weaknesses, opportunities and obstacles that exist in the Nurani Sejahtera Farmers Group. Furthermore, the strengths, weaknesses, opportunities and challenges were arranged in the form of IFE and EFE matrix which were aimed at identifying internal environmental factors and measuring the extent of strengths and weaknesses of farmer groups. While the EFE Matrix was intended to identify external environmental factors and measure the extent of opportunities and threats faced by the company. After identifying IFE and EFE followed by giving weight and score to determine the position of the Nurani Sejahtera farmer group in organic rice farming. In addition, it's strengthened by the IE matrix to build a more detailed strategy which was a combination of IFE matrix and EFE Matrix [14].

4.Result and Discussion

4.1 Farmers Group Environmental Analysis

The initial process in strategy management is analyzing the environment that aims to monitor the business environment. The business environment includes all factors that can meet the achievement of the desired goals. Environmental analysis can be divided into the internal environment and external business environment of the Nurani Sejahtera Farmers group

Internal Environmental Analysis

Internal environmental analysis is the process of identifying the company's weaknesses and strengths which consist of human resources, financial management, production and research and development institutions and marketing.

A. Internal Strategic Factors of Nurani Sejahtera Farmers Group

Strength

1). Quality of organic rice Product

Nurani Sejahtera Farmers Group produces high quality organic rice. This was because the farmer group always tries to follow the SOP and instructions from the extention agent in their organic rice cultivation. Therefore evidence procures organic certification by the Inofice

2.) Good and Complete Postharvest Facility

Harvesting activities are one of the determining factors for production. If the harvest method is wrong, it results in a loss of yield of up to 20%. Therefore, the Agricultural Extension Agency tried to socialize the use of Power Thresher in Bojongsari Village, so that the loss of production could be reduced. In addition to maintaining the quality of the harvest, Gapoktan already has a vertical dryer with a capacity of 3-5 tons. so if the harvest coincides with the rainy season, the farmer's grain can still be dried using the vertical dryer.

3). Extension Activities for good Farmers

The Nurani Sejahtera Farmer Group participated in the implementation of extension activities in cultivating organic rice. This is done for the farmers to gain knowledge or insight in developing the quality of rice cultivated in order to obtain maximum results. The extension activities conducted by extension agent to farmers can reach 3-4 times a month.

4). Availability of Organic Fertilizers and Pesticides

Organic fertilizers and pesticides are important inorganic rice cultivation because organic rice treatment is different from inorganic. The Nurani Sejahtera Farmer Group process or make their own organic fertilizers or pesticides by utilizing their own livestock. For manure purposes, sometimes farmers buy manure to husbandary a price of Rp 300 per kg.

5). Motivation of Farmers to Keep Cultivating Organic Rice

Farmers have a high motivation to keep organic rice farming..The narrowing of the land does not make the farmers of the Nurani Sejahtera farmer group stop farming organic rice, this is based on the support of citizens who are also positively affected by organic rice farming.

6). Have Fixed Consumers

In business activities, consumers play an important role in the sustainability of a business because the results of the business will definitely reach consumers. Organic rice from the Nurani Sejahtera farmer group itself has permanent consumers in the surrounding area, namely traders and consumers.

Weaknesses

1). Reduced organic rice fields in the Nurani Sejahtera Farmers Group

In 2005 the Nurani Sejahtera farmer group had a land area of 25.4 ha with the number of farmers reaching 35 farmers. In 2012, the Nurani Sejahtera farmer group received an organic rice certification with a land area of 8.5 ha. In 2017 organic rice fields were only 4.5 ha for 13 farmers who cultivated organic rice. This is as a result of the location of organic soil close to inorganic land, causing organic land to be contaminated by inorganic land.

2). Market information is still limited

Although the market for organic rice is large and already has permanent customers, but to access the market that guarantees the price of organic rice in accordance with the expectations of farmers is still constrained. This is because partnerships with organic rice suppliers have not been built because the group cannot provide organic rice continuously with a certain quantity.

3). Limited of Working Capital

The development of organic rice business in the Nurani Sejahtera farmer group is still constrained by low capital ownership, so that the business scale of this farmer group is still very small.Because of their farming was small scale, so the farmers difficult accesing capital or financial institution or credit institution. In addition, financial Institution such as bank applied prudentially principles.

4). Expensive Production Costs

Production costs are still a weakness because the costs incurred for organic rice cultivation are greater than inorganic rice. The reason why prices are higher for organic rice, reflect many of the costs as conventional rice in terms of growing, harvesting, transportation and storage. wage for labor women was IDR 40.000 and labor man was around IDR 50.000 for a full working from 07.00-12.00 PM. Organically produced rice must meet strict regulations (certification), and intensive management and why was farming mostly done on a smaller scale. Organic farming is still working with the problem of higher labor input in its operation. It's why [15] stated that the labor input measured in terms of either hours of work or full –time job is usually greater on organic than on equivalent conventional farms. Other studies shows that the main reason why organic farming require more labor is to carry out manual and mechanical tasks essential to growing. The preparation for sale on the farm or on the market also involves more labour on organic holdings [16].

B. External Strategic Factors of the Nurani Sejahtera Farmer Group

Opportunity

1). Increased Public Awareness of the Importance of Healthy Life

The increasing level of education of the Indonesian people, makes public awareness increase on the importance of healthy living, so this provides a great opportunity for organic agriculture. The upper middle class people have started to care about nutritional content and are free of pesticide residues in every food they consume. So prices are not a big problem for this type of consumer. Consumers are now turning to organic food because they believe it to be tastier, as well as healthier, both for themselves and the environment. Alfoldi et al. (1998) cited in [17] summarized in the published literature on organic and other management systems and found that, of the seven studies produced from taste-crop comparison with organic management versus conventional management, they were

positive that there was a positive impact on organic management in potatoes in Finland [18]. Nevertheless, the other five studies show no differences.

2). Availability of Organic Rice Market a broad

The limited supply of environmentally friendly rice or organic rice on the one hand and on the other hand public awareness of health, has resulted in an increase in demand that has not been fulfilled by some organic producers. This makes the market available for organic rice commodities. The vast changes in the organic lifestyle make consumers prefer organic rice than inorganic rice. The level of awareness of the dangers posed by the use of synthetic chemicals in agriculture makes organic farming attractive both at producer and consumer level. Most consumers will choose food that is safe for their health and environmentally friendly. Thus it encourages the increasing demand for organic products.

3). Government Support for Organic Farming to Support Environmental Sustainability

Organic farming requires government support, mainly due to high production costs in the development of organic rice, including the existence of certification financing assistance in the 1000 organic village program. Therefore, this is a great opportunity for farmers to cultivate organic farming including organic rice.

Threat

1) The conversion of agricultural land

Depreciation of land due to environmental pollution causes a reduction in land that meets the requirements of organic farming. In addition, more and more agricultural land is converted to non-agriculture. This is due to the location of the Nurani Sejahtera Farmers group in sub-urban villages where there are many residential settlements that have resulted in the narrowing of the farm production land.

2). Number of Circulating Fake Organic Products

Consumers need to get guarantees and protection that the products they buy are truly organic products. Guarantees for organic agricultural products rely on labeling. Labeling is usually preceded by inspection activities by an accredited certification body, but due to weak supervision of the guarantee of organic products circulating in the market, it is possible for producers of inorganic rice to fake their products as if rice is organic rice because they want to get high profits.

3). The Purchasing Power of the People is low

Organic rice is more expensive than inorganic rice, so organic rice is usually only consumed by people from certain groups who have middle to upper income. Price of rice organic is Rp. 20.000 per kg and price of inorganic is Rp. 12000 per kg. People prefer rice with affordable prices.

4).Weather Changes and Issues of Natural Disasters that Occur in Indonesia

The weather in Indonesia is currently uncertain as a threat to farmers and their farming. Conditions where sometimes rainfall is too high so that floods or droughts are too long also occur in Bandung. This causes farmers to be more risky in carrying out their products, including organic rice farming.

4.2.Formulation of Strategy for Organic Rice Farming Development for Nurani Sejahtera Farmers Group

After identifying internal and external factors that formulate strengths, weaknesses, opportunities and threats of Nurani Sejahtera farmer groups, then IFE and EFE factors will be developed.

IFE Matrix Analysis

The IFE matrix analysis is carried out on internal factors of business units of the Nurani Sejahtera farmer group which are divided into strengths and weaknesses. From the results of the IFE matrix, the Nurani Sejahtera farmer group obtained a cumulative index value of 2.818. The biggest weakness factor in the Nurani Sejahtera farmer group is the cost of production for labor wages of 0.216.

Table 1. IFE Matrix Nurani Sejahtera Farmer Grup

	Internal Strategc Factors	Weight	Rating	Score
	Strength			
1	Quality of rice produced	0,109	4,000	0,436
2	Postharvest facilities managed by the group are quite good and complete from government aid	0,098	3,000	0,294
3	Extension activities for quite good farmers	0,080	3,000	0,240
4	Organic fertilizers and pesticides are available	0,112	4,000	0,448
5	Farmers have motivation high enough to keep organic rice farming	0,117	4,000	0,468
6	The existence of fixed organic rice consumers	0,104	3,667	0,381
	Weakness			
1	Shrinking organic rice fields into inorganic	0,087	1,333	0,116
2	Group financial recording and farmer farming are still modest	0,083	1,000	0,083
3	Ownership of working capital is still limited	0,102	1,333	0,136
4	The cost of labor production is relatively expensive	0,108	2,000	0,216
	Total	1,000		**2,818**

In the Table 1 it was explained that the various forces that exist, the motivation of farmers to remain organic rice farming is the greatest strength with a score of 0.468.

EFE Matrix Analysis

EFE matrix analysis of external factors of the Nurani Sejahtera farmer group is divided into two parts, namely opportunities and threats. The results of the EFE matrix analysis of the farmer group obtained a cumulative index value of 2.518

Table 2. EFE Matrix Nurani Sejahtera Farmer Group

	External Strategic Factors	Weight	Rating	Score
	Opportunity			
1	Increased public awareness of the importance of healthy live	0,125	2,000	0,250
2	Availability of Still Extensive Organic Rice Market	0,141	2,667	0,376
3	Government Support for Organic Farming to Support Environmental Sustainability	0,169	3,333	0,563
	Treath			
1	The conversion of agricultural land	0.144	2.667	0.384
2	Circulation of counterfeit organic products	0.132	1.667	0.22
3	The purchasing power of the people is still low	0.136	2.333	0.317
4	Weather Changes and Issues of Natural Disasters that Occur in Indonesia	0.153	2.667	0.408
	Total	1.000		2.518

Table 2. shows that the existence of government support for organic agriculture to support environmental sustainability provides the greatest opportunity with a score of 0.563. The biggest threat is climate change and natural disaster issues that generally occur in Indonesia with a score of 0.408. Weather in the long term climate is a condition that is difficult to control humans.

Internal-External (IE) Matrix

The IE matrix is obtained from the results of the IFE matrix and EFE. The average value of IFE is 2.818 and EFE is 2.518, thus placing the Nurani Sejahtera farmer group on cell V. This position showed that farmers groups conscience prosperous being in a survive and keep going on sustainable farming.

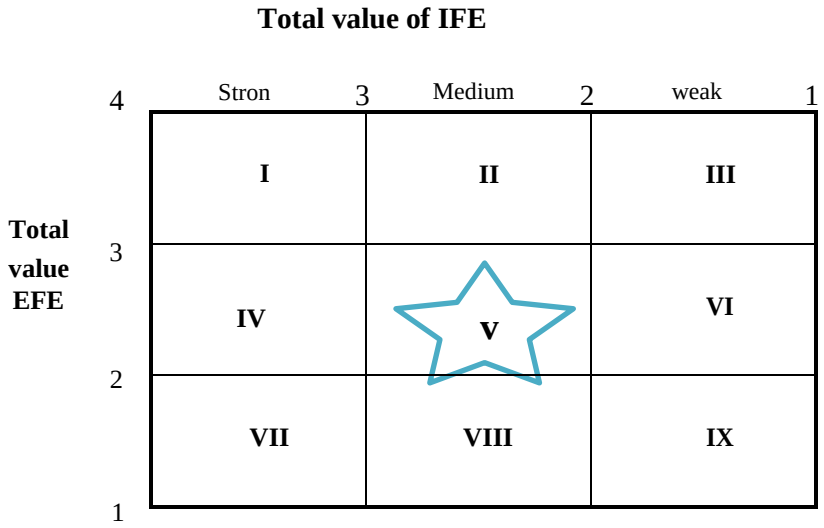

Figure 1. IE Matrix of Nurani Sejahtera Farmers Group

The strategy that should be taken by this farmer group is the survival and safeguard strategy that is generally carried out through market penetration and product development. Market penetration strategy is a search for a larger market share or an increase in the market share of existing products or services through increased marketing efforts.

SWOT Matrix

Various alternative strategies can be formulated based on the SWOT analysis model. The advantage of using this model is easy to formulate strategies based on a combination of external and internal factors. The main strategies that can be suggested are various types, namely: SO, ST, WO and WT strategies. This analysis uses the data obtained from the IFE and EFE matrix. The results of the analysis can be seen in the SWOT Matrix

Table 3. Matrix SWOT analysis

Internal Factors External Factors	Strength 1. Quality of rice produced 2. Good and compete postharvvest Facilities. 3. Extension activities for quite good farmers 4. Availability of Organic Fertilizers and Pesticides 5. Motivation of Farmers to Keep Cultivating Organic Rice 6. Have fixed organic rice consumers	Weaknesses 1. Reduce organic rice fields into inorganic 2 Market information is still limited 3. Limited of working capital 4. Expensive Production cost
Opportunities 1. Increased public awareness of the importance of healthy live 2. Availability of Organic Rice Market a broad 3. Government Support for Organic Farming to Support Environmental Sustainability	S-O Strategy SO1.Expanding the market distribution by maintaining good relationship and cooperation of its distribution network. (O1, O2, S1, S3, S6) SO2.Increasing the organic rice production by optimizing the existing resources. SO3.Increasing organic rice product quality by development good handling (O3, S2, S4, S5)	*W-O Strategy* WO1 Strengthening capital by developing cooperatives. (O3, W3, W4) WO2 Increasing the knowledge and skill of farmers by conducting training of business management and financial management. (O1, W2). WO3. Cost efficiency to be follow the guidance extension workers in the cultivation
Treath 1. The conversion of agricultural land 2. Circulation of circulating Fake organic products 3. The purchasing power of the people is low 4. Weather Changes and Issues of Natural Disasters that Occur in Indonesia	S-T Strategy ST1. Increase promotion of organic rice to the community through counseling or other media (T1, T2, S3, S6) ST2. Maintain existing land to remain organic while still using organic fertilizers and pesticides and organic farming principles (T1, S4, S5)	*WT Strategy* WT1 Improving the market distribution channels (T2, T3, T4, W1, W3, W4) WT2.

5. Conclusions

Intenal factors (strengths and weaknesses) affect the Nurani Sejahtera farmer group in cultivating organic rice. The strengths of the Nurani Sejahtera farmer groups include quality rice, postharvest facilities that are quite good and complete because of government assistance, sufficient extension activities for farmers, sufficient organic fertilizer and pesticides, farmers have the motivation to keep organic rice farming and there are fixed consumers. For the following weaknesses the shrinking of organic to conventional rice fields, limited working capital and expensive labor production costs.

External factors affecting the Nurani Sejahtera farmer group in organizing organic rice include opportunities for increasing education and public awareness of the importance of healthy living, the existence of broad organic rice market and government support for organic farming to support environmental sustainability. As for the threat from the Nurani Sejahtera farmer group as well as the people's purchasing power which is still low, the number of fake organic products circulating, weather changes and the issue of natural disasters that occur in Indonesia as well as the production of rice fields which are narrowing due to conversion and contamination.

Based on the analysis of internal and external factors using the IFE matrix and EFE matrix, the greatest strength is the motivation of farmers to remain organic rice farming. The biggest disadvantage is the shrinking area of organic land. The biggest opportunity is the government's support for organic agriculture to support environmental sustainability. The biggest threat is climate change and natural disaster issues that occur in Indonesia. From the formulation of the IFE matrix and EFE matrix, the best strategy to be carried out based on the IE matrix is to survive and keep the farm running.

Using the SWOT analysis, several strategies can be applied by the Nurani Sejahtera farmer group. Among them are 1) Expanding marketing networks; 2) Improve the quality of organic rice products through the development of postharvest handling; 3) Strengthen capital and reduce production costs by proposing cooperation or assistance to the government; 4) Make improvements to; 5) Increasing promotion of organic rice to the community through counseling or other media; 6) Maintain existing land to remain organic by still using organic fertilizers and pesticides; 7) Optimizing production activities. Based on the conclusions of this study we recommend to conduct a further implementations : the resulting strategy must be communicated and disseminated to all members, discussed before implementing the strategy, the government in supporting organic farming development must be continuous, simultaneous until the farmers are truly independent in their organic rice business.

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