

SMALL SCALE ORGANIC PADDY FARMING IN WEST SUMATRA: POTENCIES, CHALLENGES AND STRATEGIES

Pertanian Padi Organik Skala Kecil Di Sumatera Barat: Potensi, Tantangan Dan Strategi

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ABSTRACT

This study aims to analyse the potencies, challenges and strategy to develop organic paddy farming in West Sumatra. The selection of study area used a snowball sampling technique. To get the characteristics, potencies and challenges faced by farmers in the development of organic paddy, the researchers conducted a survey by using simple random sampling. In total, 144 organic farmers were chosen from cities and districts. Based on the results obtained from the survey, the researchers conducted in-depth interviews related to the potencies, challenges and strategies of developing organic paddy in West Sumatra. Those strategies were analyzed using SWOT analysis. The results show that organic paddy farming in West Sumatra has the potential to develop despite of the existing of challenges. The potencies of organic farming are discussed in several aspects such as government support, economic, environmental and health benefit. Nevertheless, the main serious problem that often encountered are land ownership, marketing, and quality as well as quantity issues. Moreover, the strategy that can be taken into account is to strengthen the government support and market network and establish integrated pest control field schools.

Keyword : *agriculture, challenges, potencies, organic paddy, , strategies, SWOT*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis potensi, tantangan dan strategi pengembangan usahatani padi organik di Sumatera Barat. Pemilihan daerah penelitian menggunakan teknik snowball sampling. Untuk mengetahui karakteristik, potensi dan tantangan yang dihadapi petani dalam pengembangan pertanian padi organik, peneliti melakukan survei dengan menggunakan simple random sampling. Secara total, 144 petani organik dipilih dari kota dan kabupaten di Sumatra Barat. Berdasarkan hasil survei yang diperoleh, peneliti melakukan indebt interview terkait potensi, tantangan dan strategi pengembangan pertanian padi organik di Sumatera Barat. Strategi tersebut dianalisis menggunakan analisis SWOT. Hasil penelitian menunjukkan bahwa usaha tani padi organik di Sumatera Barat memiliki potensi untuk dikembangkan meskipun terdapat tantangan. Potensi pertanian organik diantaranya adalah dukungan pemerintah, manfaat ekonomi, lingkungan dan kesehatan. Sedangkan tantangan yang dihadapi adalah masalah kepemilikan tanah, pemasaran, dan kualitas serta kuantitas hasil pertanian organik. Selain itu, strategi yang dapat dipertimbangkan adalah meningkatkan dukungan pemerintah dan jaringan pasar serta mendirikan sekolah lapangan pengendalian hama terpadu.

Kata Kunci: *pertanian, hambatan, potensi, padi organik, strategi, SWOT*

INTRODUCTION

Agricultural sector is known as the cause of climate change in the world especially for a country where agricultural is the biggest contributor of their economic growth. To overcome this problem, a new method of production is needed. Organic farming is one of the agricultural methods that are supportive for environment. However, most often issues about organic farming are still debated such as, is the production of organic farming the same with conventional farming, are organic farming is friendly to environmental, and is organic agriculture gives benefit economically and etc.

Organic farming gives positive effect from many aspects. For instance, it reduces the emissions of nitrous oxide from agriculture (Rahmawati et al., 2015), it is safer because the use of natural pest control and green manure for fertilizer (Bacenetti et al., 2016) , it improve the land-use efficiency (Lin & Hülsbergen, 2017) and the soil's fertility. Those environmental performance of organic farming has increased the level of food security and nutritional (Wiggins & Nandwani, 2020).

On the other hands, the negative effect of organic farming is also well documented (Yanakittkul & Aungvaravong, 2020). Many questions appear whether the production and productivity of organic farming are comparable to nonorganic farming. (Musyoka et al., 2017) showed that organic farming is not performing better than nonorganic method because organic farming can't feed the world because its lower yield (De Ponti et al., 2012; Seufert et al., 2012)

which leads to lower profit (Froehlich et al., 2018). It is known that the longer conversion period from conventional to organic method is the cause, it taken two until three years period of transition. Such indicator as land ownership of farmers plays an important role when determining the risk of transition period. However despite of this fact, organic farming is the best alternative of food security issues face by the agricultural sector (Sajadian et al., 2017).

The positive effect of organic farming shows the potencies of organic farming to be developed and the negative affect of organic farming is the sign that barries of organic farming is available as well. So that the strategies are needed for the sustainable agricultural method is existed.

The government of West Sumatra has started to develop organic farming since 2006 (Pertanian, 2017). One form of the government's action in developing organic farming is the establishment of Organic Farming Certification. It is the only institution engaged in organizing organic farming certificates on Sumatra Island and the only Organic Certification Agency owned by the government out of eight Organic Certification Institutions in Indonesia. The purpose of establishing this institution is helping to reduce the cost of organic certification for farmers and farmers groups (Pertanian, 2017). This certification gives benefits to farmers because the consumers are willing to buy organic farming products if they are certified. Around 23 farmer groups are certified organic, 11 of them are new applicants, and 12 of them are recertified. Meanwhile, there are seven farmer groups whose certificate validity period have expired and are not recertified yet.

Based on the interview session from employee of organic farming certification, in 2020 the area of organic farming in West Sumatra is 120,994 hectares with the amount of production is 297,192. The data indicates that organic farming in West Sumatra has potency to develop. However, in 2019, the total yield is 322,052. It decreased compared to 2019. In this case, a strategy is needed so that farmers can increase the amount of production. Some policies instruments have been implemented to develop organic farming in West Sumatra. Not only the aids from government in forms of free of charge for certification, the government of West Sumatra also gives support through the provision of subsidized fertilizers. Nevertheless, the lack of knowledge about managing this new method has caused farmers cannot optimize the help from government. Moreover, farmers still find difficulties on how to find the best marketing strategy to push the sale of its product.

Some systematic literature reviews have discussed about influential factors for farmers adopting this farming method (Yanakittkul & Aungvaravong, 2020), quantifying indicator of organic farming to identify the potencies of this method (Sajadian et al., 2017), some shortcomings of this method also has proposed, as well as the main opportunities and challenges (Jouzi et al., 2017). However, the strategy that could be taken into account to

develop small scale of organic farming is less research. This paper stands to at least make several questions and analysis. Accordingly, this paper will first discuss about the potencies of organic farming such as government support, economic, environmental and health benefit. It will then review about the main serious problem such land ownership, marketing, quality as well as quantity issues. That information was taken by asking the farmers through questionnaires and in-depth interview to some related parties. Finally, we found the best strategy by using SWOT analysis to ensure its development and sustainability in West Sumatra. So the contribution of this study can be well taken by small-scale farmers to increase the production and government to design some policies about organic farming in West Sumatra.

RESEARCH METHOD

Study Area and Sampling Procedure

The study area of this research is organic paddy farmers in West Sumatra. To get better results, snow balls sampling is employed in the selection of respondent. The reason for using this sampling method because we do not have perfect information about organic farmers in the West Sumatra or the target characteristics are not easily accessible (Naderifar et al., 2017). Firstly we look for information from organic farming certification about how many organic farmers are in West Sumatra. However, from this institution only the number of farmer group leaders was obtained. The data about the number of organic paddy farmers in some districts/cities across West Sumatra which are respondents in this study was collected by asking the information from the leader of farmer. Then, Padang Pariaman, Solok, Lima Puluh Kota, Agam and Tanah Datar were selected as the study area.

Data Collection

Survey

After getting the information about the number of paddy farmers across West Sumatra, the respondents in this study were chosen using accidental sampling procedure. Accidental sampling is a type of nonprobability or non-random sampling where target population members are based on general criteria such as ease of access in finding respondents, geographical proximity, time availability and respondents' willingness to participate in research (Etikan et al., 2016). The reason for using accidental sampling because we only selects the respondents who could be found during the survey either by chance or spatially who were at the time of the study and want to be the respondents. In total, 144 organic farmers from cities and districts in West Sumatera were chosen. The researchers conducted a survey to those farmers through the

distribution of questionnaires by identifying characteristics, potencies and challenges in the development of organic paddy in West Sumatra.

Interview

Based on the results obtained from the survey, the researchers conducted in-depth interviews related to the potencies, challenges and strategies of developing organic paddy in West Sumatra. The strategies were analyzed using SWOT (Strength, Weaknesses, Opportunity and Threats) analysis. The informant was chosen based on key informant strategies which mean the informants were the parties who involve in the development of organic paddy farming in West Sumatra. Three employees from food and service department in West Sumatra, three employees from organic certification institute, the head of the organic farmer groups, practitioners, and employees from the local farming institution were selected to be interview.

Data Analysis

SWOT stands for strength, weakness, opportunities and threats. SWOT analysis is used to analyze strengths and weakness in internal issues, while opportunities and threats is used to analyze external issues. By having strength we can limit the weakness, by taking opportunities we can eliminate threats (Dyson, 2004). Furthermore, by using strength and opportunities we will able to minimize the weakness and reduce the risk of threats (Aslan et al., 2012). The purpose of using SWOT analysis is to find the solutions in developing organic agriculture in West Sumatra through various interconnected components.

We obtained information about potencies and challenges of organic farming in West Sumatra by asking informants who involved in the development of organic farming, and then by combining those information about strengths-opportunities, weaknesses-opportunities, strengths-threats, weaknesses-threats, we can formulate the strategy to ensure the sustainability of organic farming as this analysis provide a strategic process (Phadermrod et al., 2019) and a formulation of good strategy foundation (Alptekin, 2013).

RESULT AND DISCUSSION

Characteristics of Farmers in West Sumatra

Based on the survey results, 38,3 % of farmers are on productive ages with the largest age group was 37-46 years old, most likely have 4-5 family members, had only attended elementary school (40%), otherwise have already 1-10 years' experience in farming (22,3%), The data also shows that 78% of workers were their own families and relatives which managed their own land.

The small scale of business is one of the reasons why farmers do not employ workers from outside the family.

Table 1. Characteristics of Farmers in West Sumatra

Indicators	Criteria	Percentage
Ages	17 - 26	2.8
	27 - 36	8.6
	37 - 46	38.3
	47 - 56	24.6
	57 - 66	23.1
	67 - 76	1.4
Educational level of farmers	Elementary School	40.0
	Junior High School	30.0
	Senior High School	27.0
	College	3.0
Number of household members	2 - 3 people	14.5
	4 - 5 people	51.4
	6 - 7 people	23.9
	8 - 9 people	1.4
Farming experience	1 - 10 years	22.3
	11 - 20 years	47.0
	21 - 30 years	13.7
	31 - 40 years	7.8
	41 - 50 years	1.4
Involvement in paddy business	Farmers	90.0
	Unpaid Worker	3.0
	Non Participant	7.0
Involvement of child labour	No	79.0
	Yes	21.0
Involvement of female labour	Yes	99.0
	No	1.0
Land ownership	Rent	65.0
	Privately Owned	31.0
	Others	4.0
Sources of seeds	Purchased of Seeds	14.0
	Own Captivity	37.0
	Self-Cultivation	48.0
	Others	1.0
Planting frequency	Once	3.0
	Twice	89.0
	Three Times	8.0

Pests and diseases	Yes	93.0
	No	7.0
Source of fertilizer	Livestock	82.0
	Bought	15.0
	Others	3.0

Source : Data Processed, 2020

Most of land is rented (65 %). In agricultural activities, the farmers admitted that 79% of them did not employ child labor, but they employed women because 99% of respondents stated that there was an involvement of women in farming activities. It can be seen from the process of planting and weeding the paddy fields. The presence of women in agricultural activities gives benefits because it can improve the conditions of health, security of food, standards of living, reduction of spending, and lack of dependency to debt lenders (Altenbuchner et al., 2017).

The seeds used by farmers come from their own cultivation (48% of respondents) to guarantee the quality of paddy. This is usually done by leaving some of the previous production for the next production to save or decrease the costs of production, with the frequency of planting by farmers is twice a year (89% of farmers). The other strategies used by farmers to decrease the production cost is by using fertilizer from farmyard manure that they treat themselves. In addition to guaranteed quality, 54% of farmers stated that the land they managed was irrigated, and also 93% of farmers control their pests. This is done to prevent harvesting failures that may occur due to plant pests and diseases.

SWOT Analysis of Organic Farming in West Sumatra

Developing organic paddy farming in West Sumatra needs to be supported by alternative strategies provided to farmers and farmer groups. The analysis of the recommended strategy using the SWOT matrix obtained from the results of external and internal factors is presented as follows.

Table 2. SWOT Analysis

	STRENGTHS (S)	WEAKNESSES (W)
Internal Factors	<ol style="list-style-type: none"> Farmer groups are active in participating the training related to organic farming Developing organic paddy by optimally utilizing organic fertilizers such as animal waste and manure. The number of producers increase Production cost of organic paddy farming are more efficient compared to non organic paddy. The consumers want to use paddy organic because of health benefit 	<ol style="list-style-type: none"> Farmer's capital is still low Most of farmers' lands are not privately owned Production are still on a small scale Farmers have less interest in converting non-organic agricultural land into organic agricultural land Many farmers did not recertify their certificate of organic product
External Factors		
OPPORTUNITIES (O)	S-O STRATEGY	W-O STRATEGY
<ol style="list-style-type: none"> Land area is available for production of organic farming The high demand for organic paddy due to the community has realized the importance of healthy food There is support from the local government There exist of West Sumatra Organic task force and Organic 	<ol style="list-style-type: none"> Optimizing training for organic farmers who have land for agriculture to increase the amount of paddy production by utilizing the existing land. Monitoring the production until it is ready for final consumption Giving encouragement for farmers to improve the quality and quantity of organic paddy through the 	<ol style="list-style-type: none"> Seeking government support through providing financial assistance, provision of subsidies, and purchasing organic farming equipment Providing assistance especially in transition period from unorganic into organic land farming Giving socialization about the importance of certification of organic farming product Giving socialization

Certification	provision of organic	about the helath
5. Free charge of certification	paddy certification	benefit from consuming organic product.
TREATHS (T)	S-T STRATEGY	W-T STRATEGY
1. Land ownership status because most of land are rented	1. Land owners provide a support to farmers to increase the amount of production	1. The government should provide special sites for selling organic products
2. Lack of cooperation between institution involved in organic farming	2. Optimizing training for organic farmers to increase the knowledge of farmers about managing organic product.	2. Looking for cooperation with parties who can market organic products in greater quantities
3. Lack of farmers knowledge about organic farming	3. The government improve the cooperation between related parties in marketing organic products	3. Free charge of recertification
4. There is no market fo organic product	4. Creating a market and provide infrastructure for organic product	4. Establish Integrated Pest Control Field Schools for farmers to increase their knowledge about how to manage organic product

Source: Data Processed

From the table above potency, challenge, and strategy for developing organic paddy in West Sumatra can be formulated as follows:

Discussion of SWOT Analysis

Potencies of organic farming

Economic Benefit

One of the ways to get higher profit is by minimizing the production cost. Organic farming tend to make the production cost become lower (Froehlich et al., 2018) . Based on the 3 informants from Organic Farming Certification, this activity can save 80% of production costs compared to conventional farming because farmers do not need to buy high-cost chemical fertilizers and pesticides. This is in line with the results found by (Berentsen & van Asseldonk,

2016), cost for fertilizer and crop protection is lower in organic farming. The fertilizer used is organic fertilizer from manure or herbs that they treat themselves (Jeločnik et al., 2015).

Organic Fertilizer in West Sumatra can be obtained through government subsidies from the Organic Fertilizer Management Unit. The organic fertilizer can be in forms of manure, compost and animal waste. (Markuszezwska & Kubacka, 2017) said that financial support is important factors to determine the development of organic farming. The government offers lower price of organic fertilizer fo farmers who want to switch into organic farming. The price of fertilizers from the government is around IDR 500 per sack while the market offers IDR 1000 per sack. This significant difference will certainly reduce production costs.

Health Benefit

Organic farming does not use chemical fertilizers or pesticides. Instead, farmers use animal manure in either solid or liquid forms. The solid fertilizer used is partly derived from their own livestock, while liquid fertilizers come from manure or herbs that they treat themselves. This fact has tend to causes chemical residues in organic farming decrease compare to nonorganic thus reduced risk of chronic diseases and stabilizes the quality of farmer's life.

Based on the results of the indebt interviews with all the informants, they are three employees from organic certification institute, the head of the organic farmer groups, practitioners, and employees from the local farming institution, the demand for organic paddy in West Sumatra was quite high. This is because people have started to become aware about the dangers of eating foods that contain pesticides, and have already been concerned with the environmental quality that results from consuming organic paddy. This is in line with results found by (Winstone et al., 2019), he found that most producers and consumers want to adopt organic farming because of better health/wellbeing, environmentally friendly farming, reduce soil degradation (Wiggins & Nandwani, 2020) reduce greenhouse gas emission and also enhances biodiversity in agricultural landscapes (Squalli & Adamkiewicz, 2018).

Government Assistance

One of the important indicators for the development of organic farming is the assistance from the government (Altenbuchner et al., 2017). Based on the results of the interview with farmers, 60% of them stated that they received assistance from the government. The forms of assistance provided by the government are seeds, fertilizers, and tools/machines which are distributed to farmer groups. It is hoped that the existence of government support in the form of financial support gives contribution to the development of organic farming (Markuszezwska & Kubacka., 2017).

Forming the Organic Farming Certification is another kind of government support, and this is the only institution owned by the government in Sumatra Island. This institution is also in charge of providing socialization and training to the society, especially for farmers engaged in organic farming. According to (Polat., 2015) such training is important where all stages of production are controlled until it is ready for final consumption. In West Sumatra, Organic Farming Certification began their intervention by giving socialization about the introduction to organic farming, mentoring farming activities, and giving assistance for farmers and farmer groups especially in transition period. Through this activity, it is expected that the number of farmers engaged in organic farming is increase. The Local Government itself is targeting 10 farmer groups per year who move from non-organic into organic farming.

Challenges of Organic farming

Land ownership Issues

Farmers moving to organic farming mostly aim to restore soil fertility and land use efficiency (Lin & Hülsbergen., 2017). Agricultural land that has been used through non organic agriculture for a long time will reduce land fertility, thereby reducing production (Sajadian et al., 2017). So, land ownership is one of the important indicators in the development of organic farming to ensure its sustainability (Torres et al., 2016). If the land is a rented land, farmers will automatically be reluctant to do organic farming because it could be taken by its owner somehow. Land ownership is one of the obstacles to develop organic agriculture . Not all agricultural land cultivated by farmers are privately owned land (31%); most of them are rented land (65%).

Quality and Quantity Issues

The organic farming has no better performance rather than conventional farming method (Musyoka et al., 2017). This farming method did not bring any benefit to quality as well as quantity product (Bieluczyk et al., 2020; Das et al., 2017) said that this farming practice method will suffer loses in the short term, and results in higher productivity after many years practiced.

Based on the data obtained from the all informants from the Organic Farming Certification, the head of the organic farmer groups, practitioners, and employees from the local farming institution, the problems that arise in organic agriculture are quality and quantity issues. The quality of organic paddy is still not optimal due to the limited experience of farmers. The majority of them (47%) have 11-20 years experience. This limited experience has become the risk of organic farming which become the influential factor before adopting organic farming method (Yanakittkul & Aungvaravong., 2020). This also causes productivity to be lower so that the quantity of paddy produced is lowered.

Furthermore, in small scale farming, organic farming tend to enables a direct increase of production due to conversion period from non-organic farming to organic farming where farmers suffer low yield (Berentsen & van Asseldonk., 2016). So productivity becoming an important issue of organic farming. In addition, the planting system with the planting frequency of two times a year and on the relatively small land area disrupts the continuity of organic paddy.

Marketing Issues

Experience of famers about marketing their product is important when they move to organic farming methods (Mouter et al., 2019). Based on indebt interview from all informants, most farmers lack of knowledge and information on how to market and distribute their product. Furthermore, the significance difference about the yield of organic product and nonorganic product which makes organic product does not have market in the society so the farmers sell it directly to the consumers (90% of farmers). Moreover, the production is still on small scale which results the production of organic product is only enough to meet the consumption of those farmers.

There absence of market in organic farming has becoming another important issue in developing organic farming (Binta & Barbier, 2015). The marketing methods used to market organic farming products should be in the form of building consumers' awareness about the positive effect of consuming organic food such as health, improving consumer's knowledge about the importance of consuming organic food, having retail structure in market, having market segment (Mouter et al., 2019) and expanding market net worth (Moschitz et al., 2016).

Strategy of organic farming

Optimizing Government Assistance and Support

Supportive institution is a top priority concerns for sustainable future of organic farming. Based on the SWOT matrix, the local government should encourage farmers who have agricultural land to move from conventional farming into organic paddy farming by promoting sustainable agriculture. This involves in increasing the awareness of farmers about consuming organic paddy for health and environmental issues (Barański et al., 2014).

The local government should help farmers by giving a training to increase farmers knowledge such as soils knowledge because training is important regarding to farmers' knowledge about soil (Winstone et al., 2019). Moreover, Farmers are given support through socialization on how to get higher productivity. If productivity increases, it is expected that farmers' production will also increase, so the income and profits of organic farmers will increase as well.

The encouragement from the provincial government through the establishment of an organic farming certification by providing free certificate and recertification to farmers engaged in organic farming is other kind of government assistance. The purpose of this certificate is to improve the quality of organic paddy, to ensure the quality of organic paddy production whether it has been carried out in accordance with standards of organic farming product. This institution also monitors the activity of farmers, so that the production process is monitored especially in transition period, until the product is ready for final consumption.

Expanding market net worth

Marketing of organic product may be able to encourage organic production. This can be done through expanding market segment and net worth (Kerdsriseam & Suwanmaneepong, 2015). Government can create market for organic product and provide special site for producers and consumers to sell their organic product, so that they can meet less than one roof. Furthermore, through cooperation with various parties, farmers not only able to sell organic rice to one middleman but also to many middlemen. That way, farmers can increase their sales, in addition to this that place also can be used for storage and distribution place.

Establish Integrated Pest Control Field Schools

Many farmers still has lack of knowledge concerning organic rice's management (Orlando et al., 2020). This strategy is used to improve the state of knowledge on organic rice, because better farmer's education is important to maintain the sustainability of organic farming (E & S, 2009). It can be done through the implementation of Integrated Pest Control Field Schools to reduce the occurrence of pest attacks. Integrated pest control is carried out through regular and routine control of plants so that they can take good action in accordance with existing pest diseases. Moreover, pest control can also be done by means of the use of materials and natural enemies by using predators to be able to reduce chemicals and using plant-based pesticides and organic fertilizers

CONCLUSION AND SUGGESTION

Conclusion

Nowadays, organic agriculture is rapidly gaining more attention. It happens because many societies already concerned about health and environmental issues (Squalli & Adamkiewicz, 2018) as awareness of farmers about negative effect of conventional farming is increase (Das et al., 2017) and

many farmers are found to be poisoned by pesticides due to conventional farming method.

Based on the results of survey and indepts interview, it is concluded that organic paddy farming in West Sumatra has the potencies to develop. This is due to there exist of support from local government and beneficial aspects which was created during the production process such as economic and health. Meanwhile, the challenges that are often encountered in the development of organic farming, among others, are the land ownership issues, marketing issue and quantity issues as well as quality issues. By using matrix S-O, W-O, S-T, and W-T, the strategy that can be taken into account are optimizing government assistance, expanding the market segment and market net worth and the last establish Integrated Pest Control Field Schools.

Suggestion

This study has some limitations. We still find difficulties on finding the information about land area of organic farming, total production, and the number of farmers who have used organic farming. This study only records the data of organic farming based on the number of organic farms that have organic certificates. In addition, this study also has shortcomings in sample selection process. The limitation in the number of samples of organic farming causes the lack of informants who can be interviewed.

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