

The Value Chain of System of Rice Intensification (SRI) Organic Rice of Rural Farm in Kedah

Siti Norezam Othman^{#1}, Zakirah Othman^{#2} and Noorulsadiqin Azbiya Yaacob^{#3}

*School of Technology Management and Logistics
Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia*

¹norezam@uum.edu.my

²zakirah@uum.edu.my

³sadiqin@uum.edu.my

Abstract---System of Rice Intensification (ability through improving paddy ecosystem, better sustainable economic due to improving paddy production and sales and social sustainability through local community development through community activity and health. This study aimed to find out whether the innovative practices of SRI affect the rice value chain and to determine the roles, activities of the actors in the value chain as well as challenges that impacted the value chain. Using interview as data collection method, case samples were selected from various SRI paddy site in Kedah. The findings indicated that implementing SRI practices in organic paddy cultivation had caused the value chain to be different from conventional paddy value chain in terms of actor and effect of middle man subject to the small scale paddy production. For organic rice value chain to become competitive, roles, activities and challenges were identified so that supports could be provided to the farmers and other related parties in the value chain.

Keywords--- System of Rice Intensification (SRI), Organic Rice, Value Chain, Rural farms, Paddy

1. Introduction

Malaysia has the potential to develop new businesses through its organic agriculture opportunity [5]. In terms of market potential, the average annual growth rate of the organic market is projected to be in the range of 20-30% and expected to grow from the current estimate of USD\$11 billion to USD\$100 billion in 2010.

Major organic markets are developed countries such as European Union (EU), Japan and USA. Many organic conversions in the developing countries are driven by export premiums to serve this market, but not in the case of Malaysia. Conversion to date has mainly come from the producers' personal interest and domestic market. Exports are minimal with a small quantity exported to Singapore [4].

Unfortunately, based on the fact provided by Department of Agriculture [7], organic paddy was not included in the organic products although it has a huge potential specifically with the growing preference by customers for organically produced food due to health reasons [6]. One of the initiatives to close the yield or production gap is organic farming. This is increasingly recognized worldwide as a suitable model for creating environmental, economic and social sustainability in agriculture. It is a crop production system that avoids the use of synthetic fertilizers and pesticides, hormones, antibiotics and takes measures to protect the environment. Crop pests and diseases are managed by cultural, biological, physical, mechanical methods and the use of bio-pesticides [7]. So, sustainable paddy practices are committed to balance with nature. System of Rice Intensification (SRI) is a method to manage organic farming. SRI was developed in Madagascar in 1983 as are revolutionary paddy cultivation method to achieve very high yields with well managed resources such as less water requirement, natural and organic fertilisers. Although SRI planting tests have been carried out in 42 countries, and at present, the SRI planting areas have expanded in many developing countries of Asia, Africa and Latin America, the

practice only has been implemented recently in Malaysia since 2009 [8]. The SRI initiative is an alternative way of growing paddy that focuses on sustainability. In SRI paddy farming, the main determinant of the growth and development of the plant, and its subsequent yields, derives from how the growing paddy environment, such as seeds, seedlings, soil, water, nutrients, air, and the prevailing weather and climatic conditions, is managed. Since the entire organic rice sector had not been explored in depth, the competitiveness of this sector is yet to be known. For existing conventional farming, the non-economical nature of this sector is due to the number of parties involved along the value chain for instance during field preparation, planting, cultivating, harvesting and processing [9]. Value chain development (VCD), a relatively new approach to agricultural development, is widely accepted and becoming the focus of agricultural development strategies. The concept of value chains, which was developed in the 1960s and 1970s, is to aid the analysis of mineral exporting countries and becomes widely known and popularized in the 1980s as a business tool to analyse and assess possible upgrading of technologies and processes in individual firms before being applied more broadly to supply chains and distribution [10]-[11]. It is a relatively new approach to agricultural development [12], although the thinking about entire chains from production to consumption and increasing the share of value captured by farmers is not new to agricultural development. The original concept is based on the idea that a firm can develop strategies to improve and maintain its competitive advantage by disaggregating its core activities and quantifying the value of each activity. This concept has been extended beyond individual firms to whole supply chains and distribution networks. Hence, in this study, a new method such as SRI would be explored and its impact on rice value chain would be investigated.

2. Literature Review

2.1 Background

The cost of paddy production had kept on increasing significantly and causing the local farmers to find it hard to compete with those in traditional rice growing countries like Thailand and

Vietnam, which can produce at lower cost. One of the initiatives to revive the paddy farming industry is to go into sustainable agriculture. The movement in organic farming had gained its footing recently and it is quite new among local farmers. However, there were organic produce farms and there were estimated that only 600 hectares of lands were organically managed and about twenty seven producers were certified with proper organic certification. Several organic farms were in Johor and Perak and were growing steadily due to the market demand and high prices tagged on organic produce. Organic rice farming in West Malaysia began in the early 1990's under the guidance of a Non-Governmental Organization (NGO), working with smallholder farmers on rice storage in the state of Selangor. They found that the system was not sustainable due to a number of factors, such as poor production technology support, marketing problems, certification, and farmers' commitment.

Malaysia was seen to have potential to develop new business through organic market opportunity [5]. Due to the potential of this organic market, Malaysia government had allocated US\$3.08 billion under the 9th Malaysia Plan to transform into a modern, dynamic and competitive sector. Efforts to improve soil fertility, rehabilitation of marginal land and water conservation were undertaken by the government. With the growing of consumer preferences for organic products due to health concern, this organic farming has a big potential in Malaysia [6] and opportunity to attain high income nation due to the premium price of the organic products.

Since most of the organic produce comes from fruits and vegetables, there is little information found on organic rice farming in Malaysia. A report stated that the demand on organic rice has been rising, especially in Philippine, Malaysia, and Singapore, however, the domestic production supply is unable to meet increasing consumer's demand on organic rice [16]. As an introduction to organic rice, the first initiative in farming organic rice was conducted in Kahang, under a private company known as KOREF, using natural farming method. The organic paddy farming is developed on 260 acres of land, which also provide accommodation and holiday package through its farm stay programme. KOREF is the first farm to attain the Certified Organic Rice in Malaysia.

Later, in 2009, SRI method was introduced as one of the methods for farming paddy after a visit and discussion with by Prof Norman Uphoff, the proponent and distinguish scholar on SRI, to Malaysia. Despite constraints, in 2009, using SRI method as first trial, the yield for paddy variety in Beranang was 7 tonnes for MR219 and 5 tonnes for UKMR2 while in Tanjung Karang, Selangor, for both paddy varieties, the yields were 4 tonnes. On 2011, a Memorandum of Understanding was signed between FELCRA Training & Consultancy Sdn Bhd and an NGO in Indonesia, Nusantara Organic SRI Centre, with the purpose to develop SRI in Malaysia. In the context of FELCRA, in an effort to develop organic SRI, the paddy cultivation trials were mixed with organic and inorganic fertilizer and over the time the chemical substance would gradually be reduced over the time. As a result of improvement in yields, more farmers from other states such as Kelantan, Kedah and Penang, followed the path of Selangor farmers.

Most of the studies conducted in Malaysia were addressing the conventional paddy farming and little was known related to sustainable rice farming and its value chain. Thus, the scarcity of the studies on SRI practices and its value chain effect requires further investigation specifically on the issue of whether the practices can be adopted to complement existing conventional paddy production. In addition, the effect of SRI method on the value chain of the organic paddy could be observed in terms of the activities participated by the actors in the value chain.

Based on 'A Fair Green Economy?' agriculture, energy and waste initiatives' study in Malaysia [15], improvement in poor farmer's income from Kampung Lintang, Sik, and Kedah can be observed after the community involved in paddy cultivation of the organic paddy through SRI organic rice's niche market with premium price. The farmers that made up the community participated in a community cooperative organisation under the supervision and mentoring of KEDA. The purpose of establishing the cooperative organisation under the name of Koperasi Belantik Berhad which is run by farmers is to develop the socio economy of the community. KEDA has sent farmers for SRI training and they have performed SRI cultivation technique to increase the paddy productivity of the village. Since this method promotes the use of natural and organic inputs to stimulate paddy plant,

the paddy ecosystem such as soil, pest control and others have improved tremendously. The used of organic manures that contain nutrients allow more air into the soil and improve soil structure and drainage. In addition, the cooperative under its management has innovatively combining the use of labour and modified machinery to assist them in farming paddy. As a result, cost for SRI paddy production at Lintang could be minimised because of the use of organic inputs such as fertilizers, biological methods of pest control and also applied sustainable agro-ecosystem management.

This is because the SRI practices are different from the conventional paddy farming and their requirement on seed selection, technology, equipment and tools for SRI organic paddy farming, maintenance of the organic paddy field, paddy processing, grading and quality. Thus, it is important to conduct a value chain study on SRI organic paddy farming to determine the constraints, opportunities and possible solution to develop the competitiveness of SRI organic rice value chain.

As a conclusion, although organic rice farming in Malaysia is still at an infancy stage, it has gained farmer acceptance over the time. Most of organic farming representing vegetables and fruit sector, hence, not many studies is focusing on the organic paddy farming. Due to that fact, there are vast opportunities to study on the organic paddy cultivation specifically using SRI method. The potential of SRI could be comprehended through looking into its value chain because through value chain, authority would be able to build the right ecosystem for the organic paddy

2.2 *The function of value chain development (VCD)*

Value chain development (VCD) is increasingly being seen more specifically as an important approach to agricultural development that explicitly recognizes the role of the private sector and that agricultural markets and institutions rarely function efficiently. The emerging VCD-oriented approaches go somewhat further from interventions that develop input and outputs markets in general to making more focused interventions to improve the competitiveness of selected commodities. These interventions can be in the form of programme for farmers or effective policy to

facilitate the development of the selected commodities. The value chain development is conducted on varieties of fruits, vegetables and crops including rice.

2.2.1 *The importance of value chain development (VCD)*

While the approach offers valuable tools for identifying points for intervention [17], there is less clarity on what the interventions should be. VCD is expected to involve actions such as facilitating changes in behaviour, transforming relationships, targeting leverage points and empowering the private sector. ACDI/VOCA's strategy suggests that addressing major constraints and opportunities in value chains includes activities such as facilitating access to inputs, or strengthening delivery of business and financial services or increasing access to higher value markets. A wide range of interventions are employed to achieve the above that would strengthen the competitiveness of value chains. In other words, value chain analysis (VCA) can be related to achieving competitiveness of the specific agricultural products..

2.2.2 *The value chain analysis (VCA) studies in agriculture*

Value chain development (VCD), a relatively new approach to agricultural development, is widely accepted and becoming the focus of agricultural development strategies. The concept of value chains, which was developed in the 1960s and 1970s, is to aid the analysis of mineral exporting countries and becomes widely known and popularized in the 1980s as a business tool to analyse and assess possible upgrading of technologies and processes in individual firms before being applied more broadly to supply chains and distribution [10]. It is a relatively new approach to agricultural development [12], although the thinking about entire chains from production to consumption and increasing the share of value captured by farmers is not new to agricultural development. The original concept is based on the idea that a firm can develop strategies to improve and maintain its competitive advantage by disaggregating its core activities and quantifying the value of each activity. This concept has been extended beyond individual firms to whole supply chains and distribution networks.

Many studies in analysing the agricultural products value chain have been done in developed and developing countries. Most of the agricultural products are fruits, vegetables, poultry, fisheries and others have been conducted considerably in many developing countries such as countries in African continent, India, China, Bangladesh and also from mainly South East Asia from countries like Indonesia, Thailand, Cambodia, and Vietnam, Philippine. There are studies done on value chain analysis of rice sector in three African countries; Mali, Niger, and Nigeria with the purpose of improving the value chain of the crop in these three countries in order to attain competitiveness in the rice sector. Other than the African countries, a value chain analysis study was also conducted in Bangladesh. The findings of the study indicated that rice is no longer perceived as cheap staple food. By conducting the value chain analysis, it was found that demand on expensive varieties could be associated with off farm activities such as milling, retailing, and branding [18]. A value chain analysis on rice sector was also conducted in Haiti under the research grant of OXFAM. The results of the study had implication on the programme design [19]. These studies mentioned earlier were focusing on the conventional paddy farming.

There were studies on value chain analysis done on organic rice, nevertheless, the studies were hardly found. A study on value chain analysis of organic rice was undertaken in Indonesia with the purpose of linking the small scale farmers to market and assist them on maximising the benefits from the value chain. Other aim included to help anchor companies to make decision and develop strategic directions and key linkages with industry players and institutions [20]. Likewise, in Cambodia, the value chain analysis study was conducted to assess constraints, cost, quality and efficiency of the rice market and finally, proper intervention could be made to improve the competitiveness of the crop [21]. In other study related to organic rice, the value chain analysis study is conducted to integrate smallholders into supply chain because through the integration they would be able to offer inputs, business and technical services via market linkages [22]. In the context of Malaysia, there is one study discussing on the conventional rice supply chain model [23], however, the value chain analysis study in Malaysia is rarely undertaken specifically pertaining to organic rice. Hence, it is one of the

motivations for the researcher to explore on value chain analysis of organic rice in Malaysia.

3 Methodology

3.1 *Qualitative method and case study*

This study employed qualitative method specifically the case study. It had been widely known that case study was widely used in the areas of organizational studies, public administration, political science and sociology. It had been particularly effective in studies that examine institutions with a high degree of complexity, especially when a 'how' or 'why' question was being asked about a contemporary set of events, over which the investigator had little or no control" [13]. However, the qualitative case study research had been criticized as a methodology that lacked rigor and precision. One reason for this reaction was that case study research had none of the technical complexity that seemed to render statistical research more objective in the eyes of many academics [13]. Nevertheless, this method had helped the researcher to understand a phenomenon in depth. In addition, the case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context when the boundaries between phenomenon and context are not clearly evident [13].

Since the primary goal of this study is to explore the innovative practices of System of Rice Intensification (SRI) on organic paddy cultivation and to examine the value chain of the organic paddy in Malaysia, the case study method would help the researcher to understand the practices and the roles of the actors in the chain and the interrelationships of one actor to another in the value chain. In addition, through qualitative case study, the important determinants that made up a value chain of organic paddy could be explained. This study involved multiple respondents with different perspectives; hence, this would provide feedbacks from different angle. Thus, this was also known as multiple case studies. A multiple case approach would allow a comparison between cases. Such a study was especially suitable for this research because it allowed the researcher to make cross-case comparisons and helped to identify the SRI paddy cultivation practices among farmers from different sites and operational context as well

as to comprehend the actors' that made up the value chain.

The selection of case samples were based on the actors that made up the SRI organic paddy cultivation. The respondents of this study were stakeholders in SRI organic rice industry such as farmers, authority such as BERNAS, MARDI, Department of Agriculture in the state of Kedah and other related parties. The analysis is at an individual level. In the second phase, an interview was conducted with the case samples in order to find out their perspectives on the SRI technique and the constraints as well as opportunities in the organic paddy value chain. In qualitative study, for this technique, the issue of sample size was ambiguous. There was no fixed number of sample sizes because the sample size was dependent on the number of research questions and objectives. Hence, the issue was on what the researcher needed to find out, what would be useful, what would have credibility and what could be done within the available resources [14]. The purposive sampling technique was one of the common techniques in identifying the case samples. Since purposive sampling was a non-probability sampling technique, therefore, its function was not to provide generalisation to the population. Case samples selection was based on the predetermined criteria as indicated;

1. The respondent must be familiar with the SRI technique in cultivating organic paddy
2. The respondent might cultivate the paddy using the SRI technique or had business with the person that cultivate the paddy using SRI technique
3. The respondent must be the primary actor in the organic paddy value chain

3.2 *The conceptual framework -the value chain theory*

In guiding the study, the value chain theory had been used. The value chain theory started in manufacturing sector where trends of global manufacturing especially in the processes of upgrading and the increasing roles of retailers and

brand making companies in global market. The value chain analysis was done to find out the relationships and linkages between actors along the chain as well as the role of the lead firm in determining what to produced, how and by whom and who is to perform what role in its focus. The value chain study included the pattern analysis of relationships, coordination and network integrations in order to be competitive in business [24].It is expected that contributing factors that strengthen the value chain of the organic rice would be identified from the findings of the study. Figure 1 illustrates the conceptual framework of organic paddy value chain.

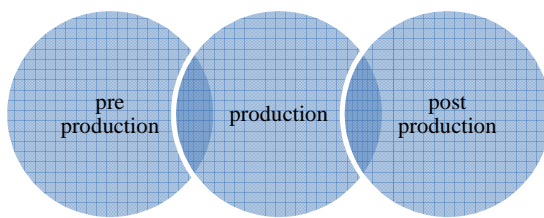


Figure 1- Conceptual framework of the study- the value chain of organic paddy

4. Results

The principles in the SRI practices had affected the value chain of the rice in various ways. The actors in the value chain could be reduced and the middle man effect could be lessened. In the organic rice value chain, the main actor was the farmer. Farmer was involved from the preproduction phase until postproduction phase. The preproduction phase was the initial phase where land had to be prepared, huge initial investment had to be acquired to improve the soil health and all other necessary inputs such as seed, fertilizer, pesticides, weeding equipment, labour and machineries. In the SRI method, the inputs could be prepared by the farmer without depending on seed seller, fertilizer and pesticides manufacturer. For seed, farmer could outsource from the government agencies such as MADA, KEDA and also from other farmers at the initial stage but later they could self-propagate the seeds for next cultivation period. As for the fertilizer and pesticides, farmers could produce themselves using the natural resources such as fruits, leaves and others, where they could get around them. In addition, farmers had to be innovative in order to invent machineries and

equipment that fitted the SRI practices although they had alternative to request higher education institutions to help them to produce prototype of the machine or equipment.

Since the production operated in small scale, farmer was able to handle small machinery and easy handling equipment such as paddy straw cutter, weeding machine and others during the production phases. Hence, the need for larger machine with higher rents was not an immediate requirement to the farmer. In terms of marketing, for farmers, they could market the rice themselves through the Cooperative or individually or through Non-governmental organisation (NGO) such as SRI Mas. Farmers were empowered and they could decide the selling price of the rice since they were not depended on subsidy. Thus, the value chain of the SRI organic rice was explained in the Table 1

Table 1 - Actors and Activities in the Organic Rice Value Chain

Activities of the value chain/ Actors in the chain	Pre-production phase	Production phase	Post product phase
Farmers	1)Input provider (govt. agency initial stage), farmer 2) Self-propagated seeds by farmer 3)Preparing land for cultivation, labor, machine equipment	1)Cultivating, weeding, 2) Preparing organic fertilizer & repellent, harvesting, drying, storing and processing	Packaging
Retailer/ Farmer/ Agent			Marketing and selling

Since this SRI method was purely organic without any mixture of chemical substances and SRI organic paddy farming was at the early stage, hence, the primary actor was farmer because

almost all activities were under their responsibilities. Nonetheless, it did not mean that other actors like conventional paddy cultivation actors were not significant. The reason farmer became the main actor in all activities along the chain was the SRI organic value chain was new to conventional or potential farmers. This method also had its own requirements, which differed from the conventional paddy value chain and had to be fulfilled before a developed SRI organic paddy value chain could be developed. As indicated in Table 1, the roles and activities of the actors in the value chain are explained.

In organic paddy specifically to SRI organic paddy value chain, at the initial stage of the organic paddy farming, the actors of the value chain analysis were input providers such as the government agencies like MARDI, KEDA, the farmer. This was due to the fact that government agency such as KEDA had initiated the establishment of cooperative among villagers in the rural area such as Belantik. KEDA was a Kedah development agency where its focus was on rural development. At an initial stage, high working capital and initial investments were required hence, KEDA had played the role of an agency that not only focused and supported the rural project but also provided initial investment or working capital in the form of machinery, fund to start operations such as levelling the soil, packaging, fertilizer, seeds and others to the project in Belantik. At initial stage, the investment was very high and rural community project needed to be supported. Other than KEDA, public research institute such as MARDI also involved in this project for instance, in terms of conducting studies related to water management, seed quality and by supplying seeds to farmer in Belantik. Certain allocation of Belantik paddy farming sites had become the research plot for MARDI, Department of Agriculture and also public universities such as UKM and UPM to conduct research related to soil quality and others.

4.1 *Initial and Development stage*

After the initial stage, farmers in Belantik produced their own seeds to be planted at the paddy field. For SRI organic paddy, one hectare land only required 5 to 7 kilograms of seeds, which if compared to conventional paddy farming, the weight of seeds was heavier more than SRI organic paddy farming. In addition, the farmers produced the organic

fertilizer to be used at their paddy fields. They were capable of producing the organic fertilizer and also insect repellent to be utilized at their paddy fields.

4.2 *The roles, activities and challenges of farmers at initial and development stages*

Belantik farmers rented the land from villagers at around RM150-200 per acre. The size of the land was huge and was underdeveloped compared. The land size of organic farming for Belantik was 6 hectares. Belantik farmer had received the support from KEDA on one off basis. This meant that the supports from KEDA including the advices were only materialized during its initial stage. For Belantik farmer, the support and networking with the government agencies such as KEDA and Department of Agriculture were on continuous basis. In cultivating the paddy, farmer in Belantik adopted all SRI principles in farming the paddies. All the cultivation activities including weeding were done manually with the help of workers. The activities done by farmers at three sites were preparing land, preparing organic fertiliser and insect repellent and cultivating paddy. In the next phase, after producing and maintaining the paddy fields, farmers were also involved in the post production stage. These post production stage activities covered harvesting, drying, storing and milling the paddies. The activities such as harvesting, drying and storing were done by the farmers and with the help of their workers. Harvesting was done manually using the paddy straw cutter with the help from workers. These workers were capable of undertaking the task manually because paddy farming in Belantik was cultivated in staggering stages. For Belantik farmer, harvesting activity was done manually using mini harvester machine to separate the seeds from the paddy plant. Then, the paddy seed would be dried under the sun manually, which would take time for the workers to handle. The dried seed were processed using milling machine owned by the cooperative.

4.2 *The roles, activities and challenges of miller*

The farmers had two options to process their paddies. They had options either to process the dried paddies with BERNAS or using the rice milling machine owned by the cooperative. If the

quantity of the paddies were large, Belantik farmers would send them to BERNAS milling facility. By processing with BERNAS, there was advantage on farmers in getting quick payment from the miller. Processing paddies with BERNAS implied that selling the raw paddies to the miller and farmer could get money quickly from the sales. However, if farmer decided to process the paddy using its own milling, farmers had to wait longer time to sell the rice because it took time for the farmers to market the processed rice. In terms of profit, by processing using his or her milling machine and selling the processed rice to market, farmers would get higher profit compared to selling the raw paddies. The milling machine capacities at Belantik were one to three tonnes per day.

4.3 *The roles, activities and challenges of marketers at initial and development stages*

Interestingly, farmer in Belantik had his or her own worker doing the marketing task. Sometimes, through networking with local universities and also friends, they managed to sell the organic rice. In certain case, the sales of organic paddy were done among friends, pharmacies and mostly those individual that had health problem. The sales of organic rice were done at exhibition, exposition and sometimes they were offered booth to sell their products without any cost incurred by government agency.

Based on the analysis of multiple cases, for paddy farmers under specific organisational structure i.e. cooperative and private companies, it was interesting to find out that at an initial stage the actors were mainly two parties; the input providers that represented by government agencies, friends as seed suppliers, the farmers and the organisation as marketing arm. In addition, the paddy sites Belantik had received continuous support from government agency even though they were in the development phase, whereby they had their own milling facility and were capable of selling their organic rice. This was due to strong networking with the personnel at the government agency. Farmers in Belantik were still using pure SRI method in land preparation, farming and also harvesting

5. Discussion

Based on the results of the study, SRI practices have promoted the sustainability focus on betterment of environment, which could be achieved through practices such as well managed water resources, using organic matter that would improve fertility of the soil through healthy living microorganism and hazardous free chemical substances that might cause affluence and negative impact on consumer health. In addition, the practices have improved the paddy ecosystem and subsequently improved the productivity of the paddy.

The SRI practices have effect on the value chain of the organic paddy in terms of number of actors involved in the chain. Due to the small scale production of paddy cultivation, the main actor at paddy farming phases, preproduction, production and post - production is the farmer. Middle man can be reduced or eliminated, hence increases empowerment of the farmer [14]. Farmer is the important actor due to the capability of the farmer to sustain in cultivating paddy, for instance, farmer is capable to propagate the seeds, produce the organic fertiliser and pesticides. In addition, farmer becomes more innovative since he or she has to invent equipment or machine that fits in the SRI principles. Thus, reliance on huge machinery such as weeding, milling machine can be reduced. The roles and activities involved by the actors in the value chain can be categorised in three phases; the preproduction, production and post - production. The activities under preproduction are providing seed to farmer (initial stage –government agency), self -propagated seeds by farmer, labour input, land, machine and equipment. In a production phase, the activities are preparing organic fertilizer and repellent, harvesting, drying, storing and processing while in post-production phase, the activities are packaging, marketing and selling. In a production phase, challenges faced by farmers are high initial investment especially in preparing and treating the soil, lack of committed workforce in paddy farming while in production phase, it is found that there hardly mechanical tools such as machine and weeding equipment since majority of the farmers preferred to farm manually. Finally, the post – production phase, farmers highlighted that drying and milling facilities for organic rice are needed so that organic rice would not mixed with conventional rice. In addition, they also required

programmes and workshop especially related to marketing competencies.

6. Conclusion

Organic rice cultivation in Belantik adopts a method known as System of Rice Intensification (SRI). Farmers in Belantik utilised the six principles of SRI farming practices in their cultivation. These six principles were investigated and the impact of these practices was found out to affect the roles of the actor in the value. Farmers were found to be the main actor and played most important roles in the organic rice value chain. Farmers involved in all phases from pre-production until post production phase in the value chain.

Acknowledgement

The author would like to thank Ministry of Education for funding this study under Research Acculturation Collaborative Effort (RACE) Grant.

References

- [1] Fahmi, Z., Abu Samah, B and Abdullah, H (2013). *Asian. Social. Science.*, 9, 3, 177-181
- [2] Vijian, P. Situation of Agriculture in Malaysia-A cause for concern, Education and Research Association for Consumers, Malaysia, (2001), 49-72
- [3] ...*Program Transformasi Kerajaan*, Jabatan Perdana Menteri, Putrajaya, (2011), 264-278
- [4]The organic market outlook. (2012). National Study on Malaysia, (Ministry of Agriculture, Kuala Lumpur, 2012)
- [5] Quah, S.H (2000). Agro-chemicals news in brief special issue (Paddy Division, Department of Agriculture, Kuala Lumpur, Malaysia)
- [6] Wan Abdul Wahab, W.N.Z and Mustafa, S (2009). National. Conference. on Postgraduate. Research. (NCON-PGR), 1st Oct, Universiti Malaysia Pahang (2009)
- [7] Malaysia Farm Certification Scheme for good agriculture practices (SALM) Standard (2007), Department of Agriculture Malaysia, Putrajaya, 1-66
- [8] Othman, Z (2011). Phd thesis, Uni.Malaya, (unpublished)
- [9] ...Reinvigorating rural Malaysia, *Asia Sentinel*, retrieved at <http://www.asiasentinel.com/society/reinvigorating-rural-Malaysia>, June, 30, 2013
- [10] Porter, M.E. (1998) Competitive advantage: creating and sustaining superior performance; with a new introduction. 1st ed., Free Press,; New York
- [11] Kaplinsky, R and Morris, M.(2013). A handbook for value chain analysis, retrieved at <http://www.valuechain.org/dyn/bds/docs/395/handbook%20value%20chain%20analysis.pdf> accessed on 23rd March
- [12] Altenberg, T. ((2011), Between the global and local, the material and the normative: power struggles in India's Agrifood System, *Food Policy*,.36(6), 729-848
- [13] Yin, R.K. (2008).Case study research, Sage: Thousand Oak
- [14] Othman, S.N, Othman, Z, Yaacob, N.S and Ab Hamid, K. (2015) Exploring the innovative SRI cultivation method and impact on the organic rice value chain. RACE Grant Research Report
- [15] Hezri A. A.and Ghazali R. (2011). A fair green economy? Studies of Agriculture, Energy and Waste Initiatives in Malaysia. *United Nations Research Institute for Social Development*. Retrieved from [http://www.unrisd.org/80256B3C005BCCF9/httpNetITFramePDF?ReadForm&parentunid=85AECC96CC26C369C12579760054BFCF&parentdoctype=paper&netitpath=80256B3C005BCF9/%28httpAuxPages%29/85AECC96CC26C369C12579760054BFCF/\\$file/2%20HezriGhazali%20%28with%20cover%29%20Small.pdf](http://www.unrisd.org/80256B3C005BCCF9/httpNetITFramePDF?ReadForm&parentunid=85AECC96CC26C369C12579760054BFCF&parentdoctype=paper&netitpath=80256B3C005BCF9/%28httpAuxPages%29/85AECC96CC26C369C12579760054BFCF/$file/2%20HezriGhazali%20%28with%20cover%29%20Small.pdf)
- [16] Renzenbrink, A (2012). "Rising world demand for Cambodian organic rice", Open Development Cambodia (OPC) retrieved from <http://www.opendevdevelopmentcambodia.net/about/> on 5 March, 2012
- [17] Webber, C.M and Labaste, P.(2014). "Building competitiveness in Africa's agriculture: A guide to value chain concepts and applications", retrieved at http://siteresources.worldbank.org/INTARD/Resources/Building_Competitiveness_in_Africa_Ag.pdf accessed on 25 February, 2014
- [18] Minten, B. and Murshid, K.A.S., & Reardon, T. (2013). "Food quality changes and implication: Evidence from the rice value chain in Bangladesh", *World Development*, 42, 100-113
- [19] Wilcock, D.C and Jean-Pierre, F. (2013). "Haiti rice value chain assessment: Rapid diagnosis and implications for programme design," Oxfam American Research Background Series, retrieved at <http://www.oxfamamerica.org/publication/haiti-rice-value-chain-research>, accessed on 20 September, 2013
- [20](2009). "Marketing initiatives by CSOs in Indonesia: Value chain analysis report

- of organic rice in Indonesia”, Asia DHRRA and ASEAN Foundation
- [21](2002), “Rice value chain study: Cambodia, A report prepared for World Bank”, Agrifood Consulting International, September
- [22] Santacoloma, M (2012). “linking smallholders to organic supply chain: what’s needed?”, retrieved at <http://www.rural21.com> and accessed on 30 December, 2012
- [23] Wong, L.C.Y, Emrus, S.A, Md Bashir, B, and Tey, J.Y.S. (2010). “Malaysia Padi & Rice Industry: Applications of supply chain management approach”. National Rice Conference, Lumut, 28-30 June, 2010
- [24] Woranoot, I. (2009). “Implications of organic farming in development: experiences from organic rice farms in Northeastern Thailand”, Master thesis, Graduate School of Development Studies, International Institute of Social Studies