
Social sustainability of conventional and organic rice farming in north-eastern Thailand

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Abstract: While the benefits of organic rice for consumers are obviously seen in terms of nutritional and health aspects, the social effects of conventional and organic rice farming are also important to be investigated. This study compared the social performances of conventional and organic paddy rice in the north-east of Thailand by using the social life cycle assessment approach. The

three stakeholder groups examined were workers, local community and rice farmers. It was found that overall the social performance of the organic rice was better due to its better performance on food security and income satisfaction. In the site studied, organic rice has been cultivated for several years resulting in a slightly higher yield and lower production costs than the conventional rice product. Moreover, all supplies used in organic farming could be produced locally, which is desirable for food security.

Keywords: social life cycle assessment; S-LCA; social sustainability; social performance; conventional rice farming; organic agriculture; organic rice farming; Thailand.

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1 Introduction

Rice is an important economic crop of Thailand; it is also a staple food for people in the country. In 2020, Thailand was ranked the second largest rice exporter in the world (Workman, 2020). The export value of rice for the country was more than 116,000 million THB (Ministry of Commerce, 2020) (THB is a Thai currency, equal to USD0.031 in July 2021), accounting for 15.1% of the world's total value worth of rice (Workman, 2020). In the crop year 2019/2020, rice production of Thailand was approximately 29 million tonnes (Office of Agricultural Economics, 2020). The highest rice growing area is in the north-eastern region which shares more than 60% of the total rice plantation area of Thailand (Office of Agricultural Economics, 2020).

Agricultural development, following the so-called Green Revolution since the 1960s, resulted in the government and the private sector introducing mono-culture into Thai agriculture. On the one hand, this agricultural practice introduced modern technology to agriculture, including chemical fertilisers, pesticides, and hormones, aiming to increase productivity to meet the market's needs, reduce production costs, reduce labour intensity and increase profits from agriculture. On the other hand, the use of chemicals in the cultivation process caused farmers to have high production costs leading to debts (Kaufman, 2015). Conventional farming involves intensive agriculture and can result in a risk of chemical contamination of the food produced leading to a reduction in consumers' confidence in agricultural products (Kaufman, 2015). Continuous consumption solely of chemical fertilisers in conventional rice farming can cause a number of damaging effects on the soil properties, ground and surface water (Surekha et al., 2013), on biodiversity (Lu et al., 2020), and on global warming (Yodkhum et al., 2017).

Organic rice farming avoids the use of chemicals and focuses on using organic matter such as manure, compost, green manure and biological fertilisers. While maintaining the environment as well as resulting in the production of quality rice that is safe from residue hazards, it reduces the risk to the health of consumers. Organic farming has been introduced in Thailand for more than 30 years (Kongsom and Panyakul, 2016). Organic farming has increased due to the high cost of agro-chemicals, as well as the increased markets for export of Thai organic products (Ruenglerpanyakul, 2015). Important organic products are rice, crops and vegetables (Office of the National Economic and Social Development Board, 2017). Of all the organic agricultural products exported, organic rice shares the largest value (Kongsom and Panyakul, 2016). In addition, recently, domestic markets for organic food have been growing due to consumer awareness and demand (Kongsom and Panyakul, 2016). Therefore, there is a higher competition in organic farming. Most of the producers of organic agricultural products are small-scale family farmers (Ruenglerpanyakul, 2015).

Sustainable agriculture has been emphasised in the sustainable development goals of Thailand (Department of International Organizations, 2021). Moreover, a balanced development of the environment, economy, and society is the core of sustainable development (Holden and Linnerud, 2016). Life cycle thinking is a concept considering all stages of a product/service from cradle to grave which helps to identify hotspots along the life cycle that need improvement (Klopffer and Grahl, 2014). Life cycle-based approaches such as environment life cycle assessment, life cycle cost analysis, and social life cycle assessment (S-LCA) are used in assessing the life cycle sustainability of products and services (Valdivia et al., 2013). These approaches should be applied to achieve a holistic balance of economic, environmental, and social dimensions, leading to

sustainable development (Kloepffer, 2008; Finkbeiner et al., 2010; Valdivia et al., 2013). Among these approaches, S-LCA, focusing on the social and economic effects of products or services, is the newest (UNEP, 2020). It assesses both positive and negative social and socio-economic effects on different stakeholders throughout the life cycle of the product: acquisition of raw materials, production, use, maintenance, recycling and final disposal (UNEP, 2020). S-LCA could be used to support social aspects of the sustainable development of a product/service (Feschet et al., 2018).

In recent years, there have been some life cycle-based studies on the environmental and economic aspects of conventional and organic rice products, both at the international level (Tashi and Wangchuk, 2016; Jimmy et al., 2017; He et al., 2018; Habibi et al., 2019) and in Thailand (Yodkhum et al., 2017; Mungkung et al., 2019; Suwanmaneepong et al., 2020). However, a life cycle-based study on the social and economic aspects of conventional and organic rice products has not yet been found in literature. The purpose of this study is to compare the social performances of paddy rice from conventional and organic farming using the S-LCA approach. The findings from this study can reveal opportunities or hotspots to improve both the conventional and organic rice farming in a life cycle thinking perspective. A case study in the north-east of Thailand, which is the largest rice growing area in the country, is presented in this paper.

2 Materials and methods

The five steps in conducting the S-LCA study include site selection, goal and scope definition, social inventory analysis, impact assessment and interpretation (UNEP, 2020). Each step is described in the following subsections.

2.1 Context of the study site

Det Udom District of the Ubon Ratchathani Province in the north-eastern region of Thailand was selected as the study site. This region hosts the largest rice plantation area, representing more than 60% of the total rice plantation area in the whole country (Office of Agricultural Economics, 2020). Ubon Ratchathani Province, sharing the largest rice plantation area within the north-eastern region, was selected as the study area. Det Udom District was chosen to collect data because it shared the largest rice plantation area within the Ubon Ratchathani Province (Center for Information and Communication Technology, 2017).

Interviews with farmers in the study area revealed that organic rice farming has been practiced there for more than ten years with the original aim to reduce the production cost. The most common type of rice grown in this area is 'Khao Dawk Mali 105'. All rice farms in the study site depend on rain as the only source for water. The most common practice for rice planting is rice sow seedling. Fertilisation, weed control, and pest management, are done manually while the harvesting is generally mechanised.

2.2 Goal and scope definition

The goal of this study is to assess and compare the social performances of conventional and organic paddy rice using the S-LCA approach.

2.2.1 Reference unit

The reference unit was one hectare of paddy rice growing area. Although the results of an S-LCA may not always be expressed in relation to the reference unit, it is still recommended to set the reference to help define unit processes involved in the study (Macombe et al., 2013).

2.2.2 System boundary

The processes included in the system boundary cover land preparation, planting, fertilising, weed and pest management, harvesting, transportation, and waste disposal. Three key stakeholder groups were selected to be included in this study: workers, local community and rice farmers. Workers are defined as employees in rice farms. Local community refers to the people living in the area near the rice farms, and rice farmers are defined as rice farm owners.

While final consumers are an important stakeholder group that would directly benefit from the organic rice in terms of food safety, they were not included in the study because rice products are sold to large mills. The milled rice products are then packed for selling across the country. Therefore, it is difficult to identify specific consumers of the studied rice products. This study focused on the farming stage of rice product as previous studies have shown that cultivation is the most socially affected stage within the life cycle of an agricultural product (Prasara-A and Gheewala, 2018, 2019).

The number of interviewees for each stakeholder group is shown in Table 1. All the interviewees were selected using the purposive sampling technique (Robinson, 2014). To gain information related to the topic of study, the interviewees were selected based on their involvement with rice farming.

Table 1 Numbers of interviewees for each stakeholder group

<i>Stakeholder group</i>	<i>Number</i>
Workers	34 ^a
Local community	30
Farmers	30 ^b

Notes: ^aWorkers who work on both conventional and organic rice farms.

^bFarmers who own both conventional and organic rice farms.

2.3 Social inventory analysis

2.3.1 Selection of social aspects and indicators

The social aspects and indicators in this study were adapted from relevant guidelines, including the Guidelines for Social Life Cycle Assessment of Products and Methodological Sheets of UNEP/SETAC (2009, 2013), Sustainability Assessment of Food and Agriculture Systems (SAFA) (Natural Resources Management and Environment Department of FAO, 2013), Food Security Indicators at the community Level (Yaimuang, 2012), and Sustainable Rice Platform (2015) Performance Indicators for Sustainable Rice Cultivation.

2.3.2 Data collection

Information used to assess the social performances throughout the life cycle of the conventional and organic paddy rice were obtained by using face-to-face interviews with stakeholders in November 2018. The interviews were conducted by the researchers, using structured and open-ended questions. The data collected included quantitative, semi-quantitative and qualitative data on production processes and the opinions of the stakeholders on different social and economic issues.

2.4 Impact assessment methods

Two types of data were used in the analysis in this study, quantitative and semi-quantitative data. The quantitative data used were average yields, average working hours of workers, and average incomes for different stakeholder groups. These were collected by interviewing workers and farm owners, and were expressed per reference unit (1 hectare of rice plantation area). The semi-quantitative data were social indicator scores as described in detail in the following subsection. The performance reference point method was used to analyse the semi-quantitative data. This method compares indicator data for each social indicator with the social standards (Sureau et al., 2018). This method was preferable for use with the site-specific data as it is more accurate (Chhipi-Shrestha et al., 2015). Details of each step in this method are described below.

2.4.1 Characterisation

Social aspects and indicators used in this study are shown in Table 2. Characterisation of social indicators was done via a scoring system for each metric which was assigned a value of 1 for compliance and 0 for non-compliance with the social standards. This approach was adapted from a method used in the study of Aparcana and Salhofer (2013). The characterised social indicator result for each indicator was the average score of values from all stakeholders for that particular indicator. The results of the average scores were between 0 and 1 for each indicator. Calculation of characterised social indicator results used the following formula (adapted from Aparcana and Salhofer, 2013):

$$\frac{\sum_{i=0}^n CS_j}{n}$$

where

CS_j characterised social indicator score for indicator j given by the interviewee i

n number of interviewees.

2.4.2 Weighting

Weighting is needed to take into account the difference in significance of different social indicators. The characterised data were weighted using weighting factors based on the importance given by the stakeholders following the method used in Prasara-A and Gheewala (2019). In the questionnaires, interviewees were asked to give an importance score between 0 and 10 for each social aspect. The average importance scores were then used to calculate weighting factors for all social aspects. A weighting factor for each

social aspect is equal to its average importance score divided by sum of average importance scores for all social aspects within the same stakeholder group.

Table 2 Description of social aspects and indicators

<i>Stakeholder group</i>	<i>Social aspects</i>	<i>Indicators</i>	<i>Questions to stakeholders</i>	<i>Indicator scores</i>
Workers	Minimum wage	Receiving at least the minimum wage rate	Do you receive at least 300 THB/day?	Yes = 1 No = 0
	Equal opportunity	Equal wage rates for all genders for the same type of work	Do all genders working in the same type of work receive the same wage?	Yes = 1 No = 0
	Health and safety	No accident	Have you ever experienced a work accident in the past year?	Yes = 0 No = 1
	Freedom of collective bargaining	Have freedom of collective bargaining	Do you have the right to negotiate with employers?	Yes = 1 No = 0
	Forced labour	No forced labour	Have you ever been forced to work in rice fields?	Yes = 0 No = 1
Local community	Community Strength	No community conflicts and lawsuits caused by rice farming	Have you ever experienced conflicts and lawsuits caused by rice farming?	Yes = 0 No = 1
	Community Engagement	Participation in the community's cultural activities	Do rice farmers in your community cooperate with your community's cultural activities?	Yes = 1 No = 0
	Local employment	Local employment	Does the rice farming in your community hire local workers?	Yes = 1 No = 0
Farmers	Food security	All supplies used in rice farming are produced locally	Are all your supplies used in rice farming produced locally?	Yes = 1 No = 0
	Income	Income satisfaction	Are you satisfied with the income from rice growing?	Yes = 1 No = 0
	Land use rights	Having the right to use land	Are you entitled to use the land to grow rice?	Yes = 1 No = 0
	Women empowerment	Women involvement in decision making in rice farming	Are women in your household involved in decision making in all processes of rice farming?	Yes = 1 No = 0

The weighting factor for each social aspect was a portion of the weighting factor of all social aspects belonging to one stakeholder group. Therefore, weighting factor for each social aspect was in the range of 0 to 1. The weighting factors for all social aspects for a particular stakeholder group added up to a value of 1. The characterised data for each social indicator was then multiplied by the weighting factor for each social indicator to get the weighted results. Those weighted results for all the social indicators belonging to

same stakeholder group were summed up to get the social performance for that particular stakeholder group.

2.5 Interpretation

The social performance scores were classified into five levels. The scores were in the range of 0 to 1. The width of the class of points is 0.20. The classification of social performance scores were designed following the method of Sawaengsak et al. (2019). The meaning of the social performance scores is shown in Table 3.

Table 3 Interpretation of social performance scores (see online version for colours)

Score	Symbol	Interpretation
0.1–0.20		Poor
0.21–0.40		Fair
0.41–0.60		Moderate
0.61–0.80		Good
0.81–1		Very good

3 Results and discussion

The results of social performances of conventional and organic rice farming are shown in Table 4 and Figure 1. Figure 2 shows yields and working hours gained from different rice farming practices in 1 hectare of rice farming area per crop. Figure 3 presents income distribution for different stakeholders per 1 hectare of rice plantation area per crop.

Figure 1 Social performances of different rice farming practices for different stakeholder groups (see online version for colours)

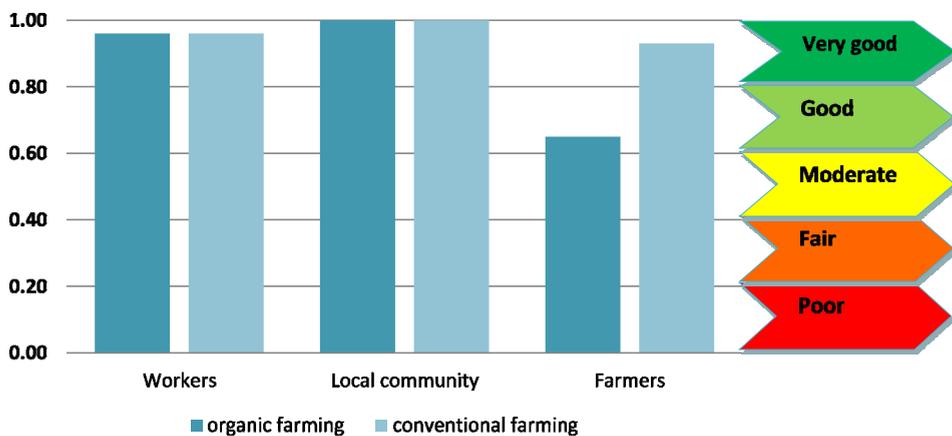
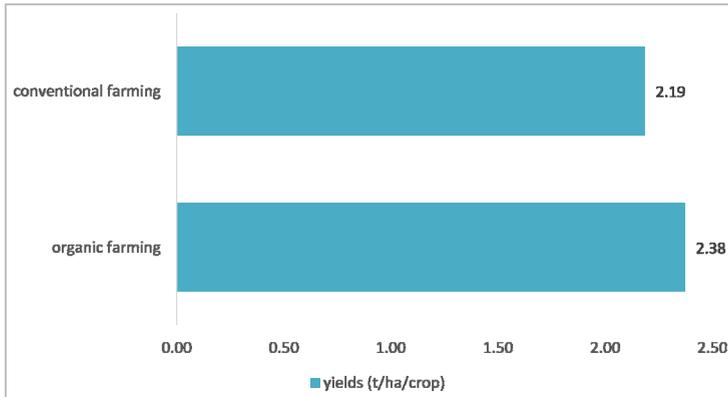


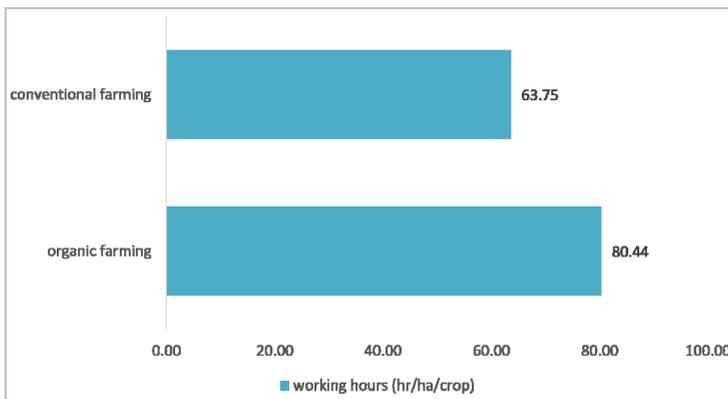
Table 4 Social performances of conventional and organic rice farming

Stakeholder group	Social aspects	Indicators	Social indicators result		Weighting factors	Weighted social indicator results	
			Conventional farming	Organic farming		Conventional farming	Organic farming
Workers	Minimum wages	Receiving at least the minimum wage rate	0.79	0.79	0.21	0.17	0.17
	Equal opportunity	Equal wage rates for all genders working on the same type of work	1	1	0.20	0.20	0.20
	Health and safety	No accident	1	1	0.20	0.20	0.20
	Freedom of collective bargaining	Have freedom of collective bargaining	1	1	0.19	0.19	0.19
Social performance for workers	Forced labour	No forced labour	1	1	0.20	0.20	0.20
	Community strength	No community conflicts and lawsuits	1	1	0.27	0.27	0.27
	Community engagement	Participation in the community's cultural activities	1	1	0.37	0.37	0.37
	Local employment	Local employment	1	1	0.36	0.36	0.36
Rice farmers	Food security	All supplies used in rice farming are produced locally	0	1	0.21	0	0.21
	Income	Income satisfaction	0.57	0.80	0.33	0.19	0.26
	Land use rights	Having the right to use land	1	1	0.31	0.31	0.31
	Women empowerment	Women involve in decision making in all processed in rice farming	1	1	0.15	0.15	0.15
Social performance for rice farm owners						0.65	0.93

Figure 2 (a) Yields and (b) working hours of different rice farming practices (see online version for colours)

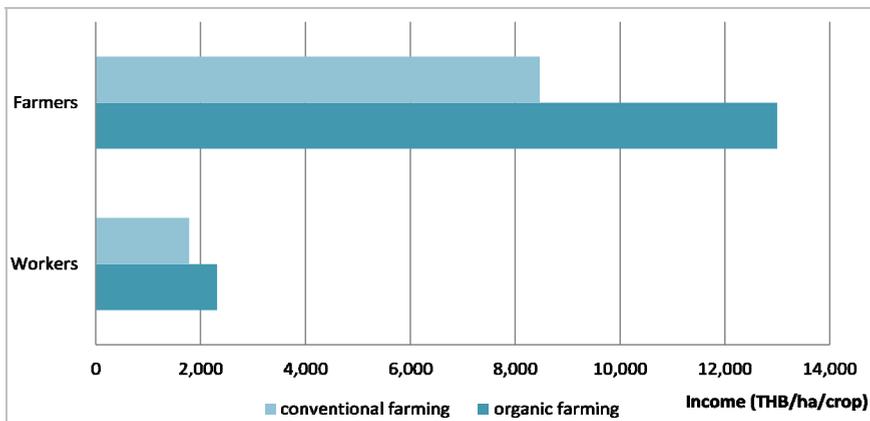


(a)



(b)

Figure 3 Income distribution of different rice farming practices for different stakeholder groups (see online version for colours)



3.1 *Workers*

Based on results in Table 4, the social performances of conventional and organic paddy rice farming for workers group had a performance score of 0.96, which is at a very good level. There was no difference in practices between the groups, considering the social indicators examined, whether it is minimum wages, equal opportunity, health and safety, freedom of collective bargaining, and forced labour aspects. Discussion on each indicator is in the following subsections.

3.1.1 *Wages*

In Thailand, there is no law regulating wages specifically for agricultural workers. However, there is the Labour Protection Act 1998 (B.E. 2541) for employers to follow. In this study, the standard wage in the agricultural sector in the area of study was employed as the comparison benchmark, which was 300 THB per day. Employment in some areas depends on the nature of the tasks, and on the competition in finding workers. The results showed that in the site studied, daily wages paid in the organic and conventional rice farming were not different. Workers received wages of 250–350 THB per day depending on the tasks. For example, in fertilisation and management of weeds and pests, wages depended on the ability of workers. In the site studied, most workers obtained at least the standard wages, with a score of 0.79 (at a very good level). When considering worker's income per hectare (see Figure 3), workers in the organic rice farming earn a little more than that of the conventional farming. This is due to more working hours during land preparation being needed to apply manure for the organic rice farming, while this is not the case for the conventional farming (see Figure 2).

3.1.2 *Equal opportunity*

Everyone deserves an equal opportunity, regardless of sex, race, age, ethnicity, religion, status or group characteristic unrelated to performance, ability and qualification. A lack of equal opportunity for everyone is a huge obstacle to sustainable development (UNEP/SETAC, 2013). The results from this study found that both organic and conventional practices showed no difference in this aspect. All workers working on the same tasks for both practices reported that they received equal wages for all genders, ages, ethnicity, etc., resulting in a score of 1 (means at a very good level).

3.1.3 *Health and safety*

The workers should be protected from health problems caused by their working conditions. These may be by training them before the actual work; and providing protective equipment to the workers in order to protect them in case of accidents caused from work. The indicator used for the health and safety aspect was the occurrence of accidents in the workplace that caused injury to workers during the past year. Results from this study found that social performance on this aspect for both organic and conventional practices was not different; both were at a level of very good. There was no accident reported in the previous year. In the site studied, most workers had the ability and experience to work on rice farms.

3.1.4 Freedom of collective bargaining

In employment, there should be no restriction on freedom of collective bargaining. Workers should be able to freely negotiate wages with employers or have the freedom to join any labour associations (UNEP/SETAC, 2013). In both conventional and organic rice farming, all workers reported that they were not restricted against joining any labour associations, resulting in a score of 1 (means at a very good level). In the area of study, the employment in rice farming was not contracted, it was seasonal work. The employers normally made agreement on wages with workers before they started working.

3.1.5 Forced labour

In any employment, there should not be forced labour. Forced labour includes forcing labourers to work in danger and not allowing workers to have holidays. Workers should have the right to work with limited scope and work time. They can stop working freely without relying on the satisfaction of employers (UNEP/SETAC, 2013). Results for both organic and conventional practices in rice farming showed that there was no forced labour, resulting in a score of 1 (means at a very good level). In rice farming, there was no issue of forced labour as employers and workers made agreement before working.

3.2 Local community

The social performances of both the organic and conventional rice farming practices for local community group had a value of 1, which is at a very good level. Discussion for each indicator is as follows.

3.2.1 Community strength

Community conflicts and lawsuits causing discontent can lead to problems in activities of the community, and may cause violence and damage to interpersonal relationships. These can harm the strength of the community (Siripongtugsin, 2018). This study assessed the occurrence of conflicts and lawsuits caused by rice farming in the community that may affect the strength of the community, which is the foundation for sustainable development. It was found that both conventional and organic rice farming practices had social performance scores at a level of very good. In the site studied, people in the community have a good relationship with each other. There was no conflict and lawsuit arising from rice farming. The coexistence of people in the community was peaceful. This implies that the rice cultivation did not cause conflict in the community.

3.2.2 Community engagement

Participation in the community's cultural activities was used as an indicator for this social aspect. To assess whether the rice farming affects the community engagement, the locals were asked whether the workers and rice farm owners participated in the community's cultural activities. This is because workers and rice farm owners are part of the community and are responsible for carrying out community activities. The results from this study showed that the social performances of both organic and conventional rice farming practices were not different and were at a level very good. Usually, they did not work on the day of community activities. Everyone participated and cooperated in

various community activities. They had roles in society and paid attention to maintaining cultural identity and local traditions, which is the core leading to sustainable development of the community.

3.2.3 Local employment

The semi-quantitative indicator used for this aspect was whether the rice farm owners hire people in the community to work. Hiring local workers can help with economic development and help locals in the community to have strong and good relationships, as well as to reduce migration out-of-town for work. The results from this study found that both organic and conventional rice farming used local workers, resulting in having social performance scores of 1 (at a level of very good). When considering quantitative indicators (working hours/ha/crop) shown in Figure 2, it is seen that the organic rice farming contributed a little more on employment. This resulted from more workers being hired to apply manure during the land preparation stage in organic rice farming.

3.3 Rice farm owners

The overall social performance of the organic rice farming practice had a social performance score of 0.93, which was at a level of very good. The conventional farming practice had the score of 0.65, which was at a level of good. The factors causing the difference between social performance scores of the two farming approaches were local supplies and income satisfaction issues. Other indicators show the same social performance scores. Discussion for each indicator is as follows.

3.3.1 Food security

The use of supplies that could totally be produced locally implies food security. The fact that all inputs used on the rice farms are acquired from the local area ensures food security of the community (Yaimuang, 2012). The indicators used for this issue was whether all supplies used in rice farming were produced locally. The results from this study showed that the organic rice farming obviously had more food security than the conventional rice farming practice. In the conventional farming, to help in rice cultivation, the farmers still depend on agro-chemicals which need to be imported from abroad or from other provinces. In organic rice farming, no chemicals were used and all inputs were produced locally. In addition, there was support from the government, such as training on organic farming, providing equipment for making organic fertilisers, etc., which could also help them to save production costs.

3.3.2 Income satisfaction

Income satisfaction of the farm owners was used as an indicator for this aspect. In a study of Kaufman (2015), it was reported that income is the most important factor for the rice farmers to convert to organic rice farming. The rice farm owners should have sufficient income; this will result in stability in life and improvement of the quality of life for themselves and their families. Moreover, they should have an incentive for their occupation and economic development. If the farmers' incomes are inadequate, it may affect farmers and their families. This may lead risks of debts and non-formal loans

problems. The results from this study showed that in the study area, the organic rice farmers were more satisfied with income than the conventional rice farmers. This corresponded with the quantitative results (net income) shown in Figure 3.

This resulted from lower costs of inputs used in the organic rice farming and a slightly higher yield for the organic rice (see Figure 2). Yields of organic and conventional rice found in this study may seem to contradict the results reported in some other studies (Mungkung et al., 2020; Suwanmaneepong et al., 2020). However, it corresponds to the results in a five-year study of Surekha et al. (2013). They found that the yields for organic rice were lower than the conventional rice in the first few years. In the fifth year, the yield of organic rice was comparable to that of the conventional one, due to soil quality improvement. Moreover, in a study of Tamaki et al. (2002), it was found that yield and growth of rice with continuous organic farming was higher than that of conventional farming. The organic rice cultivation in the site studied has been going on for more than ten years. Therefore, the soil quality has been improved, resulting in higher yields for organic rice.

3.3.3 Land rights

Having the right to use land is very important for every farmer. They should have the right to use the land freely and correctly. If not owning the land themselves, they should at least have a written lease. Having proper land rights to grow rice could also imply food security (Yaimuang, 2012). The results from this study indicated that social performances on this aspect for both organic and conventional rice farming practices were not different, both had scores of 1 (at a level of very good). Farmers had the proper rights to use land to grow rice. In the site studied, there were both farmers owning land and the lands that farmers had contracted to rent correctly. The land used to grow rice was mostly not changed to grow other crops.

3.3.4 Women empowerment

Women in the household being involved in decision making in rice farming indicates women empowerment (Sustainable Rice Platform, 2015). In this study, the indicator used to assess this issue was whether the women in their families were involved in decision making in all processes of rice cultivation. The results showed that both conventional and organic rice farming in the study area had the social performance scores (for this aspect) of 1 (at a level of very good). There was no difference in results for both cultivation practices and it implies that the women empowerment was strong in rice farming in the study area.

3.4 Social performances for different stakeholder groups

When considering social performance scores for different stakeholder groups, the scores for farmers, of both conventional and organic paddy rice, are lower than scores for other stakeholder groups. In addition, the overall social performance score of organic paddy rice is higher than that of the conventional one. This implies that farmers are affected by a change in agricultural practice (conventional or organic). The key social aspects influencing the social performance score of organic rice farming for farmers are food security and income. Food security of organic rice farming is due to all supplies used in

the rice cultivation being produced locally. Incomes of farmers for organic rice farming in this study are higher because in the study site, the organic rice has higher yields (discussed in details earlier in Section 3.3.2). Moreover, the production cost of organic rice is lower as organic rice farming use local supplies which are available at lower prices, compared to agro-chemicals.

The results from this S-LCA study suggest that farmers should initially be supported in organic rice farming, as they are affected by a change in rice farming practice (conventional or organic). Moreover, they have a role to decide their agricultural practice (Sharma, 2016) which will consequently affect other stakeholder groups in the supply chain. Although S-LCA approach is useful in providing social performances of conventional and organic rice farming for different stakeholder groups, it only provides results on a limited dimension of sustainability. It is suggested that the results from this study are used with other studies on environmental aspects of conventional and organic rice farming as supporting information to enhance sustainable agriculture.

4 Conclusions

This study used S-LCA to compare the social performances of conventional and organic paddy rice. The results revealed that the social performance scores of all stakeholder groups were not so different except for the case of farm owners. The workers and local community had very good social performances for both conventional and organic paddy rice. For the rice farmers, the social performance score of the organic paddy rice was higher than that of the conventional one. This is because the organic rice farming performs better in terms of food security and income satisfaction. One of the major factors influencing this was that all supplies used in rice organic farming were produced locally, which is required for food security. In addition, in the study area, organic rice farming had lower production costs and slightly higher yields, resulting in a higher income for the farmers. Given that organic rice farming has been practiced for several years, it can provide slightly higher yields than that of the conventional rice. The results obtained from this study are expected to be used as supporting information for policy makers for indicating the social and economic aspects in sustainable development. It should be used together with the results from other research such as that on environmental assessment of conventional and organic rice products to have wider views on sustainability performances of the conventional and organic rice farming.

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