Enhancing sustainability amongst oil palm smallholders in Malaysia

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Abstract: Oil palm research is performed to develop new and upgraded products to face global challenges and thus, the industry is emerging as a dependable source of empowerment for the country. However, it also poses a serious threat due to unawareness of sustainability issues by the smallholders. Thus, this study assesses the actions of oil palm smallholders in a sustainable manner from the environment, economic, and social perspectives. The primary data is collected through a questionnaire survey with 50 supported smallholders in the Terengganu state under the FELDA scheme in Malaysia. The result demonstrates that dependent smallholders with primary level education are responsible for most of the pollution in the environment due to wrong agricultural practices. The study suggests that there is room for improvement in the social, environmental, and economic aspects of sustainability through intensive and quality training, depending on the role played by the authorities and the dependent smallholder cooperatives.

Keywords: sustainability; oil palm; palm oil industry; smallholders; environment sustainability; economic sustainability; social sustainability; FELDA; Federal Land Development Authority; spider diagram; Terengganu; Malaysia.


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This paper is a revised and expanded version of a paper entitled ‘Enhancing sustainability amongst oil palm smallholders in Malaysia’ presented at the ‘International Symposium on Sustainable Development and Management (ISSDM)’, UTM International Business School (UTM IBS), Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia, 8-9 October 2016.

1 Introduction

Oil palm (Elaeis guineensis) is an emerging economic sector globally because of the continuous high demand (Basiron, 2007). However, the origin of oil palm is from the tropical rainforests of West Africa and it is traditionally used for different purposes such as a food ingredient, medicine, woven material, and for the production of wine (Corpuz and Tamang, 2007). Besides, other oil crops have much smaller outputs comparatively such as soybean, sunflower, and rapeseed with yields of 0.36, 0.42, and 0.59 tons per hectare in a year, respectively (Alam et al., 2015; Basiron, 2007). Admittedly, 89% of the world’s palm oil is produced in the Asia Pacific region, with 84% from Indonesia and Malaysia and has been cultivated on around 15 million ha of land (FAO, 2009; Fitzherbert et al., 2008; Koh and Wilcove, 2008). Since the 1990s, the area occupied by oil palm cultivation has expanded worldwide by approximately 43%, driven mainly by demand from India, China, and the European Union, and global demand for palm oil is expected to double by 2020 (RSPO, 2011).

In addition, oil palm cultivation is mainly centralised in some countries in Southeast Asia, South America, Africa, and Oceania. Major countries producing oil palm are Malaysia, Indonesia, Thailand, Ecuador, Colombia, Nigeria, and Papua New Guinea, while still expanding (FAO, 2009). As a result, total land used for cultivation doubled to 6.3 million hectares from 2.9 million with active participation from smallholders and this has also created approximately 1.3 million jobs to add to the existing 1.7 million jobs in this sector (Deininger, 2011; Ismail et al., 2003; Rahman et al., 2008; McCarthy, 2010).
This development is not only for strengthening the economy but also for participating in poverty alleviation, rural, and social development (Feintrenie et al., 2010; Basiron, 2007).

It should be noted that Malaysia is one of the second largest producers after Indonesia (MPOB, 2009; MPOB, 2007; MPOC, 2007) and the largest exporters of palm oil in the world, accounting for 11% of the world’s oils and fat production and 27% of export trade of oils and fats (Oil World, 2006; MPOB, 2015). The industry provides employment to more than half a million people and livelihood to an estimated one million people in Malaysia as well (MPOB, 2012). In 2012, the oil palm planted area reached 5.08 million hectares, an increase of 1.5% against 5.00 million hectares recorded in 2011 in Malaysia. This was due to increases in planted area in Sarawak, which recorded an increase of 5.3% or 54,651 hectares (MPOB, 2012). Besides, the export of palm oil products such as palm kernel oil, palm kernel cake, oleo-chemicals, biodiesel, finished products in 2011 and 2012 brought in revenue in excess of RM 80.4 and RM 71.4 billion respectively to the country (MPOB, 2015). However, it is mentioned that the smallholder’s productions have been decreasing after 2014 in the country (MPOB, 2015; Oil World, 2016).

Moreover, according to MPOB (2015), Malaysia has 4.7 million hectares of oil palm plantations, 439 mills, 43 crushers, 51 refineries, 18 oleo-chemical plants, and 25 biodiesel plants. However, oil palm plantation makes up 77% of agricultural land or about 15% of total land area (MPOB, 2012). It is asserted that the industry is dominated by large plantation companies (private- and government-linked companies) which hold 60% of total plantation land, with a growing level of integration along the value chain (IFAD, 2013). However, there is a significant share of palm oil plantation area under the ownership of organised smallholders and independent smallholders (ETP, 2009). To define oil palm smallholders, the existence of recent literature on this matter is ample (McCarthy and Cramb, 2009; Jelsma et al., 2010; Feintrenie et al., 2010; McCarthy et al., 2012; Rist et al., 2010; Cramb, 2011). However, the term smallholder (the definition used by the Roundtable on Sustainable Palm Oil, RSPO) relates to family-based enterprises producing palm oil from less than 50 ha of land (Vermeulen and Goad, 2006). The smallholders make up nearly 41% of the area in Malaysia (Adeeb et al., 2011). On the other hand, smallholders form a vital part of the global agricultural community, yet they are often neglected (IFAD, 2013) and it increases the community problem. Hence, the industry faces the shortages of labour to boom their production (MPOB, 2009; MPOC, 2007; MPOB, 2007).

Beside, smallholders are categorised as mainly dependent and independent smallholders (RSPO, 2007). It is mentioned that supported or dependent smallholders: growers with direct support from either the private or government sector are bound by agreements with limited autonomy (Vermeulen and Goad, 2006). Independent smallholders mainly growers with tiny or no assistance from government and Private plantation also play an important role in the industry controlling 14% of the industry in the country. It is estimated that smallholders account for nearly 41% of the total oil palm plantation in the country, with about 28% from supported and 11.30% for independent smallholders, respectively, while private estates account for 60.7% (MPOB, 2011). However, the expansion of smallholders has had considerable impacts on the indigenous communities, affecting their rights to land, territories and natural resources that they have traditionally owned, occupied, or otherwise used (Colchester et al., 2011; Majid Cooke, 2012). It is asserted that the smallholders are a prominent contributor to the national economy (Alam et al., 2016).
On the contrary, the livelihood of smallholder farmers is significantly increasing with their increase of incomes (Feintrenie et al., 2010), and the productions of smallholders have much to offer the future of the palm oil industry in terms of sustainability and credibility. Indonesia and Malaysia, two countries responsible for over 80% of world oil palm production, have smallholders who account for 35–40% of the total area of planted oil palm and as much as 33% of the output, and in West African countries that produce mainly for domestic and regional markets, smallholders produce up to 90% of the annual harvest. Additionally, by 2020, the cultivation of palm oil is expected to be expanded in both Indonesia and Malaysia with a range of 3–8% (Wicke et al., 2011). However, the growth of this sector has not only produced revenue and employment, but it is also responsible for deforestation, greenhouse gas emissions, and social-political unrest at the community level due to land conflicts, insecure property rights, and a failure of companies to provide promised services to communities (Reijnders and Huijbregts, 2007; Danielsen et al., 2009; McCarthy and Cramb, 2009; Tan et al., 2009; McCarthy, 2010; McCarthy and Zen, 2010; Rietberg, 2011). Conversely, the formation of the crops (along with other plantations) in Sumatra, Kalimantan, and East Malaysia has been cited as the foremost reason for air pollution and for instance, in 1997, pollution affected many areas of Southeast Asia (Clay, 2004; Sargeant, 2001), creating an economic loss (for agriculture, health, tourism, etc.) estimated at US$9.3 billion (Kamal, 2001).

In addition, in 1875, oil palm was introduced to Malaya by the British as an ornamental plant and first commercial planting in Tennamaran Selangor Estate in 1917. However, to initiate a scheme in the 1960s, the Government of Malaysia increased the cultivation pace of oil palm by introducing land settlement schemes (e.g. FELDA smallholders) to eradicate poverty on an initial size of 375 ha to help the landless farmers and committed to the environment guides their operations to put into action using sustainable practices (FELDA, 2006; FELDA, 2007). FELDA is an active member of the RSPO since 18 October 2004. FELDA has since set up over 442 schemes, covering roughly 800,000 ha and involving more than 100,000 families (FELDA, 2006; FELDA, 2007).

However, defining Sustainability is a pluralistic concept (Rietberg, 2011) that has been transcribed in many ways with different meanings depending on the context of the discussion and the audience of the debate (Redclift, 2005). Nonetheless, sustainability has created a boundary term to link disparate groups on the basis of a broad common agenda (Scoones, 2007). To make it clear, Agyeman et al. (2003) define that sustainability is not only about environmental concerns, but it is also a wider perspective of social needs, welfare and economic opportunity which are integrally connected to environmental concerns.

The intention to analyse sustainability of smallholder palm oil production looks at all three of the Brundtland report (1987) recognised as dimensions of sustainability – namely environmental, social, and economic. Oil Palm can be grown and harvested in environmentally sustainable and socially responsible ways, especially through small-scale agro forestry. Much of the production in West Africa fits into this category. Nonetheless, a great number scale of mono-cropping plantations in many countries does not have a good record (UNDP, 2007). It is not just the sustainable practices of West African growers in particular, but the relatively higher sustainability of smallholders in general, which seems to have become common knowledge in most discussions on oil palm sustainability. However, the debate continues about the oil palm ambiguity of the sustainable development concept and oil palm is the golden crop that catalyses
smallholders out of poverty and brings salvation to the global food and energy crisis towards its supporters (Basiron, 2007; de Vries et al., 2010).

Although some scholars argue that the sustainability concept has been used too extensively and that the concept should be ‘reclaimed’, indicators limited to environmental impacts are not sufficient in the analysis of palm oil production (Johnston et al., 2007). Johnston argues that too much attention has been given to economic aspects of sustainability, and that emphasis should be returned to the environment. The Malaysian oil palm industry strives to strike a holistic balance with environments. However, proper management of natural resources would help protect their biological production potential and help maintain future options for their use. Indeed, a major objective of sustainable land management is the harmonisation of agricultural priorities with environmental concerns (SD, 2014). Nonetheless, the researcher includes that smallholders are mostly responsible for environmental pollution including Malaysia (IFAD, 2013).

Moreover, the United Nations Development program (UNDP, 2007) has been just one source among several others that believes smallholder production to be a better alternative than the larger mono-crop plantations. Despite the often cited claim that oil palm is the golden crop that lifts people out of poverty (Simeh and Tengku, 2001b), small land sizes paired with unsustainable management and resulting low yields keep a significant number of farmers at low profit margins (Ismail et al., 2003; Rahman et al., 2008; McCarthy, 2010). Unfavourable farming contracts and loss of autonomy over their land restricts a large number of smallholders to oil palm only, making them vulnerable to production and price shocks (McCarthy, 2010; McCarthy and Zen, 2010; Cahyadi and Waibel, 2016.)

Vermeulen and Goad (2006) and Abazue et al. (2015) also believe that ‘smallholder oil palm production has the potential to secure mutually beneficial outcomes for large and small producers and processors, enhance social and environmental sustainability at the landscape scale, ease land disputes between smallholders and large plantations and promote credibility among consumers – going beyond simple criteria for corporate responsibility’. Moreover, they added that smallholder oil palm production is believed to ensure good relationships between growers and both the environment and surrounding communities. For its critics, it is the single biggest threat driving the whole destruction of peatlands and rainforests, as well as increasing greenhouse gas emissions (Fitzherbert et al., 2008; Island, 2015; Clough et al., 2016; Linder and Palkovitz, 2016).

However, it is evident that smallholders represent a very important role in oil palm plantation (Jelsma et al., 2010) and they are responsible for two-fifths of global palm oil production (Balch, 2013). However, there is a lack of knowledge on good agricultural practices for becoming sustainable (Begum et al., 2014a; Begum et al., 2014b; Begum et al., 2014c; Alam et al., 2015). In connection with previous research, it is revealed that the policies and regulatory approaches may fail to meet the needs of the oil palm smallholders if there are no concerns about its sustainability approach (Gillespie, 2012). Moreover, fertiliser prices have already risen sharply since a lot of smallholder oil palm was planted, and further price increases and continued volatility of the oil palm market could quickly make oil palm a much less attractive smallholder crop (Ghazoul et al., 2015). There is a great need to help smallholders meet the international and national standards for oil palm production and to develop capacities to diversify their options for livelihood (Mohd Noor et al., 2017). This belief is reflected in suggestions to improve oil palm sustainability in the future in many of the literature sources that have been
reviewed, as well as projects carried out by institutions such as the World Bank and FAO. World Bank, particularly, has been investing heavily in the establishment of various smallholder scheme projects in palm oil producing countries. Thus, this study aims to explore the benefits and actions of ensuring sustainability that smallholders are currently receiving, and will receive in the future through their personal and social lives, as well as the country’s economy, if they practise all the rules and regulations as guided by the MPOB and FELDA for the betterment of the Malaysian oil palm sector.

2 Research methods

A questionnaire was developed from Begum et al. (2014a, 2014b, 2014c, 2015), Abazue et al. (2015), and Alam et al. (2016) in order to obtain the perspective from several smallholders in Malaysia. The different causes were identified from the literature review and these were divided into three factors to investigate the sustainability of oil palm smallholders based on the economic, social, and environmental perspectives (3Ps). The researcher made contact with potential respondents based on the statistics of settlers in the Terengganu state that had been formed under FELDA, MPOB. FELDA was chosen because it has improved in its products as it is directly involved with the Roundtable Sustainable Palm Oil (RSPO). The smallholder of FELDA is a member of the ‘Environment Working Committee’ in the MPOA (Malaysian Palm Oil Association). According to the RSPO annual communication of progress report with FELDA smallholders (FELDA, 2007) with continuous sponsored by FELDA for the restoration, beautification and maintenance places of historic, cultural and environmental interest (such as the Kota Gelanggi caves in Pahang) for valuing national heritage near FELDA projects, indeed, the oil palm industry in Malaysia including FELDA is well and truly regulated with a series of legalisation that covers the uses of pesticides, land, environment, wildlife, labour, and employee matters.

Moreover, the study adopted the quantitative approach. It was possible as the questionnaire-based survey targeted a large number of the smallholders (workers) themselves and would permit generalisation of findings as against a few individuals. An open-ended questionnaire forms the main instrument for data collection, based on a three-scale Likert’s option with 50 respondents. Use of literature review complemented the information obtained from the questionnaire. The sampling technique adopted was cluster sampling in which the participants were categorised according to the number of months spent on the scheme.

3 Data analysis and discussions

The questionnaire was divided into several sections including the demographic information on the respondents, the environmental aspect of sustainability, followed by the social and economic sustainability.

3.1 Demographic profile of the respondents

The demographic background of the respondents is illustrated in Table 1. It represents the frequency and proportion of the respondents according to their age, gender, ethnic,
education, duration of involvement and the size of their family members. 54% of the respondents illustrate that maximum smallholders who are farming are between 41 to 60 years old. According to gender, most of the smallholders (98%) are male and the rest (2%) are females who participated in this study. The findings assert previous researches to encourage women in the plantation sector with the treatment of women workers in plantations deserving attention (Teoh, 2010). Besides, only 20% of the Indian race are working in plantations under the FELDA scheme though they are industrious rather than the Malay race based on personal observation during the interviews. Additionally, based on the table, 40% mention that the majority of the oil palm smallholders have only completed their primary education which is an obstacle to gathering knowledge about sustainability. This is also highlighted by a previous study (Alam et al., 2015). According to the involvement of schemes among the respondents, the study found that the majority (70%) of the respondents have been involved in the schemes for a maximum of between seven to ten years. Moreover, the number of family members of the respondents has a maximum of five to seven members, whereas only 18% have eight to ten members.

### Table 1  Demographic profile of the respondents

<table>
<thead>
<tr>
<th>Issues</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>21–40 (16%)</td>
<td>41–60 (54%)</td>
<td>61–80 (30%)</td>
<td>–</td>
</tr>
<tr>
<td>Gender</td>
<td>Male (98%)</td>
<td>Female (2%)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ethnic</td>
<td>Malay (80%)</td>
<td>Indian (20%)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Education</td>
<td>Diploma/degree (30%)</td>
<td>Secondary school (26.0%)</td>
<td>Primary school (40.0%)</td>
<td>Others (4.0%)</td>
</tr>
<tr>
<td>Duration of involvement</td>
<td>1–3 years (20%)</td>
<td>4–6 years (10%)</td>
<td>7–10 years (70%)</td>
<td>10+</td>
</tr>
<tr>
<td>Size of household</td>
<td>2–4 (36%)</td>
<td>5–7 (46%)</td>
<td>8–10 (18%)</td>
<td>–</td>
</tr>
</tbody>
</table>

**Source:** Author’s primary survey at Jerangau Dungun, FELDA Terengganu State, 2013

### 3.2 Environment sustainability

The smallholders level of environmental sustainability awareness is mentioned in Table 2. A greater number of the smallholders practise (70%) a high level of awareness to protect the environment. However, around 30% are still reluctant to indicate about saving energy but 50% agreed about saving energy. The huge proportion of almost 70% of the respondents did not give an answer about their awareness of pollution during the plantation activity. However, the smallholders do participate in training about harvest and the harvesting act (FELDA, 2006; Butler, 2007; Begum et al., 2014a; Begum et al., 2016; Alam et al., 2016). Majority (42%) of respondents agree that their method of land preparation has led to air pollution. Indeed, 46% of the respondents agree that their settlements comply with the good agricultural practices (GAP) in compliance with laws and enactments. These are evident through laws and enactments including the adoption of environmental policies and requirements, implementation of Good Agriculture Practices (GAP), and Implementing Codes of Practices (COPs). Moreover, on the issue of bush burning as a means of preparing the land is isolated as only a few burning really takes place. Besides, the statistical tools of mean and standard deviation show a positive significant influence boosting productivity in the palm oil industry. However, the government has committed itself towards ensuring the protection and preservation of the
biodiversity by setting aside 2.1 million hectares of the 19.37 million hectares in the whole country under a forest cover, for nature parks, wildlife reserves, bird sanctuaries, and marine parks which is consistent with the concepts of sustainability (MPOB, 2011).

**Table 2**  Smallholders awareness of environmental issues of oil palm plantation

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Yes</th>
<th>No</th>
<th>Undecided</th>
<th>Mean (%)</th>
<th>SD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect environment</td>
<td>70%</td>
<td>30%</td>
<td>0%</td>
<td>4.22</td>
<td>0.58</td>
</tr>
<tr>
<td>Save energy</td>
<td>50%</td>
<td>20%</td>
<td>30%</td>
<td>4.20</td>
<td>0.45</td>
</tr>
<tr>
<td>Awareness about pollution during plantation activity</td>
<td>20%</td>
<td>10%</td>
<td>70%</td>
<td>3.80</td>
<td>1.70</td>
</tr>
<tr>
<td>Land prepare (leads to air pollution)</td>
<td>42%</td>
<td>32%</td>
<td>26%</td>
<td>3.06</td>
<td>0.94</td>
</tr>
<tr>
<td>Settlement complies with the good agricultural practices with the GAP</td>
<td>46%</td>
<td>30%</td>
<td>24%</td>
<td>3.12</td>
<td>0.94</td>
</tr>
</tbody>
</table>

*Source: Author’s primary survey at Jerangau Dungun, FELDA Terengganu State, 2013*

**Figure 1**  Smallholders awareness of environmental issues (see online version for colours)

**Smallholders Awareness of Environmental Issues**

Figure 1 illustrates for the smallholders awareness of environmental issues. It shows the average performance of the basic environmental issues. The environmental protection issue is reached 4.22 out of 5 scale. Energy savings issue 4.2; pollution awareness (during plantation activity) 3.8; land preparation (leads to air pollution) 3.06 and finally good agricultural practices (GAP) achieve 3.12 out of 5 scale.
3.3 Economic sustainability

In fact, as reviewed by the researcher, the oil palm plantation is regarded as a success story in terms of the contribution of economic emancipation and jobs creation (Begum et al., 2014a; Begum et al., 2014b; Alam et al., 2015; Alam et al., 2016). However, based on Table 3 designated for sustainable economy, 44% of the respondents agree that joining the scheme has given them opportunity to manage their daily expenses as compared to their previous jobs. The evidence can be compared with previous literatures that is ‘the industry is the fourth largest contributor to the national economy, accounting for RM53 billion in the Gross National Income (GNI) and accounted for 9% of the country’s GDP; in terms of jobs, it has created 0.16 million jobs in the year 2011’ (MPOB, 2011). However, consistent with evidence, about 62% agree that they have increased their monthly savings. In addition, the assertion is consistent with existing literatures that ‘the demand for edible vegetable oils is expected to double from present consumption of around 120 to 240 M t yr-1 by 2050, based on projected per capita consumption and population growth’ (Corley, 2009). However, majority of the respondents (92%) agree that their incomes are affected by uncertain commodity prices and it is consistent with a previous study as well (Alam et al., 2015). When pressed further to explain, some of them said that they have to use their savings to pay up in some cases especially for taking loans to procure planting materials and other inputs. On whether the scheme has brought meaningful economic development to them and their community, a large segment of the respondents is positive. A total of 80% of the respondents strongly agree that it has brought meaningful economic development while only 18% could not profit from the cultivation of oil palm and previous findings have also interpreted the same finding (Begum et al., 2014b).

<table>
<thead>
<tr>
<th>Issues</th>
<th>Yes</th>
<th>No</th>
<th>Undecided</th>
<th>Mean (%)</th>
<th>SD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage daily expenditure</td>
<td>44%</td>
<td>26%</td>
<td>30%</td>
<td>2.70</td>
<td>1.42</td>
</tr>
<tr>
<td>Increased monthly savings</td>
<td>62%</td>
<td>20%</td>
<td>18%</td>
<td>2.62</td>
<td>1.47</td>
</tr>
<tr>
<td>Increased savings affected by the instability of commodity price</td>
<td>92%</td>
<td>8%</td>
<td>0</td>
<td>4.26</td>
<td>0.83</td>
</tr>
<tr>
<td>as a member of the scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance economic development by agricultural training course</td>
<td>42%</td>
<td>58%</td>
<td>0</td>
<td>1.42</td>
<td>1.50</td>
</tr>
<tr>
<td>increased profit from being involved in FELDA scheme compared to previous job</td>
<td>80%</td>
<td>18%</td>
<td>2%</td>
<td>4.12</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Source: Author’s primary survey at Jerangau Dungun, FELDA Terengganu State, 2013

Moreover, 58% mention that the scheme does not train them properly to enhance the economic development through agricultural training courses such as the GAP method. Nonetheless, the statistical tools of mean and standard deviation show a positive significant influence in boosting productivity in the palm oil industry and showing that it has boosted its income and improved national economy for the youths. During the interview, they also stated that the oil palm industry has indirectly led to infrastructural development in the form of access road networks and affordable health facilities developed for their children, educational facilities, and many other benefits due to the oil palm plantation.
The radar chart in Figure 2 simplifies the growth rate of sustainability of oil palm smallholder’s average performance based on economic issues. The daily expenditure they can cover still poor (2.7) out of 5 scale; increased monthly savings also poor (2.62); savings affected by the uncertain commodity price is very high (4.26); economic development through agricultural training needs to raise up (1.42); developed through FELDA scheme compared to previous job is good (4.12) out of 5 scale.

Figure 2  Economic sustainability of oil palm smallholders (see online version for colours)

3.4 Social sustainability

One of the major criticisms associated with oil palm industry has to do with social issues (Table 4). The welfare of the workers is based on their living condition and quality of life as well as the corporate social responsibility of the plantation industry to the local people. Majority of the respondents (60%) highly agree that since joining the scheme they do not suffer any health problems as they (90%) are aware of avoiding hazards during their agricultural activities. 96% of the respondents agree that their children have access to quality education system and getting equal opportunities that is in comparison with other national educations in the country and merely 4% disagree about this. On the question about the fulfilment of their basic needs, most of the respondents (90%) strongly agree that their basic needs are better taken care of now as compared to pre-scheme and the settlers regularly have money in their pockets at the end of the month after expenses compared to when they never joined. On the impact of smallholders’ oil palm scheme on the rural livelihoods in terms of poverty alleviation, finds a significant reduction in poverty among the smallholders from 68.3 % in 1970 to 11.8% in 1997 (Simeh and Tengku, 2001a).
Since most of smallholders are migrant workers from neighbouring countries, the study paid attention in making sure that their identities were concealed in order to protect their jobs. Since the study was carried out on a few FELDA schemes, the findings may not represent the overall picture of what actually happens in the other plantations including private plantation. However, neighbourhood is in good practice rather than before as mentioned by 56% of the settlers. For instance, there is a consensus based on the finding of the study that the oil palm industry has helped in reducing poverty especially among the rural population – in terms of job creation, improvement in the income level of the rural folks as well as the workers, giving credence to Basiron (2007), that the oil palm plantation has contributed in uplifting the quality of life of many Malaysians and has thus served as a catalyst in poverty alleviation among the landless farmers through their participation in the FELDA scheme. Besides, about 76% of the respondents indicate that they are involved in decision-making for social activities because of their rapid positive change of income status. Besides, the statistical tools of mean and standard deviation are showing positive significant influences boosting productivity in the palm oil industry. However, there is a scarce of quality medical treatment as this is far from the cities. The evidence is consistent stating that ‘the scheme is an active player through providing support for the socio-economic development of the rural populations’ (Pride, 2006; Begum et al., 2014a; Begum et al., 2014c).

Table 4 Social sustainability of oil palm smallholders

<table>
<thead>
<tr>
<th>Issues</th>
<th>Yes</th>
<th>No</th>
<th>Undecided</th>
<th>Mean (%)</th>
<th>SD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suffered in health problems</td>
<td>40%</td>
<td>60%</td>
<td>0</td>
<td>1.30</td>
<td>0.46</td>
</tr>
<tr>
<td>The awareness avoid of hazards for health security</td>
<td>90%</td>
<td>2%</td>
<td>8%</td>
<td>4.22</td>
<td>0.65</td>
</tr>
<tr>
<td>Children access in education and equal opportunities by scheme’s support</td>
<td>96%</td>
<td>4%</td>
<td>0</td>
<td>1.96</td>
<td>0.20</td>
</tr>
<tr>
<td>Involvement in social activities</td>
<td>76%</td>
<td>24%</td>
<td>0</td>
<td>1.76</td>
<td>0.43</td>
</tr>
<tr>
<td>Access to quality medical care as a member of the scheme</td>
<td>12%</td>
<td>6%</td>
<td>82%</td>
<td>3.92</td>
<td>0.72</td>
</tr>
<tr>
<td>Fulfilled basic needs are better than before</td>
<td>90%</td>
<td>2%</td>
<td>8%</td>
<td>4.12</td>
<td>0.63</td>
</tr>
<tr>
<td>Neighbourhood is in good practice rather than before</td>
<td>56%</td>
<td>44%</td>
<td>0</td>
<td>1.56</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Source: Author’s primary survey at Jerangau Dungun, FELDA Terengganu State, 2013

Figure 3 (spider gram) explains about the sustainability of oil palm smallholder’s average performance based on social issues. The health problems issues are still exist (1.3); hazards awareness for health security is good position (4.22); children’s access to education and equal opportunities need still some focus (1.96); involvement in social activities is also not in a good position (1.76); access to quality medical care appears to be improving (3.92); fulfil more basic needs is also good (4.12); on the other hand, good neighbourhood practices are still in a worse situation (1.56) based on the 5 scale.
4 Discussion and conclusion

The findings show that oil palm is increasing the value of the Malaysian smallholders by comparing it with the Indonesian palm oil sector and assess the sustainability of oil palm smallholders according to the environment, economic and social perspectives. The findings of the study based on an open-ended questionnaire with the smallholders themselves largely point to positive impacts on the scheme on the local participants. Nonetheless, negative impacts such as deforestation, river and land pollutions were believed to be of great concern to those whose livelihood depends on the traditional ways of life. The study is also limited to smallholders (employees) based on the information they provided, augmented with past literature on the FELDA scheme. However, the findings highlight that the training scheme is not helpful for them to understand sustainability.

In addition, the smallholders added the value of their personal life through their income and they have managed to cover their daily expenditure. Hence, the commodity prices are increasing. In adding details, it is also asserted before (Begum et al., 2015) and it increases the sustainability of the oil palm sector. However, the communities are facing health problems due to the hazards of the open burning process. On the contrary, smallholders are mainly responsible for environmental pollution due to the limitation of knowledge of GAP. Thus, it enhances the climate change fiction. During the field survey, the settlers mentioned that they are receiving less training and less performance award for their FFB production especially those who really follow the GAP method. However, the scheme claimed that they have continuous training of GAP from MPOB and local Standard bodies such as DOE (FELDA, 2006). Thus, the supported smallholders are also neglected to get proper training and education of sustainability similar to independent smallholders. Besides, the majority of the smallholders is not aware fully of these.
policies and laws and does their bit in adhering to these provisions through the concern of the scheme manager. Issues that concern the estate workers/smallholders were not serious as the findings show that in facilities such as schools, hospitals, sanitation, and accessible roads were present but there is neither quality treatment nor quality education. Hence, the quality education is also compulsory to enhance the knowledge of the oil palm sector’s sustainability as it is directly connected to the Gross National Income (GNI). Findings also show that environmental sustainability is a big issue in increasing the social harmony. From the authors’ personal observation, the smallholders are really neglected in terms of decision-making, their performance reward, overcome societal problem, and economic development issues but the monthly savings are increasing. One method of improvement in the social, environmental and economic aspects of sustainability is through intensive and quality training by scholars, depending on the role played by the authorities and smallholder cooperatives.

The study suggests that the supported smallholders should get more training and they should get their performance reward in a month and annually on the basis of fruit collections. On the other hand, all ages and women are also encouraged to join the oil palm cultivations except for pregnant women. However, it is also important to motivate them for more education at least to achieve a diploma in order to increase the knowledge of how to use pesticides and the GAP method through a time to time intensive learning. At the same time, it is noted that new stringent market standards often shift the burden of compliance to the three million smallholders that depend on oil palm cultivation for their livelihood (Giovannucci and Purcell, 2008; Dolan, 2010; Hidayat et al., 2015). Hence, supported smallholders should be certified through standards such as the RSPO and Malaysian Sustainable Oil Palm (MSPO). In addition, they should also be under the inspection of the Department of Environment (DOE) on a regular basis. Nonetheless, this paper is of the opinion that more can still be done to achieve socially responsible, environmentally sustainable, and economic development in the oil palm industry to assess sustainability.

Acknowledgement

Financial assistance provided by GUP-2015-050 and AP-2014-017, headed by Prof. Chamhuri Siwar and EP-2014-014 and MPOB-UKM-2013-001 ‘Research Grant’ headed by Prof. Dr. Er Ah Choy are gratefully acknowledged.

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Enhancing sustainability amongst oil palm smallholders


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