Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

# Smallholders the prominent contributor towards sustainable oil palm sector

A. S. A. Ferdous Alam [1,*], A. C. Er [2], Halima Begum [2], Chamhuri Siwar [3], Ahmad Bashawir Abdul Ghani [1]

[1]School of International Studies, University Utara Malaysia, 06010 Sintok, Kedah, Malaysia
[2]Faculty of Social Sciences and Humanities, National University of Malaysia, Bangi, Selangor, Malaysia
[3]Institute for Environment and Development, National University of Malaysia, Bangi, Selangor, Malaysia

ARTICLE INFO

*Article history:*
Received 15 January 2016
Received in revised form
12 March 2016
Accepted 12 March 2016

*Keywords:*
Oil Palm Sustainability
Environment
Economic
Social
CFA
FELDA
Malaysia

ABSTRACT

Smallholders are one of the most prominent contributors in the oil palm sector. The visions of Malaysian palm oil board (MPOB) are to ensure a balance between development needs for social and economic aspects through ensuring quality environment. However, smallholders are mostly involved in maintaining sustainable processing activities during their operation. The aim of this study is to measure the sustainability awareness and practices amongst the smallholders who are under the Federal Land Development Authority (FELDA). Descriptive statistics and Confirmatory Factor Analysis (CFA) were used to analyse the primary data. The findings indicate that most of the smallholders are going forward towards sustainability positively.



## 1. Introduction

Globally, oil palm is an emerging sector because of continued high demand. The origin was in the tropical rainforests of West Africa and traditionally used for different purposes: 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 have yields of 0.36, 0.42, and 0.59 tons per hectare in a year respectively; (Basiron, 2007). In addition, around 13% of palm oil output is now used in the production of biofuels (Dauvergne and Neville, 2010; Mielke, 2008). Admittedly, 89% of the world's palm oil is produced in the Asia Pacific region, whereas with 84% from Indonesia and Malaysia and has been cultivated on around 15 million ha (FAO, 2009; Fitzherber et al., 2008; Koh and Wilcove, 2008). Since the 1990s, the area occupied by oil palm cultivation has expanded worldwide by 43 %, approximately, 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).

As of MPOB (2014), Malaysia has 4.7 million hectares of oil palm plantations, 439 mills, 43 crushers, 51 refineries, 18 oleo chemical plants and 25 biodiesel plants. In Malaysia, oil palm plantation makes up 77% of agricultural land or about 15% of total land area (MPOB, 2012). The industry is dominated by large plantation companies (private- and government-linked companies) which hold 60 percent of total plantation land, with a growing level of integration along the value chain. Both players (supported and independent) and private plantations are important players in the industry. Independent Smallholders (mainly growers with little or no assistance from government or private plantations also play an important role in the industry controlling 14% of the industry in the country. It is estimated that smallholders account for nearly 40 percent of the total oil palms planted in the country, with about 28 percent from supported and 12 percent from independent smallholders respectively, while private estates account for 60.7 percent (ETP, 2009; MPOB, 2011).

1960's Malaysia increased cultivation pace of oil palms as introduced 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 for putting into action in sustainable practices. As the sustainability of environment and oil palm is highly interrelated, FELDA is an active member of the Roundtable on Sustainable Palm Oil (RSPO) since 18 October 2004. FELDA then, since set up over 442 schemes, covering roughly 800,000 ha and involving more than100, 000 families (FELDA 2006). Smallholders defined by the RSPO as working on a plantation of less than 50 hectares (ha), they produced a significant share of palm oil production in Indonesia and Malaysia (approximately 35–45%),

* Corresponding Author.
Email Address: ferdous@uum.edu.my

while in Africa and Latin America the majority of producers are smallholders.

We intend to analyze the sustainability of smallholder palm oil production looking at all three of the Brundtland report's (1987) recognized dimensions of sustainability - namely environmental, social and economic.

Although some scholars argue that the sustainability concept has been used too extensively and that the concept should be "reclaimed" (Santillo, 2007), indicators limited to environmental impacts are not sufficient in the analysis of palm oil production. Santillo argues that too much attention has been given to economic aspects of sustainability, and that emphasis should be returned to the environment (Ferdous et al.; 2015). The Malaysian oil palm industry strives to strike a holistic balance with environments. However the study of Abazue, et al. (2015) and Begum et al. (2014a) concludes that there is a high degree of sustainability amongst oil palm smallholders under the management of FELDA in Malaysia. Nevertheless, this study aims to measure mainly the environment, economic and social sustainability awareness and practices amongst the smallholders under FELDA.

## 2. Methods

The study used primary data that were collected from dependent FELDA smallholders in Malaysia. FELDA had chosen as a case of study because it has improved in their products as it is directly involved with oil palm sustainability. The study adopted a quantitative approach based on empirical evidence and primary information. The data were collected through questionnaire survey with 302 respondents. A questionnaire survey was carried out from October to November 2013 and December 2013 to February 2014 at Sungai Tekam and Jerangau Dungun separately. The data were taken to reflect the current socioeconomic profile of the low income and poor communities of smallholders of FELDA. These items were measured on three-point Likert type scale. Descriptive analysis and Confirmatory Factor Analysis (CFA) analysis was used to understand several significant factors of sustainability, such as, economic, social and environment factors.

## 3. Analysis and discussions

### 3.1. Demographic profile

The demographic background of the respondents has shown the number of percentages (smallholders) according to their age, sex, education, involvement of schemes time and the size of their family member. 66.7% respondents illustrate that maximum smallholders are between 61 to 80 years old. Most of the smallholders are doing oil palm business during their retirement time. As finding shows that the majority of oil palm smallholders are male (65.2%) while female smallholders make up the rest (34.8%) of those that participated in the survey study. According to the ethnicity representation of the respondents, the majority of the smallholders tend to be from Malays which are 100%. 37.4% mention that the majority of the oil palm smallholders completed their secondary levels. The study found the majority of the respondents (33.8%) are involved in the schemes for maximum 7 to 9 years. The number of family members of the respondents is maximum 7 to 10 members, whereas only 3% have 10 members.

### 3.2. Environmental sustainability

Environmental issues rose by the oil palm cultivations, or in terms of deforestation, littering and huge habitat loss. It is painted that FELDA administration plays a vital role to enhance the smallholder's environment relation to sustainable agriculture in Terengganu. Under the environmental sustainability practices a greater number of the settlers (83.1%) agree and demonstrate for the welfare of the environment (Cc1) to protect the atmosphere. Around 84.8% respondents agree that they are concern towards the environmental conservation and safety (Cc2) in their daily procedures in order to ensure that minimal damage is done to the environment. 79.8% respondents agreed that they have awareness to reduce environmental pollution (Cc3) activity of the ecosystem and wildlife. More modern machinery causes environmental pollution (Cc4) agreed by 51.7% respondents i.e. collecting FFB by the lorry burns fuel which causes air pollution. Conserve and preserve the environment (Cc5) is the main motto of the sustainability agreed by 82.1% respondents. This statement is consistent with Begum et al. (2015) that there are laws and policies for the preservation of the environment, including the protection of Wildlife Acts 1972 and the ban on the establishment of oil palm plantations on natural forests and peat lands (Butler, 2007). Merely about 45.7% undecided that water, soil and air pollution (Cc6) done by farms while 45.7% are agreeing to this statement. Standards farm practice scheme can preserve ecosystem (Cc7) which was agreed by 82.8% respondents. The smallholders (81.1%) are concerned that systematic farming management can reduce wastage (Cc9) and 80.5% decide that timely follow-up can reduce environmental pollution (Cc8). The majority of the respondents also agreed about following the national environmental policy (Cc10) which can reduce environmental pollution (76.8%).

### 3.3. Social sustainability

One of the major criticisms associated with oil palm industry has to do with social issues. The welfare of the workers in terms of their living condition and quality of life as well as the corporate social responsibility of the plantation industry to local people. Major respondents (80.5%) highly

agreed that since joining the scheme they improved their quality of life and health (Cb5), and (81.5%) help them to improve their social status (Cb3). (80.1%) FELDA provide them worthy social services (Cb6) such as (Cb7) quality education to settler's children (82.1%) and (Cb4) training for the oil palm yield improvement (81.8%). Equally so, 78.8% agreed that they have good medical facilities (Cb1), (Cb2) improved infrastructure facilities (83.4%) and (Cb9) getting access to the protection tools system (76.2%) which reduce the crime in the society. On the question about the (Cb10) fulfillment of their basic and social needs; most of the respondents - around 79.5% -strongly agree about the fulfillment of their basic needs.

Since most of smallholders are migrant workers from neighboring 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. Besides, about 80.1% respondents indicated that they feel (Cb8) empowered when they are involved in the decision making process for social activities because of their rapid positive change of income status.

### 3.4. Economic sustainability

Oil Palm plantation is regarded as a success story in terms of its contribution to the economic growth of the countries and jobs creation. Respondents were asked if joining the scheme has given them the opportunity to cover their daily expenses as compared to their previous jobs. The evidence can compare with previous literatures that are highly positive awareness for sustainability in FELDA (Begum et al. 2014a; MPOB, 2011). But consistently with evident about 81.8% agree that they have financial stability after joined FELDA. In addition, the assertion is consistent with existing literatures 'the demand for edible vegetable oils is expected to double from present consumption of around 120 to 240 metric tons/year by 2050, based on per capita consumption and population growth (Corley, 2009). However, the majority of the respondents (58.9%) agreed that their incomes are affected by fluctuations of palm oil commodity prices. 83.1% respondents agreed that consumer focus and export demand (Ca1), they also agree (83.8%) to generate revenues and incomes (Ca2) by the FELDA as well as (85.1%) generate employment to the FELDA family (Ca3), during the time (81.8%) settlers improved their living standards (Ca4), 80.8% Create downstream industries to settlers as additional income (Ca5), 72.8% additional income for everyday life (Ca6), Economic condition depends on palm oil product prices (Ca7) by agreed 58.9%, Seminars and courses on entrepreneurship is improve the settlers (Ca8) by agreed 83.1%, Financial stability after joined FELDA (Ca9) also 81.8% agreed, young people interested into the plantation and reduce migration (Ca10) agreed by 78.5%.

## 4. Results

### 4.1. Confirmatory factor analysis (CFA)

The CFA model was used to examine the hypothesized relationships between the constructs (factors) in the model. The correlation of the latent variables and observed variables demonstrates in the factor loadings for each variable. Among the economic latent variables, the path coefficient of the overall economic condition of the settler's that farmer's personal income and government revenues (Ca2) obtained the highest value (0.88), followed by the issues smallholder's employment opportunities (Ca3), standard of living (Ca4), financial Stability (Ca9), additional income for everyday life (Ca6), reduced migration (Ca10), Settlers' training (Ca8), export demand (Ca1) etc. The CFA is showing all data are significant that is smallholders are highly reliable for increasing national economic growth.

However, within the social latent variables, the path coefficient of overall social situation of the settler's that infrastructure facilities improved (Cb2) obtained the highest value (0.87), followed by the issues, CSR improved the social status (Cb3), Education incentives to settlers children (Cb7), Training improved the yield (Cb4), Satisfied social services (Cb6), Fulfillment of basic and social needs (Cb10), Improved Quality of life (Cb5), Safety control systems reduce crime (Cb9), Participation in the decision-making (Cb8), smallholder's social landscape change (Cb1), etc. The CFA is showing all data are significant that is smallholders are highly reliable for the social wellbeing.

Among the environment latent variables, the path coefficient of overall economic condition of the settlers that environmental conservation and safety (Cc2) obtained the highest value (0.88), followed by the issues smallholder's welfare of the environment (Cc1), reduce environmental pollution (Cc3), modern technology increase environmental pollution (Cc4), farmers manage systematic farming waste (Cc9), standards of good farm practice scheme ecosystem preserved (Cc7), Periodic review to solve the environmental pollution (Cc8), conserve and preserve the environment (Cc5), farms could potentially pollute water, soil and air (Cc6), national environmental policy (Cc10) etc. The CFA is showing all data are significant that is smallholders are highly reliable for increasing national economic growth.

Cronbach's alpha is used to determine the reliabilities of data. The latent variable in this model has high Cronbach's Alpha values which are at 0.905 for Economic aspect, 0.937 for Social aspect and 0.885 for Environment aspect. Therefore, the reliability level of attitudes towards economy meets the critical value of 0.7 suggested by Nunnally and Bernstein (1994).

Oil palm cultivations have impacted positively on the lives of the community, people and country.

Findings show that oil palm plantation when properly managed has the potential in addressing unemployment and reducing poverty especially among the rural dwellers. The majority of the smallholders is aware of these policies and laws and does their bit in adhering to these provisions. 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.

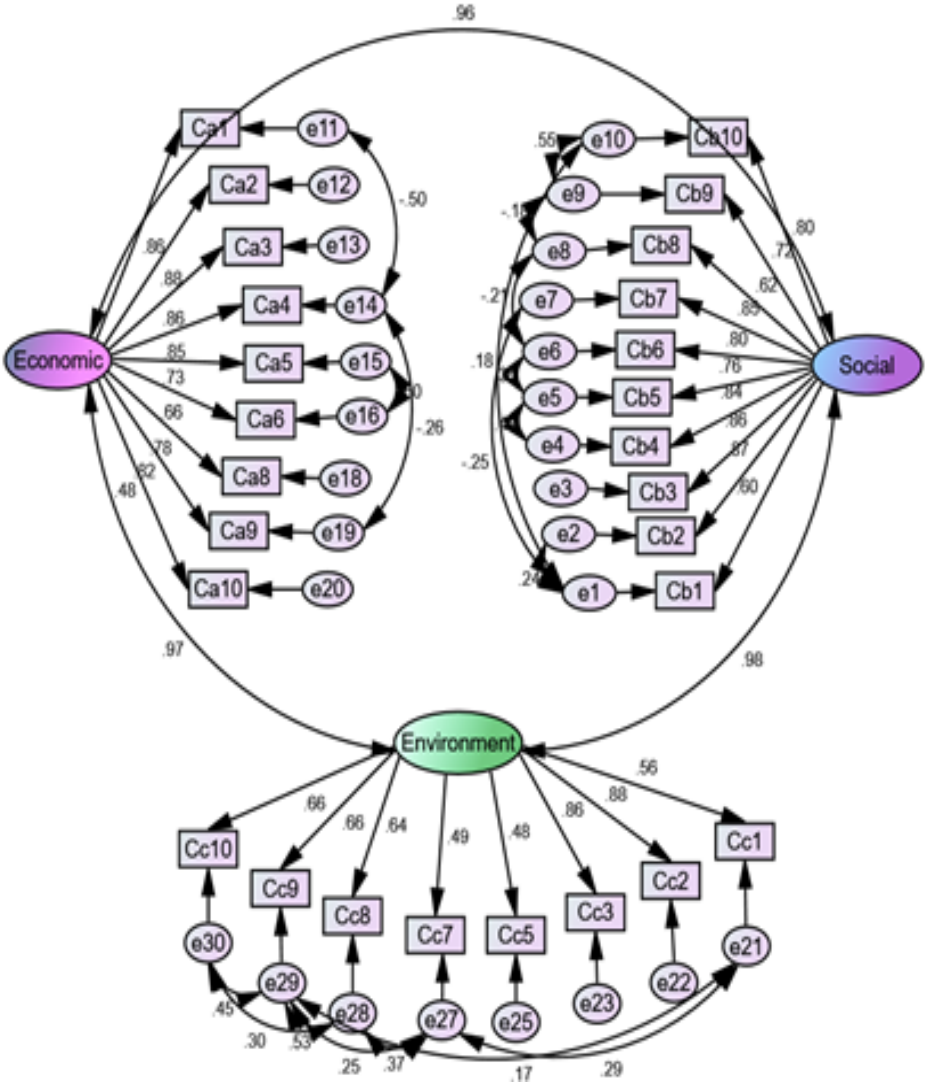


**Fig. 1:** Confirmatory Factor Analysis
Source: Primary survey from FELDA Sungai Tekam, Pahnag and Jerangau Dungun, Terengganu 2014

This study found that awareness of sustainable agricultural practices among FELDA farmers is placed at a high level. On average, respondents who answered the questionnaire have a high awareness of their farming practices. According to the study, sustainable agriculture practices developed by the smallholders are satisfied. The impact is spread from financial security to jobs creation and developmental projects, including good and accessible road networks, medical facilities and schools. Nonetheless, it has come with its negative impacts too; which includes loss of traditional ways of life in daily routines because of instability of commodity prices, quality of life issues such as lack of agricultural training course etc. (Begum et al., 2014b).

## 5. Conclusion

This study assesses the sustainability practices of the oil palm smallholders among the FELDA settlers, in order to draw lessons for future practices. To individual smallholders, the benefit depends on the level of involvement in the scheme. Results from the questionnaire mostly point to positive impacts of 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 FELDA scheme. Moreover, the findings highlight some room for improvements in the social, environmental and economic aspect of sustainability through intensive and quality training by scholars, depending on the role played by the authorities and smallholder cooperatives.

Limitation: This study only measures on the dependent smallholders under FELDA. Independent smallholders are not included due to time obstacle and tough accessibility.

**Acknowledgement**

This work was supported by the MPOB-UKM Endowment Chair EP-2014-014 and MPOB-UKM-2013-001 Grant headed by Prof. Dr. Er, Ah Choy, Faculty of Social Sciences and Humanities, National University of Malaysia is gratefully acknowledged.

**References**

Abazue CM, Er AC, Alam AF and Begum H (2015). Oil Palm Smallholders and Its Sustainability Practices in Malaysia. Mediterranean Journal of Social Sciences, 6(6 S4): 482.

Basiron Y (2007). Palm oil production through sustainable plantations. European Journal of Lipid Science and Technology, 109(4): 289-295.

Begum H, Alam ASAF, Er AC, Siwar C and Ishak S (2014a). Economic Sustainability of Oil Palm Cultivations: Smallholders Perspective. Proceedings, RENPER5, Banking University, Ho Chi Min City Vietnam. October 2014.

Begum H, Alam F and Choy EA (2014b). Social Sustainability of Oil Palm Settlers. Proceedings "Empowering Sustainable Development through Knowledge and Human Advancement" 5th - 7th December 2014, Corus Paradise Resort Port Dickson, PP 1002-1015, ISBN: 9789832408222

Begum H, Choy EA, Siwar C, Alam F and Ishak S (2015). Smallholder's practices towards environment sustainability. Advanced Science Letters, 21(6): 1742-1745.

Brundtland G, Khalid M, Agnelli S, Al-Athel S, Chidzero B, Fadika L and Singh M (1987). Our Common Future (\'Brundtland report\').

Butler RA (2007). Palm oil doesn't have to be bad for the environment. Mongabay News, April 4, 2007.

Corley RHV (2009). How much palm oil do we need?. Environmental Science and Policy, 12(2): 134-139.

Dauvergne P and Neville KJ (2010). Forests, food, and fuel in the tropics: the uneven social and ecological consequences of the emerging political economy of biofuels. The Journal of peasant studies, 37(4), 631-660.

ETP (2009). A Roadmap for Malaysia Kulim Sustainability: a new road for sustainable Growth: Sustainability Report 2010 /2011. Evolution 23(10): 539-545.

FAO F (2009). "FAOSTAT, Online Statistical Service. Food and Agriculture Organization of the United Nations.

FELDA (2006). Company profile. http://www.felda.net.my/holding/about/about.htm.

FELDA (2007). RSPO Annual Communication of Progress Felda's Report

Ferdous Alam ASA, Er AC and Begum H (2015). Malaysian oil palm industry: prospect and problem. Journal of Food, Agriculture and Environment, 13(2): 143-148.

Fitzherbert EB, Struebig MJ, Morel A, Danielsen F, Brühl CA, Donald PF and Phalan B (2008). How will oil palm expansion affect biodiversity?. Trends in ecology and evolution, 23(10): 538-545.

Koh LP and Wilcove DS (2008). Is oil palm agriculture really destroying tropical biodiversity?. Conservation letters, 1(2): 60-64.

Mielke T (2008). Global supply, demand and price outlook for oilseeds, Veg. oils and oilmealsReation of the global oilseed sector to the new price proce determining factors (No. DE-0276). ISTA Mielke GmbH.

MPOB (2011). Economics and Industry Development Division -Malaysian Palm Oil Board [MPOB, 2011].

MPOB (2012). The Oil Palm Tree. Journal of oil palm and environment

MPOB Publications (2014). Issues related to the Impact of Oil Palm on the Environment.

RSPO (2011). Promoting the Growth and use of sustainable palm oil. Roundtable on Sustainable Palm Oil, Zurich.

Santillo D (2007). Reclaiming the Definition of Sustainability (7 pp). Environmental Science and Pollution Research, 14(1): 60-66.

Tauli-Corpuz V and Tamang P (2007). Oil palm and other commercial tree plantations, monocropping: impacts on indigenous peoples' land tenure and resource management systems and livelihoods. In UN Permanent Forum on Indigenous Issues Working Paper, E/C, 19