The Role of Malaysian Palm Oil Industry in the Malaysian Sustainable Economic Development

Peranan Industri Minyak Sawit Malaysia dalam Pembangunan Ekonomi Lestari di Malaysia

Mohammed Ebrahim Hussein, Chamhuri Siwar & Khairul Naim Adham

ABSTRACT

In traditional business philosophy, companies are largely motivated by three determinants in order to maintain their competitiveness: product quality, cost and product delivery. The efficiency dimension of the company is determined by producing a product maintaining its quality, with less cost and distributing it using efficient delivery system. Regardless of social and environmental issues, companies were used to focus on financial and economic aspects of the business in order to determine the growth of their profitability and market share. However, in the last few decades, especially as of the United Nations Conference on Environment and Development (UNCED) or the Earth Summit in 1992, business companies began to incorporate environmental issues as one of determinant factors for their profitability and market share. This study assesses the role of Malaysian palm oil industry in the Malaysian sustainable economic development. Utilizing secondary data, the paper uses the concept of national income accounting approach to show the contribution of Malaysian palm oil industry in the aggregate economy. The study shows that the Malaysian palm oil industry is playing a significant role in sustaining Malaysian economic development via high production and cleaner environment.

Keywords: Green economy; sustainable development; sustainable oil palm; palm oil industry

ABSTRAK

Dalam falsafah perniagaan tradisional, sebahagian besar syarikat-syarikat di dorong oleh tiga penentu bagi mengekalkan daya saing mereka. Antaranya adalah kualiti produk, kos dan penghantaran produk. Dimensi kecekapan syarikat ditentukan dengan menghasilkan produk yang mengekalkan kualiti, kos yang kurang dan penghantaran produk. Dengan tidak mengambil kira isu-isu alam sekitar, syarikat-syarikat tersebut terus sahaja memberi tumpuan kepada aspek-aspek kewangan dan ekonomi perniagaan mereka untuk pertumbuhan keuntungan dalam pasaran. Walau bagaimanapun, dalam beberapa dekad yang lalu, di persidangan Bangsa-Bangsa Bersatu mengenai Alam Sekitar dan Pembangunan (UNCED) atau Sidang Kemuncak Bumi pada tahun 1992, syarikat-syarikat perniagaan mula melihat isu-isu alam sekitar sebagai salah satu faktor penentu untuk keuntungan mereka. Ia juga termasuk kajian pasaran dalam menilai peranan industri minyak sawit Malaysia untuk pembangunan ekonomi yang mampan di Malaysia. Dengan menggunakan data sekunder, makalah ini menggunakan konsep pendekatan perakaunan pendapatan negara untuk menunjukkan sumbangan industri minyak sawit Malaysia dalam agregat ekonomi. Kajian ini menunjukkan bahawa industri minyak sawit Malaysia memainkan peranan penting dalam mengekalkan pembangunan ekonomi Malaysia melalui pengeluaran yang tinggi dan persekitaran yang bersih.

Kata kunci: Ekonomi hijau; pembangunan mampan; pengurusan kelapa sawit; industri kelapa sawit

INTRODUCTION

Currently Malaysia is an upper-middle income economy that is planning to be in the category of high income countries. In 2010, Malaysia launched a New Economic Model (NEM) for Economic Transformation Program which targeted to put the country in the status of high income country in 2020. In 2012, the gross per capita income of Malaysia was reported as 9,991.00 USD while it was estimated to be 10,687.00 USD in 2013 (EPU 2013). NEM aims to insure the growth of the country to be sustainable and inclusive. Furthermore, the goal of NEM is to make the private sector is a leading sector of the economy as well as realizing high value-added activities both in the industry and services of the country. In order to attain this target, the greater efforts needed to ensure the sustainability of environment along with economic growth (World Bank 2012).

Indeed the role and contribution of agricultural sector was not marginalized. Although service sector is now becoming the main contributor to the economic growth of the country overtaking the manufacturing, still agriculture is the foundation of a country's economy. Despite the decline of the trend

of agricultural contribution to the Gross Domestic Product (GDP), its absolute output value increased and productivity enhanced. Agriculture plays a considerable role as a major source of nation's food supply, improving the livelihood of farmers. Furthermore, it is vital for supporting the demand (as source of raw materials) and supply (being market) of industries particularly agro-based industries. To this end, Government gave a due emphasis where it allocates a total of RM3.8 billion for the agricultural sector (Malaysia 2012).

In the economic Transformation Program, 12 major economic sectors has been identified as National Key Economic Areas (NKEA) for the potential they have in uplifting the country's income in order to realize the vision 2020. Palm oil industry is among the identified sectors as NKEA. The contribution of this sector to GNI is projected to increase from RM52.7 billion in 2009 to RM178 billion in 2020 (Choo 2011).

In line with this, oil palm sub-sector is the main sub-sector of agricultural sector. As Malaysia is one of the world largest producer and exporter of palm oil, the palm oil industry has significant contribution in employment creation and foreign currency generation among other contributions. For instance, in the last two years the export of palm oil was 17,993,265 and 17,562,841 tonnes while the revenue generated was 60,471.92 and 52,957.24 Million RM for 2011 and 2012, respectively (MPOB 2012).

Besides, the industry especially the plantation sector is a pool of employment for labor force engaged in agricultural sector. Furthermore, although Malaysia is the leading country in international trade of oil palm and exposed to global interdependence; palm oil industry has shown resilience in contributing to the GDP during different economic and/or financial recession. For instance it has played a key role in helping the country through the 1997/98 Asian financial crises. Likewise, during the global economic recession of 2008, palm oil industry generated an income value that represents 5-6% of country's GDP (Mohd Basri et al. 2009).

PALM OIL FOR SUSTAINABLE ECONOMIC DEVELOPMENT

In traditional business philosophy, companies are largely motivated by three determinants in order to maintain their competitiveness – product quality, cost and product delivery. The efficiency dimension of the company is determined by producing a product maintaining its quality, with less cost and distributing it using efficient delivery system (Teoh 2004). Regardless of social and environmental issues; companies were used to focus on financial and economic aspects of the business in order to determine the growth of their profitability and market share. However, in the last few decades, especially as of the United Nations Conference on Environment and Development (UNCED) or the Earth Summit in 1992, business companies began to incorporate environmental issues as one of determinant factors for their profitability and market share. In addition, palm oil industry has to adhere to sustainability by considering the positive effect of its production on economic resource, environment and human in order to be competent in the modern global market. For instance, the European Union (EU) demands for sustainably produced palm oil product without a negative impact on resource and environment (Kuntom et al. 2010).

Accordingly, palm oil industry has played a considerable role in order to make the development of the sector sustainable and inclusive. Throughout the supply chain of the industry there is huge potential to contribute to sustainable development. Not only its products, which is agricultural process, but there are also its by-products such as biomass, which is industrial process, to play a vital role in sustaining economic development (Zakri 2011).

METHODOLOGY

The study used secondary sources such as annual reports, articles and websites mainly from Malaysian Palm Oil Board (MPOB), Department of Statistics (DOS) and Economic Planning Unit (EPU). The methodology used is simple regression and comparative analysis adopting the concept of Final National Accounting System (FNAS). The FNAS is normally computed annually to show the annual growth or contribution of different indicators to the Gross Domestic Product (GDP). It enables GDP to be compiled by three approaches i.e. the production, expenditure and income approach. Here the paper used a time series data from 1981 to 2011 in the framework of FNAS assuming 'ceterus paribus' for all partial derivation of the equations.

RESULT AND DISCUSSION

Here under we discuss the contribution of palm oil industry for the economic development of Malaysia based on the concept of Final National Accounting System (FNAS) to answer for different objective of the paper.

First objective: to evaluate the responsiveness of national economy due to change in the palm oil industry.

Specifically, the paper analyzes the responsiveness value of Malaysian Gross National Income (GNI) and the total oil palm production volume due to change in the volume of palm oil export. As well as to show the elasticity of the output of palm oil industry as a result of the quantity of employed labor force in the sector. Accordingly,

using the concept of expenditure approach, the functional relationship between GNI vis-a-vis palm oil net export as well as the relationship between total palm oil productionvis-a-vis palm oil net export were analyzed as below.

a) $GNI = \beta_0 + \beta_1 Nx$ where, GNI is gross national income and Nx is palm oil net export

The functional relationship between GNI and Nx is statistically significant since the probability of t-statistics (0.000) is less than α value (0.05). Thus holding other explanatory variables constant, an increase of one tonne in net export of palm oil, increases the predicted GNI by 0.265 Mill RM (See Table 1). The result is consistent with the average price of last five years which is 2,694.50 Million RM.

TABLE 1. Significance relationship between GNI and palm oil Nx

Dependent variable: GNI		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	174276.8	9.047482	0.0000
Nx	0.265208*	12.27102	0.0000

$\Re^2 = 0.862526$
* denotes the variable is significant at 1% significance level

Analogously, the responsiveness of palm oil production as a result of palm oil net export analyzed using model (b).

b) $Y = \beta_0 + \beta_1 Nx$ where, Y is total palm oil production

Holding other factors constant, the predicted total palm oil production increases by 5.43 tonnes

due to an increase in 1 tonne in palm oil net export. This shows about 40% growth in the predicted palm oil production as compared to the average growth for the last five years. In addition, the model has strong statistical significant relationship as probability of t-statistics (0.000) is less than α value (0.05) (See Table 2).

TABLE 2. Significance relationship between palm oil production and palm oil Nx

Dependent variable: Production of palm oil		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	7280147	17.42003	0.0000
Nx	5.431343*	12.71116	0.0000

$\Re^2 = 0.866005$
* denotes the variable is significant at 1% significance level

Similarly, model (c) analyzes the responsiveness and the statistical significance between palm oil production and number of employed labor force in the sector. Although we adopt the idea of income

approach of FNAS which deals with the value compensation of labor factor; our model focuses on the quantity relationship rather than monetary value.

c) $Y = \beta_0 + \beta_1 L$ where, L is employed labor in the palm oil sector

The model shows a positive functional relationship between palm oil production and employed labor in the sector. Also there is a good fitness of the model since $R^2 = 0.976532$. Thus holding other factors of production constant, an increase in employment of 1 labor in the sector, increases the predicted palm oil production by 45 tonnes (See Table 3). On the other hand, (Ramli et al. 2011) computing labor-land ratio of Malaysian Palm oil sector reveals that one worker in general works about 10 hectares of palm oil land. Since the average yield of the last 3 decades is 18 tonnes per hectare, the contribution of labor input will be 25% of the total factors of production.

TABLE 3. Significance relationship between GNI and palm oil Nx

Dependent variable: GNI		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	174276.8	9.047482	0.0000
Nx	0.265208*	12.27102	0.0000

$\Re^2 = 0.862526$
* denotes the variable is significant at 1% significance level

Second objective: analyzing structural stability of palm oil price and net export after 1997/98 Asian Financial crises and 2008 global economic recession.

Export is one of positively contributing factor to the income of national economy in general and to the income of the sector in particular. Income is directly proportional to the trend of export, ceterus paribus. Since the statistical significance was discussed on the outset, this objective intends to evaluate whether there is structural change in the volume of export due to 1997/98 Asian Financial crisis or otherwise. If there is change, it shows whether the trend is increasing or decreasing after break point. To do so, the model employed binary (dummy) variable to analyze the impact and its direction.

To this end, the palm oil net export is regressed vis-a-vis palm oil total production. Using year 1998 as a break point Dummy = 1 denotes for the period 1981-1998 whilst 0 for the period after 1998. Thus since the Probability of t-statistics is less than α=0.05, the utilized dummy variable is statistically significant even at 1% of significance level. It indicates that there is significant difference between pre and post of 1997/98 Asian Financial crisis in the trend of palm oil net export. In addition, the negative sign of the dummy's coefficient implies that the growth rate of the volume of palm oil net export is less for the period before 1997/98 Asian Financial crisis compared to post crisis (See Table 4). Moreover, the implication of dummy was crosschecked the other way round by switching dummy's value as where 0 represents the period 1981-1998 whilst 1 denotes for the period post1998. With the exception of the sign of binary variable, coefficients and the value of associated probabilities of the model were maintained (See Table 5). Meanwhile, binary variable is not significant to show structural change for the global recession of 2008 (See Table 6).

TABLE 4. Structural stability of palm oil net export (using year 1997/98 break point)

Dependent variable: Production of palm oil		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	10060397	11.63016	0.0000
Nx	3.672765*	5.981889	0.0000
DUMMY	-3399370*	-3.508324	0.0018

$\Re^2 = 0.911428$
* denotes the variable is significant at 1% significance level

TABLE 5. Structural stability of palm oil net export (using year 1997/98 break point)

Dependent variable: Production of palm oil		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	6661028.	17.11895	0.0000
Nx	3.672765*	5.981889	0.0000
DUMMY	3399370*	3.508324	0.0018

$\mathfrak{R}^2 = 0.911428$
* denotes the variable is significant at 1% significance level

TABLE 6. Structural stability of palm oil net export (using year 2008 break point)

Dependent variable: Production of palm oil		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	7296008.	17.04911	0.0000
Nx	5.284429	8.691588	0.0000
DUMMY	466775.0	0.345878	0.7324

Similarly, since price is a determinant variable for the supply of and demands for products; the change in the trend of price of palm oil was assessed. Analogous to net export, the year 1998 taken as a break point to analyze whether the change is structural or else. The production of palm oil regressed against average palm oil price while dummy =0 stands for the period 1981 to 1998 whereas dummy 0 for post 1998. From the regression output $R^2 = 0.898991$ shows a very good fitness of the model and the coefficient of dummy is statistically significant at 1% significance level (See Table 7). The result reveals that there is a significant difference in price of palm oil in which it is significantly higher for post crisis. Furthermore, during global economic recession, there is no significance difference in the trend. This shows the vital role of palm oil sub-sector in supporting Malaysian economic development including in the episode of 1997/98 Asian financial crisis and 2008 global economic recession. This is consistent with the study by Mohd Basri et al. 2009.

TABLE 7. Structural stability of palm oil average price (using year 1997/98 break point)

Dependent variable: Production of palm oil		Method: Least Squares	
Variable	Coefficient	t-stat	Prob
B_0	2568645.	3.683072	0.0010
P	2976462*	5.553782	0.0000
DUMMY	6521840*	8.917901	0.0000

$\mathfrak{R}^2 = 0.898991$
* denotes the variable is significant at 1% significance level

Third objective: To show the significance of palm oil industry in contributing to agricultural sector and/or in Malaysian economy

Following the concept of production approach of FNAS, this objective shows the contribution of palm oil industry to Malaysian economy in general and agricultural sector in particular. Normally production approach is a sectoral analysis to show the contribution of different sector to the economy.

Similarly, the share of palm oil industry is overviewed in terms of its contribution to export, employment creation, value generating and its share to GDP of agricultural sector and national GDP.

The share of palm oil sub-sector is substantial in agricultural sector in creating value and pooling agricultural labor force. For instance, in the end of 2008, palm oil sub-sector alone contributed about 93% of the employed labor in agricultural sector

(See Graph 1). Likewise, in 2012, palm oil registers 36.5% of value created in agricultural sector. Not only 2012, but it is the leading contributor throughout the reviewed period across the sector (See Graph 2 & 3). In the same way, analyzing the export of agricultural sub-sectors within a decade time period taking year 1991 and 2011 as a reference; the share of palm oil export increased almost by double. In 2011, its share is the largest in the sector following oil & gas sub-sector (See Graph 4). Furthermore, the share of palm oil and agriculture in contributing to the national GDP is directly proportional to each other. That is the contribution rate of agricultural sector follows the ups and down contribution rate of palm oil sector to the GDP. Thus agriculture contributes more whenever the contribution of palm oil is more and vice versa (See Graph 5).
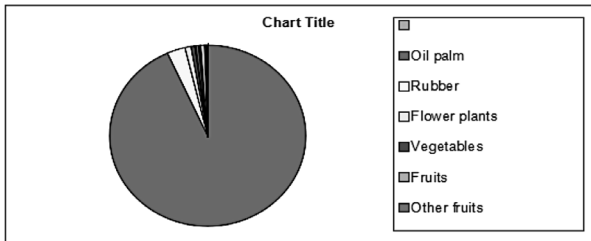
GRAPH 1. The share of palm oil sub-sector in employment generation in agriculture sector

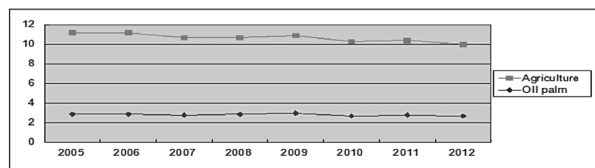*Source:* Department of Statistics, 2008
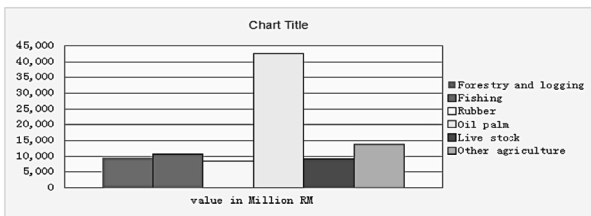
GRAPH 2. The contribution of palm oil sub-sector to agriculture sector in value, 2012

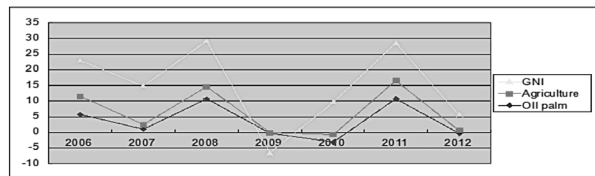*Source:* Department of Statistics, 2012
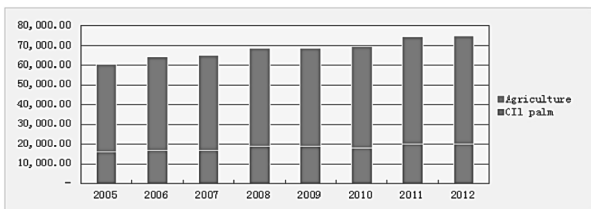
GRAPH 3. The contribution of palm oil sub-sector to agricultural sector in Million RM of value

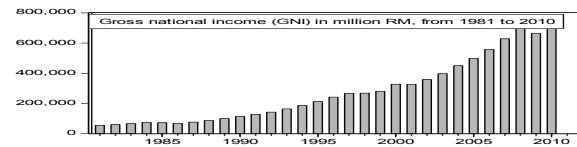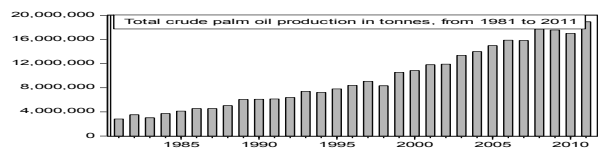*Source:* Department of Statistics, 2012
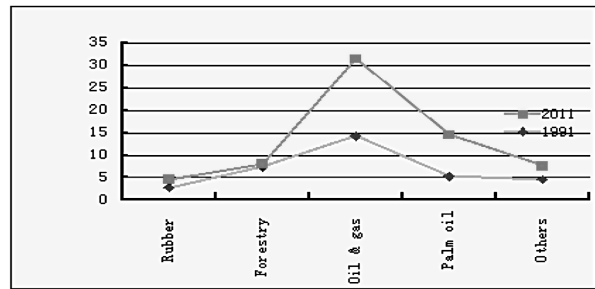
GRAPH 4. Show the trend of agricultural sub-sectors within a decade time period

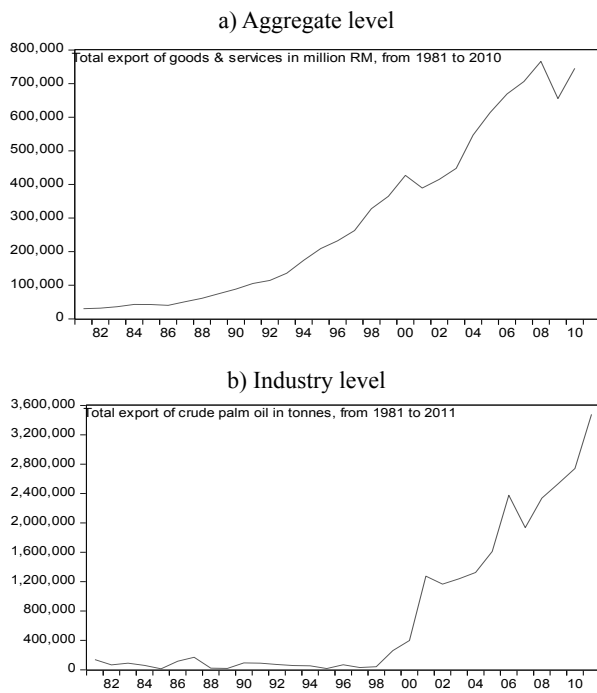*Source:* Department of Statistics, 2011

GRAPH 5. Associated percentage share of palm oil and agriculture to GDP, 2005-2012

Source: Department of Statistics, 2012 & EPU, 2012

GRAPH 6. Annual percentage change of GNI, agricultural sector and palm oil sub-sector

Source: Department of Statistics, 2012 & EPU, 2012

GRAPH 7. Total crude palm oil production vis-a-vis gross national income (GNI)

Source: Department of Statistics, 2012 & EPU, 2012

a) Aggregate level

b) Industry level

GRAPH 8. Total export of crude palm oil vis-a-vis total export of goods & services

Source: Department of Statistics, 2012 & EPU, 2012

Moreover, comparing the progress of palm oil industry and growth of national economy; there is high similarity between the trends of some associated economic indicators. To illustrate the scenario, some indicators such as annual percentage change, production, income, and export were analyzed. Accordingly, the trend of annual percentage change of GNI, agricultural sector and palm oil sub-sector is quite similar throughout the past three decades. Interestingly, there is high similarity between the trend of crude palm oil production and gross national income across the study duration. Likewise, the trend of palm oil's total export and the total export of country's GDP is more or less directly proportional to each other (See Graph 6 to 8(b)). This illustration is consistent with the second objective of the paper which shows the strong significance of palm oil sub-sector in supporting the economy including the recession period.

Forth objective: to show the potential of palm oil industry in contributing to low carbon economy via cleaner environment

In order to realize the target of reaching high income category and sustainably developed economy, Malaysia has take different schemes and initiatives. Among initiatives one is to be low carbon economy via producing and consuming

while keeping the environment cleaner. To mitigate the environmental issues some policies and initiatives have been undertaken. Even before the development of sustainability concept as a science, Malaysia has laid down new practices that set to raise environmental standards, the Environmental Quality Act of 1974 (EQA) (MPOB 2010). Similarly, following the development of sustainability concept, Malaysia has playing a considerable role in mitigating global climate warming applying different schemes and initiatives.

In line with environmental issues, the by-product of oil palm industry in its downstream value chain i.e. biomass has given due emphasis to achieve the objective of clean environment. This can be realized via waste minimization and emission reduction of the sector. By conversion of the wastes to the wealth, negative environmental externality will be minimized and cleaner environment will be attained. Furthermore, as biomass is one of the leading global energy sources its utilization and shifting from fossil fuels to bioenergy will mitigate emission and thereby remedy a global warming.

The following hypothetical figure shows the potential of biomass sub-sector in making the environment clean through linking household and palm oil industry. The figure is derived from expenditure approach of simple macroeconomic model where the economic actors are only household and industry.
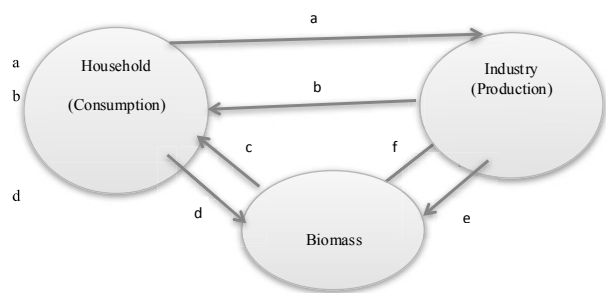

FIGURE 1. Illustration of sustainable production model of industry (knowledge driven economy)

Hint:
a. Factor of production (from household)
b. Final product (from oil palm industry)
c. Final product (from biomass industry)
d. Consumer recyclable product
e. Factor of production (from biomass industry)
f. By-product (from oil palm industry)

According to the above hypothetical figure, the utilization of biomass helps the economic cycle of the industry to be efficient and waste free. According

to traditional business models, the waste will be released to the environment (negative externalities). However, the sustainability approach deals both for efficient utilization of resources and clean environment, simultaneously.

CONCLUSION

Palm oil industry has played a considerable role for sustainable and inclusive economic development of Malaysia. Throughout the supply chain of the industry there is huge potential to contribute to sustainable development. Not only are its products but there also its by-products such as biomass play a vital role in economic development along with sustaining environment. In addition, the production of the sector has to be sustainability compliant in order to be competent in the global market. Moreover, palm oil sector witnessed as of significant supporter for the GDP of the country including in the period of financial crises and economic recession. Furthermore, the Malaysian government has given a due consideration for palm oil sector in identifying it as one of National Key Economic Areas (NKEA) in uplifting the country's income in order to realize the vision 2020.

ACKNOWLEDGMENT

REFERENCES

Choo. 2011. Malaysia's economic transformation programme: the role of the oil palm industry *Proceedings of Global Economics and Marketing Conference.* Nov. 2011.

Economic Planning Unit (EPU). 2013. Economic Planning Unit, Prime Minister's Department, Putrajaya, Malaysia.

Kuntom et al. 2010. MPOB code of practices for sustainable production of palm oil. *Further advances in oil palm research* (2000-2010) 1: 122-143.

MPOB. 2010. Malaysian Palm Oil Board. Malaysian Palm Oil Sustainability Manual.

MPOB. 2012. Malaysian Palm Oil Board. Economics and Industrial Development Division.

Malaysia. 2012. Department of Statistics.

Mohd Basri et al. 2009. Recent findings on carbon footprint of oil palm. *Proceedings on oil palm and the environment.*

Ramli et al. 2011. Labour requirements in the Malaysian oil palm industry in 2010. *Oil Palm Industry Economic Journal* 11(2): 57-89.

Teoh. 2004. Selling the green palm oil advantage? *Oil Palm Industry Economic Journal* 4(1): 102-111.

World Bank Outlook, Malaysian overview, 2012.

Zakri. 2011. Global sustainability issues with respect to Malaysian oil palm industry. *Proceedings of Global Economics and Marketing Conference.*

Mohammed Ebrahim Hussein
Institute for Environment and Development (LESTARI)
Universiti Kebangsaan Malaysia (UKM), Malaysia
E-mail: mohaibro1977@gmail.com

Chamhuri Siwar
Institute for Environment and Development (LESTARI)
Universiti Kebangsaan Malaysia (UKM), Malaysia
E-mail: csiwar@ukm.edu.my

Khairul Naim Adham
Institute for Environment and Development (LESTARI)
Universiti Kebangsaan Malaysia (UKM), Malaysia
E-mail: naimadham@gmail.com