

THE ROLE OF RSPO TOWARDS SUSTAINABILITY IN THE PALM OIL INDUSTRY:

A CASE STUDY ABOUT INDONESIA



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Thesis Title	The Role Of RSPO Towards Sustainability In The Palm Oil Industry: A Case Study About Indonesia
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ABSTRACT

The global demand for palm oil is growing day by day and palm oil companies have been taking necessary actions to meet this demand. In this thesis, a brief overview of palm oil plantations and palm oil production in Indonesia is given. Furthermore, environmental and social impacts from palm oil plantations are briefly discussed. Moreover, the approach of the Roundtable on Sustainable Palm Oil (RSPO) Principles & Criteria (2007) to provide for a more sustainable solution for palm oil plantations is analyzed and discussed. This thesis presents how a palm oil company mitigates social and environmental impacts with the help of RSPO Principles & Criteria (2007). Also, this thesis illustrates the major loopholes of RSPO Principles & Criteria (2007).

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Abbreviations

ACP	= Africa, Caribbean, and Pacific
AI	= Agro Indomas
AMDAL	= Analisis Mengenai Dampak Lingkungan
ASEAN	= Association of South East Asian Nation
BOD	= Biological Oxygen Demand
Ca	= Calcium
COD	= Chemical Oxygen Demand
CPO	= Crude Palm Oil
CSPO	= Certified Sustainable Palm Oil
CSR	= Corporate Social Responsibility
CWG	= Criteria Working Group
EFB	= Empty Fruit Bunches
EHS	= Environmental Health and Safety
EIA	= Environmental Impact Assessment
EPA	= Economic Partnership Agreement
EU	= European Union
FDA	= Food and Drug Administration
FFB	= Fresh Fruit Bunches
FPIC	= Free, Prior, Informed, and Consent
GoI	= Government of Indonesia
GSP	= Generalized System of Preferences
ha	= Hectares
HCV	= High Conservation Value
HGU	= HakGuna Usaha
ICRAF	= International Centre for Research in Agroforestry
IFC	= International Finance Cooperation
IPOC	= Indonesian Palm Oil Commission
ISPO	= Indonesia Sustainable Palm Oil
IUCN	= International Union for Conservation of Nature
K	= Potassium
KPA	= Konsorsium Pembaruan Agraria

Mg	= Magnesium
MPOA	= Malaysian Palm Oil Association
N	= Nitrogen
NGOs	= Non Governmental Organizations
O₂	= Oxygen
OHS	= Occupational Health and Safety
OHSAS	= Occupational Health and Safety Management System
P	= Phosphorus
P&C	= Principles and Criteria
POME	= Palm Oil Mill Effluent
POMS	= Palm Oil Mill Sludge
ppm	= parts per million
PTA	= Preferential Trade Agreement
RBD	= Refined Bleached Deodorized
RSPO	= Roundtable Sustainable Palm Oil
RSPO	= Roundtable Sustainable Palm Oil
SEIA	= Social and Environmental Impact Assessment
SOP	= Standard Operation Procedure
SPO	= Sustainable Palm Oil
TFA	= Trans Fatty Acids
WWF	= World Wide Fund



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Chapter 1

Introduction

1.1 Background

History of palm oil runs back to several millenniums in the past. Majority of West African countries used it as cooking oil. Later on Europeans started to use it as cooking oil but not for other commercial uses. Demand for palm oil started to peak with Britain's industrial revolution, since they used it as an industrial lubricant. It became the major export of some West African countries in 1870, which was overtaken by cocoa after a decade¹.

Palm trees can be grown only in tropical areas of Asia, Africa, and South America. Since the global demand for the palm oil has increased significantly, to meet the required demand, palm oil production has expanded swiftly. From 1990s to the present time, area of palm oil expansion is nearly 43%. Indonesia and Malaysia claims 85% of global palm oil production, which includes the production of 15 other countries². Currently Indonesia is the world's largest palm oil producer, followed closely by Malaysia.

1.2 Objectives

This thesis focuses on the plantations of palm oil and their environmental and the social impacts of Indonesia. Furthermore palm oil trade and the Roundtable on Sustainable Palm Oil (RSPO) Principles and Criteria (P&C) are illustrated. The report assesses the possible benefits gained and costs of being a RSPO member. One of the main objectives of this thesis is to review the implementation of relevant RSPO principles and criteria to mitigate the adverse effects caused by the plantations, and to identify whether the RSPO certified palm oil are sustainable or not.

1.3 Scope

A brief discussion about the palm oil plantations in Indonesia and Palm oil trade is included in this report. Under these topics, the palm oil production and exports, the market for Palm Oil in the European Union (EU) and the United States of America (USA) are reported. The means of Palm oil usage, export and import rates are included. Positive and Negative impacts to

¹ Palm Oil <http://www.fao.org/docrep/005/y4355e/y4355e03.htm>

² Green Palm Sustainability <http://greenpalm.org/en/about-palm-oil/what-is-palm-oil>

environment and society are identified and discussed accordingly. Possible solutions to mitigate adverse environmental impacts are discussed briefly.

The meaning of the RSPO, reasons to form such a standard among palm oil producing companies, benefits and costs to the companies, smallholders, and consumers, sustainability of RSPO certified palm oil are briefly discussed in this thesis. RSPO principles 4, 5, and 6 are used to elaborate how a RSPO certified company (PT Agro Indomas (PT AI)) mitigates adverse environmental and social impacts. .

1.4 Outline

Chapter 2 presents an overview about the Palm oil plantation in Indonesia. Under this chapter land area, government support, palm oil production in Indonesia, and sustainable palm oil are elaborated briefly. In chapter 3, a detailed overview of Palm oil trade is recorded. Under chapter 4 and 5 major environmental impacts and social impacts occurred due to palm oil plantations in Indonesia are listed respectively. Chapter 6 discusses about the possible solutions to overcome those identified environmental impacts. In chapter 7 the reasons obtain RSPO certification, relevant costs and benefits from the certification, sustainability of the palm oil, and arguments about RSPO are briefly described. Under chapter 8, RSPO certified company is taken as an example to review how the Principles 4, 5, and 6 help are implemented and help to mitigate environmental and social impacts.

Chapter 2

Palm Oil Plantations

2.1 Background

Palm oil is one of the world's renowned plant oil, which is derived from the palm fruit. Oil can be extracted from the flesh of the fruit and as well as from the kernel. Due to the fact of containing high levels of beta carotene, it naturally shows a reddish color, which is also known as Crude Palm Oil (CPO). However, Palm Kernel Oil (PKO) contains very low levels of beta carotene, which doesn't bring up a reddish color. Also palm oil has a high percentage of high saturated and unsaturated fats (Polyunsaturated, Monounsaturated).

Table 1: Saturated & Unsaturated content in Palm Oil

Type of Oil	Polyunsaturated Fatty Acids	Monounsaturated Fatty Acids	Saturated Fatty Acids
Palm Oil	9%	37%	49%
Palm Kernel	2.5%	15%	80%

Source: NutriStrategy, 2010 & Smart Fuel: Palm Oil, 2009

Nearly 20 meters tall palm trees bear clusters of fruit all year along. Palm fruits are graciously capable of producing a higher level of oil, since each fruit contains nearly 50% oil. According to the reports, total vegetable oil production around the world is nearly 144 million tons per year. Out of that huge figure, 47 million tons alone come from palm oil³.

Palm oil is used to make both food and non-food products. The use of Palm Oil is quite unpopular within the society since it is mostly mentioned as "vegetable oil" under ingredients section of the final product. Table 2 illustrates several products which are made from palm oil. To view the CPO and PKO processes, please refer Appendix A.

³ Green Palm Sustainability <http://greenpalm.org/en/about-palm-oil/what-is-palm-oil>

Table 2: Palm Oil Products

Food	Non – Food
Cooking Oil	Soap
Margarine	Shampoo
Shortenings	Detergents
Vegetable Ghee	Animal Feed
Ice Cream	Bio Diesel
Coffee Creamers	Cosmetics
Vitamin E Supplements	Pharmaceuticals
	Lubricants
	Paints
	Stabilizers for Rubber & PVC

Source: *Mr. Mathew Gomez, 2013*

2.2 Area in Indonesia

History of Palm oil trees run back to 1848, where they were mostly used as ornamental trees. Plantations for commercial benefits were started in late 1911, where it started in North Sumatra and Java, which became government estates later. In 1960s, larger palm plantation projects were started by smallholders, people who own their own palm oil plantations, with the help of government. After a decade, in 1970s, government expanded its helping hand to private sector as well.

The palm oil industry has developed swiftly over the years. Plantation and the Crude Palm Oil (CPO) mills played a major role in their earlier stage of development. However there is a notable positive rise up from upstream industry lately, which produces food, Bio diesel, and various cosmetic products (Indonesian Palm Oil Board, 2007).

According to the reports issued by Indonesian Palm Oil Board, the area of the palm oil plantation was about 782,000 hectares in 1986. It has been briskly growing over the time and reached up to 6.1 million hectares in 2006⁴. In year 2009, it has increased up to 9.7 million hectares, where 7.9 million hectares are already cultivated. At the very same year, the Indonesian government decided to allocate 18 million hectares of land only for palm oil plantations, since the plan is to hold their leading position as the World's largest palm oil producer. As for the minister of agriculture, this additional allocated land won't affect Indonesian forest conservation efforts⁵.

⁴ Indonesian Palm Oil Board <http://www.indonesian-embassy.de/image/Palmoil/Indonesian-Palmoil-1.pdf>

⁵ Green Palm Sustainability <http://greenpalm.org/en/about-palm-oil/what-is-palm-oil>

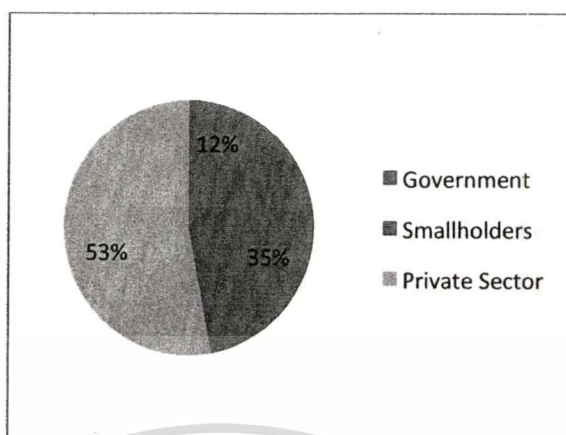


Figure 1: Plantations owned by different sectors in 2006
Source: *Indonesian Palm Oil in Numbers, 2007*

Table 3: Land area by Category of Producers

Year	Land area in Hectares			
	Smallholders	Government	Private	Total
2000	1,166,758	588,125	2,403,194	4,158,077
2001	1,561,031	609,943	2,542,457	4,713,431
2002	1,808,424	631,566	2,627,068	5,067,058
2003	1,854,394	662,803	2,766,360	5,283,557
2004	2,120,339	664,776	2,781,520	5,566,635
2005	2,356,895	677,792	2,915,662	5,950,349
2006	2,548,452	679,235	3,022,773	6,250,460

Source: *Indonesian Palm Oil in Numbers, 2007*

Since the Dutch colonial era, Palm oil plantations are mostly focused in Sumatra. The development of plantations and correlated infrastructure in this region is quite higher compared to other regions of Indonesia. Kalimantan was recognized as a feasible alternative and it contains a highly conceivable land bank for plantations. According to Tree Crop Estate statistics 2009-2011 for oil palm, 66% of total plantations in Indonesia were situated in Sumatra and remaining plantation areas are scattered across other islands (PwC Indonesia, 2012).

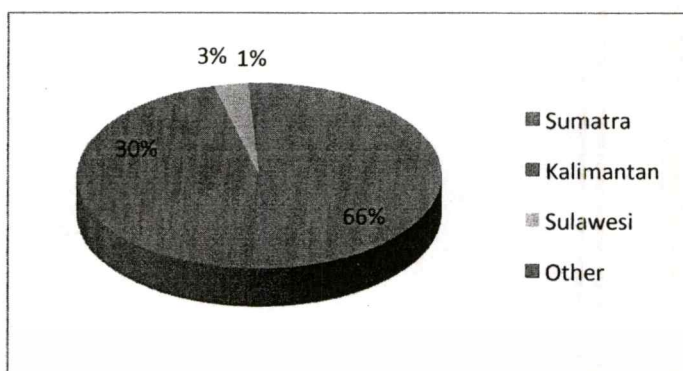


Figure 2: Geographic Distribution of Palm Oil Plantations in 2010
 Source: *Tree Crop Estate Statistics 2009-2011 for Oil Palm by the Directorate General of Estates*

Projected cultivated plantation area in 2020 is approximately 13 million ha.

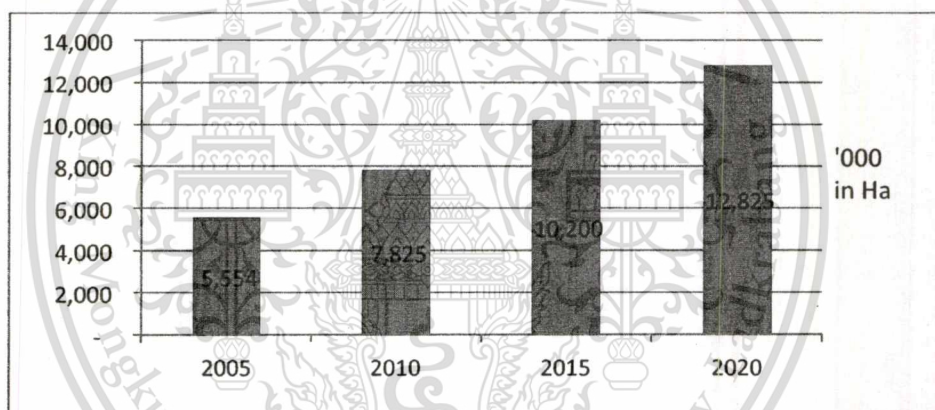


Figure 3: Projected Palm Oil Plantation Area
 Source: *Business Information Focus, 2010*

2.3 Production

In 2000, Indonesia produced nearly 5.8 million tons. 33% of that amount was produced by smallholders and the rest was produced by the government (25%) and the private companies (42%). According to the Figure 4, it is quite clear that, palm oil production has been increasing greatly. Palm oil production in 2006, including all sectors, was approximately 16.4 million tons. The growth rate of palm oil production since 2000 to 2006 was nearly 185% (Indonesian Palm Oil Board, 2007).

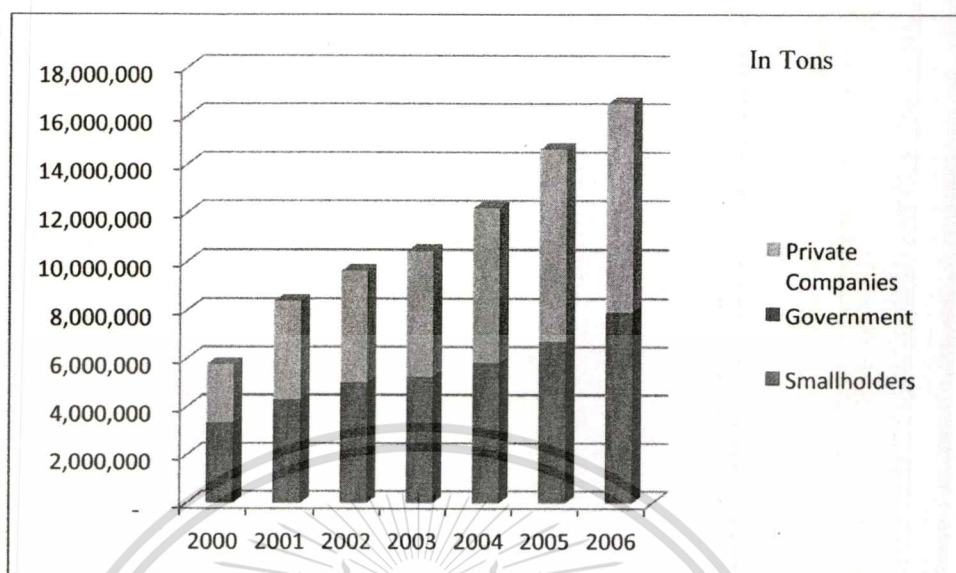


Figure 4: Annual Palm Oil Production by Different Sectors

Source: *Indonesian Palm Oil in Numbers, 2007*

From the year 2000 to 2006, palm oil production of the private sector companies and smallholders have increased greatly. The increase rates of private sector companies and smallholders were nearly 255% and 195% respectively. Compared to the private companies and smallholders, the palm oil production rate of the government was 59%. Figure 5 illustrates the total palm oil production of Indonesia from year 2000 to preliminary period of 2011.

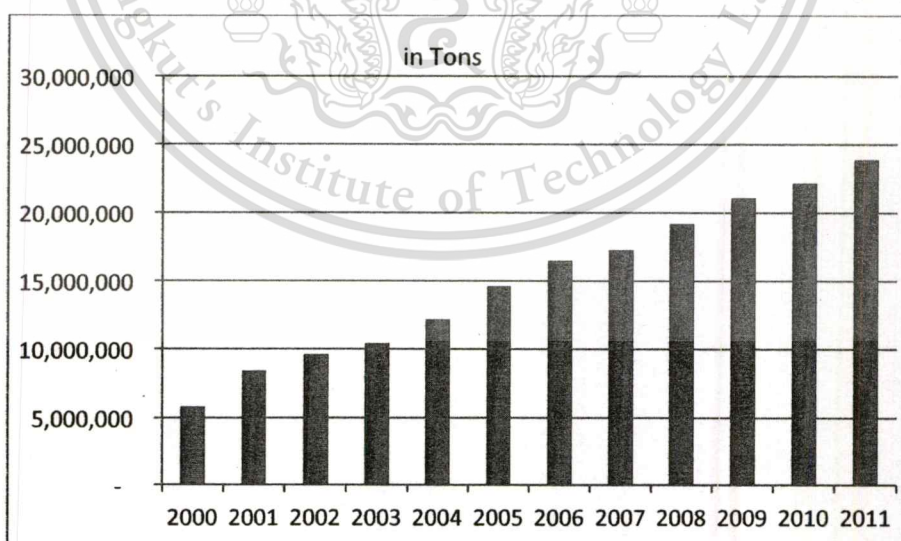


Figure 5: Annual Palm Oil Production of Indonesia

Source: *Indonesian Palm Oil in Numbers, 2007 / The Product Board for Margarine Fats and Oil (MVO), 2011*

2.4 Government Support

Palm Oil companies have created a lot of job opportunities in Indonesia and helped to reduce the unemployment rate of the country. The GoI has developed better frameworks, such as encouraging the development of palm oil plantations in industrial cluster areas, revitalization of palm oil estates, providing adequate incentives & support services for the upstream and downstream palm oil industry, and evolving palm oil based bio fuels for the year 2010 and onwards⁶. This will lead the Indonesian palm oil producers to have a wider access to the export market. In 2006, the Finance Ministry of Indonesia launched a loan program with interest rate subsidies, in the means of helping the revitalization programs mentioned above. It is to be noted that participation of the Indonesian banks to provide those loans have increased gradually. At the end of year 2007 there were 5 banks (Bank Mandiri, Bank Bukopin, BRI, Bank Nagari, and BPD Sumatera Utara⁹), who offered financial support for revitalization programs, and it has increased up to 16 banks in 2009 (Plantation Industry, 2010). The figure 6 & 7 elaborates the processes of upstream and downstream of palm oil industry.

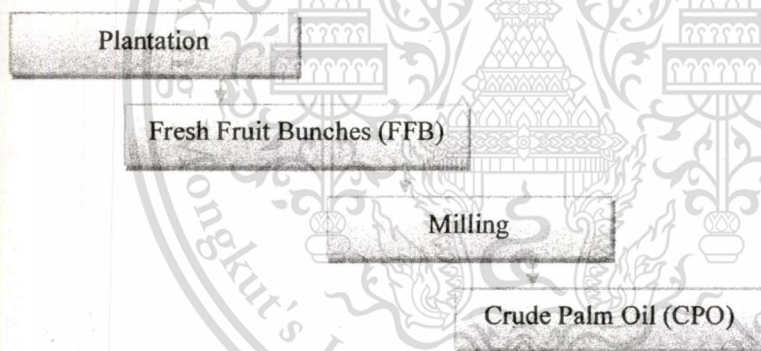


Figure 6: Palm Oil Plantation Upstream Process

Source: *Fact Sheet Palm Oil, 2011*

⁶ Plantation Industry http://new.pefindo.com/files/id_plantation_201001.pdf

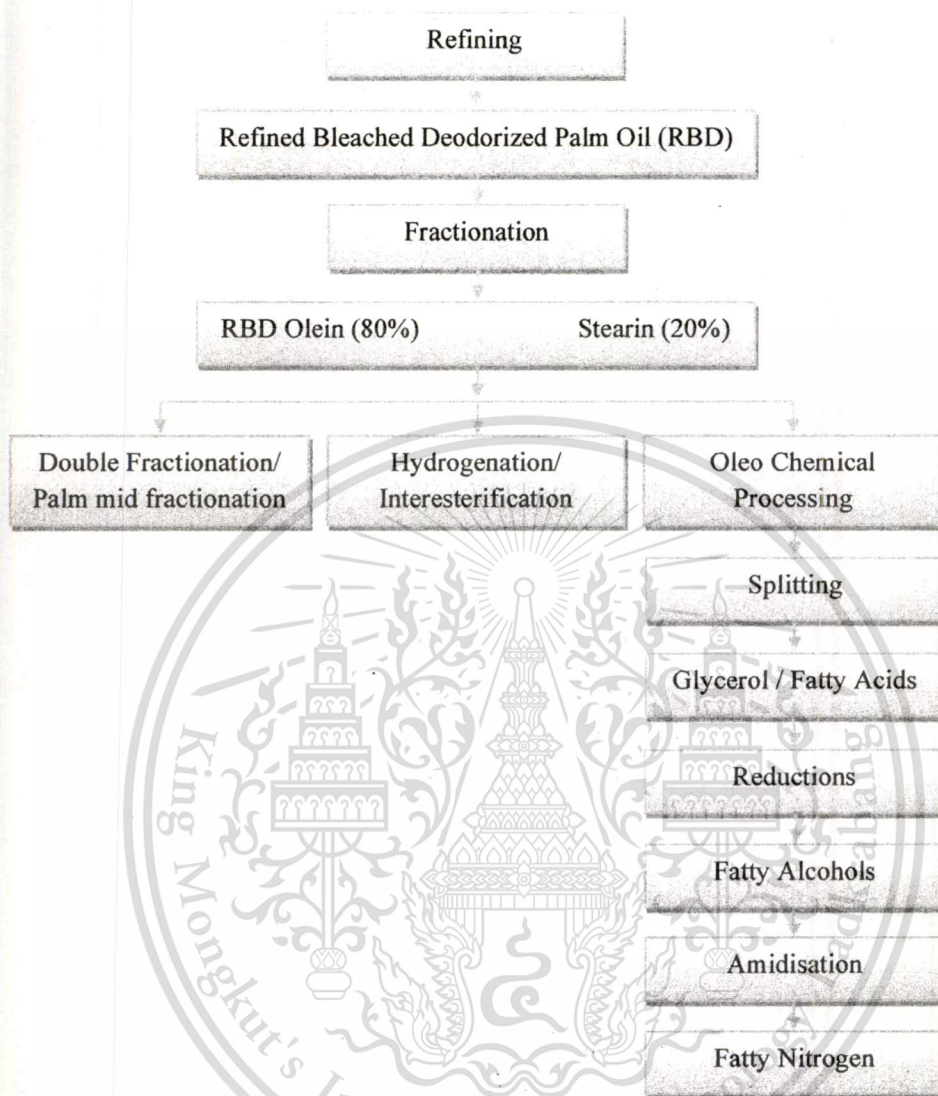


Figure 7: Palm Oil Plantation Downstream Process
 Source: *Fact Sheet Palm Oil, 2011*)

GoI plans to increase the demand for bio fuel within the country, using new regulations, with the help of Ministry of Energy and Mineral Resources. Decree number 32/2008 has been issued on 26th of September 2008, which states that bio diesel should be mixed with fuel oil. Palm oil is used to produce bio diesel as well, and according to the updated government regulation issued in January 2009, decree number 32/2009, it is mandatory to mix bio diesel with fuel oil up to certain levels. For the transportation sector, minimum amount of bio diesel to be mixed is 2.5%. Additionally, for the industry commerce sector and electricity sector have minimum levels of 5% and 1% respectively. The GoI believes that this will help to increase the demand for palm

oil in the domestic market. Their long term plan is to achieve a 5% of national energy mix made up from no less than 5% bio fuel (Plantation Industry, 2010).

According to the new framework, the GoI has joined forces with palm oil producers to establish the Indonesian Sustainable Palm Oil (ISPO) system, which is a set of standardized guidance about sustainable palm oil plantations and their developments. It also contains several regulations imported from Roundtable on Sustainable Palm Oil (RSPO), which is described in the Chapter 7. Furthermore the GoI has given adequate tax benefits to palm oil production companies. The export tax scheme applying to exporting palm oil is explained briefly in Chapter 3 under Trade Policy (Plantation Industry, 2010).

2.5 Sustainable Palm Oil

The demand for the palm oil has increased hugely within the past decade to produce both food and non food products. Bio fuel is one of the main reasons to have a high demand for non food palm oil products. Since the demand has increased greatly, serious problems were occurred to environment, eco systems, and made large social and economic impacts. Therefore most of the companies have agreed to form the RSPO. It was founded in 2003, in the purpose *“to promote the growth and use of sustainable palm oil through cooperation within the supply chain and open dialogue between its stakeholders”*⁷.

Members of RSPO come from different backgrounds such as, Palm oil planters, Manufacturers, Non Governmental Organizations (NGOs), and retailers. Other than RSPO, there are numerous criteria established by European countries, especially Germany, the UK, and the Netherlands. They will only import palm oil, only if the producers are meeting their criteria successfully.

⁷ Sustainable Palm Oil <http://www.greenpalm.org/en/about-palm-oil/what-is-sustainable-palm-oil>

Chapter 3

Palm Oil Trade in Indonesia

3.1 Export of Palm Oil

Approximately 68% of oil production was exported to more than 150 countries, including their major importers. Table 4 shows the export quantities to their major buyers for 5 years starting from the year 2006.

Table 4: Annual Palm Export Volumes of Indonesia

Country	(in Tons) 2006	(in Tons) 2007	(in Tons) 2008	(in Tons) 2009	(in Tons) (Until June) 2010
India	1,893,813	2,742,757	3,871,491	4,402,353	1,654,028
The Netherlands	834,256	569,871	968,205	1,057,227	285,150
Malaysia	469,106	265,180	574,530	1,053,516	584,649
Singapore	489,370	490,676	504,513	606,727	246,567
Italy	87,861	140,770	331,236	628,521	265,660
Germany	174,155	290,100	303,353	394,889	170,568
China	311,121	237,206	306,205	335,769	39,988
Pakistan	236,194	226,277	224,906	58,909	-
Spain	95,665	95,665	130,397	238,307	156,242
Ukraine	27,472	60,318	182,724	139,524	50,000

Source: *TradeData International Analysis Report, 2010*.

According to the table 4, it appears that India is the biggest buyer of Crude Palm Oil (CPO) produced by Indonesia. Since 2007 to 2009, the export quantity has increased vastly. Figure 8 indicates the total palm oil exports of Indonesia from 2000 to 2011.

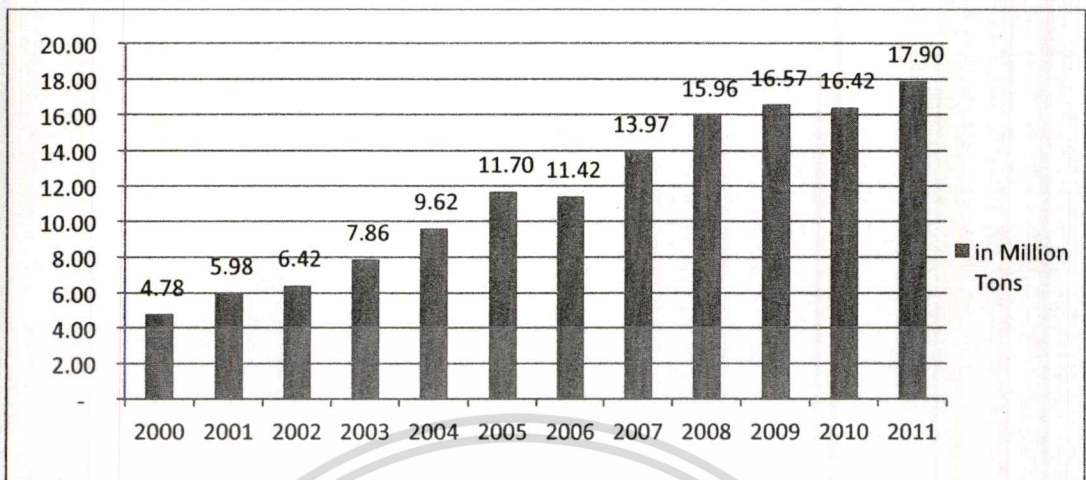


Figure 8: Annual Palm Oil Export Volumes of Indonesia

Source: *Indexmundi.com*, 2012

However in September 2012, it showed a drop in exports. This happened due to government decisions made by India and China, to reduce their purchase quantities of cooking oil from Indonesia. Recorded shipments to India and China in that month were 507,460 tons and 205,730 tons, which is a reduction of 9.5% and 29% respectively (The Jakarta Post, 2012).

Mr. Deddy Saleh, the director general for foreign trade of Trade Ministry of Indonesia has stated that Indonesia is currently looking forward to explore new markets for CPO and currently under discussion with the responsible persons of Russia. According to the director general, the calculated market potential for Russia goes up to 2 million tons. So far Russia has been importing CPO from the Netherlands and Ukraine, who import CPO from Indonesia. If they reach to a successful agreement, Indonesia will be able to export CPO directly to Vladivostok port, Russia via sea without the help of any third parties (The Jakarta Globe, 2012).

In February 2012, GoI signed a Preferential Trade Agreement (PTA) with Pakistan in order to boost CPO exports further. Indonesia have been earning approximately \$550 million per annum before 2007, but decreased down to \$100 million per annum after Pakistan has signed a PTA with Malaysia in 2007, who is also the major competitor of Indonesia. After the PTA agreement with Malaysia, Indonesian exporters faced high import taxes in Pakistan, while Malaysian exporters gained benefits, such as low prices and capturing the palm oil market in Pakistan, with lesser import taxes. Even though GoI has proposed a PTA with Pakistan in 2009, it has been delayed due to governmental change of Pakistan. GoI believes that they could increase their total exports up to \$1.5 billion - \$1.6 billion. Currently their earnings from the exports to Pakistan are approximately \$1 billion (The Jakarta Globe, 2012).

3.2 EU Market

Palm oil is considered as a major feedstock for numerous industrial products in the European Union (EU). The EU imports large amounts of CPO, and process the imported CPO to produce processed palm oil, Refined Bleached Deodorized (RBD) palm oil, which is mostly used in the downstream process (refer Chapter 2, Figure 7). Imported palm oil is used in food, cosmetics, pharmaceuticals, animal feed, and to produce bio diesel. The figure 9 shows the total imports of palm oil (Fact Sheet Palm Oil MVO, 2011).

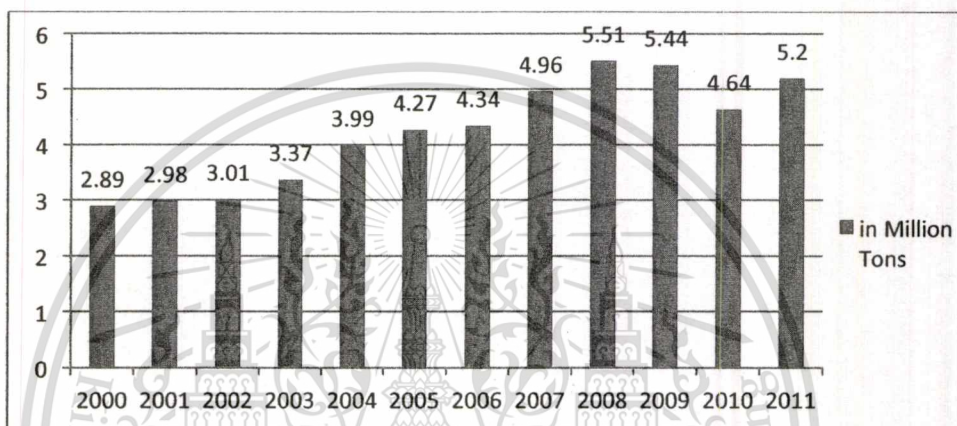


Figure 9: Annual Import Volumes of Palm Oil by the EU

Source: *Indexmundi.com, 2012*

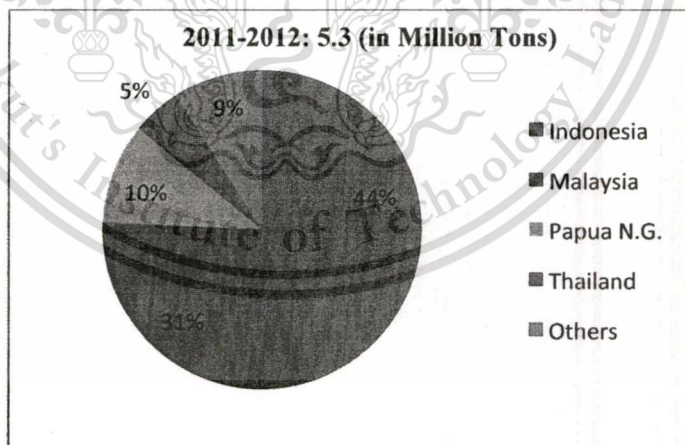


Figure 10: The EU Palm Oil Imports by Origins 2011-2012

Source: *EU Oil Seed Trading 2012*

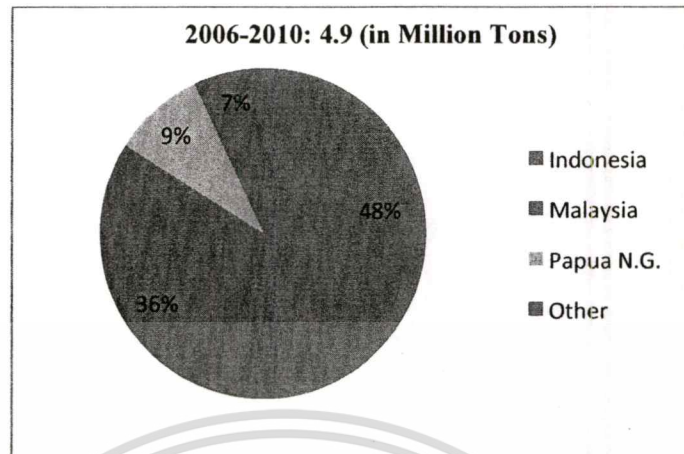


Figure 11: The EU Palm Oil Import by Origins 2006-2010
Source: *EU Oil Seed Trading 2012*

3.3 US Market

The Market for palm oil in USA is still rising since palm oil is playing a noteworthy role in the food industry. However most of the edible oils are produced domestically, where soybean and corn oil remain as the top sellers. According to WWF, consumption of palm oil in 2011 was approximately 1 million tons. Out of this amount, 90% of palm oil was imported from Malaysia and Indonesia claims nearly a 7% of it. The remaining is produced by other countries such as Thailand and Ghana (Realizing Sustainable Oil Palm Development in Indonesia, 2011).

Recently there have been increases in palm oil importing after finding out that Trans Fatty Acids (TFA) in most food sources are unhealthy. Therefore in 2003 the Food and Drug Administration of USA (FDA) announced in 2006, that it is required to label the Trans fat amount in foods. Since palm oil has a low amount of TFA, most food companies are planning to use palm oil for their productions and some companies have already switched into palm oil. Therefore usage of widely consumed oil in the USA, which is Soybean oil, has been declining over the past few years. Palm oil imports started to increase steadily after the announcement of Trans Fat labeling. In 2008, the analyzed information, which was gathered by FDA, reported an amount of 1 million tons of palm oil and again in 2011. It is to be noted that California has banned Trans fat completely, which means there shouldn't be Trans fat included in any food services and restaurants, following this decision, few other states have decided to take actions against TFA, which will create an increase in demand for palm oil (wwf.panda.org, 2012).

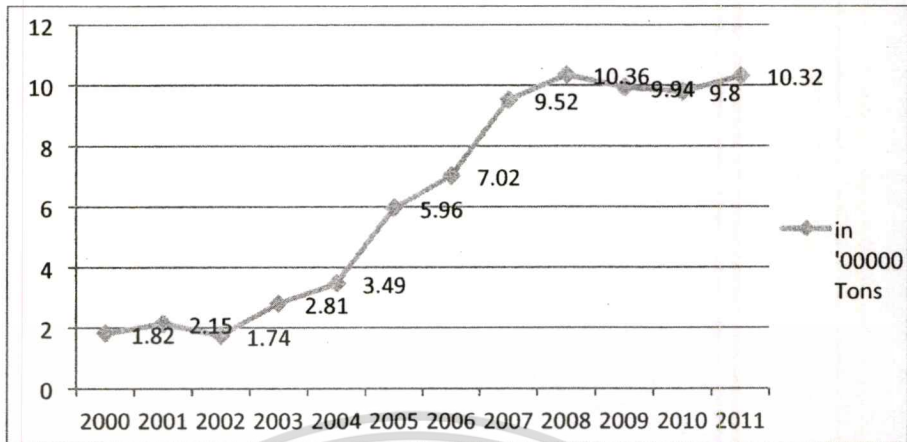


Figure 12: Annual Palm Oil Imports by the USA
Source: *Indexmundi.com, 2012*

3.4 Trade Policy

The EU follows a different tax structure to import palm oil. When applying taxes, Origin of the palm oil, processing stage, and application of the product will be considered. Taxes for bulk imports from Indonesia, applicable for food, are as 3.8% for CPO (Import tax rate applies flat to the whole value of the imported CPO and there is no volume threshold for the rate. So if a company import 10 tons with the price of \$10, the importer has to pay \$3.8 of taxes if the tax rate is 3.8%) 9% for RBD palm oil, 10.9% for Palm stearin, and 9.6% for hydrogenated (This is applicable to Malaysia as well).

Non food applicable oil will be taxed separately (RBD palm oil). The tax rate is amounted as 5.1%, however until 31st of December 2013; taxes are suspended on RBD oil, palm Olein, and Palm Stearin. According to the Generalized System of Preferences (GSP), palm oil produced by the developing countries other than Malaysia and Indonesia, such as Thailand, Brazil, and Nigeria receive significant tax reductions. Also GSP+ countries such as Andes and Central American countries are exempted from any import taxes⁸.

Lately in 2007 EU signed an agreement with Africa, Caribbean, and Pacific (ACP) countries where most of them were former colonies of EU member countries (e.g.: Ivory Coast, Ghana). The agreement is named as Economic Partnership Agreements (EPAs). These countries also entitled to get the same benefit like GSP+ countries⁸.

⁸ Fact Sheet Palm Oil, Product Board MVO

<http://www.mvo.nl/LinkClick.aspx?fileticket=jsFVMZwZzkc%3d&tabid=2301&mid=3341&language=en-US>

Table 5: The EU Import Duties on Palm Oil

Product	Indonesia & Malaysia	GSP	GSP+	EPA
CPO - non food applications	0%	0%	0%	0%
CPO - other	3.8%	0%	0%	0%
Palm Stearin, Solid Fractions - immediate packaging of a net content not exceeding 1Kg	12.8%	4.4%	0%	0%
Palm Stearin, Solid Fractions - other	10.9% ¹⁾	3.8% ¹⁾	0%	0%
Refined Palm Oil / Palm Olein - non food applications	5.1% ¹⁾	1.6% ¹⁾	0%	0%
Refined Palm Oil / Palm Olein - other	9.0%	3.1%	0%	0%
Hydrogenated Palm Oil - immediate packaging of a net content not exceeding 1Kg	12.8%	8.9%	0%	0%
Hydrogenated Palm Oil - Other	9.6%	6.1%	0%	0%
1) The EU has fully suspended its all taxes until 31 st of December 2013				

Source: *The Product Board for Margarine Fats and Oil (MVO), 2011*

The GoI also established a tax procedure to control the export of CPO. The main aim is to ensure that there will be enough supply to satisfy the demand of domestic customers. It will help to keep the price of cooking oil at a reasonable rate. According to this tax scheme, export tax amount is calculated using the average Rotterdam monthly market price. Taxes are not charged if the CPO price fell below or equal to US\$700/ton, which is mentioned in the decree number 223/PMK.011/2008 of Ministry of Finance (Plantation Industry, 2010). Table 6 illustrates the tax rates to be applied in various prices.

Table 6: Export Tax Rates by the Indonesian Government

Price under Rotterdam (US \$/ton)	Export Tax Rates (in %)		
	CPO	PKO*	Biodiesel
≤ 700	0		
701-750	1.5		
751 - 800	3	1.5	
801 - 850	4.5	3	
851 - 900	6	4.5	
901 - 950	7.5	6	
951 - 1000	10	8.5	2
1001 - 1050	12.5	11	2
1051 - 1100	15	13.5	2
1101 - 1150	17.5	16	5
1151 - 1200	20	18.5	5
1201 - 1250	22.5	21	7.5
≥ 1251	25	23	10

Source: *The Product Board for Margarine Fats and Oil (MVO), 2011*

*Palm Kernel Oil

Chapter 4

Environmental & Social Impacts

4.1 Environmental Impacts

4.1.1 Deforestation

It is to be noted that palm oil is considered as one of the major causes to create significant environmental impacts in Indonesia. Due to palm oil plantations, problems such as deforestation, habitat and species destruction, pollution (soil, air, water), and chemical contamination have occurred. In Indonesia most of the palm oil plantations are grown as an individual plantation crop, and the planters often use freshly acquitted rainforests or peat swamp forest lands, without using degraded lands. Both Malaysia and Indonesia have involved in obliteration of tropical rainforests in massive amounts of acres. Those rainforests are claimed to be remarkable for having vast bio diversities (Cruel Oil, 2005).

According to the International Finance Cooperation (IFC), palm oil plantations have boosted up approximately 12.2 million ha in end of 2009. In early 1980, palm oil plantations were accounted as 1.55 million hectares. Out of those lands, some were in improper states to use for other plantations rather than palm oil. However all of these lands used to be lowland tropical forests. As mentioned earlier palm oil plantation reported a huge expansion during the year 1990 to the year 2005. Among these planted lands, approximately 55% of lands were planted by clearing tropical forests. It is reported by IFC that the average deforestation rate of Indonesia is nearly 300,000 hectares per year. In early stage the government supported planters to easily obtain forest lands, conversion of lands to plantations, and leased them for a long term basis. Most of the large plantations have been handed over to families in the hope of gaining more commercial interests by leasing them for a long term (The Root of the Problem, 2011).

In 2009, the Indonesian Environment Ministry approved a decree, which enables to convert peat lands into Palm oil plantations. However according to the regulations issued by the ministry, only lands which have 3 meters deep peat can be converted and the environmental impact analysis should be done before the conversion. Converting peat lands, which are deeper than 3 meters, is considered to be strictly forbidden (mongabay.com, 2009).

It is possible to use lands other than newly cleared forest lands for palm oil plantations. Especially there are vast numbers of degraded lands available in Indonesia, where planters can use for palm oil plantations. According to the environmental perspective view, a degraded land is

a land, where refurbishing doesn't emit any more considerable amount of green house gasses to the atmosphere. Even though the GoI agreed to use peat lands in 2009, the president of Indonesia, Mr. Susilo Bambang, has professed a new policy in 2010 to develop upcoming palm plantations in degraded lands without clearing peat lands or tropical forests (wri.org, 2010). However, most of the companies or planters tend to exploit newly cleared forest lands due to additional benefits that they can earn, especially the profits they can earn by selling timber. In most situations they can find enough capital to start palm oil plantations by selling timber. According to a government research, it is identified that they could earn nearly US \$10,000 per hectare, which makes it as one of the most profitable possibilities of forest clearance (The Root of the Problem, 2011).

4.1.2 Illegal Logging

Forest clearance for palm oil plantation has become a main reason to various illegal activities. Especially illegal activities by loggers take a major role in this situation. Some loggers use palm oil plantation as an excuse to get the license from the government, in the purpose of getting enough access to timber. There are cases in Kalimantan and Papua, where small companies are established in the means of accessing timber. Presence of such companies, point out loop holes in government procedure to obtain licenses for timber logging (Indonesia Palm Oil Synthesis, 2010).

4.1.3 Endangered Species

Deforestation brought a great disaster for wild life. Most of the species are in near extinction. Since the forests are cleared and biological forests are grown, most of the eco systems started to crumble. Several species have been recorded in the International Union for Conservation of Nature (IUCN) Red List, which is the most recognized list for the endangered species in the world. Below mentioned species are some of the endangered species due to forest clearance (Cruel Oil, 2005).

1. Orangutan
2. Sumatran Tiger
3. Clouded Leopard
4. Asian Elephant
5. Sumatran Rhinoceros

According to the IUCN red list, Sumatran Orangutan, Sumatran Tiger, and Sumatran Rhinoceros are recognized as critically endangered species.

4.1.4 Other Related Issues

Deforestation will invite a lot of problems such as soil degradation, erosion, high green house gas emissions⁹, drought, sky rocketing global temperature, and finally climate change. According to the “Greenpeace.org” Indonesia is ranked as number 3 in world’s largest green house gas producers, where China and USA remain as the leaders. Since peat lands in Indonesia contain a high density of carbon in soil, therefore draining and cleaning them will release a massive amount of Carbon to the atmosphere. Released greenhouse gasses will be the main reason for rising global temperature. High temperatures are capable enough to bring further destruction to trees. Eventually droughts will occur, where more Carbon is added to the atmosphere due to natural forest fires (Greenpeace.org, 2012).

4.1.4.1 Soil Erosion

There are numerous reasons to have soil erosions. The main reason is leaving the soil exposed after the forest clearance. It can be further boost up by not having a proper management of the forest clearance. In 2001, noticeable mismanagement of forest clearance has occurred in Riau Province of Sumatra, Indonesia. Loggers bulldozed the logged trees straight down the hills without going through contour rows, which will tend to siphon rain water into gutters where it will boost the soil erosion (wwf.panda.org, 2004).

Not having a proper road infrastructure is another reason to cause erosion. Also planting trees in rows from top to bottom will boost the erosion rather than following contour plowing or contour bunding techniques which are the best ways to reduce erosion. Another mistake that planters cause is having a slope more than 15 degrees (wwf.panda.org, 2004).

4.1.4.2 Air Pollution

Air pollution occurs specially due to the forest burning. It is the most common method that planters used to clear forests for plantations. Once started, the fire is extremely uncontrollable, and will last for months. Those fires release thick smog, which cause health issues for people who are exposed and have a direct impact on pollinate. Even though the government

⁹ Environmental, Economic and Social Impacts of Oil Palm in Indonesia: A Synthesis of Opportunities & Challenges
[http://www.ifc.org/ifcext/agriconsultation.nsf/AttachmentsByTitle/WB+discussion+paper/\\$FILE/WB_Oil+Palm+SynthesisDiscussionPaperMay2010.pdf](http://www.ifc.org/ifcext/agriconsultation.nsf/AttachmentsByTitle/WB+discussion+paper/$FILE/WB_Oil+Palm+SynthesisDiscussionPaperMay2010.pdf)

has passed laws and regulations against the forest burning, it still happens in some areas (wwf.panda.org, 2004).

4.1.4.3 Soil and Water Pollution

A large amount of water is used during the palm oil extraction process. Estimated amounts point out that to generate 1 ton of crude palm oil, 5-7.5 tons of water is required, where nearly half of that amount will be ended up as effluent. It is called as Palm Oil Mill Effluent (POME). To squeeze out the palm oil, harvested Fresh Fruit Bunches (FFB), have to be processed in the CPO mills within 24 hours. POME liquid is generated mostly during the extraction, washing, and cleaning processes. Newly disposed POME is a brownish hot liquid, which contains a pH value of 4 or 5. Releasing them directly into the soil will kill the vegetation. Disposing into the water, which is the cheapest method available, will cause water pollution even though it is not highly toxic (Review of Current POME Treatment Methods, 2010). A majority of planters have built an outdoor basin near to their CPO mills to store POME until they are detoxified down to a safer level. However these basins are highly vulnerable for heavy rains, which cause them to overflow pretty easily. Since the Biological Oxygen Demand (BOD) of POME is naturally high, it is considered as a highly pollutant substance. Also it has been reported that some companies are releasing POME liquid directly into the rivers without undergoing any detoxifying procedures (Greasy Palms, 2005).

There are solid parts included in the POME liquid. Basically they are made of leaves, trunks, empty fruit bunches, seed shells, and etc. This type of waste is called Palm Oil Mill Sludge (POMS). However POMS contains a very high nutrient value with a pH value of 8.4. It produces an extremely awful odor and is recognized as a soil and water pollutant (Review of Current POME Treatment Methods, 2010).

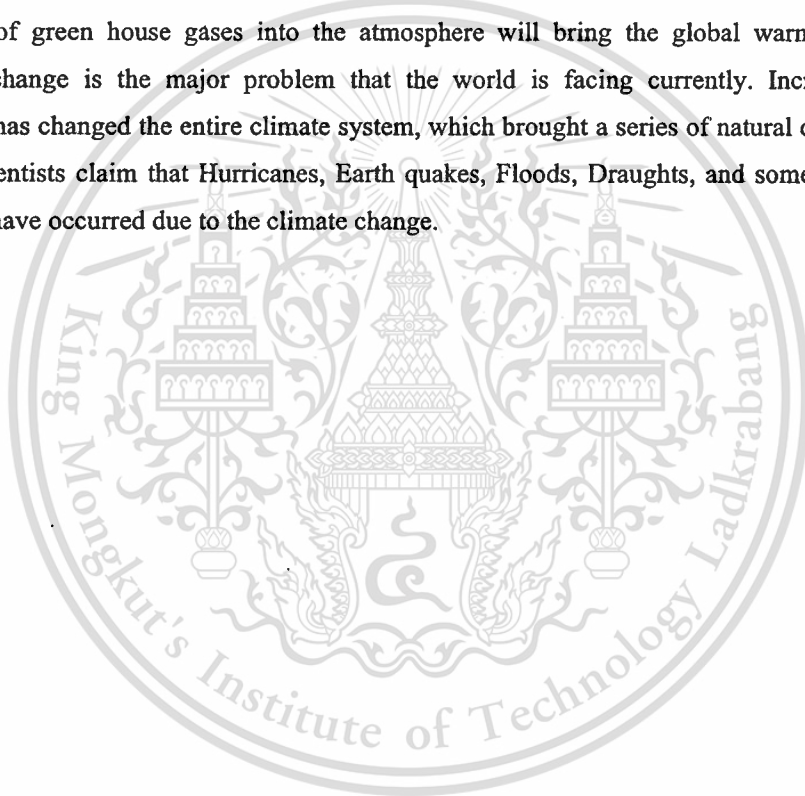
Another soil and water pollutant method is the use of pesticides and fertilizer. Fertilizer may enrich the nutrition in soil, but it might pollute the ground water. Unsystematic usage of pesticides will cause pollution as well. It will directly affect the soil and water sources. Most of the farmers use pesticides to get rid of rats. Excessive usage will kill other pesticides as well (wwf.panda.org, 2004). Another most common pesticide used by farmers is "Paraquat Dichloride", which widely known as "paraquat". Specially used as a weed killer and considered as highly toxic and extremely fatal if inhaled, ingested, or absorbed (Greasy Palms, 2005).

These types of waste can be divided into two major parts, named as Odorous Emissions and Residues, which exist as liquids or in solid forms. Odors could be generated from tank farms,

hot wells of splitting and fractionation, autoclaves, and in glycerol pre treatments¹⁰. Laboratory reports confirm that they found fatty acids in Odor, such as ketones and aldehyde. In normal circumstances, a plantation is encircled with at least 5000 parts per million (ppm) of above mentioned fatty acids. Odor will start when the acid level reaches the 1000 ppm.

4.1.4.4 Climate Change

As mentioned in “4.1 Deforestation”, clearance of peat lands will release a lot of carbon to the atmosphere, because peat lands contain extreme amounts of carbon. The normal procedure to clear tropical forest, which is burning, will release an extreme amount of CO₂. Releasing large amounts of green house gases into the atmosphere will bring the global warming situation. Climate change is the major problem that the world is facing currently. Increasing global warming has changed the entire climate system, which brought a series of natural disasters. Most of the scientists claim that Hurricanes, Earth quakes, Floods, Draughts, and some other natural disasters have occurred due to the climate change.



¹⁰ Sustainable Palm Oil Plantations <http://www.indonesian-embassy.de/image/Palmoil/Indonesian-Palmoil-2.pdf>

4.1.5 A few Examples of Forest Clearance

1. A company called PT Smart cleared an area of 2,500ha of low land forest in East Kalimantan. This forest was home to a number of Orangutans, who are listed as critically endangered and protected species.
2. PT Gunung Mas Raya, a subsidiary of Indofood Sukses Makmur Group, cleared an agreed part of a peat land. In the final stage of the clearing it has been revealed that part of the clearing will be out of the agreed clearing area. The company had to abandon the illegal clearing area due to their investor's protective policy, ING from the Netherlands, which states that there will be no financing for any illegal forest clearing.
3. Two non-governmental organizations (NGOs), Sawit Watch and Friends of the Earth Indonesia, have taken a satellite image of Lake Sentarum National Park, West Kalimantan. According to their research, they have found out that the oil palm plantation around the national park has been continuously growing over the past few years. In 1994, the reported amount was 3,000ha, which has increased up to 94,000ha in 2000.
4. In the mid of year 2001, the Itam river in Musi Rawas district turned brown in color and gave a bad odor. Water was slimy and unusable for washing and bathing, which caused skin rashes. The responsible company for the occurred pollution was PT LonSum, who claimed that POME waste was reused as fertilizer. A lawsuit was filed against the particular company and was settled within a month. As compensation, PT LonSum had to pay Rp. 6 million to the community.
5. In 2003, a group of plantation companies assured that they will take necessary arrangements to improve their waste management systems. However, after a month of this assurance, in May 2003 thousands of fish in Kunig river was killed. The Jakarta post claimed that a company called PT Surya Dumai had dumped considerable amount of waste water into the river, which caused the killing incident.

(Greasy Palms, 2005)

4.2 Social Impacts

4.2.1 Land Conflicts

Land conflicts often occur in the areas of palm oil plantations, especially in West Kalimantan, where indigenous people called Dayak live. Nearly 40 million of indigenous people and other rural community dwell on the forest lands. These people hardly have formal rights for their own lands. Lack of formal rights made it easier for private plantation companies to obtain customary rights on these lands without any great difficulties. The Indonesian Legal Aid Foundation has done a research about customary rights on lands in 1998. According to the foundation results, nearly 214,356 of households in 14 provinces, approximately 553 cases, lost 827,351ha. Most of the time, there were strong resistance from the indigenous people and other rural communities to protect their own lands. Due to the strong resistance, some companies couldn't continue their operations, which lead to illegal or violent conflicts. It is a revealed secret that some companies bribed higher government officials to subdue conflicts (Greasy Palms, 2005).

According to the Consortium for Agrarian Reform (A non profit organization formed in 1994 in order to stand by the independence of the people, environmental conservation, human rights, and etc.), also known as Konsorsium Pembaruan Agraria (KPA), 530 cases were reported, which were fully related to palm oil plantations. Out of these reports, there were cases about murders, abductions, household destructions, and other forms of violence. The reported cases were gathered in 2002, which was double the amount of the previous year (Greasy Palms, 2005).

It is being realized that most of the companies like to claim relatively small land areas. Most of the conflicts occurred around small lands in size of few hundred hectares. In several occasions plantation companies had to undergo massive social pressures, which made the companies to hand over part of their claimed lands back to local communities. There was a case, which ran nearly 17 years and finally won by the local community (Greasy Palms, 2005).

4.2.2 Cultural Issues

It is to be noted that most of the people from rural areas have been living with various farming activities, which became part of their culture a long time ago. The best example is rice. The indigenous people, who dwell with the forest, have deep rooted traditions that they pass on generation to generation. Most of these traditions are linked with forests. When the forests are gone, their long practiced traditions cannot be performed, and it will make them feel more insecure or unstable.

4.2.3 Identified Benefits

Even though there are numerous conflicts, establishing palm oil plantations bring some valuable benefits to the company and society as well. Most of the villages, which are situated really far away from the main cities, are under developed. However when the plantation is established, the particular village gets schools, shops, post offices, and other infrastructure benefits.

The most important thing is employment, where better opportunities will open up for smallholders, doctors, nurses, teachers, traders, and other outsourcing activities. Likewise this will help to reduce the poverty out of the local communities. There are cases where small villages developed into cities. Also most of the recognized palm oil companies take part in Corporate Social Responsibility (CSR) activities. Through CSR, companies actively take part in infrastructure developments, such as building schools, clinics, and roads.

Supporting smallholders is a very important factor, since it helps a lot to produce sustainable palm oil. In Indonesia any independent could start a small plantation and sell their harvest to the companies who own mills. Most of the trading will undergo a bidding process, where FFB will be bought by the highest bidder. Majority of smallholders educate their children by sending them to schools, which help to have an educated younger generation. Also most of the companies run training programs to create the awareness among the local community about the sustainable palm oil. Table 7 illustrates some of the benefits that each sector has gained due to the palm oil plantations.

Table 7: Positive Social Impacts

Sector	Benefits
Education	<ul style="list-style-type: none"> • New educational infrastructures • Scholarships for students • Increasing the quality of teaching and learning activities • New facilities for pre-element schools
Economy	<ul style="list-style-type: none"> • Amplify the revenues of community • New Job Opportunities • Training programs related to palm oil plantations and business
Social	<ul style="list-style-type: none"> • Infrastructure development of the village (Roads, transportation facilities) • Development of water supplies and other sanitary facilities • New sports facilities • Boost the unity between community through various social activities such as blood donations
Health	<ul style="list-style-type: none"> • Development of Clinics and health care activities • Provide health education to villages to increase the awareness to have a good health

Source: *Facts of Indonesian Palm Oil, 2010*

Chapter 5

Identified Solutions for Environmental Impacts

5.1 Introduction

As mentioned in the Chapter 4, palm oil plantations cause a significant amount of impacts to the environment. This chapter illustrates about the identified solutions to mitigate the adverse impacts to the environment.

5.2 Zero Burning Policy

Forest burning brings a huge damage to the environment. To reduce this impact, the zero burning policy has been implemented. This policy is backed up by numerous laws and regulations of the GoI, like Plantation Law, Forestry Law, and Environmental Law. Since Indonesia is a member country of Association of South East Asian Nation (ASEAN), the above policy is strongly backed up by (Indonesia, Malaysia, Thailand, Brunei, and Singapore) the signed Trans-boundary Pollutant plan in 1995, where it agrees on trans-boundary air pollution (Sustainable Oil Palm Plantations, 2007).

Under the influence of this policy, the government bodies who signed the pollutant plan were able to boost the awareness of people about forest fires and its drawbacks to the environment and humans. They have managed to launch training programs to local communities about how to quench forest fires, haze and the importance of using degradable lands, such as Grass lands, Flat land secondary forests, Sloping land secondary forests, and lands used for other plantations for palm oil plantations. The majority of the governmental bodies have mostly focused on local communities; however there were some teams, who have focused their attention on training plantation companies and smallholders (Sustainable Oil Palm Plantations, 2007).

5.3 Meeting the Requested Demand without Deforestation

Omitting new forest clearance and peat lands won't be a hinder for the further developments of palm oil industry and to meet its massive global demand. Naturally Indonesia contains cogon grasslands and already cleared unplanted plantation lands. As for the calculations done by the GoI, these lands will be more than enough to meet their key target, to double palm oil

production in 10 years, without clearing any new forest or peat lands (The Root of the Problem, 2011).

Focusing on degraded lands will provide enough time space for other cleared secondary forest lands to grow their forest cover. It will take more than a century to restore its lost carbon stock in the soil. However for secondary forests, it is possible to recuperate naturally an acceptable amount of carbon stock during the given period of time. If the land was a drained peat land, it is essential to refurbish the natural water balance (The Root of the Problem, 2011).

5.4 Inquiring Better Palm Oil

Campaigning against Palm Oil Producing companies to use or meet certain accepted regulations or standards have happened quite often. Mostly those campaigns were governed by NGOs, such as Greenpeace International and Friends of Earth. However their great struggles haven't been in vain. Creation of the RSPO is one outcome of those struggles (The Root of the Problem, 2011).

According to the World Bank Palm Oil Strategy External Advisory Group, clearing swamp forests will add more Greenhouse gas to the atmosphere. Therefore the advisory group highly suggests not clearing off the swamp forests, but it does not cover the high carbon secondary forest lands. They will financially support the plantation projects near to the peat lands or tropical forests. To overcome the use of peat lands, palm oil should be recognized as a major reason for the global warming. That might make a big influence over governments, investors, and planters to think clearly about sustainable palm oil (The Root of the Problem, 2011).

5.5 Cover Crop

Erosion is a main problem that occurs in plantation sites. To mitigate this problem, numerous agricultural methods were introduced. One of the most successful methods is the cover crop method. This method helps to preserve the moisture of soil, reduce soil sinking, drying, risk of forest fire, and to decrease the soil degradation. Growing plants under the palm trees, use of empty fruit bunches (EFB) to mulch the soil, constructions of proper drainages, and correct pile placements are some of the activities fall under the cover crop method (Sustainable Oil Palm Plantations, 2007).

Some companies use EFB in the means of a fertilizer for their plantations. Those companies mostly use EFB on low harvest plantations, where they think that could increase the

harvest. Usage of EFB brought several advantages to the palm oil industry, such as low operating cost, reduction of chemical fertilizer, and reduction of EFB pollution.

5.6 Pesticides

Control of pesticides is important, since chemical usage affects directly to the soil and water pollution. To overcome the disproportionate usage of pesticides, other natural pest management controlling methods can be introduced. Weeds can be controlled by life stocks and through biological control insects and parasitoids. Biological control is a natural method to control pest using other living organisms, which rely on predation or herbivore. The use of Barn owls is a good method to control rats, which is already started in some palm oil estates (Sustainable Oil Palm Plantations, 2007).

5.7 Handling POME

Planters know that releasing POME straight into the river is the easiest and cheapest way but releasing POME fluid directly into the water and land will cause pollution. One of the most popular methods is Land Application of POME. However it can be avoided if the necessary steps were taken, like releasing a manageable amount of POME during certain intervals. There will be two treatment methods. Firstly physical pretreatment will be carried out, which consist of three stages (Screening, Sedimentation, and Oil Removal). Secondly biological treatment will be carried out, mostly anaerobic treatment (Sustainable Palm Oil Plantations, 2007).

One of the advanced pre treatment system is a combined process of acidification pond and flocculation treatment. A number of chemicals are used in flocculation treatment, such as aluminum chlorohydrate, aluminum sulfate, alum, and natural products like poly D-Glucosamine (Sustainable Palm Oil Plantations, 2007).

As mentioned above, it is widely recognized that anaerobic treatment is the most suitable method to handle POME waste. To proceed with these process there are number of developed ponds, Ponding System, across the plantations, obviously closer to the CPO mills. It is a low cost method and easy to operate. Identified drawbacks are bad odor, large area for the pond, possible overflows due to heavy rains, and difficulty in collecting bio gas (Sustainable Palm Oil Plantations, 2007).

Organic substances in POME are usually biodegradable, which make the biological treatment possible and successful. There are some identified advantages with this process, such as

minimum sludge formation, low energy requirement, bio gas production as a byproduct, which can be used as an energy source to generate electricity.

The company called PT Agro Indomas, a subsidiary of Good Hope Holdings, in Central Kalimantan is already using their liquid waste as a land fertilizer. Their “Sungai Purun” mill follows the government regulation no. 28/2003, which indicates all technical guidelines and better consumption of released liquid waste from palm oil plantations. They use the Ponding system to lower the BOD and pH levels of the liquid waste, and land application of waste occurs when the BOD level is lesser than 5000ppm. The pH level should be in between 6 – 9 (Sustainable Palm Oil Plantations, 2007).

Those liquid wastes contain a notable amount of nutrients, which are important for palm oil plantations (Sustainable Palm Oil Plantations, 2007). Identified nutrients are,

- i. Nitrogen (N)
- ii. Phosphorus (P)
- iii. Potassium (K)
- iv. Magnesium (Mg)

As for an evaluation carried out by PT Agro Indomas on liquid waste applied lands and non-applied lands, applied lands showed some significant advantages (PT Agro Indomas Annual Report, 2010).

- i. Palm trees grown in liquid waste applied lands showed a higher growth rate than the trees planted in non-applied lands.
- ii. Significant cost reduction
- iii. Low usage of chemical fertilizer
- iv. Reduction of environmental pollution

5.8 Handling POMS

As mentioned in chapter 4, sludge generated in the palm oil mills is considered as solid waste. Separated sludge can be dried and used as a fertilizer for the crops. According to the reports POMS is highly rich with nutrients and became the major reason to use it as a fertilizer. Open ponds will be used to dry the sludge, which pose drawbacks during rainy seasons. It is hard to dry the sludge during the rainy season, which causes to have a slow rate of fertilizer, and pose a threat of overflowing. Two types of sludge treatment technologies are being carried out. They are Composting and Vermicompositng (Review of Current POME Treatment Methods, 2010).

Solid waste can be used as fuel to generate electricity. The Sungai Purun Mill of PT Agro Indomas Company has been using this method in order to control their solid waste and to cut costs on fossil fuel (refer Appendix A for CPO and PKO processes).

5.9 Clear Labeling

Most of the end products generated from palm oil are not labeled properly. Ingredients section of the label may display the palm oil in a different name, mostly as “vegetable oil”. Vegetable Fat, Palmate, Cetyl Alcohol, Palmityl Alcohol are some of the other names, which are used to refer the palm oil. Implementing policies to have a clear labeling structure would help consumers to know more about their products, and those customers might be aware of globally certified labels like RSPO. This will help the customers to understand whether the end product was produced from the sustainable palm oil or not, and importers can put a great pressure, providing tax benefits to sustainable palm oil, on Exporters or palm oil companies to be aware about the sustainability of the oil they produce.

5.10 Applying Proper Environmental Regulations

It is always important to have proper regulations to control the palm oil plantations. By having rules and regulations Planters, Investors, Consumers, Employees, and other related parties will be bound to have a proper control over palm oil processes, beginning from plantations until their end products. People will be obliged to follow the legal procedures. Any illegal activities should be sued and punished by the law.

So far, a number of laws have been passed in the parliament of Indonesia regarding to protect the environment. The Environmental Act number 23, which was implemented in 1997, is mainly focused on managing numerous activities related to environment. Later on this regulation was further supported by government regulations and technical legislations on Social and Environmental impacts, which was published by the Environment Ministry of Indonesia. The Forestry Act was proposed and implemented in 1999. To regulate environmental and social issues occurred by palm oil plantations, the Plantation Act was introduced in 2004. Under this law, all the palm oil plantation companies must have a report of environmental and social impact analysis in order to acquire a permit for plantations. There are laws, which come under Plantation Act, to monitor POME and other waste, which contains a number of guidelines and quality standards for liquid waste and application of them as fertilizer.

5.11 Handling Oleo Chemical Waste

As mentioned in chapter 4, the waste generated from mills can be divided into liquid and solid waste. Those remainders further divided into different categories such as fatty acids, carbon, filter cake, used catalyst, and utilized lubricants. To break down those remainders, heating and a separation process is followed. Final output of this procedure is fat deposits and water with dirt. Fat deposits can be used in furnaces as a fuel and the water will be undergone through a waste water treatment system. Majority of plantation companies have procedures to handle their own Oleo chemicals (Sustainable Palm Oil Plantations, 2007).



Chapter 6

Roundtable Sustainable Palm Oil (RSPO)

6.1 Background

RSPO is a project executed by major palm oil production companies, governments, and conservation organizations, in the means of rearranging the palm oil production processes. Rearranging will be focused from the very beginning of the plantation process until the final output. The major reason to form a RSPO is to overcome the strong protests carried out by various nongovernmental organizations (NGOs), which are mainly related to environmental activities. A significant requirement of RSPO is that palm oil plantations and palm oil production should not be carried out in primary forests or HCV areas.

The first movement to form the RSPO was done by the World Wildlife Fund (WWF), one of the largest conservation organizations in the world. The WWF began to discover positive possibilities to establish RSPO in 2001. A very successful result was achieved in 2002, by having an informal collaboration among the few giants of palm oil industry, such as Migros, Malaysian Palm Oil Association (MPOA), and Unilever (refer Appendix B.1: Timeline Review to view the achievements of RSPO).

The RSPO is run by Executive Board members and it is formed by sixteen members. The maximum period of time for selected members is two years and an election will be held at the end of their service periods to select new members for the relevant positions. If there are no new nominations for the particular position, current members can prolong their respective service for further two years. The Executive Board is comprised of seven member groups sectors, which have two seats per each sector except for the sector "Oil Palm Growers" (refer Appendix B.2: Appointed Members in Sectors) (rspo.org, 2012). Annual accounts of RSPO are done by certified accountants at the end of each fiscal year, which is June. Annual reports should be submitted in the general meeting along with the budget for the upcoming year. Membership fees will be clarified by the Executive Board, which is responsible for clarifying the amount of fee that each member should pay other due payments, and the payment methods, which should be presented in the general meeting for approval.

Known as CWG, the Criteria Working Group was formed by RSPO in 2004. Their tasks are to develop, implement, review principles, criteria, and supervision of RSPO standards.

Furthermore additional counseling is provided to bring out SPO verified products. 25 members are allocated to this field, and each of them assigned to one of the four sectors.

Table 8: Appointed Members by Sectors

Sector Name	# of Members
Palm Oil Producers	10
Supply Chain and Investors	5
Environmental Interests	5
Social Interests	5

Source: *Promised Land: Palm Oil and Land Acquisition in Indonesia, 2006*

A significant event occurred in 2005, where CWG carried out a public consultation to improve RSPO standards. As a result of this consultation, RSPO accepted new improvements in the fields of Finance, Social, and Environment. Those improved modifications were presented in the meeting held in Singapore in 2005 for the approval. The approved RSPO P&C (refer Appendix B.3: *RSPO P&C*) focus on improving the strategic development of palm oil plantations with regard to economic, social, and financial aspects.

6.2 Vision and Mission

The vision of the RSPO is to 'transform the market to make sustainable palm oil'¹¹ by following a set of comprehensible standards to promote sustainability of palm oil along the supply chain. This palm oil supply chain consists of palm oil growers, millers, manufacturers, communities, and financial institutions (rspo.org, 2013). In order to realize the vision of the RSPO, they follow their mission, which is mentioned in table 9.

¹¹ Vision and Mission http://www.rspo.org/en/vision_and_mission

Table 9: Mission of the RSPO

<ul style="list-style-type: none"> • To advance the production, procurement, finance and use of sustainable palm oil products • To develop, implement, verify, assure and periodically review credible global standards for the entire supply chain of sustainable palm oil • To monitor and evaluate the economic, environmental and social impacts of the uptake of sustainable palm oil in the market • To engage and commit all stakeholders throughout the supply chain, including governments and consumers

Source: *rspo.org, 2013*

6.3 Members

All the members of RSPO are obliged to follow the RSPO P&C and the Code of Conduct (refer Appendix A.4: RSPO Code of Conduct). Memberships are divided into 7 sectors, where all the Ordinary members belong to one of these sectors (refer table 10). Affiliate membership (refer Appendix B.5:RSPO Membership Types) is awarded to either organizations or individuals, who do not fit in to any of these membership sectors and volunteer to provide their support to achieve the objectives of RSPO. Therefore; Affiliate members are mostly donors, governmental agencies, and research organizations (*rspo.org, 2013*).

Table 10: Membership Sectors of the RSPO

Sectors	Examples
Oil Palm Growers	PT Agro Indomas, PT Agro Bukit (Indonesia)
Palm Oil Processors and Traders	Bio Oils Energy - Spain, BioMar Group - Denmark
Consumer Goods Manufactures	Allied Bakeries-UK, Avon Products Inc. - USA
Retailers	Harvest Energy-UK, Coop Switzerland
Banks and Investors	Citi Bank - USA, Standard Chartered Bank - UK
Environmental or Nature Conservation Organizations (NGOs)	WWF Malaysia, National Wild Life Federation - USA
Social or Development Organizations (NGOs)	Oxfam, UTZ Certified (The Netherlands)

Source: *rspo.org/en/stakeholder_categories, 2013*

The members are responsible to support the continuation of the projects related to RSPO and to promote the RSPO & sustainable palm oil around the world. It is more important to operate transparently to the Roundtable board and keep the board up to date about the new plans, activities, and final achievements. Sustainable attempts of the RSPO are recognized by many

governments around the world (e.g. The Netherlands)(refer Appendix B.6: Countries Interested in RSPO certified palm oil). Figure 13 illustrates the number of memberships by country (rspo.org, 2013).

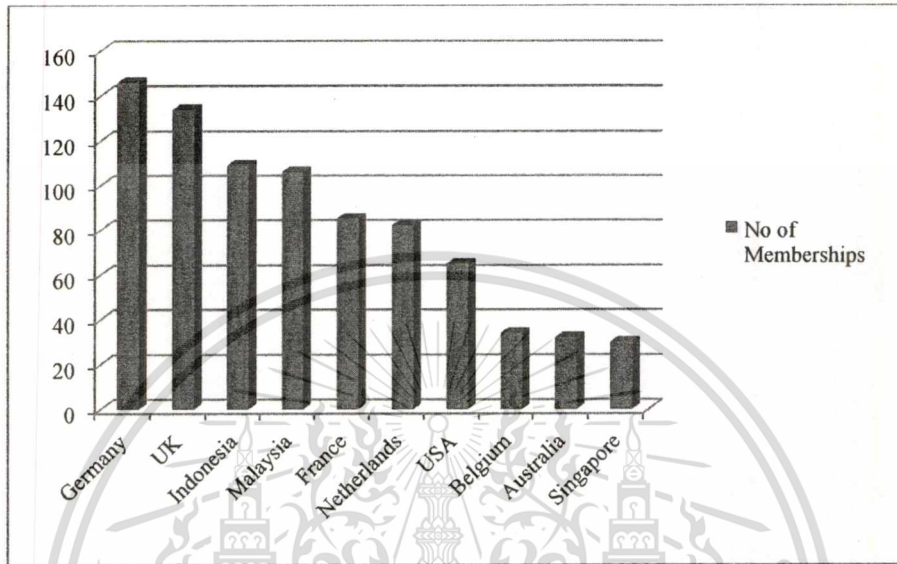


Figure 13: Number of Memberships by the Country
Source: rspo.org/en/membership_key_statistics, 2013

6.4 Effects of RSPO

At the beginning, reactions from the palm oil industry to produce sustainable palm oil were quite low, but later, starting from 2009, a noticeable change could be seen from the reports issued by WWF and RSPO. Reports show a rapid increasing tendency to obtain the RSPO membership (refer Figure 14).

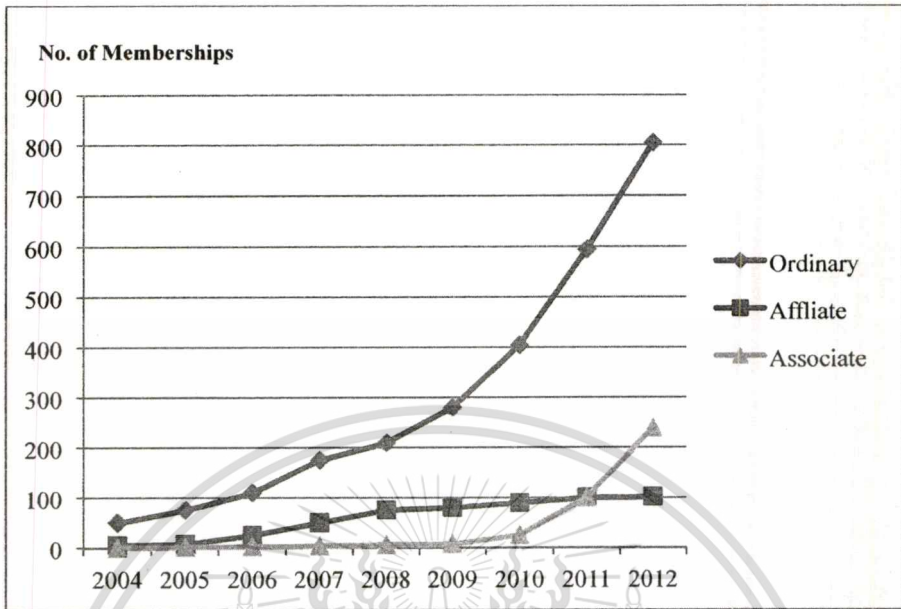


Figure 14: Growth of the RSPO Members by Type
 Source: rspo.org/en/membership_key_statistics, 2013

Figure 15 presents the world CSPO supply for the past 5 years. It shows a rapid increase in CSPO supply worldwide, where Indonesia alone supplied 4.06mil tons of CSPO in 2012.

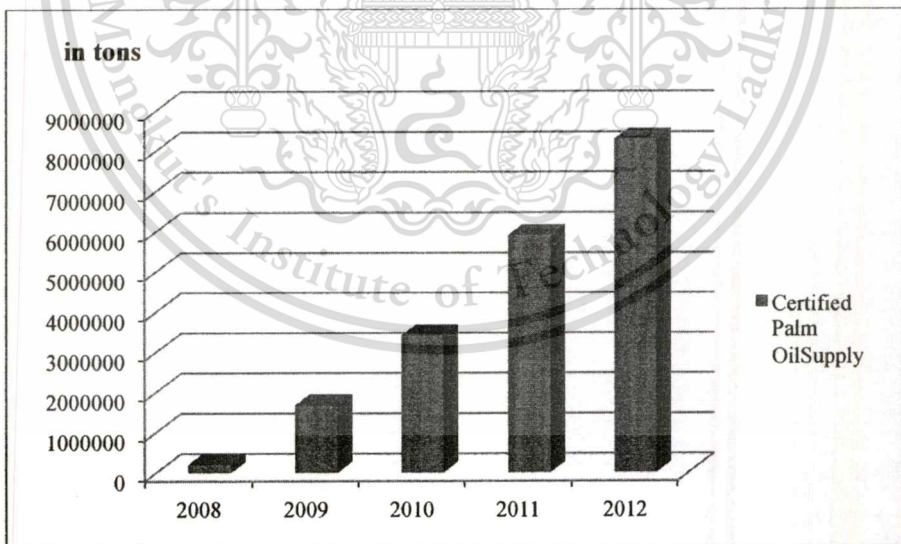


Figure 15: RSPO Certified Palm Oil Supply of the World
 Source: rspo.org/en/key_statistics, 2013

6.4.1 Why RSPO Certificate?

The difference between the RSPO certified palm oil and not certified palm oil is, that the certified palm oil is produced after adopting the RSPO P&C, which outline a sustainable palm oil growth and production. The RSPO P&C make sure that rainforests are not cleared for palm oil plantations and required actions are taken to mitigate adverse environmental and social impacts, where uncertified palm oil is produced without following any sustainable practices (seventhgeneration.custhelp.com, 2012). It is quite clear that most of the palm oil producing companies, obtained the RSPO certification due to the strong persistence from the local communities, affected by the palm oil plantations, environmental & social NGOs, and rising public awareness about the environmental and social impacts caused by the palm oil plantations. Since RSPO certification brings a sustainable image to the company, more palm oil growers, investors, manufacturers, and retailers show an interest in obtaining the RSPO certification. The world renowned Barry Callebaut, a giant in chocolate industry, has mentioned that it will start using RSPO certified palm oil for compounds and fillings in all of its factories in Europe. A sustainable oil program is started in USA as well, which will produce products using sustainable palm obtained through mass balance process (refer Chapter 6.5: Certified RSPO – Sustainable or Not?) upon the customer request. This makes clear that Barry Callebaut in America will continue to use uncertified palm oil to produce chocolate products, unless the customers specifically demand sustainable products.

“The demand for food products produced in a responsible way continues to grow, and we’re seeing this as well in our compound and fillings business with an increasing number of customers requiring sustainable palm oil” Stevan Retzlaff – President Global Sourcing and Cocoa (confectioneryproduction.com, 2013).

The above statement provides a solid proof that companies are somewhat persuaded to use sustainable palm oil due to the rising public awareness. It is better to assess the benefits and costs to a company, if the particular company is planning to follow a new procedure. The following paragraph, in 6.4.2: Benefits of RSPO Certification, illustrates the identified benefits for a company by being a RSPO certified member. Later, in 6.4.3: Costs of RSPO Certification, identified costs of RSPO are clarified.

6.4.2 Benefits of RSPO Certification

Obtaining the RSPO certification is a proof that the certified companies are producing or supporting the sustainable palm oil and companies are aware of the negative impacts caused by the palm oil plantations. Palm oil growers agree to take necessary actions to mitigate those impacts, while trying to make a sustainable approach to the palm oil market. RSPO has managed to make a significant change in the palm oil market. Based on the market results issued by WWF and RSPO, certified palm oil producers have managed to produce a significant amount of CSPO (14%) from the total world palm oil production in 2012 (refer Figure 16). Produced CSPO in 2009 and 2010 was 1.75mil tons and 2.3mil tons respectively. In 2011, 4.89mil tons of CSPO was produced, which was 10% of the world palm oil production (wwf.panda.org, 2012) (rspo.org, 2012).



Figure 16: Total RSPO Certified Palm Oil in 2012

Source: rspo.org/en/who_is_rspo, 2013

Currently RSPO certification has become the main key to open the door of EU market, where EU countries always demand for the traceable RSPO certified palm oil. Furthermore other main palm oil importers, such as India, China, and USA, are showing positive signs in buying RSPO certified palm oil (refer Appendix B.6: Countries interested in RSPO certified palm oil). After analyzing the activities of few RSPO certified companies, it is realized that RSPO brings some benefits to the environment and society (rspo.org, 2013). They are,

- Better awareness of HCV areas
- Decrease in green house gas emissions by using degraded lands and zero burning
- Improved waste and pollution management system
- Wise usage of pesticides and chemicals

- Application of Integrated Pest Management system to control pests naturally
- Better communication with local communities
- Adequate compensation are paid for particular land acquisitions
- Continuous interaction with relevant government authorities

According to a survey carried out by WWF, identified benefits for the certified palm oil producers and smallholders are listed below (Profitability and Sustainability in Palm Oil Production, 2012).

- Good reputation for the company
- Easy access to International markets
- Allowed to create better strategies to enhance the sustainability of the palm oil production
- Increase the value of Palm oil
- Improved Occupational Health and Safety (OHS) risk management
- Better communication with local communities
- Cost reductions in social conflicts
- Increase of investors
- Better relationships with the employees
- Reduction of annual costs for Pesticides and herbicides
- Skilled labor force

However there aren't any identified significant benefits that consumers get, but consumers can be a helping hand to promote the sustainable palm oil production. There are palm oil products, which are produced without under going any sustainable practices at a low price in the market. Consumer commitment to buy CSPO is a strong influence to increase palm oil sustainable practices.

6.4.3 Costs of RSPO Certification

According to the report issued by the WWF, identified costs of Palm oil producers and smallholders are described below (Profitability and Sustainability in Palm Oil Production, 2012).

- Assessment and Management of HCV areas

Costs regarding identification & management of HCV areas within the palm oil plantation.

- Costs on Environmental Impact Assessments (EIA) and Social Impact Assessments (SIA)

Since EIA is a legal requirement in GoI, it is considered as a fixed cost.

- Additional costs on segregation

Costs regarding segregation are considered as variable costs. Cost calculation for segregation is only required, if the palm oil producer is willing to produce segregated CSPO (refer Chapter 6.5: Certified RSPO – Sustainable or Not?).

- Regular payments of license fees

Fees paid to obtain relevant certificates annually or monthly, in order to obtain the updated certificates and memberships, such as RSPO certificate, RSPO membership.

- Training and Development programs for the employees and smallholders

According to the RSPO P&C, the palm oil producers should provide necessary training to their employees in order to overcome possible social and environmental impacts, which might occur due to the lack of knowledge about plantations.

6.5 Certified RSPO – Sustainable or Not?

According to the figure 16, it is clear that only a small amount of CSPO, compared to the world palm oil production, is produced. This means that there is only a little amount of CSPO included in products made by palm oil in the market. It requires some time, 10 – 15 years, to see a reasonable amount of CSPO in products as an ingredient. Consumers won't be able to find out whether the companies are using CSPO in the final product, since for most of the products palm oil is one small ingredient. The optimal solution is visiting the company website, where most of the companies who obtained the certification, mention about the level of their involvement of RSPO (e.g.: Unilever) (rspo.org, 2013).

There are companies that claim they have 'advanced' the production of CSPO, which means that those companies have produced products by using a considerable amount of CSPO. Purchase of this product certainly helps to advance the production of CSPO. This happens due to the complex supply chain of palm oil industry, which includes producers, traders, storage tanks, and palm oil processors in various countries. Therefore in some situations it will be hard and costly to keep the sustainable palm oil segregated from unsustainable palm oil, by triggering out palm oil manufacturers to give up the sustainable palm oil. In order to get the support from those companies, RSPO has made two certification systems, where the companies can support the

sustainable palm oil, and claim their products have ‘advanced’ the sustainable palm oil production. Altogether RSPO has four certification processes. They are explained briefly in below paragraphs.

1. Book and Claim Process

Companies can buy an equivalent sum of RSPO certified palm oil volume credits to the palm oil they actually buy (unsustainable palm oil) from their supplier chain. Then the particular RSPO certified mill will sell an equivalent sum of palm oil, equivalent to the volume credits received, to its supply chain (refer Appendix B.7: Book & Claim Certification Process). The traceability of the certified palm oil is really low, since these volume credits are traded electronically. The company who bought the volume credits can not claim their palm oil as RSPO certified palm oil. Instead they can refer their palm oil or products as they have ‘advanced’ the sustainable palm oil production (rspo.org, 2013).

2. Identity Preserved Process

According to this model, palm oil produced from a RSPO certified mill is delivered to the end user via the supply chain (refer Appendix B.8: Identity Preserved Process). The produced sustainable palm oil is kept separately and unsustainable palm oil is not mixed throughout the supply chain. In this case the companies who bought the palm oil can claim that their palm oil is RSPO certified and the produced palm oil is traceable back to the mill (rspo.org, 2013).

3. Mass Balance Process

This model allows the companies, who like to exhibit their support for the sustainable palm oil (refer Appendix B.9: Mass Balance Process). During the supply chain, RSPO certified palm oil is mixed with uncertified palm oil and can be claimed as “supports the RSPO certified palm oil production” (rspo.org, 2013).

4. Segregation Process

Quite similar to the Identity preserved model, but here it allows the mixing of RSPO certified oil produced from different sources (refer Appendix B.10: Segregation Process). Therefore this palm oil can not be traceable to the produced mill or estate. However this palm oil can be claimed as RSPO certified palm oil in the market, since unsustainable palm oil is not mixed during the supply chain (rspo.org, 2013).

Therefore manufacturers only can claim that their products contains RSPO certified palm oil if the palm oil come from a RSPO certified plantation, kept segregated, and monitored by UTZ Certified throughout the entire supply chain. By using the databases of UTZ Certified,

manufacturers can trace the palm oil all the way back to the RSPO certified plantation (e.g.: Identity Preserved Process) (rspo.org, 2013).

Sustainability of the RSPO certified palm oil is still questionable due to the identified loopholes in the current RSPO P&C. Some of the principles and criteria are identified with loopholes (refer Chapter 6.6: Arguments). However actions taken by RSPO towards the sustainable palm oil are praise worthy. Current Principles and Criteria are changing according to the arguments raised by the fellow RSPO members, individuals, and NGOs. The newer version of RSPO P&C will be issued in April 2013, which is updated according to the various reviews.

6.6 Arguments

Even though RSPO P&C focus on various environmental and social impacts, and avoid clearing new forest lands, some loopholes were identified. According to the Palm Oil Action Group (POAG), an environmental NGO, some of the criteria come under RSPO are weak, inefficient, and hard to monitor and audit (e.g. Criteria 6.7, 6.8, 6.11 – refer Appendix A.3: RSPO P&C). POAG claims that reserved HCV areas are not well protected, where the HCV areas are exposed to the threat of illegal logging. Furthermore, POAG argues that RSPO was not successful in marketing the CSPO (palmoilaction.org.au, 2013).

According to the reviews collected by RSPO, majority of the companies, individuals, investors, and NGOs (e.g.: IKEA, OXFAM, Zoological Society of London, Johnson & Johnson) have stated that RSPO P&C should improve the Criterion 5.2, which deals with the HCV areas. Companies and other related parties demanded well defined and clear guidance on how to protect, monitor, and manage the HCV areas. Furthermore, reviews state that RSPO should focus more on GHG emissions and the particular criterion (Criterion 5.6) should be updated in an efficient way. Companies and NGOs request to have a clear definition about harmful pesticides (Criterion 4.6). The need for a new principle with clear definitions and guidance, which focuses on ‘Corruption’, is strongly requested in most of the reviews. Other identified weak criteria are 2.3, 3.1, 4.4, 6.7, 7.1, and 7.6, which RSPO should update into clear and more efficient criteria (RSPO P&C Overall by Stakeholder, 2012).

Chapter 7

Mitigation of Environmental & Social Impacts through RSPO Principles

This chapter describes the analyzed data on how a certified company has adjusted and implemented RSPO P&C (Principles 4, 5, and 6), which focus on dealing with environmental and social impacts. A certified palm oil grower, PT Agro Indomas (PT AI), is selected to provide a better understanding of the implementation of above mentioned principles.

7.1 Background of PT AI

This is a subsidiary company of Good Hope Holdings public limited company (PLC). Good Hope Holdings contain businesses in various fields such as investment companies, Palm Oil plantations, Oil Trading, and many more. They own roughly 157,896 and 63,931 hectares of land in Indonesia and Malaysia respectively. PT AI belongs to the Palm Oil plantations category and a RSPO certified company. Table 11 will reveal some information about the PT AI.

Table 11: PT Agro Indomas

Name	PT Agro Indomas
RSPO Membership No.	1-0029-06-000-00
BSI RSPO Certification No.	SPO 569265
Membership Type	Ordinary Membership
Membership Category	Palm Oil Growers
Head Office	Menara Global 16 th Floor JI Gatot Subroto Kav 27 Jakarta 12950
Other Locations	Central Kalimantan – Plantation and Mill East Kalimantan – Plantation
Name of the Mill and Location	Sungai Purun – Central Kalimantan
Other Certificates	ISO 14001 OHSAS 18001

Source: rspo.org/en/member/21, 2013

Sungai Purun Mill is owned by PT AI, which processes FFB gathered from four estates, which are owned by the company, and from several other estates owned by out growers. Table 12 shows information regarding the Estates owned by the company (RSPO Initial Certification Assessment, 2012).

Table 12: Estates of PT AI

Estate Name	Area (in Ha)
1. Sungai Rungau Estate	3972
2. Sungai Purun Estate	4265
3. Terawan Plasma	60
4. Bangkal Plasma	60

Source: *RSPO Initial Certification Assessment, 2012*)

7.2 Mitigation of Environmental Impacts through RSPO

As for the RSPO P&C (refer Appendix B.3: RSPO P&C), principles 4 and 5 deal with the environmental impacts. Under the principle 4, which focuses on soil and water, PT AI carried out required practices to reduce the impacts on soil and water sources. The required soil assessment of the estates belonging to PT AI was carried out by a company called PRAMA Agricultural Soil Survey. Leaf analysis is run by the Agronomy department of PT AI. Amount and type of the fertilizer (refer Appendix C.1: Fertilizer types used by PT AI) to be used is decided according the final report issued by the Agronomy department. Apart from chemical fertilizer, PT AI has been using EFB and POME to keep up the nutrient levels in the soil (Criterion 4.2) (RSPO Initial Certification Assessment, 2012).

A special type of grass (e.g.: *Nephrolepis SP*) is used after realizing that most of the plantation areas are flat and faintly swelling (Criterion 4.3). PT AI has implemented a water management system to manage water. Therefore the main river and other water streams, which flow across the estates of PT AI are free from pollution (Criterion 4.4). However, according to the water quality testing report of Purun River, issued by PT Unilab Perdana, BOD, COD, and pH levels of the water were quite above the government standards. The problem occurred due to the illegal sand mining in upstream of the river. The quality of the water issued from the water treatment system of PT AI met the required standards defined in regulation No. 416/1990 of Health and Ministry of Indonesia. POME effluents are not discharged into water ways and Biological Oxygen Demand (BOD) levels of those POME are always kept under 5000ppm, which is the accepted amount by the GoI. Under the Integrated Pest Management (IPM) system, PT AI

uses Barn owls to control the growth of rats in estates. Appropriate training is given to workers to make them aware of the pest control and pesticide usage. The use of certain chemicals are banned by World Health Organization (WHO), but chemicals like Paraquat are still being used in a controlled manner, since there aren't any replacements so far (refer Appendix C.2, C.3, & C.4 for Pesticide usage of PT AI). A storage facility was established to store all the chemical containers safely (Criteria 4.7, and 5.3). A contract was signed with a company called CV NAZAR to gather and discard the chemical waste. However an observation was issued by the certification body, BSI Group, to upgrade the waste management system of PT AI (RSPO Initial Certification Assessment, 2012).

Principle 5 is mainly focused on environmental responsibility of the palm oil companies. According to the BSI Group, certification body of PT AI, PT AI has carried out required EIAs, in order to identify and minimize environmental impacts (Criterion 5.1). Under principle 5, criterion 5.2 focuses on HCV areas. It asks to identify HCV areas and must be included in the plantation management plan. As mentioned in the previous chapter (refer 6.6: Arguments), this criterion doesn't provide clear guidance to protect and control HCV areas. However, obeying the current Criterion 5.2, PT AI has identified and separated HCV areas in their boundaries, while issuing leaflets and brochures to local communities to raise the awareness about the value of HCV areas. A waste management plan was implemented by PT AI (Criterion 5.3). PT AI reuses its mill effluents as fertilizer after degrading the BOD level, ponding system is used, lower than 5000ppm (refer Chapter 5.7: Handling POME), which also help to reduce the soil erosion. 80% of electricity required by Sungai Purun mill is generated by burning the fiber extracted from the palm oil production process (refer Appendix A.1: CPO process). Zero burning policy is followed by PT AI, therefore no evidence was found regarding the usage of fire in the estates. Necessary fire fighting equipment, such as water pump, hose, water tank, and a tractor, are stored in the Sungai Purun estate (Criterion 5.5) (RSPO Initial Certification Assessment, 2012).

7.3 Mitigation of Social Impacts through RSPO

Principle 6 is made to approach the employees and local communities, who are affected by the palm oil plantations, in the means of reducing the social impacts due to palm oil plantations; better communication with local communities, compensation for affected parties, safety conditions for workers, and avoid discrimination among the workers. PT AI has carried out the required (Criterion 6.1) SIA to identify negative (water quality, erosion, and biological disruption) and positive impacts (new job vacancies and infrastructure development). PT AI

sought assistance of independent consultants and Bogor Agricultural University to deal with social impacts regarding palm oil operations. Furthermore, PT AI has been submitting their Environmental Management/Monitoring plans regularly to Indonesian Departments of Environment in related districts (RSPO Initial Certification Assessment, 2012).

Under criterion 6.2 a proper system was established in PT AI to answer or provide required information regarding plantations to interested parties (e.g.: local communities, investors). All the information requests and criticisms are directed to each department head and finally to either Corporate Social Responsibility (CSR) or Environmental Health and Safety (EHS) department. They have full authority to give the approval to issue any relevant information or to handle any criticisms. In 2011, the company showed its interest to support the plasma development program, which was arranged by the head of Terawan village as long as they are committed to follow government regulations. PT AI has already appointed their manager of the CSR department as the responsible person to consult and communicate with relating communities. Furthermore, to handle criticisms and grievances (Criterion 6.3), PT AI has validated a set of guidelines, which state how to handle complaints and criticisms. These guidelines have been introduced and explained properly to the nearby local communities and other stakeholders. During the interviews carried out by the BSI Group, they have found out that related communities and stakeholders are aware of the complaint and compensation procedure of PT AI. E.g.:- In 2010 a complaint was raised due to a construction of a boundary drain of an estate located in a sub district of Seruyan. Local communities argued that this construction has become a barrier to access their lands. Complaint was processed according the suitable procedures and identified that this may boost a social conflict between the local communities and the company. To overcome the situation, PT AI had a meeting with all the relevant communities to explain the reason for the construction, which is to avoid the theft of FFB, and agreed to build a bridge to allow the access to their lands (RSPO Initial Certification Assessment, 2012).

PT AI has respected the land rights of local communities and indigenous people, and follows the Standard Operation Procedure (SOP) to carry out a proper compensation procedure during a land acquisition (Criterion 6.4). Wages are paid according to the Plantation sector minimum wage regulations issued by the Central Kalimantan Province. Other than that they get a rice allowance and a medical insurance. Evaluation team of BSI Group has identified that workers are given better facilities, such as electricity, schools, school transportation, water, medical facilities, houses, playgrounds, and kindergartens (Criterion 6.5). As for the criterion 6.7, employment below 18 years is not allowed. National identity card is checked before starting the

work. After a series of interviews with employees evaluation team didn't find any evidences regarding underage employment, racism, and discrimination (Criterion 6.8) (RSPO Initial Certification Assessment, 2012).

PT AI provides adequate maternity leave for women and made policies to restrict pregnant women from working in health threatening areas, such as pesticide handling. Women are paid during the maternity leave period. Workers are provided with necessary protective equipment. A gender committee has been formed to handle gender issues occurred within employees (Criterion 6.9). PT AI follows a transparent price mechanism to buy FFB from smallholders, which helps to avoid social disputes, and managed to pay the smallholders on time. According to the evaluation team of BSI Group, complaints regarding late payments were not identified (Criterion 6.10). As for the criterion 6.11, PT AI has established "Agro Harapan Foundation" to start and support education programs, which are mainly monitored by the CSR) department of the company. They are currently operating four Kindergartens and paying wages for 14 teachers. Other than these activities, PT AI has carried out a number of medical programs, religious events, sports, and other related infrastructure development programs for the local community. In 2012, reserved budget for CSR activities is nearly 16 billion Rupiahs (RSPO Initial Certification Assessment, 2012).

7.4 Gained Benefits due to the Production and Supporting Sustainable Palm Oil

7.4.1 Best Management Practices

- Cutting down the costs regarding usage of chemicals for rat control by monitoring and evaluating its results
- Collaborating keenly with The World Agro-forestry Center (ICRAF) and Indonesian Palm Oil Commission (IPOC) to run the carbon footprint research project
- Taking measures to expand and buttress environmental management system, which comes under ISO 14001
- Evaluate occupational health and safety system regularly to overcome health and safety issues of employees

(PT Agro Indomas Annual Report, 2010)

7.4.2 Environment and Biodiversity Management

- PT AI always follow the government regulations and other related regulations by respected organizations thoroughly to keep up the environmental standards
- As a first step, clear explanation of HCV, then properly monitor the HCV areas

(PT Agro Indomas Annual Report, 2010)

7.4.3 Responsible towards Community and Affected Stakeholders

- Establish standard social institutions and work on socializing the social policies to meet RSPO requirements
- Assessment of land conflict handling applications, which are integrated with Free, Prior, Informed, and Consent (FPIC)
- Handled conflicts will be documented for future references
- FPIC training for employees
- These programs will strengthen the bond between community and the employees

(PT Agro Indomas Annual Report, 2010)

7.4.4 Continual Improvement

- Assess the previous reviews thoroughly and take immediate actions to fill up the loose points
- Internal Audit team is established to make a better output of the work

(PT Agro Indomas Annual Report, 2010)

7.5 Hardships

- Issues occurred regarding the regulations on land use for palm oil plantation by the government. Most regulations depend on the political situation of the country. Therefore when a government changes, there is a high possibility to have a new set of regulations about the land use, even the plantation is already established according to the previous regulations they might affect with the new ones.
- Majority of the regulations passed by the government do not match or go well along with the RSPO principles and criteria. They only bring confusions about which one to follow.
- Other economic, social, and environmental problems during the production stage and in the consumer side.
- Problems occurred when promoting RSPO due to the lack of influence by RSPO over the government.
- Currently there isn't any regular evaluation of RSPO P&C with government regulations.
- Continuous changes over RSPO Principles and Criteria make it harder to adapt or implement in a company, until a significant amount of companies adjusted and be stabilized with the existing Principles and Criteria.

(PT Agro Indomas Annual Report, 2010)

Chapter 8

Conclusion

The reason for the rapid increase of palm oil is clearly elaborated at the beginning of this paper, which is the rising demand for Palm Oil. Impacts on environment and society have increased after the existing palm oil producers started to expand their plantation territories to increase the palm oil supply, while the new palm oil growers started entering into this profitable palm oil market. Even though there are national regulations to mitigate adverse environmental and social impacts, the implementation of those regulations were weak and could not hold down various major impacts, such as deforestation, high carbon emissions, habitat extinction, and violence on land rights. Palm oil producers increased their production as much as they could without considering environmental and social impacts caused from the palm oil plantations.

Current RSPO P&C mitigate the environmental and social impacts to some degree. For the environmental appropriateness, RSPO P&C (Principle 4 & 5) attempts to mitigate adverse impacts through various actions such as protection of endangered species, reserve HCV areas, reduction of air, soil, and water pollution, increasing energy efficiency, and prevention of deforestation and fire. However, still some of the Principle and Criteria are proven to be weak and need to be updated, such as Criteria 4.4 and 5.2. Those criteria need proper and clear guidance. Furthermore, RSPO gives an unclear impression regarding the use of Paraquat, which is highly toxic to animals and humans. The best solution to avoid any toxic pollution is to ban the use of Paraquat completely. RSPO shows a little concentration on GHG emissions. There should be a proper procedure to identify the sources and calculate the carbon emissions in order to cut down the carbon emission into the atmosphere.

Regarding the negative social impacts, some criteria need to be updated. As for the criterion 6.7, child labor is somewhat allowed in plantations, which belong to families. The rule should be same for every palm oil grower. There should be no child labor included in the palm oil plantations. Even though principle 6 attempts to provide a safe environment for pregnant women, monitoring them seems to be quite hard. There are incidents occurred in PT AI, where pregnant women were identified dealing with Paraquat spraying. Answers remain unclear for at least two reasons. Either those women didn't know that they were pregnant or ignored the situation due to their financial problems. This proves that the criterion 6.9 should be updated with clear guidance.

Furthermore there should be a new criterion under principle 6 to answer problems with migrated workers.

Actions to be taken against the RSPO members who have breached the P&C are not strong enough. The highest punishment that a company, who breached P&C, could get is the termination of RSPO membership. After the termination, still there is a chance to obtain the membership back as long as the responsible party settles down their disputes. Membership reclaim procedure should be strict (e.g.: After the membership termination, breached party is not allowed to apply for RSPO membership again for a given period of time (3-5 years or more)). A strict procedure will help to keep the RSPO members intact with the RSPO P&C.

After reviewing the RSPO Principles 4, 5, & 6, which are focused on environmental and social impact mitigation, it is quite hard to say that RSPO certified palm oil is 100% sustainable. Identified loopholes of the P&C play a major role to bring palm oil towards the sustainability. However, still it is a good starting point and praise worthy action to drive the palm oil industry towards a sustainable approach. RSPO Task Force was developed in order to identify the current blind spots of the P&C, where RSPO P&C are scheduled to be reviewed and updated in every 5 years. These actions show a positive sign of having a better sustainable palm oil industry in the future. According to the RSPO website, they have done various modifications to the current P&C, which is planned to be implemented in April 2013.

References

- Aryo Gustomo (2012), *BSI Public Summary Report: RSPO Initial Certificate Assessment*, Retrieved January 24, 2013 from website: http://www.rspo.org/sites/default/files/PT_Agro_Indomas_Terawan_Mill_Public_Summary_FINAL_180912-47.pdf
- Beth Gingold (2010), *Degraded Land, Sustainable Palm Oil, and Indonesia's Future*, Retrieved December 28, 2012 from website: <http://www.wri.org/stories/2010/07/degraded-land-sustainable-palm-oil-and-indonesias-future>
- Beth Gingold, Anne Rosenbarger (2012), *Degraded Land for Sustainable Palm Oil in Indonesia: Practical Guidance*, Retrieved December 18, 2012 from website: <http://insights.wri.org/news/2012/04/degraded-land-sustainable-palm-oil-indonesia-practical-guidance>
- Buntoro Rianto/Hafidsyah Mochtar/Aditya Sasmito (2012), *PricewaterhouseCoopers: Overview of Palm Oil Industry Landscape in Indonesia*, Retrieved December 16, 2012 from website: <http://www.pwc.com/id/en/publications/assets/Palm-Oil-Plantation-2012.pdf>
- Code of Conduct for Members of the Roundtable on Sustainable Palm Oil (2012), Retrieved February 02, 2013 from website: http://www.rspo.org/en/rspo_code_of_conduct
- Confectionery Production (2013), *Barry Callebaut Switches to RSPO Certified Palm Oil*, Retrieved February 10, 2013 from website: <http://www.confectioneryproduction.com/8825/news/barry-callebaut-switching-to-rspo-certified-palm-oil/>
- CSPO Market Performance (2013), Retrieved February 02, 2013 from website: www.rspo.org/en/key_statistics
- Derom Bangun (2010), *Indonesian Palm Oil Industry: Mapping the Future*, Retrieved December 18, 2012 from website: http://www.mosta.org.my/PDF/Module1/2_DeromBangun.pdf

- Donald F. Larson (1996), *Indonesia's Palm Oil Subsector*, Retrieved December 20, 2012 from website: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1996/09/01/000009265_3961214191924/additional/112512322_20041117141530.pdf
- Ellie Brown, Ph.D and Michael F. Jacobson, Ph.D. (2005), *Cruel Oil: How Palm Oil Harms Health, Rainforest & Wildlife*, Retrieved December 17, 2012 from website: <http://www.cspinet.org/palm/PalmOilReport.pdf>
- Eric Wakker – AIDEnvironment (2005), *Greasy Palms: The Social and Ecological Impacts of Large-Scale Oil Palm Plantation Development in Southeast Asia*, Retrieved December 17, 2012 from website: http://www.foe.co.uk/resource/reports/greasy_palms_impacts.pdf
- EU Oil Seeds Trade (2011/12), Retrieved December 28, 2012 from website: http://ec.europa.eu/agriculture/cereals/trade/oilseeds/2011-12_en.pdf
- FAO Corporate Document Repository (n.d.), *Small-scale Palm Oil Processing in Africa*, Retrieved December 15, 2012 from website: <http://www.fao.org/docrep/005/y4355e/y4355e03.htm>
- Green Palm Sustainability (2012), Retrieved December 20, 2012 from website: <http://greenpalm.org/en/about-palm-oil/what-is-palm-oil>
- Greenpeace (n.d.), *Palm Oil*, Retrieved December 18, 2012 from website: <http://www.greenpeace.org.uk/forests/palm-oil>
- Ian MacKinnon (2009), *the guardian – Indonesia Reopens Peat land to Palm Oil Plantation*, Retrieved January 18, 2013 from website: <http://www.guardian.co.uk/environment/2009/feb/18/indonesia-peat-palm-oil>
- Indonesian Palm Oil Board (2007), *Indonesian Palm Oil in Numbers*, Retrieved December 20, 2012 from website: <http://www.indonesian-embassy.de/image/Palmoil/Indonesian-Palmoil-1.pdf>
- Indonesian Palm Oil Board (2007), *Sustainable Oil Palm Plantations*, Retrieved January 15, 2013 from website: <http://www.indonesian-embassy.de/image/Palmoil/Indonesian-Palmoil-2.pdf>

- Indonesian Palm Oil Board (2010), *Facts of Indonesian Palm Oil*, Retrieved December 21, 2012 from website: http://seafast.ipb.ac.id/unduh/Booklet_Facts-of-Indonesian-Oil-Palm.pdf
- Ivan Mangungsong (2012), *Plantation Revitalization Program*, Retrieved January 20, 2013 from website: <http://daunhijau.com/program-revitalisasi-perkebunan/?lang=en>
- Joshua Levin (2012), *WWF Report – Profitability and Sustainability in Palm Oil Production: Analysis of Incremental Financial Costs and Benefits of RSPO Compliance*, Retrieved February 24, 2013 from website: http://awsassets.panda.org/downloads/profitability_and_sustainability_in_palm_oil_production_update.pdf
- K. Obidzinski, R. Andriani, H. Komarudin, A. Adrianto (2012), *Ecology and Society: Environmental and Social Impacts of Oil Palm Plantations and their Implications for Biofuel Production in Indonesia*, Retrieved December 20, 2012 from website: <http://www.ecologyandsociety.org/vol17/iss1/art25/#environmentalimpacts>
- Marcus Colchester, Norman Jiwan, Andiko, Martua Sirait, Asep Yunan Firdaus, A. Surambo, Herbert Pane (2006), *Palm Oil and Land Acquisition in Indonesia: Implications for Local Communities and Indigenous Peoples*, Retrieved January 15, 2013 from website: <http://www.forestpeoples.org/sites/fpp/files/publication/2010/08/promisedlandeng.pdf>
- NutriStrategy (2013), *Fats, Cooking Oils and Fatty Acids*, Retrieved January 24, 2013 from website: <http://www.nutristrategy.com/fatsoils.htm>
- Palm Oil Action Group (n.d.), Retrieved January 16, 2013 from website: <http://www.palmoilaction.org.au/sustainable-palm-oil.html>
- PEFINDO Credit Rating Indonesia (2010), *Plantation Industry*, Retrieved December 17, 2012 from Website: http://new.pefindo.com/files/id_plantation_201001.pdf
- Praveen Fatemaeh Rupani, Rajeev Pratap Singh, M. Hakimi Ibrahim, Noriuzan Esa (2010), *Review of Current Palm Oil Mill Effluent (POME) Treatment Methods*, Retrieved January 23, 2013 from website: [http://idosi.org/wasj/wasj11\(1\)10/12.pdf](http://idosi.org/wasj/wasj11(1)10/12.pdf)
- Product Board MVO (2011), *Fact Sheet Palm Oil*; Retrieved December 20, 2012 from website: <http://www.mvo.nl/LinkClick.aspx?fileticket=jsFVMZwZzkc%3d&tabid=2301&mid=3341&language=en-US>

PT Agro Indomas Annual Report (2010), *RSPO Annual Communication of Progress*, Retrieved January 23, 2013 from website: <http://www.rspo.org/sites/default/files/133.%20PT%20Agro%20Indomas%20annual%20report%202010.pdf>

Questions and Answers (n.d.), Retrieved February 07, 2013 from website: [http://www.rspo.org/en/questions and answers](http://www.rspo.org/en/questions%20and%20answers)

Rhett A. Buttler (2006), *Why is Oil Palm Replacing Tropical Rainforests and Why are Biofuels fueling Deforestation?*, Retrieved December 30, 2012 from website: http://news.mongabay.com/2006/0425-oil_palm.html

Rhett A. Buttler (2009), *The Impact of Oil Palm in Borneo*, Retrieved January 15, 2013 from website: http://www.mongabay.com/borneo/borneo_oil_palm.html

Rob Glastra, Eric Wakker, and Wolfgang Richert (2002), *WWF: Oil Palm Plantations and Deforestation in Indonesia – What Role Do Europe and Germany Play?*, Retrieved December 17, 2012 from website: www.panda.org/downloads/forests/oilpalmindonesia.pdf

Rosidah Radzian (2010), *Palm Oil Market Share in the US*, Retrieved December 16, 2012 from website: <http://palmoilis.mpob.gov.my/publications/pod52-rosidah.pdf>

Roundtable on Sustainable Palm Oil – Wikipedia, the free encyclopedia (2011), Retrieved January 15, 2012 from website: [http://en.wikipedia.org/wiki/Roundtable on Sustainable Palm Oil](http://en.wikipedia.org/wiki/Roundtable_on_Sustainable_Palm_Oil)

RSPO Principles and Criteria for Sustainable Palm Oil Production (2007), Retrieved January 15, 2013 from website: http://www.rspo.org/files/resource_centre/RSPO%20Principles%20&%20Criteria%20Document.pdf

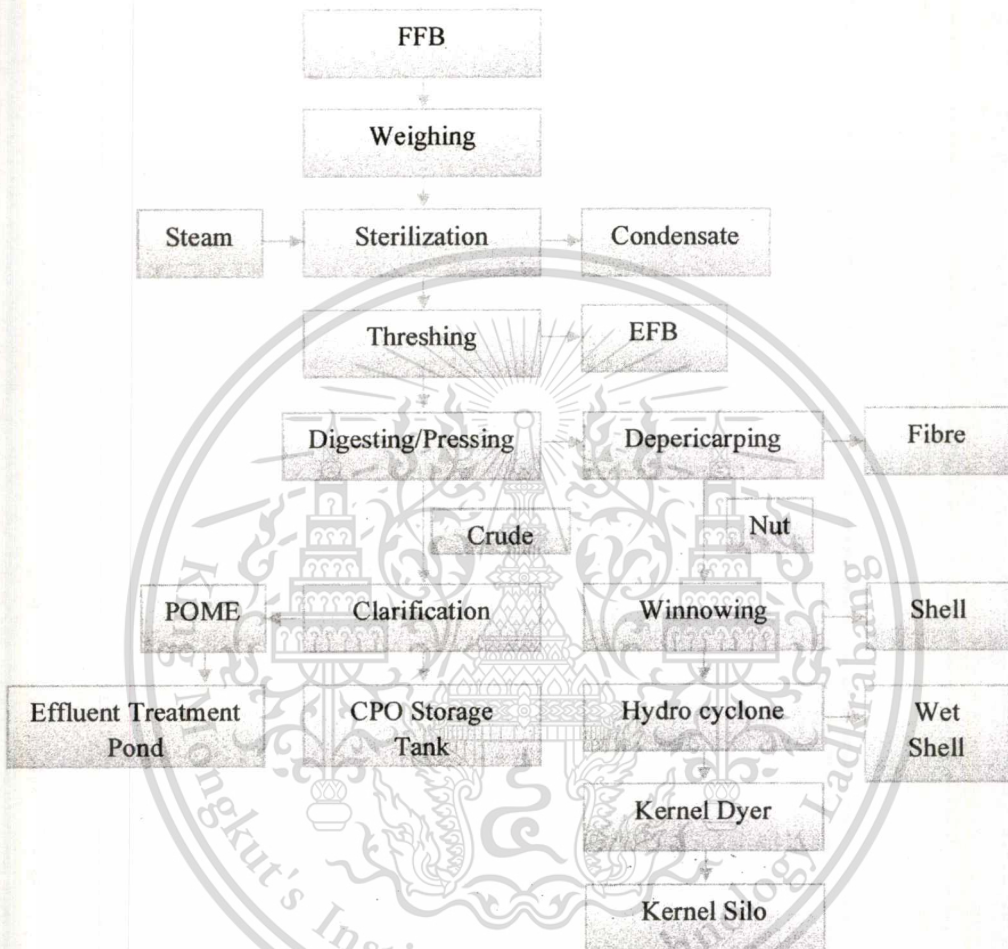
Roundtable on Sustainable Palm Oil (2012), Retrieved December 22, 2012 from website: <http://www.rspo.org/>

- Seventh Generation (2012), *What is the difference between a plantation that is RSPO certified and one that isn't certified*, Retrieved February 06, 2013 from website: http://seventhgeneration.custhelp.com/app/answers/detail/a_id/427/~/-what-is-the-difference-between-a-plantation-that-is-rspo-certified-and-one-that
- The Jakarta Globe (2012), *Indonesia Aims to Boost Palm Oil Export to Russia*, Retrieved December 18, 2012 from website: <http://www.thejakartaglobe.com/business/indonesia-aims-to-boost-palm-oil-exports-to-russia/522494>
- The Jakarta Globe (2012), *Indonesia Hopes to Boost CPO Exports to Pakistan*, Retrieved December 18, 2012 from website: <http://www.thejakartaglobe.com/economy/indonesia-hopes-to-boost-cpo-exports-to-pakistan/496638>
- The RSPO New Planting Procedure: Ensuring Responsible Expansion by Palm Oil Growers, Retrieved December 25, 2012 from website: <http://www.rspo.org/sites/default/files/The%20RSPO%20New%20Planting%20Procedure%20FINAL%20Jan%202012.pdf>
- Tom Knudson (2009), *environment360 – The Cost of the Biofuel Boom: Destroying Indonesia's Forests*, Retrieved December 17, 2012 from website: http://e360.yale.edu/feature/the_cost_of_the_biofuel_boom_destroying_indonesias_forests/2112/
- TradeData International Pty Ltd (2010), *Trade Data International Analysis Report: An Analysis of Indonesian Exports of Crude Palm Oil*, Retrieved December 22, 2012 from website: http://www.tradedata.net/files/1TQQ3XTKTI/Indonesian_exports_of_Crude_Palm_Oil_HS_Code_1511100000_.pdf
- Trading Process (n.d.), Retrieved February 20, 2013 from website: http://www.rspo.org/en/trading_process
- Union of Concerned Scientists (2011), *Chapter 6 – The Root of the Problem: What's Driving Tropical Deforestation Today?- Palm Oil*, Retrieved December 28, 2012 from website: http://www.ucsusa.org/assets/documents/global_warming/UCS_DriversofDeforestation_Chap6_PalmOil.pdf

- United States Palm Oil Imports Annual Growth Rate (2012), Retrieved December 17, 2012 from website: <http://www.indexmundi.com/agriculture/?country=us&commodity=palm-oil&graph=imports-growth-rate>
- World Palm Oil Production (2011), Retrieved December 21, 2012 from website: <http://www.poram.org.my/v1/poram/statistic/3.%20World%20PalmOil%20Production.pdf>
- WWF Global (n.d.), *Palm Oil in the US*, Retrieved December 26, 2012 from website: [http://wwf.panda.org/what we do/footprint/agriculture/palm oil/solutions/responsible purchasing/scorecard2011/markets/us/](http://wwf.panda.org/what_we_do/footprint/agriculture/palm_oil/solutions/responsible_purchasing/scorecard2011/markets/us/)
- WWF Global (n.d.), *Palm Oil: Environmental Impacts*, Retrieved December 16, 2012 from website: [http://wwf.panda.org/what we do/footprint/agriculture/palm oil/environmental impacts/](http://wwf.panda.org/what_we_do/footprint/agriculture/palm_oil/environmental_impacts/)
- Yusof Basiron (2007), *Palm Oil Production Through Sustainable Plantations*, Retrieved December 27, 2012 from website <http://americanpalmoil.com/pdf/enviromental/Palm%20Oil%20Production%20Through%20Sustainable%20Plantations.pdf>

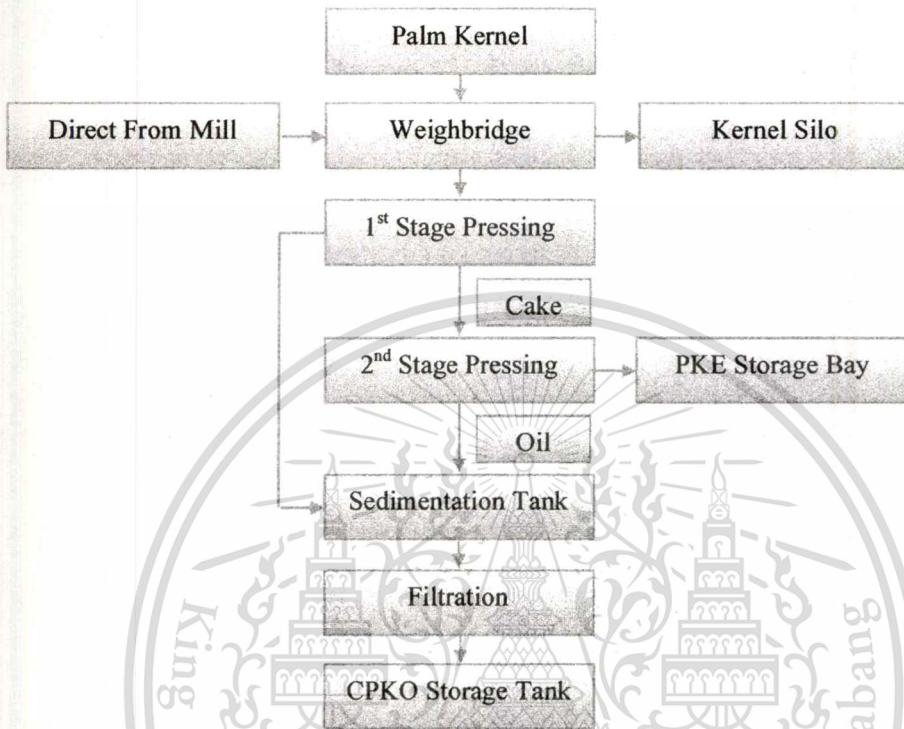
APPENDIX A

APPENDIX A.1: CPO Process



Source: Information gathered from PT Agro Indomas

APPENDIX A.2: PKO Process



Source: Information gathered from PT Agro Indomas

APPENDIX B

APPENDIX B.1: Achievements of RSPO in brief

Year	Place	Achievement
09/2002	London, UK	<ul style="list-style-type: none"> • First gathering to form the RSPO code of conduct
12/2002	Gland, Switzerland	<ul style="list-style-type: none"> • Second gathering to form the RSPO code of conduct • SOI was formed
2003	Kuala Lumpur, Malaysia	<ul style="list-style-type: none"> • Introductory meeting • Agreement with the SOI • Definition of Sustainable Palm Oil
2004	Jakarta, Indonesia	<ul style="list-style-type: none"> • RSPO is formed • Criteria working group was appointed • Work related to Principles & Criteria (P&C) was started
2005	Singapore	<ul style="list-style-type: none"> • P&C were elected • Started pilot testing with 14 companies • Verification working group was appointed
2006	Singapore	<ul style="list-style-type: none"> • Implemented the Member's Code of Conduct • Indonesian Liaison office was build in Jakarta • Special team was appointed to work with smallholders • Elaboration of National Interpretations on general P&C was initiated
2007	Kuala Lumpur, Malaysia	<ul style="list-style-type: none"> • RSPO certification system was implemented • General P&C was rechecked and passed by the general assembly • Board level committees were arranged to work with different sections like certification & standards
2008	Bali, Indonesia	<ul style="list-style-type: none"> • National Interpretations on general P&C for Indonesia, Malaysia, and Papua New Guinea were accepted.

		<ul style="list-style-type: none"> • First RSPO certification was released • First shipment was reached to Rotterdam • First meeting of Latin America was held in Colombia • First Greenhouse gas working group was assigned
2009	Kuala Lumpur, Malaysia	<ul style="list-style-type: none"> • Released the RSPO supply chain certification system • Development of P&C guidance for smallholders was started • Second working group for Greenhouse gas was assigned • A committee for Biodiversity was appointed
2010	Jakarta, Indonesia	<ul style="list-style-type: none"> • Evaluation of RSPO by PricewaterhouseCoopers • Acceptance of a new structure • New Planting of Palm oil procedure was introduced • P&C guidance for smallholders were proposed • 25,000 smallholders under 5 companies obtained RSPO certificate • Supplementary guidelines were added to establish an agreement with EU Renewable Energy Directive • Daabon Group of Colombia obtained the first RSPO certificate in Latin America • A new logo for Certified Sustainable Palm Oil (CSPO) was issued
2011	Sabah, Malaysia	<ul style="list-style-type: none"> • RSPO trade mark was marketed • Reached its first 1 million hectares of plantation lands, which are certified as sustainable • Agropalma company in Brazil was the first to obtain RSPO certification in Latin America • CSPO had a production of 5 million tons • Highest number of participants from 20 countries, more than 1000 attendances • Growth Interpretation Narrative for CSPO was

		issued
2012	Singapore	<ul style="list-style-type: none"> • More than 1000 members were recorded • Annual Production capacity of Palm Oil reached 14% of global palm oil production • First RSPO certified independent smallholders were from Thailand • Marketing the RSPO trademark along with the products • Evaluate and Assess RSPO P&C

Source: rspo.org, 2013

APPENDIX B.2: Appointed Members in Sectors

Sector Name	# of Seats	Company of Acting Members
Oil Palm Growers	4	Indonesia, Malaysia, Smallholders, Rest of the World
Palm Oil Processors	2	IOI Group, AAK
Consumer Goods Manufacturers	2	Unilever, Kraft Foods
Retailers	2	RPG Corporation, Carrefour
Banks or Investors	2	HSBC, Rabobank
Environmental NGOs	2	WWF, Conservation International
Social or Development NGOs	2	Oxfam

Source: rspo.org, 2013

APPENDIX B.3: RSPO P&C

Principles	Criteria
1. Commitment to Transparency	<p>1.1 Oil Palm growers and millers provide adequate information to other stakeholders on environmental, social, and legal issues relevant to RSPO criteria, in appropriate languages & forms to allow for effective participation in decisions making</p> <p>1.2 Management documents are publicly available, except where this is prevented by commercial confidentiality or where disclosure of information would result in negative environmental or social outcomes</p>
2. Compliance with applicable laws and regulations	<p>2.1 There is compliance with all applicable local, national, and ratified international laws and regulations</p> <p>2.2 The right to use the land can be demonstrated, and is not legitimately contested by local communities with demonstrable rights</p> <p>2.3 Use of the land for oil palm does not diminish the legal rights, or customary rights, of other users, without their free, prior and informed consent</p>
3. Commitment to long term economic and financial viability	<p>3.1 There is an implemented management plan that aims to achieve long term and financial viability</p>
4. Use of appropriate best practices by growers and millers	<p>4.1 Operating procedures are appropriately documented and consistently implemented and monitored</p> <p>4.2 Practices maintain soil fertility at, or where possible improve soil fertility to, a level that ensures optimal and sustained yield</p> <p>4.3 Practices minimize and control erosion and degradation of soils</p> <p>4.4 Practices maintain the quality and availability of surface and ground water</p> <p>4.5 Pests, diseases, weeds, and invasive introduced species</p>

	<p>are effectively managed using appropriate Integrated Pest Management (IPM) techniques</p> <p>4.6 Agrochemicals are used in a way that does not endanger health or the environment. There is no prophylactic use of pesticides, except in specific situations identified in national Best Practice guidelines. Where agrochemicals are used that are categorized as World Health Organization Type 1A or 1B, or are listed by the Stockholm or Rotterdam Conventions, Growers are actively seeking to identify alternatives, and this is documented</p> <p>4.7 An occupational health and safety plan is documented, effectively communicated and implemented</p> <p>4.8 All staff, workers, smallholders, and contractors are appropriately trained</p>
<p>5. Environmental Responsibility and conservation of natural resources and biodiversity</p>	<p>5.1 Aspects of plantation and mill management, including replanting, that have environmental impacts are identified, and plans to mitigate the negative impacts and promote the positive ones are made, implemented, and monitored, to demonstrate continuous improvement</p> <p>5.2 The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the plantation or that could be affected by plantation or mill management, shall be identified and their conservation taken into account in management plans and operations</p> <p>5.3 Waste is reduced, recycled, re-used, and disposed of in an environmentally and socially responsible manner</p> <p>5.4 Efficiency of energy use and use of renewable energy is maximized</p> <p>5.5 Use of fire for waste disposal and for preparing land for replanting is avoided except in specific situations, as identified in the ASEAN guidelines for other regional best practice</p> <p>5.6 Plans to reduce pollution and emissions, including</p>

	greenhouse gases, are developed, implemented, and monitored
6. Responsible consideration of employees and of individuals and communities affected by growers and mills	<p>6.1 Aspects of plantation and mill management, including replanting, that have social impacts are identified in participatory way, and plans to mitigate the negative impacts and promote the positive ones are made, implemented and monitored, to demonstrate continuous improvement</p> <p>6.2 There are open and transparent methods for communication and consultation between growers and/or millers, local communities and other affected or interested parties</p> <p>6.3 There is a mutually agreed and documented system for dealing with complaints and grievances, which is implemented and accepted by all parties</p> <p>6.4 Any negotiations concerning compensation for loss of legal or customary rights are dealt with through a documented system that enables indigenous peoples, local communities and other stakeholders to express their views through their own representative institutions</p> <p>6.5 Pay and conditions for employees and for employees of contractors always meet at least legal or industry minimum standards and are sufficient to provide decent living wages</p> <p>6.6 The employer respects the right of all personnel to form and join trade unions of their choice and to bargain collectively. Where the right to freedom of association and collective bargaining are restricted under law, the employer facilitates parallel means of independent and free association and bargaining for all such personnel</p> <p>6.7 Children are not employed or exploited. Work by children is acceptable on family farms, under adult supervision, and when not interfering with education programmes. Children are not exposed to hazardous</p>

	<p>working conditions</p> <p>6.8 Any form of discrimination based on race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, or age, is prohibited</p> <p>6.9 A policy to prevent sexual harassment and all other forms of violence against women and to protect their reproductive rights is developed and applied</p> <p>6.10 Growers and mills deal fairly and transparently with smallholders and other local businesses</p> <p>6.11 Growers and millers contribute to local sustainable development wherever appropriate</p>
<p>7. Responsible development of new plantings</p>	<p>7.1 A comprehensive and participatory independent social and environmental impact assessment is undertaken prior to establishing new plantings or operations, or expanding existing ones, and the results incorporated into planning, management and operations</p> <p>7.2 Soil surveys and topographic information are used for site planning in the establishment of new plantings, and the results are incorporated into plans and operations</p> <p>7.3 New plantings since November 2005, have not replaced primary forest or any area required to maintain or enhance one or more High Conservation Values</p> <p>7.4 Extensive planting on steep terrain, and/or marginal and fragile soils, is avoided</p> <p>7.5 No new plantings are established on local peoples land without their free, prior and informed consent, dealt with through a documented system that enables indigenous peoples, local communities and other stakeholders to express their views through their own representative institutions</p> <p>7.6 Local people are compensated for any agreed land acquisitions and relinquishment of rights, subject to their free, prior and informed consent and negotiated</p>

	<p>agreements</p> <p>7.7 Use of fire in the preparation of new plantings is avoided other than in specific situations, as identified in the ASEAN guidelines or other regional best practice</p>
8. Commitment to continuous improvement in key areas of activity	8.1 Growers and millers regularly monitor and review their activities and develop and implement action plans that allow demonstrable continuous improvement in key operations

Source: RSPO Principles and Criteria for Sustainable Palm Oil Production, 2007

APPENDIX B.4: RSPO Code of Conduct

1. Promotion & Commitment	<p>1.1 Member organizations will acknowledge their membership of the RSPO, its objectives, statutes and by laws, the P&C and its respective national interpretations and implementation process through informed and explicit endorsement</p> <p>1.2 Members will promote and communicate this commitment throughout its own organization and to its customers, suppliers, sub-contractors, and wider value chains where necessary</p> <p>1.3 Membership of the RSPO must be endorsed by a senior representative of the member organization</p>
2. Transparency, Reporting and Claims	<p>2.1 Members will not make any misleading or unsubstantiated claims about the production, procurement or use of sustainable palm oil</p> <p>2.2 Members are required to report annually on progress against this code</p> <p>2.3 Members will commit to open and transparent engagement with interested parties, and actively seek resolution of conflict</p>
3. Implementation	<p>3.1 Members to whom the P&C apply will work towards implementation and certification of the P&C</p> <p>3.2 Members to whom the P&C do not apply directly will</p>

	<p>implement parallel standards relevant to their own organization, which cannot be lower than those set out in the P&C</p> <p>3.3 Members are responsible for ensuring that their commitment to the objectives of the RSPO is underpinned by adequate resources within its organization</p> <p>3.4 Relevant personnel within member organizations will be provided appropriate information that will enable them to work towards the objectives of the RSPO in their work</p> <p>3.5 Members to whom the P&C do not directly apply will actively seek to promote sustainable palm oil and will give support to those members engaged in implementing the RSPO P&C</p> <p>3.6 In the required annual communication on progress (see 2.2), existing RSPO members are required to specify steps taken last year, specific steps intended for the coming year and for the long term in the form of a time-bound plan of working towards producing or buying certified sustainable palm oil, applying any or a combination of the RSPO approved supply chain mechanisms and relevant to the scope of the member's operations (e.g. specifying volume or percentage targets, or a commitment to above-average proportions of trade or investment volumes in comparison to production or demand trends)</p> <p>3.7 New members are required at the least in their first annual progress report to specify a time-bound plan of working towards producing or buying certified sustainable palm oil, relevant to the scope of the member's operations</p> <p>3.8 Subsequently, members need to report progress against the time-bound plan annually as part of the mandatory progress report</p> <p>3.9 Names of members who meet these requirements will be contained in the annual RSPO publication collating or summarizing progress reports. Members who fail to meet these</p>
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	requirements will be listed as such in the same publication
4. Pricing and Incentives	<p>4.1 Members procuring palm oil will integrate implementation and independent verification of the P&C as a positive performance measure when assessing supplier performance</p> <p>4.2 Members will adhere strictly to the RSPO anti-trust guidelines, and refrain from any behavior which can be constructed as anti-competitive practice</p>
5. Breaches of this Code	<p>5.1 Members will seek to resolve grievances directly with other member organizations in a timely fashion, and will not make unsubstantiated allegations of breaches against other members</p> <p>5.2 Breaches of this Code, or the by-laws and statutes of the RSPO may lead to exclusion from the organization</p>

Source: Code of Conduct for the Members of the RSPO, 2012

APPENDIX B.5: RSPO Membership Types

Membership Type	No. of Memberships	Membership Fee/Yr	Remarks
Ordinary Members	815	€2000	<ul style="list-style-type: none"> • Right to vote at general assembly • Applicant of a specific sector (refer Table 20 for sectors) • Access to all the RSPO materials produced to their members (e.g. Newsletters)
Affiliate Members	104	€250	<ul style="list-style-type: none"> • No voting rights at the general assembly • Not actively involved in any of the sectors • Limited access to the RSPO materials
Supply Chain Associates	258	€100	<ul style="list-style-type: none"> • Members whose palm oil usage is less than 500 mt/yr

			<ul style="list-style-type: none"> No voting rights at the general assembly
Total Members	1,177		

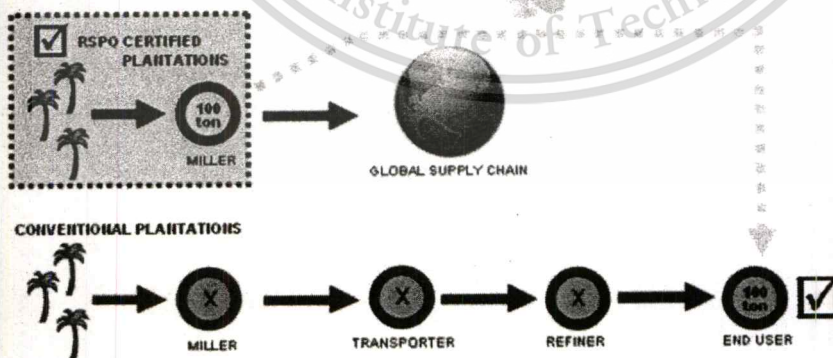
Source: rspo.org, 2013

APPENDIX B.6: Countries Interested in RSPO certified Palm Oil



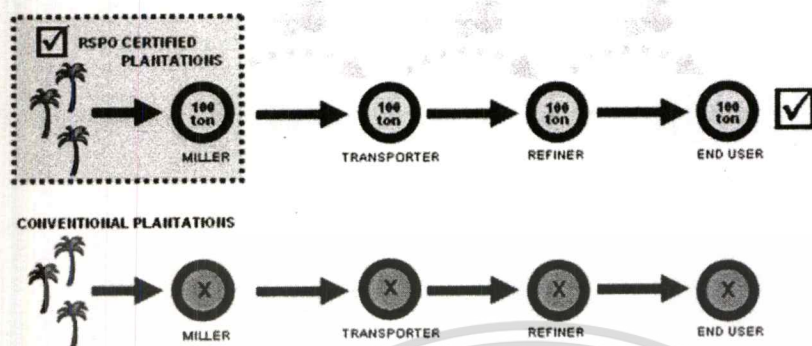
Source: rspo.org, 2013

APPENDIX B.7 Book & Claim Certification Model



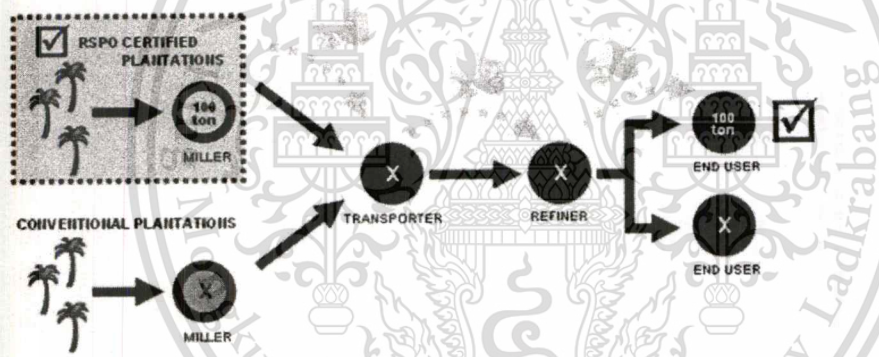
Source: rspo.org, 2013

APPENDIX B.8: Identity Preserved Model



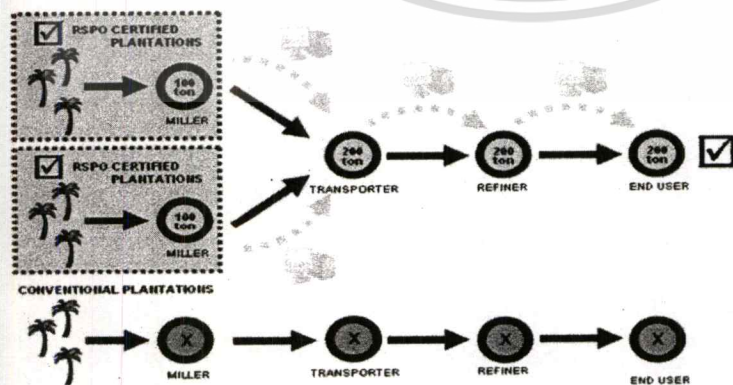
Source: rspo.org, 2013

APPENDIX B.9: Mass Balance Model



Source: rspo.org, 2013

APPENDIX B.10: Segregation Model



Source: rspo.org, 2013

APPENDIX C

APPENDIX C.1: Fertilizer types used by PT AI

Fertilizer Type	Origin	Purpose of Usage
Urea	East Kalimantan	Mainly for Vegetative
Rock Phosphate	Egypt	Mainly for Root
Muriate of Potash	Russia	Mainly for Yield
Dolomite	East Java	To treat pH levels and leaf magnesium deficiency in the soil
Borate	Turkey	To treat leaf boron deficiency in mineral and organic soil
Zinc Sulphate	China	To treat leaf zinc deficiency in Organic soil
Copper Sulphate	Taiwan	To treat leaf copper deficiency on Organic soil

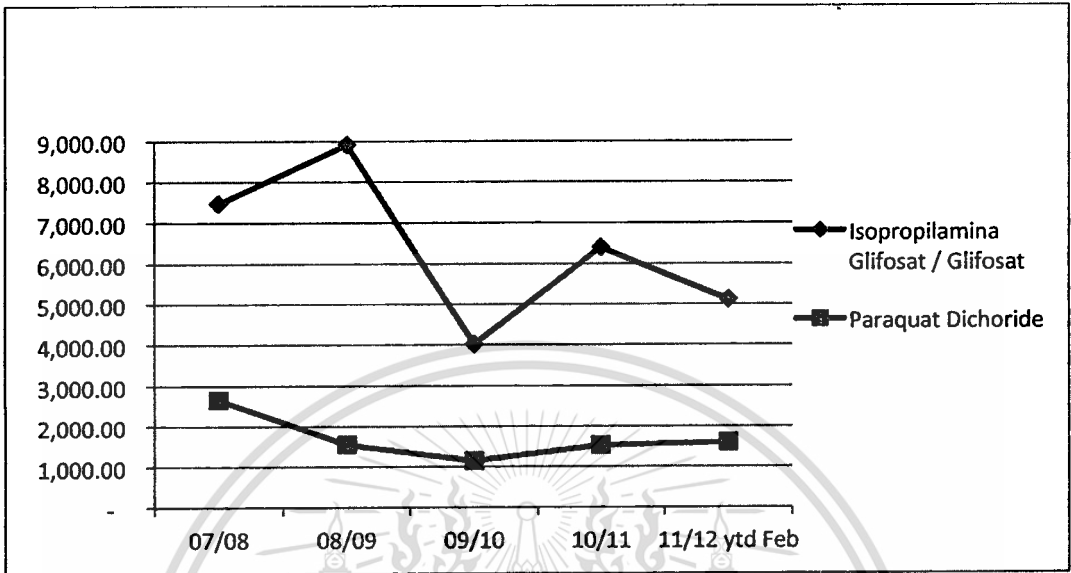
Source: Information gathered from PT Agro Indomas

APPENDIX C.2: Agrochemical Usage by PT AI

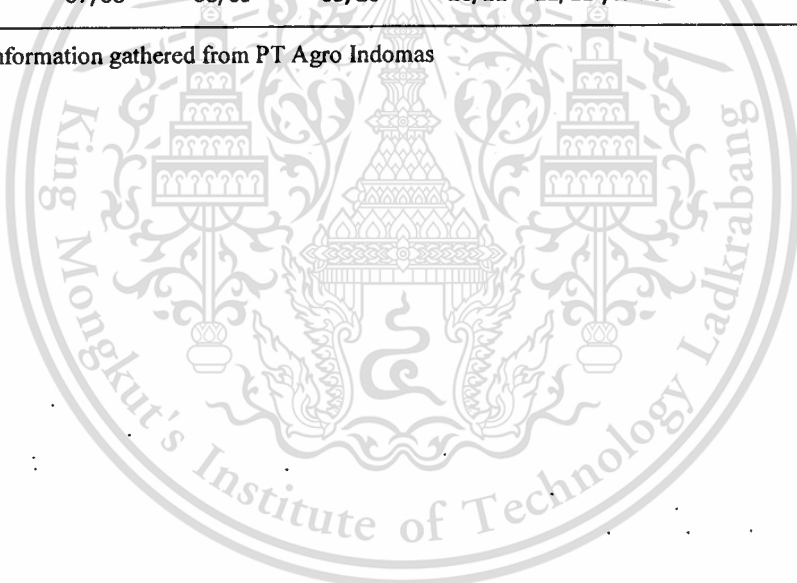
PT AI Ingredients Used (KG)						
Active Ingredients	07/08	08/09	09/10	10/11	11/12 ytd Feb	Remarks
Isopropilamina Glifosat / Glifosat	7,463.67	8,899.60	4,018.14	6,394.10	5115.9	slightly hazardous
Paraquat Dichoride	2,667.91	1,544.58	1,146.95	1,527.51	1,600.95	1. Restricted pesticide (ministry regulation No 1 /2007) 2. Pesticide hazard WHO class II
2,4-D Amine	234.33	279.23	508.52	534.65	655.48	Pesticide hazard WHO class II
Triclofir	441.75	213.13	228.22	198.40	382.07	Pesticide hazard WHO class III
Metil Metsulfuron	110.93	121.50	70.74	40.89	50.80	slightly hazardous
Caumatetralyl	0.73	0.65	0.71	0.21	0.08	Pesticide hazard WHO class 1B
Thiram	4.00	28.00	-	-	-	slightly hazardous
Mancozeb	50.40	21.60	-	-	-	slightly hazardous
Parafin HVI 650	0.000772	0.000386	-	-	-	slightly hazardous
IPA Glifosat	1,382.44	-	-	-	-	slightly hazardous
Benomil	10.00	-	-	-	-	slightly hazardous
BPMC	10.00	-	-	12.25	0.50	slightly hazardous
Deltametrin	1.50	-	-	-	-	slightly hazardous
Dimetoat	13.92	-	-	-	-	slightly hazardous
Mafenoksam	0.35	-	-	-	-	slightly hazardous
Tetradifon	4.89	-	-	-	-	slightly hazardous
Trichlorfon	14.25	-	-	-	-	Pesticide hazard WHO class II
Carbofuran	-	-	0.42	0.60	1.80	Pesticide hazard WHO class 1B
metamidhapos	-	-	0.48	-	-	Pesticide hazard WHO class 1B

Source: Information gathered from PT Agro Indomas

APPENDIX C.3: Most Used Agrochemicals by PT AI



Source: Information gathered from PT Agro Indomas



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