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Palm Oil – a comprehensive analysis

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Abstract

Palm oil is one of the most used edible oils among the FMCG industry, being present in more than 50% of the available products on supermarkets´ shelves. With a sharp increase in its production due to its versatility and relative low cost, palm oil has strongly been associated with deforestation practices and with its negative and irreversible consequences. The aim of this case study is to analyse palm oil market in the last decades and give a wide and critical perspective on the issue and its possible alternative policy approaches.

Key words: **palm oil**; **deforestation**; **palm oil market**;

PART A – Palm Oil Industry Overview

Palm Oil

Elaeis guineensis, most known as oil palm has its roots in the West African tropical rainforest region. Oil palm fruits are made up of an outer skin, which is known as the exocarp, a pulp (mesocarp), a central nut consisting of a shell (endocarp) and the kernel. The fruit yields two different oils: Palm Kernel oil, which derives from the kernel; and Palm Oil, deriving from the outer parts of the fruit **(Poku, K. 2002)**. Palm Oil and Palm Kernel oil are among the world´s most versatile raw materials and can be found in approximately 50% of products on the supermarkets´ shelves, such as food (consumer packed goods, snacks, animal feed) and non-food (personal care, cosmetics, pharmaceutical). Although its non-food applications, it is estimated that about 80% of palm and kernel oil is used in the food industry **(Green Palm Sustainability. 2016).**

Palm oil settles its roots as back as 5 000 years, however oil palm production only experimented a sharp increase in the beginning of the 90´s of the 20th century **(Kiple, KF et al. 2000)**. Palm oil production has been increasing at a fast pace since 1994 due to its high versatility and efficiency in its appliances. Since 1994, when world total production of palm oil accounted with 14,8 million tonnes, until 2014, palm oil production increased more than 250%, reaching an annual production of 57,3 million tonnes **(FAOSTAT Database, Palm Oil)** (Exhibit 1)**.** When comparing with its usual substitutes, such as soybeans, rapeseed and sunflower oil, palm oil has a significant better performance due to its impressive production yields. Its average production yield per hectare is what makes palm oil the most efficient oilseed crop nowadays, with one hectare of oil palm producing up to ten times more oil than its substitutes **(Oil World. 2016)** (Exhibit 2). Nonetheless, oil palm is also the oilseed crop that uses the least land when comparing with its direct substitutes (rapeseed, soybeans and

sunflower oil), with only 9% of the total area harvested with these crops **(FAOSTAT Database, Palm Oil)** (Exhibit 3).

Palm Oil Producers

Despite its African roots, the largest production share comes from Asia, accounting for 87% of the world´s total production of palm oil, with the remaining distributed by Oceania (1,2%), Africa (6,3%) and Americas (5,5%) (Exhibit 4). Following the sharp increase in palm oil usage, oil palm harvested area has also increased significantly from 1994 until 2014, with an increase of 125% reaching, in 2014, 18,7 million hectares. Oil palm worldwide area harvested increase compared with palm oil production increase (more than 250%) reflects its high yield per hectare as referred but also the differences in land productivity among countries (Exhibit 5). In fact, recent production increase is mainly concentrated in two Asian countries, Malaysia and Indonesia, that together are responsible for more than 85% of world´s annual production of palm oil **(FAOSTAT Database, Palm Oil Fruit)** (Exhibit 6). Besides being the countries where palm oil majority is produced, they are also the ones with the higher palm oil exportation rate (Exhibit 7), with India, China and European Union among the main consumers (Exhibit 8).

To enhance palm oil importance for producers´ countries, according with Indonesian Palm Oil Producers Association & Indonesia Ministry of Agriculture, in terms of agriculture, palm oil industry is one of the most important ones in the country, contributing with 1,5 to 2,5% of the GDP (Exhibit 9). In Malaysia, the second largest producer, the contribution to the GDP is higher than in Indonesia, with an approximate contribution of 4% to the Malaysian GDP[1]. Palm oil industry is a significant contributor for both national economies, contributing at the same time for the regional development as a significant source of poverty alleviation. It is also

[1] Assuming a 34% world market quota of Malaysian palm oil, representing around 19,5 million tonnes of palm oil per year; Assuming an average palm oil´s price per tonne of 620 USD and taking Malaysian 296 Billion USD GDP, the contribution of palm oil to Malaysian GDP is around 4%

estimated that in Indonesia, the employment generated by palm oil production can potentially reach over 6 million lives, taking them out of a poverty levels **(Vijay, V et al. 2016)**.

Palm Oil´s Supply Chain

The palm oil supply chain starts with plantations, where producers are usually divided into two groups: smallholders (until 20 hectares) and corporate farmers. At production stage, the fresh fruit bunches are picked and further transported to mills, where they are sterilized and pressed to extract oil - Crude Palm Oil. Crude Palm Oil is shipped to refineries where it is separated according to the pretended destination. After it, it is sold to manufacturers and further incorporated into hundreds of different products, from soaps to cookies (Exhibit 10). By assessing the palm oil supply chain, its main stakeholders are: oil palm producers, processors, traders, consumer goods manufacturers, retailers, bank/investors and environmental and social NGOs, and governments **(RSPO Supply Chains. 2017)**.
Based on **(World Growth**, **2011)**, in Indonesia, approximately 41% of plantations are owned by smallholders, while 49 percent belong to corporate farmers and the remaining 10% owned by the government. As it is showed in Exhibit 2, oil palm has an impressive yield per hectare, in average producing 4 tonnes of oil per hectare, a significantly higher yield than its substitutes. However, as Exhibit 2 shows, these high yields come specifically from Indonesia and Malaysia, the ones responsible for around 85% of world´s palm oil production, which enhance the favourable climatic conditions Malaysia and Indonesia have to produce palm oil, significantly contributing for its settlement as world leading producers. According with **(World Growth, (2011)**, palm oil benefits from land-use range between 960 USD per hectare to 3 340 USD, which, when compared with the usual crops Indonesia and Malaysia grow (rubber, rice fallow and cassava) is significantly much more profitable, up to 100 times more than cassava. Another recent study **(Irawan et al. 2013)** estimates for Indonesia´s farmers a NPV/hectare ranging from 6000 USD to over 7 000 USD (Exhibit 11).

As it would be expected, with such incentives to production, several farmers are switching usual crops to oil palm to improve their economic situation. However, as also shown in **(Irawan et al. 2013)** there is also a clear economic incentive for farmers to prefer palm oil production with prior logging in forest. By clearing virgin forest, farmers are cutting costs by avoiding the use of fertilizers (one of the most expensive inputs in agriculture), since the ash produced by the forest clearance own fertilizer properties and can supress the use of chemical fertilizers. Additionally, the cost of clearing tropical virgin forest is subsidised by the sale of commercially valuable timber taken from concession areas as a part of the conversion process. In addition, **(Irawan et al. 2013) also** shows that the revenues collected from governments through taxes and fees from land-use activities are extremely high, almost as high as companies' revenues, which poses a serious incentive to deforestation. In fact, **(Irawan et al. 2013)** study clearly identify the economic incentives behind the perceived relationship between palm oil production and deforestation problems and as long as financial benefits from unsustainable practices keep surpassing its observed direct costs, countries will not have an incentive to stop it.

Finally, price trends are crucial information to understand market evolution and producers' profitability. Palm oil is traded as a commodity futures contract, where the most popular trade occurs in Bursa Malaysia Derivatives Exchange and Chicago Mercantile Exchange, as CPO futures (Crude Palm Oil Futures Contract), an agreement between two parties for a transaction of a specific amount of crude palm oil at a specific time in the future for a specific price **(Oriental Pacific Futures SDn Bhd. 2017)**. Palm oil price varies according with demand and supply, as well as other agricultural commodities, having a behaviour very much alike other vegetable oils **(Isermeyer, F. 2015)** (Exhibit 12), however, always showing a lower price when comparing with its substitutes, with its high producing yield as one of the main reasons for its lower price.

In general, oil prices show an increasing pace until 2010 and afterward a decreasing one. Palm oil prices were in 1992 around 300 USD/tonne, peaked up almost to 1.200USD/tonne and are now around 620 USD/tonne.

Palm Oil´s Environmental Problem

Notwithstanding palm oil high versatility and production yields, a major problem of related deforestation is recognized at a global level. For decades, deforestation has been associated with palm oil production, where in **(European Commission, 2013)**, it is stated that 40% of global deforestation between 1990 and 2008 was caused by conversion to large-scale monocultural oil palm plantations. Also, in **(FAOSTAT Database, Palm Oil Fruit)**, global oil palm area harvested increased between 1990 and 2008 by 8,7 million tonnes, of which, 5,5 million tonnes were associated with deforestation, concentrated mainly in Indonesia, accounting with 57% of that area, Malaysia (25%), Nigeria (7%), Thailand (2%) and Ghana (2%) **(European Commission, 2013)**. Corroborating the above-mentioned data, a study from **(Vijay, V et al. 2016)** where sample areas were assessed to find where oil palm plantations have recently replaced forests, revealed that in Southeast Asia, 45% of sampled oil palm plantations came from areas that were forests in 1989.

As deforestation being the main identified problem from palm oil production, several negative and irreversible consequences arise, posing a great impact in the world in the long-term scale. Consequences such as the increase of greenhouse gas emissions due to deforestation have been reported, as Indonesia recently became the third highest polluter of CO_2 in the world, highly contribute to the global warming problem **(European Commission, 2013)**. Other impacts, such as irreversible biodiversity losses in the affected areas, as rainforests contain an immense number of species which science still knows very little about and whose losses could not be estimated at a short term; reduced flood protection has also been identified by

(Brookhuis, BJ et al. 2016), concluding that the number of large floods and the costs of flood events increase strongly with increased deforestation.

Deforestation repercussions assume a significant cost for humanity and consequently, the situation should be carefully analysed, because, at the same time, palm oil exploration is leveraging countries economic situation by helping their inhabitants moving from poverty levels.

It is important to relate with previous section information that not only the higher financial benefits for producers from deforestation practices, but also the allocation of tax revenues at the government level are important incentives to deforestation practices.

Government Role

During the past decades, Malaysia and Indonesia governments have been playing a major role by incentivising the expansion of oil palm cultivation. State policies aiming for economic development, as well as agricultural subsidies and tax breaks have been encouraging farmers to incur into deforestation actions. In fact, several of those policies led to harmful consequences in the environmental due to the high incentives for the cultivation of oil palm in forest land without any harm for the ones involved.

According to **(Margono et al. 2014)**, Indonesia has recently taken over as the country with the highest deforestation rate, and despite several number of public policies, such as a moratorium on the conversion of primary forests and peat lands **(Murdiyarso et al. 2011)**, a high-profile attempt to harmonize and register land rights and land use licences **(Setiawan et al. 2015)**, or specific regulations to improve land use planning and address fires during forest conversion processes, it still lags behind other countries in mitigating the impact of agriculture on its forests **(Margono et al. 2014)**. Also, **(Irawan et al. 2013)** states that, weak law enforcement, local vested interests and the belief that sectors responsible for deforestation play a major key in the economic development and employment targets, have been working

against the implementation of the strategic and promising policies. It is a priority for the Indonesian government to boost its capacity to accelerate economic growth and develop rural areas.

It is now clearer that state policies along with a growing demand for palm oil led to several harmful consequences to the environment caused by the intense deforestation of tropical forests in the main producers (Indonesia and Malaysia). The absence of any policies regarding forest conservation incentivised farmers to adopt a non-environmental friendly strategy and so, farmers prefer to clear primary forests, rather than crop conversion or the use of degraded areas or grasslands for the cultivation of new oil palm fields. As it can be concluded, the root cause of Palm Oil deforestation problem is a question of incentives. For farmers, an incentive exists to cultivate oil palm since it has a higher productive yield, allowing them to collect higher profits and escape from poverty levels. On the other side, this incentive comes from the lack of policies to prevent deforestation and with perverse tax systems that incentivises governments to allow deforestation practices.

Alternative policies to address Palm Oil production through deforestation:

- **Addressing global sustainability trough United Nations conventions REDD+**

Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) has the objective of mitigating climate change by reducing greenhouse gases emissions through forest management practices in developing countries. The main purpose of REDD+ is to use funds from developed countries to mitigate unsustainable forest practices in developing countries (**World Bank. 2013)**

- **Addressing global sustainability governance beyond states (voluntary sustainability certification schemes)**

RSPO

Established in 2004, Roundtable on Sustainable Palm Oil (RSPO) has the objective of promoting the growth and use of sustainable palm oil products through global standards and engagement with stakeholders **(Schouten, G et al. 2011)**. Settling on 8 principles (Exhibit 13), RSPO has the intent to certify involved parties in palm oil industry.

- **State policies**

ISPO - Launched in 2011, The Indonesian Sustainable Palm Oil system is a policy adopted by the ministry of agriculture with the aim to improve competitiveness of the Indonesian palm oil on the global market while reducing greenhouse gases emissions. ISPO is mandatory for all oil palm growers operating in Indonesia, from large plantation companies to smallholders, although requirements for each vary **(Efeca. 2015).**

MSPO - Introduced in 2013 as a voluntary measure for oil palm planters and mills, The Malaysian Sustainable Palm Oil firms the general requirements of a management system framework, with Malaysian government establishing January 2015 as a timeline for plantation industries to become certified. It aligns the management of palm oil production with many existing national laws and regulations **(Efeca.2015).**

Exhibit 1. Production/Yield quantities of Palm Oil in World (FAO STAT)

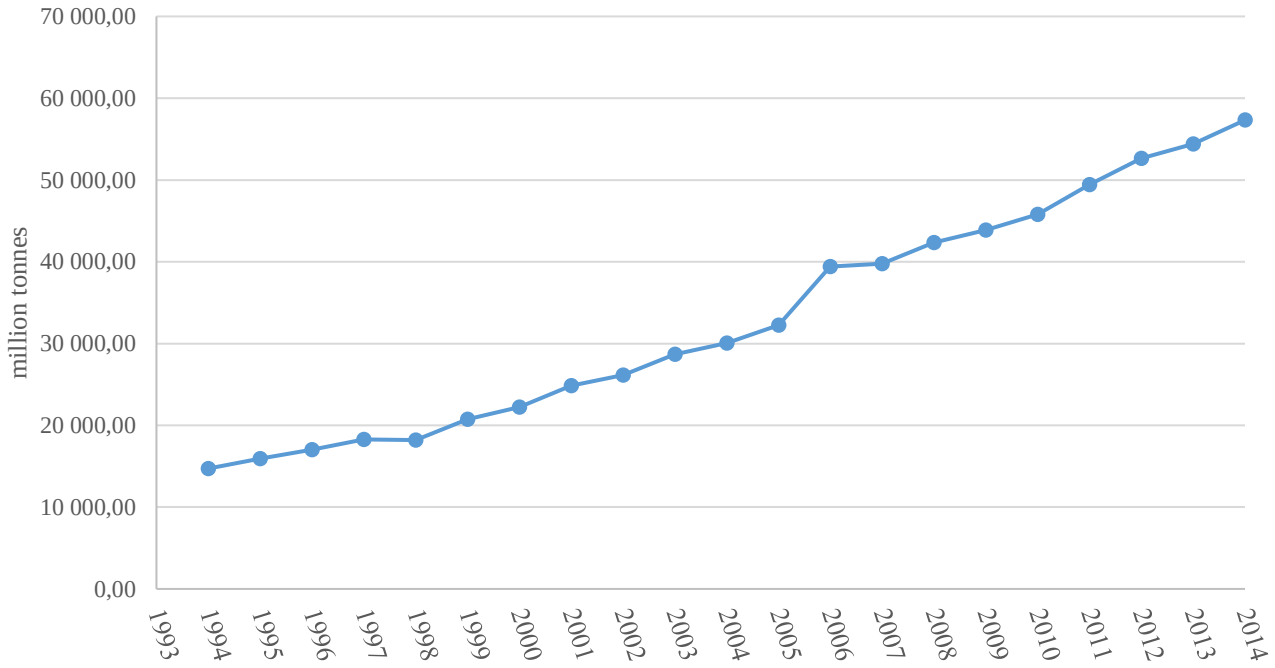
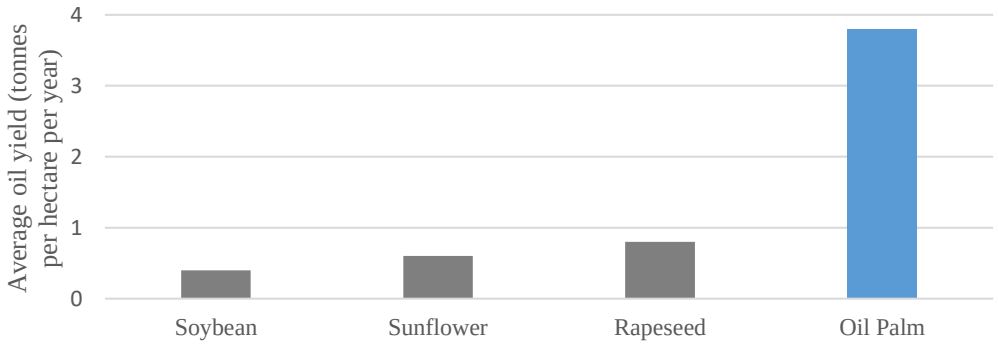


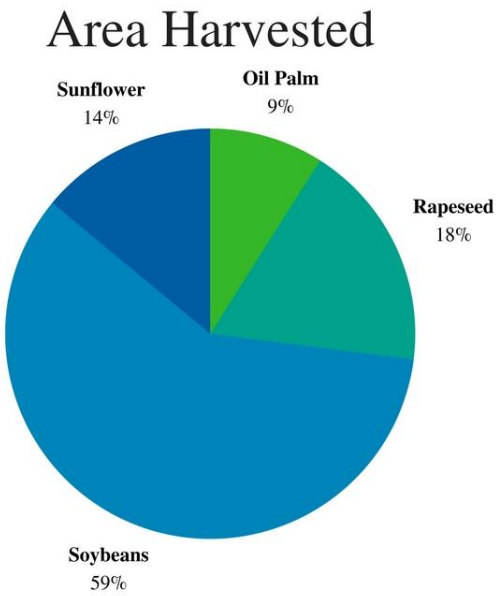
Exhibit 2. Production Yield by hectare (Oil World 2016) and palm oil Production Yield (FAO STAT)



	Oil Palm Area Harvested (ha)	Palm Fruit Production (tonnes)	Palm Oil Production (tonnes)	Palm Fruit per ha	Palm Oil Per ha
Malaysia	4 689 321	96 066 760	19 667 016	20,49	4,19
Indonesia	7 428 752	126 684 128	29 278 200	17,05	3,94
World	18 697 276	274 618 164	57 328 872	14,69	3,07

Exhibit 3. Area Harvested and Change of Main Oilseed Crops (Source: FAO STAT – 2014 data)

Crop	Area Harvested (ha)
Oil Palm	18 697 276
Rapeseed	36 117 722
Soybeans	117 549 053
Sunflower	25 203 554
Total	**197 567 605**



	1994 (million ha)	2014 (million ha)	% Change
Sunflower	18	25	40
Rapeseed	22	36	64
Soybean	62	111	79
Oil Palm	8	18	125
Total	110	190	74

Exhibit 4. Production Share of Palm Oil by region (FAO STAT – average 1994-2014)

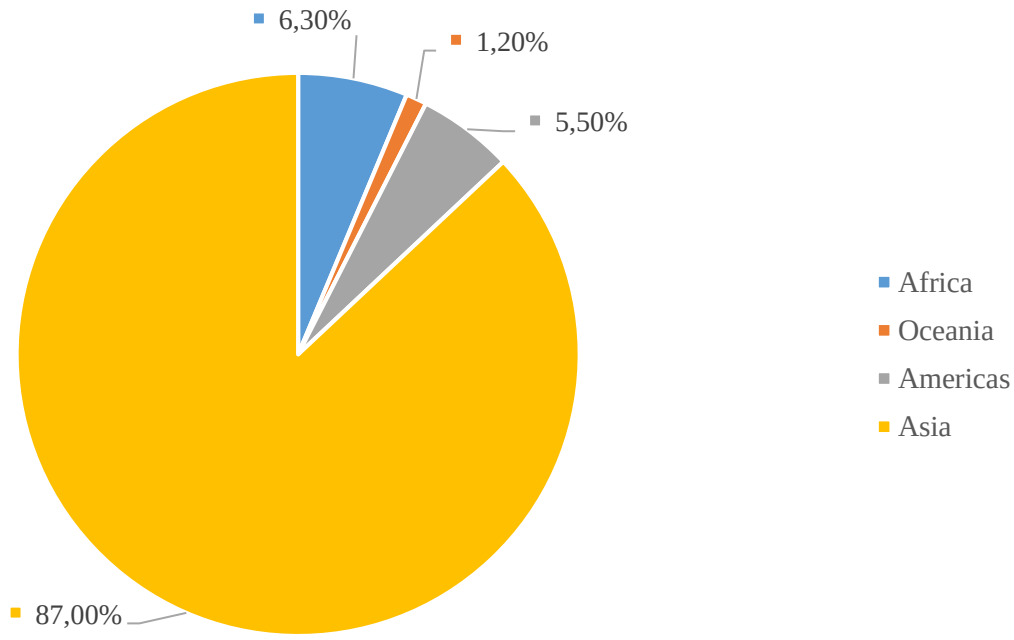


Exhibit 5. Area Harvested Evolution (1994 – 2014) (FAO STAT)

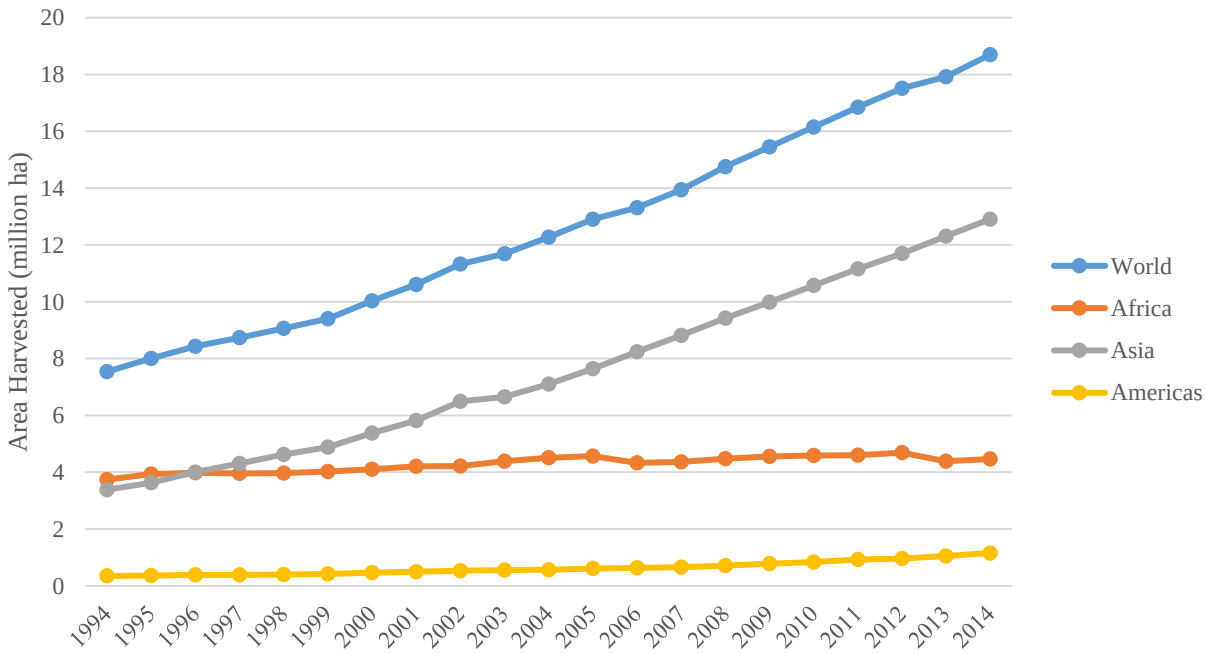
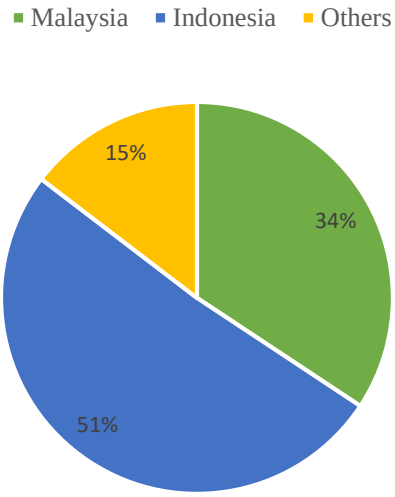
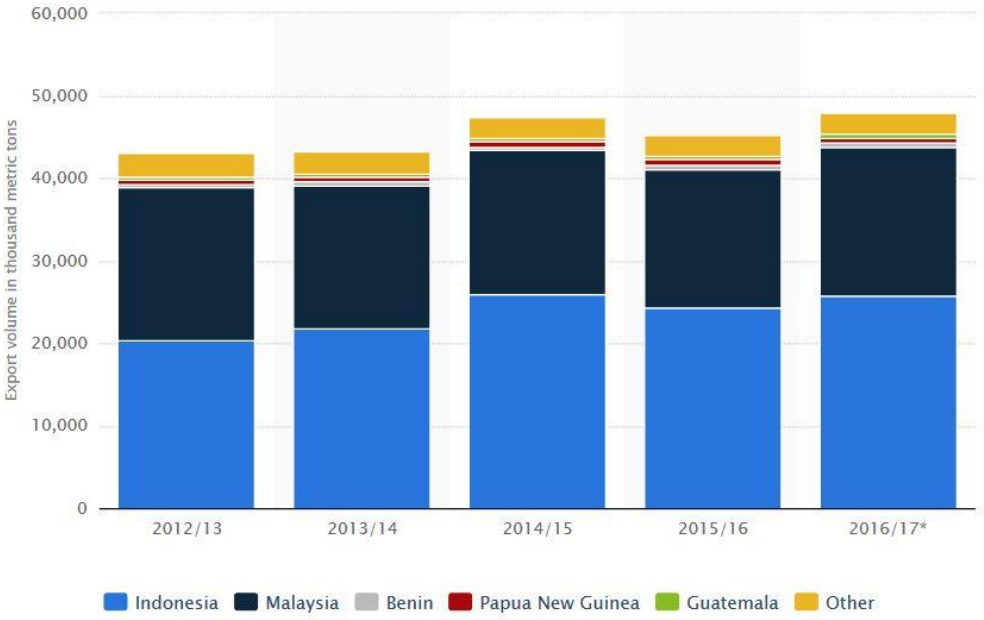


Exhibit 6. Production of Palm Oil 2014 (FAO STAT)



World: 57,3 million tonnes

Exhibit 7. Palm Oil Main Exporters (Statista)



Additional Information
World; United States Department of Agriculture; USDA Foreign Agricultural Service; 2012/13 to 2015/16

Sources
US Department of Agriculture; USDA Foreign Agricultural Service

Exhibit 8. Consumption major users of palm oil (Oil World 2016)

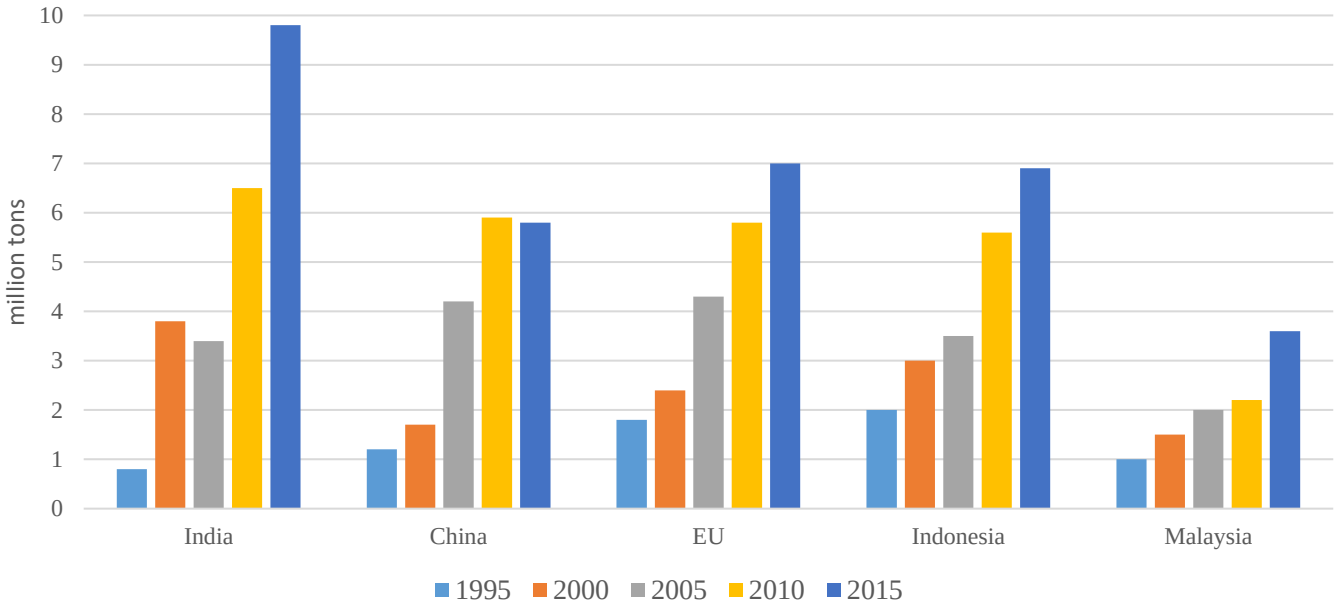


Exhibit 9. Indonesian Palm Oil Production and Export Statistics (Indonesian Palm Oil Producers Association & Indonesian Ministry of Agriculture)

Indonesian Palm Oil Production and Export Statistics:

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Production (million tons)	19.2	19.4	21.8	23.5	26.5	30.0	31.5	32.5	32.0
Export (million tons)	15.1	17.1	17.1	17.6	18.2	22.4	21.7	26.4	27.0
Export (in USD billion)	15.6	10.0	16.4	20.2	21.6	20.6	21.1	18.6	18.6

Sources: Indonesian Palm Oil Producers Association (Gapki) & Indonesian Ministry of Agriculture

Indonesia GDP: 932,3 billion USD (2016) Source: World Bank

Exhibit 10. Palm Oil Supply Chain (RSPO Website)

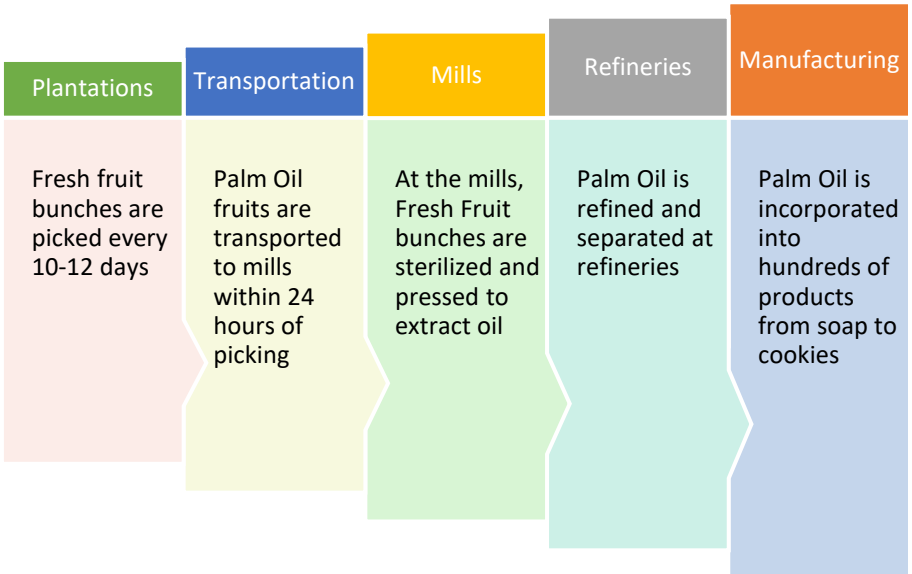


Exhibit 11. (Irawan et.al.2013) values for average opportunity costs and Minimum REDD+ payments to offset opportunity costs

Average opportunity costs (NPV USD/ha) for private and public stakeholders (percentage allocation in brackets; 10% discount rate; palm oil price USD 800/t).

Alternative land-use activities	Company	Government total	National	Provincial	Producing district	Other districts
Commercial logging	206 (46.68)	235 (53.32)	140 (31.71)	6 (1.29)	69 (15.58)	21 (4.74)
Timber plantation without prior logging	1037 (64.62)	568 (35.38)	536 (33.41)	7 (0.44)	14 (0.90)	10 (0.63)
Timber plantation with prior logging in degraded forests	1507 (58.75)	1058 (41.25)	767 (29.92)	29 (1.14)	213 (8.29)	49 (1.90)
Oil palm plantation without prior logging	6355 (57.97)	4608 (42.03)	4587 (41.85)	3 (0.03)	17 (0.15)	0 (0)
Oil palm plantation with prior logging in degraded forests	6458 (57.45)	4782 (42.55)	4678 (41.62)	10 (0.09)	82 (0.73)	13 (0.11)
Oil palm plantation with prior logging in primary forests	7099 (56.34)	5502 (43.66)	5057 (40.13)	34 (0.27)	350 (2.78)	61 (0.48)

Minimum REDD+ payments to offset opportunity costs (US$/ton CO_2 eq; palm oil price US$ 800/t).

Land use activities	Carbon loss# (tCO_2/ha)	Total US$/ton	Company	Government total	National govt.	Provincial govt.	Producing district	Other Districts
15% discount rate								
Commercial logging in primary forest	779.58	0.6	0.18	0.21	0.12	0.01	0.06	0.02
Timber plantation with prior logging in degraded forest	135.42	16.86	6.59	5.14	3.33	0.17	1.34	0.29
Oil palm plantation:								
–with prior logging in degraded forest on mineral soil	197.64	38.87	13.84	12.52	12.08	0.04	0.34	0.05
–with prior logging in primary forest on mineral soil	977.22	9.8	3.37	3.21	2.84	0.03	0.30	0.05
–with prior logging in primary forest on peat soil	2249	4.07	1.34	1.37	1.20	0.01	0.13	0.02
10% discount rate								
Commercial logging in primary forest	779.58	0.87	0.26	0.30	0.18	0.01	0.09	0.03
Timber plantation with prior logging in degraded forest	135.42	26.76	11.13	7.81	5.67	0.22	1.57	0.36
Oil palm plantation:								
–with prior logging in degraded forest on mineral soil	197.64	81.06	32.67	24.20	23.67	0.05	0.41	0.06
–with prior logging in primary forest on mineral soil	977.22	18.51	7.26	5.63	5.17	0.03	0.36	0.06
–with prior logging in primary forest on peat soil	2249	7.75	2.95	2.39	2.20	0.02	0.16	0.03
5% discount rate								
Commercial logging in primary forest	779.58	1.44	0.45	0.50	0.30	0.01	0.14	0.04
Timber plantation with prior logging in degraded forest	135.42	45.92	21.79	12.06	9.40	0.30	1.89	0.48
Oil palm plantation:								
–with prior logging in degraded forest on mineral soil	197.64	178.16	77.55	50.31	49.64	0.06	0.52	0.08
–with prior logging in primary forest on mineral soil	977.22	38.63	16.45	11.09	10.52	0.04	0.45	0.08
–with prior logging in primary forest on peat soil	2249	16.17	6.76	4.71	4.46	0.02	0.19	0.03

Exhibit 12. World Prices Evolution for Vegetable Oils (World Bank)

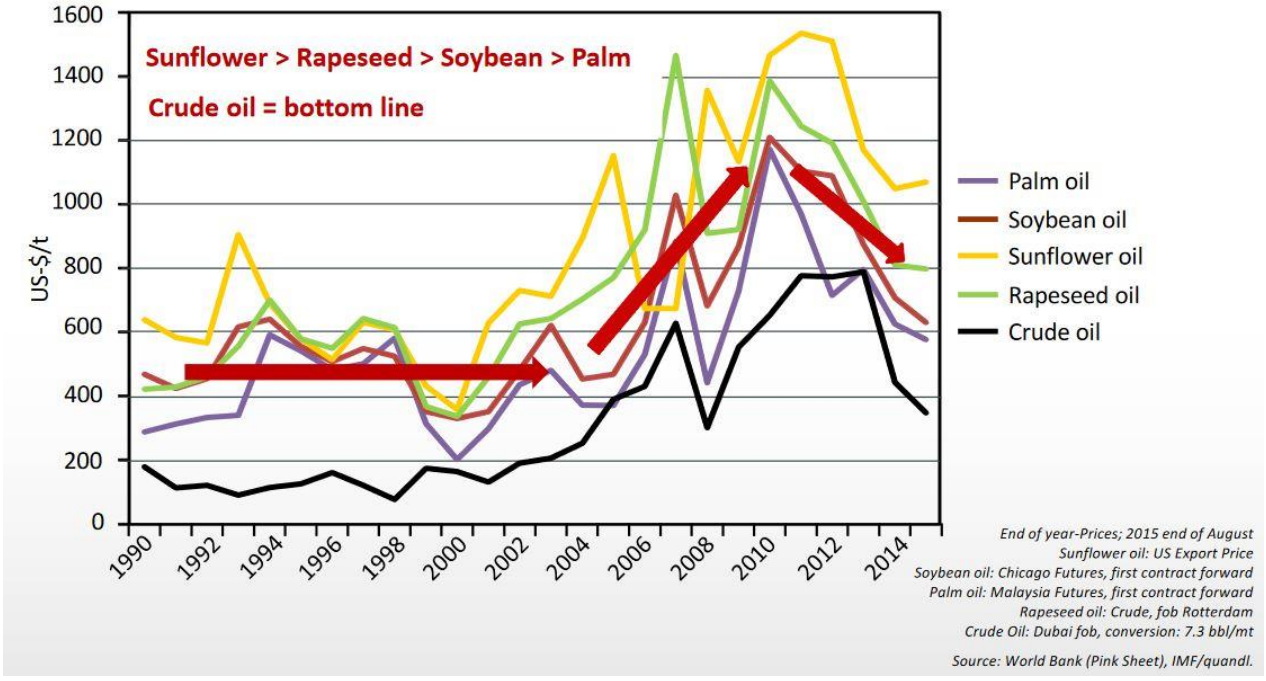


Exhibit 13. RSPO Principles (RSPO Website)

1. Commitment to transparency;
2. Compliance with applicable laws and regulations;
3. Commitment to long-term economic and financial viability;
4. Use of appropriate best practices by growers and millers;
5. Environmental responsibility and conservation of natural resources and biodiversity;
6. Responsible consideration of employees, and of individuals and communities affected by growers and mills;
7. Responsible development of new plantings;
8. Commitment to continuous improvement in key areas of activity

PART B – Discussion Notes

1. **What characterizes Palm Oil world market in the last 20 years?**

From 1994 to 2014, palm oil harvested area increased almost 125% from around 8 million ha in 1994 to more than 18 million ha in 2014. Alongside with its expansion, the environmental collaterals have always been associated with palm oil fast increasing demand, mostly from food and cosmetics multinationals. However, one should not be tempted to jump into premature judgements and so, in order to analyse and characterize palm oil expansion between 1994 to 2014, it is necessary to broadly understand the problem and look at it as a whole picture to base any conclusion.

By analysing and benchmarking palm oil with its direct substitutes – soybeans, rapeseed and sunflower – the problem can be seen through a different perspective. In Exhibit 3, in 1994, from the 4 analysed crops, palm oil was the one with the lowest harvested area, 8 million ha, less 54 million ha than soybean, 10 million ha than sunflower and less 12 million ha than rapeseed. During the analysed period (1994-2014), harvested area for all crops had been growing significantly, from around 109 million ha in 1994, to 190 million ha in 2014, an increase of 74%. Palm oil was the one with the highest percentage increase, however it was also the crop with the lowest harvested area in 1994, contrasting with its substitutes. By analysing the numbers, within the 81 million ha in harvested area between 1994 and 2014, palm oil was only responsible for 10 million ha, around 12% of the whole expansion in harvested area in the 4 analysed crops. This allows to conclude that not only palm oil suffered an almost exponential growth from 1994 to 2014, but also their direct substitutes did, contributing in fact with far more harvested area than palm oil. With this benchmark analysis, it can be concluded that palm oil demand by itself was not the root cause of the associated deforestation problems, since the demand for its direct substitutes have also been growing at a

similar pace from 1994 to 2014, and no major environmental issues aroused, at least with the same extension and intensity has palm oil.

The main difference between palm oil and its direct substitutes is its direct link with deforestation of tropical forest, since according with **(Vijay, V et al. 2016)**, almost 45% of oil palm sampled areas in Southeast Asia were forests in 1989. In fact, as it was mentioned on Part A, and by observing Exhibit 11, exists a clear incentive for companies and governments to go through deforestation practices, with NPV values with deforestation practices outpacing other kinds of oil palm land-use, posing a high stream of revenues for governments with tax collection.

From 1994 to 2014, the world observed an exponential growth of palm oil production and the transactions came mainly from these two countries (Indonesia and Malaysia), however, what could have been a positive economic driver, turned out to be one of the most unsustainable growth in the agricultural sector ever testified, leading to severe environmental problems coming mostly from deforestation practices, which can deeply impact not only the whole rainforest ecosystem, but also the world itself.

Consequently, these strong associations led to the common-sense knowledge that deforestation is the only way to produce oil palm and the only way to solve the deforestation problem is by forbidding palm oil production, which nurture palm oil bad reputation among vegetable oils.

2. Are deforestation costs higher than palm oil production benefits?

To answer this question, consider **(Irawan et al. 2013)** results in Exhibit 11. Retain that those calculations only include equivalent carbon tons, which means, the only cost authors are taking into consideration are the ones associated with carbon dioxide emissions, and that underestimate real deforestation costs since it does not include costs such as biodiversity loss, soil erosion, floods, and others.

The study analyses different emission costs according to different uses of land. Harvested oil palm with previous deforestation can occur either on degraded or primary mineral soils, or on peat soils. Due to its unique soil composition, deforestation on peat soils present the highest degree of CO_2 emissions per hectare, with **(Venter et al. 2009)** pointing for 2 249 tCO_2/ha. On other hand, **(Palm et al. 2004)** estimate deforestation on mineral soils emissions to be around 977 tCO_2/ha.

For comparable assumptions on prices and interest rates, the total compensation for both Governments and Companies would be 7.75 US$/ton to avoid deforestation in primary forests on peat soil, and 18.51 US$/ton to avoid deforestation in primary forests on mineral soil. By comparing these values with the latest EU Emission Allowances CO_2 price per ton (9,19 US$/ton), or with global reviews of opportunity costs of REDD+ **(Irawan et al. 2013)** that estimate it to lie between 2,5 USD/tCO_2 and 21 USD/tCO_2; It can be concluded that in some cases there is an opportunity to act, in which REDD+ compensations to stop deforestation would be less expensive than the carbon price per ton.

Moreover, taking into consideration the benefits companies and governments have from deforestation practices and by comparing it with the estimated cost of carbon release, it shows that producing palm oil from primary forests, may be financially justified but it is not a reasonable choice from an economic perspective. Deforestation costs surpass, with high probability, the benefits generated by this way of producing palm oil, since carbon emissions are the only one used component to assess deforestation costs in these studies.

3. What is the impact of Alternative Policies (Moratorium, REDD+ and RSPO) on the deforestation problem and their expected impact in different stakeholders

As identified in Part A, Palm Oil industry has 7 important stakeholders: **oil palm producers**, **processors**, **traders**, **consumer goods manufacturers**, **retailers**, **bank/investors**, **environmental** and **social NGO´s** and for last, **governments**. Despite the clear role of each

of the identified stakeholders, there are some stakeholders, such as retailers, bank/investors, and traders, that would not have a significant direct impact from the 3 alternative policies further assessed.

For the aim of this case study, it was considered three policy types: REDD+, Moratorium and RSPO. As it might be observed, the three types of described policies have significant differences, which means they will also have different impacts on palm oil´s stakeholders. Thoroughly analysing it:

REDD+

REDD+ policy aims to use funds from developed countries to support developing countries on its environmental policies.

As seen in question 2, REDD+ policy has an opportunity to thrive, since the amount to be paid in order to compensate the loss of revenues from deforestation would be, in the more serious cases, less than the average traded price of carbon in the market.

The main problem coming from a REDD+ policy, is mainly a political problem: Lack of trust and perverse political incentives. Taking Indonesia example, as **(Irawan et al. 2013)** showed, the distribution of funds between government levels are not balanced. Local governments receive just a residual part of the generated funds by palm oil industry, while national governments collect almost the whole value from imposed taxes on the industry. However, from all the possible different alternative land-use activities, local governments receive the highest revenue stream when oil palm plantations are preceded by prior logging in primary forests. While National Level Governments would be the ones to be compensated by REDD+ policies, it would be very likely that amount of funds to reach local governments would not be enough to supreme the perverse incentives they have to allow deforestation practices.

The abovementioned reasons show that REDD+ policy by itself would not be enough to lead into sustainable path, since it requires a complex articulation between the different levels of government, which always represent complex internal processes.

Moratorium

A moratorium is a delay or suspension of an activity. Applied to the palm oil industry, a moratorium would consist on a prohibition by governments on deforestation, which if enforced could stop the deforestation problem.

A moratorium policy would consist on suspending all land-use activities leading into deforestation. Such policy, would lead into immediate results, which would impact almost all the involved stakeholders in the supply chain

However, a moratorium policy would also harm governments. On the government side, less collected taxes create a negative incentive, since governments are the ones with the power to implement a moratorium. Despite enforced moratorium possibly be the most effective policy to end deforestation practices, the cut on revenues collected by governments makes it an unlikely choice since the most affected stakeholder would be the one with the power to implement a moratorium policy.

RSPO

RSPO is a certification scheme already being used to certify palm oil as eco-friendly. However, RSPO poses a complex certification scheme, which clearly benefits corporate producers rather than smallholders, without enough resources to pursue the complex process. From manufacturers side, RSPO emerges to leverage their brand image over its competitors, where companies using a certain amount of certified palm oil being able to claim it in its packaging.

Despite RSPO noble intentions, it seems not to be an efficient policy to overcome deforestation problems. Moreover, RSPO is not taking into consideration that approximately 45% of producers are smallholders and do not have enough resources or knowledge to invest in this certification scheme. While it is the only worldwide recognized certification scheme, it seems to only have a positive effect in the most powerful stakeholders, perpetuating the capitalism and without truly tackle the root cause of the problem – the perverse incentives to deforestation.

4. What to predict for the following 20 years?

Palm oil is undoubtedly an impressive vegetable oil and its versatility alongside with its above-normal yields makes it one of the most desired edible oils in the market. Due to its high yields per hectare together with the trend of increasing prices palm oil has been extremely attractive for small farmers, whom are incentivized by its considerable higher returns than usual crops. Although prices have now decreased to lower levels they are still double of what they used to be in 1994, indicating that the profitability in the sector has been reduced but remaining a competitive industry.

Two factors might contribute for palm oil demand to keep growing: demographics and global economic expansion, and its higher relative productivity (high yield per hectare). Assuming a demographics expansion perspective it is very likely demand for products with palm oil will keep growing in the following ten years, and palm oil, as the most efficient edible oil for the purpose, from the efficiency perspective, continue to be the most rational alternative. Factors such as rising living standards and changing eating habits in emerging countries, improving economic conditions, may continue to drive the palm oil market growth in the short run. On the contrary, the bad reputation it collected from its deforestation practices, the high exposure it has in the media, alongside with the frivolous positioning governments are taking in the

affected countries, are leading into a denial move within some consumer groups, who are now refusing to consume products containing unsustainable palm oil.

Future prediction on palm oil demand depend on which driver will prevail, however the scenario of worldwide demand increase for palm oil is reasonable, leading to high prices and production profitability in the short run.

As it is very likely that demand for palm oil will keep on growing, the pressure on deforestation will tend to persist. If an efficient measure to stop deforestation is not taken by governments of the main producers (Malaysia and Indonesia), it is very likely that despite the negative impact it might have in the public opinion, deforestation will still occur, and palm oil will still be integrated in products, without a proper and efficient solution for the deforestation issue.

In the long run and due to the competitive characteristics of palm oil market it might be expected that price, producers' profitability and drivers of domestic growth will tend to slow down, however the damage already caused by deforestation is, in most of its consequences, irreversible.

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