Study on the environmental impact of palm oil consumption and on existing sustainability standards

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Final Report and Appendices

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1. Abstract

This report reviews environmental, social and economic aspects of palm oil production and consumption, and evaluates existing palm oil sustainability initiatives.

There is clear evidence that the expansion of oil palm cultivation has resulted in deforestation, biodiversity loss, and net greenhouse gas (GHG) emissions. Oil palm has in some instances expanded onto land traditionally used by indigenous and local communities. Labour abuses, including child and forced labour, are reported on a regular basis, but the evidence on how commonplace such practices are remains incomplete.

Oil palm cultivation often provides a higher income for smallholders than other livelihoods, and thus contributes to the development of rural economies and to the overall economy of producing countries through its linkages. These economic benefits must be set against potential conflicts and the loss of ecosystem benefits, such as non-timber forest products.

These environmental and social impacts are not exclusive to oil palm. They would apply in differing degrees to other crops planted on the same land. Furthermore, other sources of vegetable oils, among which the most important is soybeans, occupy much larger areas per tonne of oil produced, and have their own environmental and social impacts. Among certification schemes, the ISCC (EU) certification system generally addresses the environmental objectives of a range of EU and UN policies, principally because of its stringent definition of High Carbon Stock forests. The RSPO certification system addresses to the largest extent policy objectives relating to human, land, and labour rights. The current ISPO standard least addresses the policy objectives under consideration in this study, with limited protection for forest, and MSPO occupies an intermediate position. The governance and transparency of those four schemes, hence their level of independence *vis-à-vis* relevant interest groups, also vary.

Although most producer countries have introduced environmental and social regulations relating to palm oil, enforcement is often selective, incomplete or ineffective.

Europe remains the leading market for sustainably sourced palm oil, but progress on the growing number of voluntary initiatives and commitments has been slow. There is limited penetration of sustainable palm oil in India and China.

2. Executive summary

The objectives of this study are to:

1. Broaden the knowledge base on the environmental, social and economic aspects of oil palm production and palm oil consumption, trade flows in palm kernel oil (PKO), and actions undertaken by economic operators, EU governments and third parties (in particular India and China) focusing on palm oil.
2. Analyse existing sustainability standards and schemes (including RSPO, ISPO and MSPO), evaluate their completeness (especially concerning biodiversity and carbon aspects) and map such schemes and how they relate to the environmental objectives in relevant EU and international policy instruments.
3. Summarise and examine existing initiatives at the EU level and in EU Member States, as well as in India and China, concerning sustainable production and consumption of palm oil.

We start with an overview of the economics and agronomics of the oil palm. We then look at each of the issues above in turn.

1. Overview of the economics and agronomics of the oil palm

A detailed description of the economics and agronomics of the oil palm is provided in **Section 4**. For the purpose of this summary, however, we will briefly outline the most important fundamentals of the oil palm.

Palm oil today is by far the most important source of vegetable oil in the world, having overtaken soybean-oil in 2006. Rapeseed oil and sunflower oil are in third and fourth place, respectively. **The world is reliant on palm oil to satisfy growing global demand for vegetable oil (see Section 7.4.1).** Because of its high yield per hectare, the land area requirement for palm oil is lower than that of competing crops. To increase vegetable oil production by the same amount by relying on competing oilseeds instead of oil palm will require 5-8 times larger areas of land.

The oil palm grows predominantly within a 5-10^{o} belt from the Equator. Indonesia and Malaysia dominate with close to 90% of world output. Growing area, though much more modest, has also expanded in West Africa and Central America. Indonesia and Malaysia will remain the major producers for the foreseeable future. **As a result, while more countries are expected to play an increasingly important role in the future, discussion of the oil palm in this study cannot disregard the key role of Indonesia and Malaysia as the most visible examples of the impact of oil palm development.**

The Indonesian Association of Palm Oil Producers (GAPKI) projects a 50% increase in output between 2014 and 2025, in part due to the growing maturity of young estates, while the FAO predicts a doubling of vegetable oils consumption between 2010 and 2050.

Oil palm is a very productive crop, with yields of oil per hectare per annum that are much greater than for other oil crops. **The high yield of the oil palm means palm oil requires less area than competing oil crops and makes it a very attractive source of income for smallholder farmers,** with the added attraction that it is harvested year round, thereby smoothing the incomes of farmers over the year.

The production of oil palm is split between plantations and small holders, and plantations are required to include land for smallholders in many countries. The contribution to palm oil production from smallholders differs depending on the country. In South East Asia,

roughly 60% of the palm oil comes from the larger plantation companies (privately owned estates) and 40% from smallholders.

Oil palms produce fresh fruit bunches (FFB) which are harvested at intervals that are ideally 7 to 10 days in duration throughout the 20-25 years of the economic life of the palm after the oil palms reach the age of 3-4 years. As there has been limited success in mechanisation to date, oil palm cultivation and harvesting is very labour intensive, which is a major financial disadvantage. **To deal with the high labour requirement of the oil palm, plantations often rely on large amounts of migrant labour (see Section 7.3.8).**

The relationship between plantations and smallholders is built on the fact that the FFB produced from these smallholders' plantations is processed in company mills alongside the FFB produced from the company's plantation. **The FFB deteriorate quickly after harvesting (typically within 24 hours), which limits the distance they can be transported**. In addition, the company may provide smallholders with technical support and subsidised inputs, such as fertiliser, **as high and consistent fertiliser applications are required to maintain yields once harvesting commences.**

In order to maximise the oil extraction rate and ensure optimum oil quality, stringent plantation management, strict harvesting standards and efficient processing of the fresh fruit bunches (FFB) are critical. **The complexity of the supply chain necessitates close co-operation between smallholders, plantations, mills and intermediaries. Traceability remains challenging from the farm to the mill.**

The oil palm produces two chemically distinct oils - crude palm oil (CPO) and palm kernel oil (PKO):

- *Palm kernel oil (PKO)* is the primary feedstock for the production of natural fatty alcohols, which are widely processed into products such as shampoos and liquid detergents. In addition, palm kernel oil is used in specialist food applications.
- *Crude palm oil (CPO)* is transformed into a variety of different products, including biodiesel, refined palm oil for frying and specialist usage in confectionary, baking and spreads.

The versatility of palm kernel oil and palm oil means that they are found in a vast variety of different consumer products.

Importantly palm oil does not require artificial hardening, via hydrogenation, for use as a food in hard fat applications. Since hydrogenation creates trans-fats, which are considered unhealthy and have stringent incorporation limits in many markets, palm oil is widely used as a naturally hard fat in food products. **Therefore, palm oil is currently important in the production of confectionery, snack foods and many baked goods in countries, particularly in markets where products are required to be trans-fat free.**

India is the largest consumer of palm oil almost all of which is imported. Among high-income consumer markets, only the EU (ranked third) and the US (ranked tenth) appear in the top ten palm oil consumers. All high-income countries together consume one sixth of world palm oil output. The remaining five sixths are consumed by middle and low income countries. Asia alone consumes two thirds of the world's palm oil supply. **The bulk of palm oil consumption and consumption growth is likely to occur in the developing world (see Section 7.4.1).**

2. Environmental, economic & social impacts of the oil palm

a) Environmental impacts

There is a high degree of confidence that **the expansion of palm oil cultivation has resulted in deforestation, particularly in Indonesia and Malaysia** (**see Section 7.1.1**). Estimates for the proportion of deforestation caused by the expansion of oil palm cultivation in Indonesia range from 11% (between 2000 and 2010) to a maximum of 16% (between 1990 and 2005).[1] [2]

The total area under oil palm in Indonesia and Malaysia has increased from 2.6 million hectares in 1990 to over 15 million hectares in 2014 (of which just over 10 million hectares was in Indonesia) roughly 40% of which was farmed by smallholders. Two-thirds of the forest area converted to oil palm plantations is estimated to be caused by global trade in palm oil.[3] The EU alone was estimated to be responsible for 0.9 million hectares of embodied deforestation through its imports of palm oil between 1980 and 2000.[4]

Remote sensing studies of a subset of plantations in 20 countries suggests that around 45% of oil palm plantations in Southeast Asia came from areas that were forests in 1989. In other regions, the planting on forested areas appears to have been lower – at 31% in South America, 7% in Africa and 2% in Central America.[5]

Globally, an estimated 234 million hectares of available land is suitable for palm oil cultivation, a significant proportion of which is in the Amazon.[6] This estimate excludes intact forest landscapes, high carbon stock forest, conservation hotspots and protected areas.

A central concern over deforestation is the extent to which it leads to **biodiversity loss** (**see Section 7.1.2**). It is well established and uncontested that **the conversion of tropical forest to agriculture, plantations and other land uses causes a significant loss of species,** and particularly forest specialist species.[7] Importantly, this loss of species occurs whether or not the forest converted to plantations has been previously logged. This is because selectively logged forest typically retains a significant proportion of the biodiversity of unlogged, primary tropical forest.

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1 Abood, S. A., Lee, J. S. H., Burivalova, Z., Garcia-Ulloa, J., and Koh, L.P. 'Relative contributions of the logging, fiber, oil palm, and mining industries to forest loss in Indonesia'. Conservation Letters 8 (2015), 58-67.

2 Personal communication from the EU delegation in Indonesia suggests that 55% of overall tree cover loss within Indonesia between 2000-2015 occurred within legal concessions, of which approximately 1.5 million hectares (one third of the total) was contributed by palm oil. The remaining 45% of tree cover loss took place outside legal concessions.

3 Henders, S., Persson, U.M. & Kastner, T. (2015). 'Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities'. Environmental Research Letters 10/12 (2015), 125012.

4 Cuypers, D., Geerken, T., Gorissen, L., Lust, A., Peters, G., Karstensen, J., Prieler, S., Fisher, G., Hizsnyik, E. and van Velthuizen, H. 'The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation'. European Union Technical Report - 2013 - 063 (2013).

5 Vijay V., Pimm S.L., Jenkins C.N., Smith S.J. 'The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss'. *PLoS ONE* 11/7 (2017), 1-19.

6 Pirker, J., Mosnier, A., Kraxner, F., Havlík, P and Obersteiner, M. 'What are the limits to oil palm expansion?' *Global Environmental Change*, 40 (2016) 73–81.

7 Brook, B.W., Sodhi N.S., Ng P.K.L. 'Catastrophic extinctions follow deforestation in Singapore'. *Nature* 424 (2003), 420–423.

The cultivation of palm oil through **peat land conversion** (**see Section 7.1.3**) is of particular concern. Peat swamp forest is a critically endangered category of habitat characterised by deep layers of peat soil and highly acidic water. Malaysia, Indonesia and Papua New Guinea support some of the most extensive tropical peatlands in the world, covering around 27.1 million hectares.[8]

The development of peat land can have a disproportionate impact on biodiversity and greenhouse gas emissions:

- Few species are confined to peat swamp forests but they nonetheless provide habitat for a large number of globally threatened species, which are threatened by the conversion of peat land.

- Peat soil contains large quantities of carbon and plays a major role in carbon sequestration. In addition, draining of peat land results in carbon dioxide emissions and drained peat is highly flammable, potentially releasing carbon dioxide.

The largest oil palm growing regions (Peninsular Malaysia, Borneo and Sumatra) are estimated to have had 14.7 million hectares of peat land. Reliable estimates of peatland conversion suggest that 3.1 million hectares of former peatland were covered by palm oil plantations by 2015, equivalent to 21% of the original area of peat in the region.[9] **Expanding palm oil cultivation, has contributed towards the environmental problems of peat swamp deforestation, drainage and fires, with concomitant impacts on biodiversity and greenhouse gas emissions**. However, there is insufficient information to assess the likelihood of significant future expansion of oil palm cultivation onto peatlands, and hence whether its contribution to global greenhouse gas emissions is likely to grow.

There is also concern over **greenhouse gas emissions from palm oil cultivation** (**see Section 7.1.4**). Greenhouse gas emissions derive from two main sources: (a) land use change and (b) plantation and mill activities. **Land use change is by far the most significant of these, and there is consistent and rigorous evidence that converting forests to palm oil plantations results in net greenhouse gas emissions.** For example, unlogged Asian tropical forests store up to 400 tonnes of carbon per hectare above ground,[10] and the oxidation of peat soil carbon stock of up to 1,550 tonnes per hectare would be added to emissions from the oxidisation of drained peat soil. By comparison, a fully mature oil palm plantation only stores around 91 tonnes per hectare. In addition, clearing forest with fire is estimated to result in additional emissions of between 207 to 650 tonnes of carbon per hectare.[11] However, **when oil**

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8 Hooijer, A., Silvius, M., Wösten, H. and Page, S. 'PEAT-CO2, Assessment of CO2 emissions from drained peatlands in SE Asia'. *Delft Hydraulics report Q3943* (2006), Delft, Netherlands.

9 Miettinen, J., Shi, C., and Liew, S.C. Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990' Global Ecology and Conservation, Volume 6, (2016), Pp 67–78.

10 Murdiyarso, D., M. van Noordwijk, M., Wasrin, U.R., Tomich, T.P. and A. N. Gillison. 'Environmental benefits and sustainable land use options in the Jambi transect, Sumatra'. *Journal of Vegetation Science* 13 (2002), 429–438.

11 Germer J. and Sauerborn, J. 'Estimation of the impact of oil palm plantation establishment on greenhouse gas balance'. *Environment Development and Sustainability* 10 (2007), 619-716.

palm is planted on grassland or scrubland, there can be a net uptake of carbon dioxide.

Greenhouse gas emissions occur from mill and plantation activities, and especially from Palm Oil Mill Effluent (POME), a liquid waste from the initial processing of fresh fruit bunches. POME is treated in a series of anaerobic and aerobic digestion ponds to make it safe for release into watercourses. **Methane emissions from POME are the second largest source of GHG emissions from oil palm production after land use change**.[12] Methane capture is increasingly practised as a fuel for boilers and power generation, with government support in many cases.

Smaller sources of greenhouse gas emissions from oil palm cultivation are nitrous oxide (N_2O), released due to the use of nitrogen fertiliser, and carbon dioxide emissions from direct burning of fossil fuel is more limited: consumption at the mill stage is low, at 0-2% of total GHG emissions.

While oil palm plantations create carbon emissions, they can potentially contribute to a **reduction in greenhouse gas emissions through palm-based biofuel** and the use of palm biomass to power boilers, thereby replacing use of fossil fuels. The amount of time it takes to reach a net-reduction in greenhouse gas emissions is commonly expressed as a 'payback time' but this varies dramatically depending on the original land-use:

- *Degraded grasslands* can yield net carbon savings within a decade of conversion or less.[13]
- *Forested land* is unlikely to achieve a net carbon gain for at least 30 years and may take up to 120 years.[14]
- *Peat land* is likely to require several hundred years before there is a net carbon gain depending on the depth of the peat.[15]
- *Land cleared by fire* will also increase the time taken to reach a net carbon gain by an estimated 18 years.[16]

It should be noted that the sustainability criteria of the EU Renewable Energy Directive (EU RED) exclude biofuels derived from previously forested land from counting towards the renewable energy targets – and related incentives.

The **use of fire** (see **Section 7.1.5**) to clear forests for agriculture expansion, in particular in Kalimantan and Sumatra, are a major source of greenhouse gas emissions. Burning is particularly severe during the droughts associated with El Niño, and drained peat land represents a particular fire hazard. The 2015 fires in Indonesia caused emissions of between 1.62[17] and 1.75[18] billion tonnes of CO_2 equivalent and effectively

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12 Chase, L.D.C., and Henson, I.E.. 'A detailed greenhouse gas budget for palm oil production'. *International Journal of Agricultural Sustainability* 8 (2010) 199-214.

13 Danielsen *et al.* (2008), *op. cit.*

14 Gibbs, H.K., Johnston, M., Foley, J.A., Holloway, T., Monfreda, C., Ramankutty, N., and Zaks, D. 'Carbon payback times for crop-based biofuel expansion in the tropics: the effects of changing yield and technology'. Environmental Research Letters 3 (2008), 034001 (10pp).

15 Fargione *et al.* (2008), *op. cit.*

16 Danielsen *et al.* (2008), *op. cit.*

17 Chamorro, A., Minnemeyer, S., and Sargent, S. *Exploring Indonesia's Long and Complicated History of Forest Fires*. World Resources Institute, February 16, 2017

tripled Indonesia's greenhouse gas emissions for that year. Approximately 19% of the land burned in Indonesia in 2015,[19] and 16.6% of fires between 2012-15 in Sumatra and Kalimantan, occurred within oil palm concessions. There is significant uncertainty in the attribution of fires to oil palm growers, as the methods used do not account for fires that have been started by communities living within or nearby concession boundaries.[20]

In addition, fires started in order to clear land for agriculture, especially on peat lands have resulted in trans-boundary **air pollution**, including haze (**see Section 7.1.6**). Haze pollution is an occasional but sometimes severe problem in Southeast Asia. The health effects of haze include potential *in utero* deaths, respiratory ailments and exacerbation of existing heart and lung conditions. Severe haze in 2015, lasting three months, resulted in an estimated 100,300 excess deaths across Indonesia, Malaysia and Singapore.[21]

Finally, the dominance of palm cultivation and milling in some landscapes means that watershed-scale **pollution of surface and ground water** can occur (**see Section 7.1.7**). The major risks are during the clearing and establishment phase of plantations (especially sedimentation); discharge of palm oil mill effluent (POME); and the release of agrichemicals through run-off and leaching. However, the available evidence is that oil palm cultivation and milling does not necessarily cause water pollution outside national or international guidelines.

b) Economic and social impact

The economic and social impacts of palm oil are complex and contradictory. Oil palm cultivation has **improved incomes for many rural people, including smallholder farmers, and supported the development of rural economies and the economies of producer countries overall. It has also often been associated with social concerns, the most important of which are land use rights, forced and child labour, and issues relating to the terms and conditions of labour**, (such as wages, health and safety and gender discrimination).

Smallholders are usually defined as family-based enterprises cultivating up to 50 ha of oil palm, but more commonly 2-4 hectares. In Indonesia and Malaysia, smallholders account for roughly 40% of the total area of planted oil palm and as much as 33% of the output, due to lower yields, on average. There is significant variation in the way that smallholder oil palm cultivation is organised. One of the most successful schemes for organizing smallholders is Malaysia's Federal Land Development Authority (FELDA). The FELDA project began in 1956 as a resettlement scheme for landless peasants. FELDA was able to settle 122,000 families between 1959 and 1990, developing about 470,000 hectares (ha).[22] Over five decades, the FELDA scheme succeeded in raising smallholder household

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http://www.wri.org/blog/2017/02/exploring-indonesias-long-and-complicated-history-forest-fires

18 World Bank (2016), *op. cit.*

19 Recalculated from figure on page 1 of World Bank (2016), *ibid.*

20 Gaveau *et al.* (2014), *op. cit.*

21 Koplitz, S.N., Mickley, L.J., Marlier, M.E., Buonocore, J.J., Kim, P.S., Liu, T., Sulprizio, M.P., DeFries, R.S., Jacob, D.J., Schwartz, J., Pongsiri, M. and Myers, S.S. 'Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure'. *Environmental Research Letters*, 11 (2016), 094023.

22 Khor, Yuleng (2016), Socio-economic parameters for peat restoration policy makers [presentation], 15th International Peat Congress (Kuching: 17 Aug. 2016).

incomes considerably above the national poverty line, prompting some observers to characterise it as 'one of the most successful land settlement organisations in the world'.[23] Other notable examples include the corporate-led development of smallholder schemes in Indonesia.

There is evidence that the **incomes of smallholder oil palm farmers are often significantly higher than those of farmers with similarly sized rice and rubber holdings** (**see Section 7.2.2**). However, yields – and therefore revenue - obtained by smallholders often depend on the assistance they receive in terms of higher-yielding planting materials, credit, fertiliser and technical advice. Achieving these gains is also dependent on families being able to manage income in the 3-4 years before harvests arrive, and managing their relationship with mills in their debt repayments and in the transmission of product prices to farmers[24].

Benefits can also emerge for people employed by plantations, especially where alternative local sources of income are scarce. In addition, there are benefits as a result of multiplier effects for other sectors of the economy (see Section 7.3.12). However, there are many situations where benefits have been made at the expense of less powerful social groups, such as indigenous peoples, small and insecure farmers and women, who tend to lose out financially and in job opportunities, for example, where labour contracts make it difficult to balance the requirements of a regular full-time job against social and cultural norms[25].

There are limited official data on the **incidence of forced and child labour** within the palm sector.[26] NGO and press reports of child and forced labour surface sporadically, largely from Indonesia and Malaysia [27] [28] [29] [30] (**see Section 7.2.3**)**.** There is insufficient information to conclude with a high degree of confidence how widespread these practices are.

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23 Sutton, K. (1989), Malaysia's FELDA (Federal Land Development Authority) land settlement model in time and space, *Geoforum*, Volume 20, Issue 3, 1989, Pages 339-354.

24 In addition, studies by SOMO, the International Union for the Conservation of Nature, are undertaking more comprehensive cost-benefit analysis of developing oil palm for the rural poor in South-East Asia. Early findings showed varied and nuanced results depending on the extents to which their rights are defined and enforced, and traditional livelihoods/subsistence depended on foregone ecosystem services.

25 Santika, T., Wilson, K,, Budiharta S., Law, E., Struebig, M., Tun M.P, Ancrenaz, M, & Meijaard, E. (2017) 'Does palm alleviate rural poverty? A landscape-scale multidimensional assessment', Personal communication from EU Delegation in Indonesia.

26 UNICEF 'Palm Oil and Children in Indonesia'. United Nations Children's Fund (2016)

27 World Vision 'Forced, child and trafficked labour in the palm oil industry'. World Vision Australia (2012).

28 Skinner, E.B. 'Indonesia's Palm Oil Industry Rife With Human-Rights Abuses: The hidden human toll of the palm oil boom'. Bloomberg Business Week, 2013). https://www.bloomberg.com/news/articles/2013-07-18/indonesias-palm-oil-industry-rife-with-human-rights-abuses

29 Al-Mahmood, S.Z. (2015), 'Palm-Oil Migrant Workers Tell of Abuses on Malaysian Plantations', The Wall Street Journal (26 Jul. 2015), https://www.wsj.com/articles/palm-oil-migrant-workers-tell-of-abuses-on-malaysian-plantations-1437933321, accessed 1 Feb. 2017.

30 Amnesty International (2016), *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names* (London: Amnesty International, 7 Dec. 2016), https://www.amnesty.org/en/documents/asa21/5184/2016/en/, accessed 1 Feb. 2017.

Outside of forced or child labour there may also be issues with the **terms and conditions of legal labour** (**see Section 7.2.4**). These cover a broad range of working conditions, including hours worked, wages, productivity targets, leave, health and safety and the right to assembly. The very high reliance on migrant workers once again is a cause for concern as they can be afforded less protection on labour rights issues than nationals.

Reports of poor labour rights have surfaced from the RSPO certification system,[31] [32] and from NGO reports suggest that such practices may be widespread. A recent Amnesty International report into five plantations in Indonesia found that workers were paid below the legal minimum wage, potential breaches of regulations on overtime pay, insufficient training on use of hazardous chemicals and inconsistent use of safety equipment and the potential exclusion of women from permanent employment. [33] It has also been reported that some labourers are kept as casual labourers for extended periods (years), without the terms and conditions to which permanent employees are entitled[34].

Oil palm expansion has been accompanied by disputes over **land rights** (**see Section 7.2.1**). The creation of large-scale plantations has, in some instances, resulted in local and indigenous peoples losing their customary land, and along with it, part of their traditional livelihoods and cultural reference. This has been particularly acute in Indonesia and has sometimes escalated into conflict and occasionally violence. For example, in West Kalimantan, land rights was the most common cause of conflict between local communities, including indigenous Dayak groups, and plantation companies, responsible for 53 of 119 (45%) recorded conflicts between 1999 and 2009.[35]

This underlines the importance of legalisation, registration, mapping and tenure, entitlement processes, many of which have been continuing for years. Such processes make very slow progress depending on their scale (estimated 1.7-4 million smallholders in Indonesia), the capacities and good will of local authorities.

Many of the **environmental and social impacts highlighted in this study exist in differing degrees if a similar analysis were made for the cultivation of other similar commodities and are not inherent exclusively to palm oil.** Furthermore, other sources of vegetable oils, among which the most important is soybeans, occupy much larger areas per tonne of oil, and have their own environmental and social impacts (see Appendix 5).

In its response to the April 2017 European Parliament Resolution on Palm Oil and Deforestation, the European Commission underlined concrete regulatory measures (such as adopting a single unified definition of 'deforestation-free') and EU action on the issue of deforestation should go beyond palm oil, "looking at all drivers of deforestation".

3. **The role and potential of existing palm oil sustainability certification schemes** (**see Section 8.1**).

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31 EIA. *Who Watches the Watchmen? Auditors and the Breakdown of Oversight in the RSPO*. Environmental Investigation Agency (2015), London.

32 Lord, S., and Durham, K. *Analysis of RSPO certification and surveillance audit reports across Indonesia, Malaysia and the Rest of the World*. Global Sustainability Associates (2014), Singapore.

33 Amnesty International. *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names*, Amnesty International (2016), London.

34 International Labour Rights Forum & Sawit Watch (2013) *op. cit.*

35 Levang *et al.* (2016), *îbid*

There are four main oil palm sustainability certification schemes:

- The **Roundtable on Sustainable Palm Oil (RSPO)** established in 2004 is a voluntary scheme developed through a multi-stakeholder partnership. It was the first scheme specific to oil palm. It remains the most prominent global scheme in the sector with a membership of 3,413 organisations. The RSPO has developed a set of more stringent 'add on' requirements to its Principles and Criteria, referred to as RSPO NEXT, as well as a second set of 'add-ons', RSPO–RED, that are compliant with EU Renewable Energy Directive (RED). However, market uptake of RSPO NEXT and RSPO-RED has thus far been minimal.
- The **International Sustainability and Carbon Certification (ISCC)** was created in 2010 and has developed a standard that is consistent with the requirements of the EU Renewable Energy Directive (Directive 2009/28/EC) for biofuel feedstock.
- The **Indonesian Sustainable Palm Oil (ISPO)** scheme was launched by the Indonesian Government in 2011. The standard is based on existing Indonesian regulations that pertain to palm oil cultivation and processing and is mandatory for Indonesian companies producing and/or processing palm oil. It is being revised but the timing, nature and extent of the changes could not be confirmed at the time of writing this study.
- The **Malaysian Sustainable Palm Oil (MSPO)** scheme was started as a voluntary standard in 2015 aiming to help small and medium-sized Malaysian growers to operate sustainably.

It should be noted that while RSPO and ISCC are voluntary industry standards, ISPO is a government-led mandatory national scheme. According to the Malaysian government, MSPO will also become mandatory by the end of 2019. The difference in the approaches has significant implications that should be also considered. While the standards of voluntary schemes may be more ambitious, their reach is limited to those operators that agree to meet the standards. By contrast, mandatory national schemes are applicable to the entire sector and have the potential to contribute to raising the bar across the industry. However, their level of ambition as shown by the analysis does not always match the standard of voluntary schemes.

a) Certification process and coverage of the scheme (see Section 8.1.1.5)

There are significant differences in the processes underpinning certification as well as the requirements of the schemes. **Table 1** below summarises the certification process in the four schemes.

Table 1: Summary of certification processes within four palm oil certification schemes

Certification scheme element		Standard			
		RSPO	ISCC	ISPO	MSPO
Certification	Who: independent 3rd Party				
	How: audit				
	How often: annual surveillance				
	Who decides: certification body				
Accreditation	Fully independent accreditation				
Complaints	Documented procedures available				
Transparency	Audit reports publicly available				
Claims	Supply chain verification				

Note: Dark shading indicates that the process reaches best practice, with the greatest restrictions on activities; pale shading indicates absence of the process; mid-shade implies an intermediate state.

All four schemes rely on **third party, independent audits** to verify compliance with the standards, and surveillance audits are repeated annually. The RSPO, ISCC and MSPO have independent **accreditation** of the certification bodies who decide whether a certificate is granted or not, and the same schemes provide a degree of transparency through making documents on audits and complaints publicly available. The ISPO system has less robust and transparent procedures on these elements, but like the ISCC and RSPO, has supply chain verification mechanisms. MSPO is currently in the process of developing similar supply chain verification procedures.

Alongside differences in the certification processes, there are differences in the coverage of key issues within the four schemes, as **Table 2** demonstrates**.**

The four schemes differ markedly regarding **deforestation**. The **ISCC** excludes production from primary forest, and forests of high biodiversity value (Criterion 1.1), and degraded forest (Criterion 1.3). Degraded forest is defined conservatively, with a high proportion of logged forest included in the restriction. The **RSPO** scheme has the less exacting requirement that forest clearance is legal, but primary forest and High Conservation forest are not to be cleared for oil palm cultivation.[36] The **ISPO** scheme permits forest clearance provided it is within land zoned for agriculture; is allowed under the environmental impact assessment; and the government has granted the necessary permits. The **MSPO** scheme is broadly similar to ISPO, but with additional requirements on Environmentally Sensitive Areas and areas with high biodiversity value.

The ISCC scheme has requirements that restrict **peat land conversion** and **greenhouse gas emissions** to a greater degree than the other schemes, while conserving biodiversity. The RSPO scheme contains the next most restrictive requirements on all aspects except biodiversity conservation and greenhouse gas emissions, on which issues the MSPO scheme has similar requirements.

The ISCC, RSPO and MSPO have similar degrees of restriction on the **use of fire** for land clearance.

Regarding **air pollution** (other than GHG), the RSPO and MSPO schemes have the greatest restrictions for plantation and mill operators.

The MSPO has the most comprehensive requirements regarding **water pollution** while the other three schemes have broadly similar requirements.

The RSPO scheme provides some of the most restrictive requirements on social issues, such as **land use rights**, **forced labour**, **child labour**, the **terms and condition of employment**, **treatment of smallholders**, and the rights and wellbeing of people affected by plantations. The other schemes have variable but generally less restrictive requirements for social issues.

However, it should be noted that all of these certification systems undertake periodic revision of their process requirements and standards. In particular, there is significant investment in revising the ISPO, which could result in significant changes to that scheme.

[36] 'High Conservation Value' was first articulated in the Forest Stewardship Council's Principles and Criteria to define and maintain the world's most important forests for biodiversity, ecosystem services, culture and society. The notion has been extended to include other, non-forest ecosystems, and within other sectors, such as oil palm.

Table 2: Summary of provisions within schemes against environmental and social themes

Theme	Standard			
	RSPO	ISCC	ISPO	MSPO
Deforestation				
Biodiversity				
Peat land conversion				
GHG emissions				
Burning				
Air pollution				
Water pollution				
Rights & Wellbeing				
Land use rights				
Treatment of smallholders				
Forced and Child labour				
Terms and conditions of labour				

Note: Dark shading indicates that the standard provides the greatest restrictions on activities; pale shading indicates the fewest restrictions; mid-shade indicates an intermediate state.

Analysis against EU and UN policy objectives (**see Section 8.2**)

The report provides a first-order analysis of how certification schemes relate to selected EU and UN policy objectives that were identified in consultation with the European Commission (**see Section 8.3.2**).

No single certification scheme fully addresses all of the EU and UN policy instruments identified and used as a framework in this study. It should be noted that this does not mean that any of the schemes assessed are 'poor': none of them were designed to address the suite of EU and UN policy instruments assessed (although the ISCC scheme was developed around the EU RED sustainability criteria), and divergence between the content of the schemes and the objectives of these instruments is therefore not surprising.

In general terms:

- The **ISCC addresses a larger share of the environmental objectives of EU and UN instruments** than the other standards. This is largely a result of the restriction on converting land with high carbon stock, and the clear and conservative definition of high carbon stock within the scheme, which prohibits conversion of all but the most highly degraded secondary forest. This resulted in a strong match with policy objectives on deforestation and greenhouse gas emissions from land use change in particular.
- The **RSPO overall addresses a larger share of the social objectives of EU and UN instruments** than the other schemes. The RSPO scheme has broader and more tightly defined requirements on rights and wellbeing, land rights, terms and conditions of labour and responsibilities towards smallholders than the other schemes.
- The **ISPO** scheme generally addresses less EU and UN instruments than either RSPO or ISCC schemes, with the **MSPO** scheme intermediate.

b) Extent of up-take of certified sustainable palm oil (see Section 9.5.3)

The global market for certified sustainable palm oil (CSPO) is broadly divided into two segments:

1. The use of CSPO in biodiesel. This is dominated by the International Sustainability and Carbon Certification (ISCC).

2. CSPO for non-energy uses such as food, oleochemicals, home & personal care (HPC) and animal feed are dominated by the Roundtable for Sustainable Palm Oil (RSPO).

Together these two schemes account for the vast majority of CSPO, estimated to be over 97% in 2016. Error! Reference source not found. shows the volumes of CSPO sold hrough RSPO and ISCC.

- The annual supply of RSPO Certified Sustainable Palm Oil (CSPO) is around 12.8 million tonnes. Sales of RSPO CSPO however, were only around 6 million tonnes.
- ISCC certification covers almost 9 million tonnes. Only around half of total ISCC CSPO was bought as such (4.2 million tonnes).

Around half of CSPO therefore was sold as RSPO or ISCC certified, with the remainder bought as conventional palm oil. Some producers opt for certification under both schemes, thereby inflating the total, and the combined uptake is closer to supply-demand balance than implied by this statistic. There is also a growing practice by users of buying palm products from certified producers, but not registering the transaction via RSPO, to avoid the transaction costs. However, it is clear that supply still exceeds the aggregate demand for certified material.

Table 3 RSPO and ISCC market uptake of certified palm oil, 2015

	Number of mills	Estimated capacity, '000 tonnes	Estimated sales, '000 tonnes	% take-up
RSPO	327	12,890	6,183	48%
ISCC	226	8,814	4,250	48%

RSPO does not provide trade data for destination markets. However, a review of the key RSPO buyers in the CGM segment reveals the dominance of the global brand names and some of regional companies. Based on these major buyers, we estimate that 48% of their overall tonnage is sold in developing or emerging markets. **Europe is the leading region for sustainable palm oil use**. However, pledges by some EU member states to achieve 100% CSPO usage have a target date of 2020; therefore, it is not yet possible to assess whether they will be met in full. **CSPO still represents less than half of non-energy uses of palm oil in Europe** and the market is declining.

In terms of attainment of general RSPO certification, the food sectors that were most advanced were bakery, dairy/non-dairy and the slowest was fried foods. The home and personal care (HPC) and cosmetics sectors appear to lag behind the food sector in their use of CSPO.

If ISCC CSPO volumes are added to RSPO ISCC, then even for the leading German and UK markets, tonnages indicate certified ratios in the region of 61-63%. Even in the most advanced markets therefore a third of palm oil is still entirely uncertified.

Uptake of CSPO in developing markets remains very low, possibly due to the extra costs associated with certification in price sensitive markets. Pledges in China and India are limited to global brand names such as Unilever and McDonald's. There are very few RSPO certified facilities in these markets, particularly in India.

c) Margins for CSPO and costs of certification (see Section 9.5.4)

The oversupply of CSPO results in a basic RSPO premium that is in the region of $2 per tonne. RSPO compliance costs for CSPO are usually higher than the premium. For plantations they are around $5 per tonne (ex-mill) and small producers' between $8-12 per tonne (ex-mill).

Higher premia are available for suppliers of segregated palm oil and downstream specialist products (such as palm kernel oil, oleochemicals and surfactants). However, these are usually the preserve of larger integrated companies.

The cost of certification depends on the stringency of principles and criteria, as well as the thoroughness of certification processes. It also depends on the level at which certification is delivered, e.g., the new ISPO standard in development pays due attention to "group certification", which is the possibility for villages, cooperatives or districts to be certified as a whole, on behalf of individual farmers within their boundaries. The accountability, economic leverage and cost-per-unit of those area-based schemes could be better than usual operator-based certification practices.

4. Voluntary initiatives and commitments relating to palm oil (see Section 8.6)

Alongside the four main certification schemes, there are an increasing number of public, NGO and private-sector-driven initiatives and commitments relating to different aspects of palm oil sustainability. These more recent commitments have differed from past sustainability policies both in the topics emphasised by them and in the range of different organisations and sectors involved. While NGO campaigns have targeted major oil palm traders, they have also extended to their third-party suppliers for the first time.

Figure 1 provides a categorisation of the main types of voluntary initiatives: group initiatives, individual initiatives, initiatives targeting finance and investment support and supporting platforms designed to assess compliance.

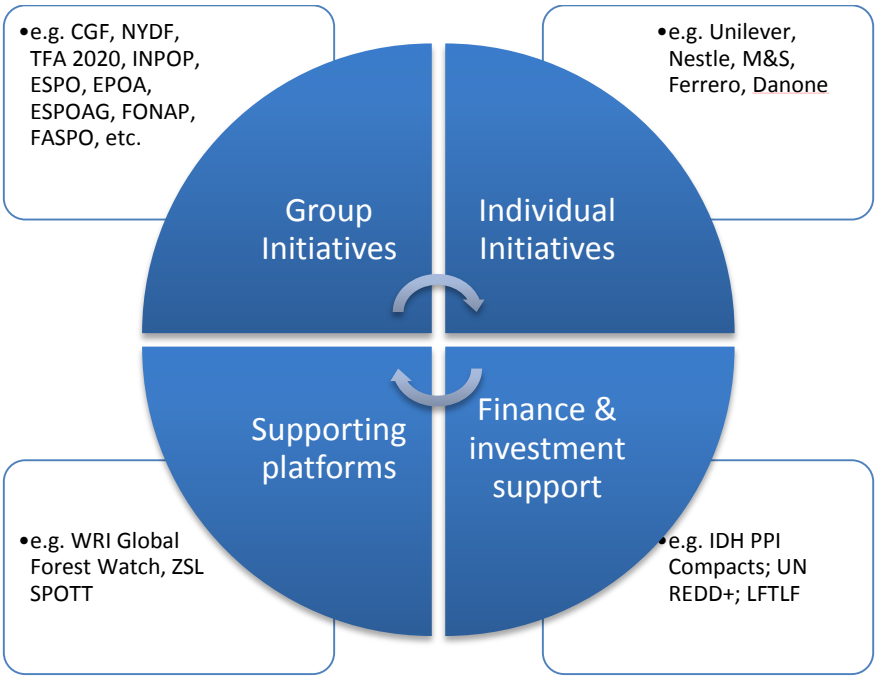

Figure 1: Typology of the main forms of voluntary initiative

Key: CGF (Consumer Goods Forum Zero Net Deforestation By 2020 Commitment; NYDF (New York Forest Declaration); TFA 2020 (Tropical Forest Alliance 2020); INPOP (Indonesia Palm Oil Platform); ESPO (European Sustainable Palm Oil); EPOA (European Palm Oil Alliance), ESPOAG (European Sustainable Palm Oil Advocacy Group), FONAP (Forum on Sustainable Palm Oil), FASPO (French Alliance for Sustainable Palm Oil), M&S (Marks and Spencer); WRI (World Resources Institute); ZSL SPOTT (Zoological Society of London, Sustainable Palm Oil Transparency Toolkit); PPI Compacts (Production, Protection & Inclusion Compacts); UN REDD+ (UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries); LFTLF (Landscape Fund for Tropical Landscapes and Forests).

Existing reviews of the progress being made under this range of individual and group initiatives suggest that: [37] [38] [39]

- Reporting of progress on voluntary commitments relating to forest risk commodities is on the rise, with palm oil leading the way;
- Commitments made on sustainable palm oil are embracing landscape-scale thinking, more restrictive or specific criteria on protecting HCV and HCS land and improvements in supply chain traceability and transparency;
- The food and farming sector dominates the commitments 'landscape';
- The nature of commitments is evolving, initially focusing on deforestation and then including reducing biodiversity loss, GHG emissions, improving water stewardship and support for smallholders;
- The number of commitments made across the supply chain varies, with producers, processors and traders making the most, followed by manufacturers and retailers;
- Collective action spurs individual action and the number of organisations involved in group initiatives is generally growing over time;

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37 Donofrio, S, et al – Supply Change: Tracking Corporate Commitments to Deforestation-Free Supply Chains, (Forest Trends, 2017).

38 Brack, D. & Gregory, M. - *Company Promises – How businesses are meeting commitments to end deforestation* (FERN, March 2017).

39 The Palm Oil Buyers Scorecard – Measuring the Progress of Palm Oil Buyers (WWF, 2016).

- Certification systems play an important role in CSPO take-up but are generally not seen as the only long-term solution for the entire supply chain, partly since they can be flawed in some areas and remain expensive for smallholders to adopt;
- Companies are investing in their palm oil supply chains, especially smallholders, but are also prepared to drop suppliers that don't comply with their commitments;
- The cost of voluntary commitments can be high, with retailers citing annual costs of implementation of £250,000 and producers (investing heavily in on-the-ground improvements) spending up to USD200 million over three years;
- Progress is being made but not by all companies, even in a market characterised by over supply of CSPO;
- Companies have used Book and Claim systems to meet their commitments in the past but are moving towards either their own sourcing guidelines or greater use of mass balance and source segregated systems;
- European and North American companies are far more advanced than their Asian counterparts.

There remain significant challenges to the achievement and collective impact of voluntary commitments, most notably: lack of engagement in major consumer countries such as India and China, cost of implementation, supply chain complexity, traceability and transparency of supply, weaknesses and lack of inclusion in land use planning (resulting in land disputes), lack of legal and geographical clarity around concession boundaries and protected areas and a lack of experienced people to conduct complex FPIC processes and certification audits (particularly those audits involving national interpretations of standards).

That said, a growing number of voluntary initiatives are attempting to overcome some of these historical barriers to progress: these include the growth of financial, data reporting and geo-spatial platforms; more investment in, and building better relationships with, suppliers (including smallholders); a growing number of public/private partnerships to improve the designation, protection and communication of protected areas and concession boundaries; the use of private and public procurement policies to drive further demand for CSPO; and the emergence of landscape-scale thinking or jurisdictional approaches to address the multiple drivers of deforestation and biodiversity loss.

5. Evaluation of existing legislation and enforcement regimes in major producing countries (see Section 8.4)

Outside of certification systems and direct commitments by companies, governments have also increasingly introduced legislation, which affects the sustainability of the oil palm. In the case of national mandatory schemes such as ISPO, there is a degree of overlap. We first look at the coverage of the legislation and then examine enforcement issues.

a) Extent of existing legislation

Table 4 summarises the main laws by topic in a selection of case study countries. Some of these laws may benefit the oil palm plantations. The most obvious of these is the introduction of mandatory biodiesel blending in Indonesia, Malaysia, Brazil and Colombia. This list is based upon the documentation of existing laws, and does not take into account the enforcement of these laws, which is reviewed in **Section 8.4.**

Table 4: Overview of legislation in the six case study countries

	Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Deforestation						

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Biodiversity loss		■	■	■	■	■	■
Reducing carbon emissions	Land use change (LUC)	■				■	
	Biofuel	■	■	■	■		
	Mills and plantations	■	■				■
Burning		■	■		■		
Peatland conversion		■			■	■	■
Water and pollution		■	■	■	■	■	■
Air pollution	Haze	■	■		■		
	Others	■	■		■	■	■
Indigenous people		■	■	■	■	■	■
Smallholders		■	■	■	■	■	■
Forced and child labour		■	■	■	■	■	■
Terms and conditions of labour	Health & safety	■	■	■	■	■	■
	Wages & others	■	■	■	■	■	■
Anti-corruption and money laundering		■	■		■		■
Fair pricing		■	■		■	■	■
Land ownership/use permit		■	■	■	■	■	■
Licensing for palm oil estate and mill		■	■	■	■	■	

1. Source: LMC International analysis based on RSPO data. Note: A shaded box indicates that there is domestic legislation dealing with that topic.

As **Table 4** shows, a large number of laws and regulations exist, dealing with most of the topics related to sustainability. The table also reveals that there are some areas that have not yet come under legislation. In some cases this may be because countries benefit from structural elements, which make certain sustainability issues less noticeable. For example, for deforestation both Colombia and Brazil have the advantage of having large areas of pasture to develop, while Malaysia has benefited from a more highly urbanised population than Indonesia, making it easier to control deforestation.

Nonetheless it is clear that there are some areas that are covered in a limited manner in individual countries:

- Very few countries have legislation specifically related to **forest degradation**. In a few cases this issue is captured in other legislation, notably for Brazil and Colombia where planting is only permitted on degraded land.
- It is noteworthy that only two countries make specific reference to **Land Use Change** (Indonesia and Gabon).
- Only in Indonesia, Malaysia and Liberia does legislation aim to reduce **carbon emissions** from mills and plantations.

- In a similar vein, **burning** does not appear to be a priority for legislation in Brazil, Gabon and Liberia and neither is **air pollution** more broadly.

The table demonstrates that most countries have sought to introduce regulations. However, in many cases they are not adequately enforced. In the next section we highlight some of the major enforcement issues.

b) Enforcement of existing legislation

Difficulties enforcing legislation can be the result of systemic corruption, a lack of political will, limited capacity, insufficient resources, and bureaucratic inertia. Often the bureaucratic inertia is compounded by factors such as decentralisation, which makes it difficult to enforce national laws. The complexity of the legal system can work in the favour of established plantations, which have more resources to tackle these issues. The overarching historical problem of land rights allocation also re-emerges frequently.

There are a number of enforcement issues worth highlighting owing to their severity or potential impact:

- In **Indonesia** there is concern that the moratorium over developing forest and peat land may be weakening, despite high-level government support for the policy. To enforce the moratorium, record fines have been meted out on agro forestry companies for illegal forest clearing and fires (including on peatlands)[40], but payment of these high fines is said to still be pending. New ministries have been created to improve enforcement but decentralisation and overlapping governance structures make it difficult for them to act.
- In **Brazil** while measures to ensure environmental sustainability, strong worker rights and transparency are enforced, the political crisis has led to a reduction in budget allocated to enforcement activities and an increase in deforestation in the recent past.
- In **Colombia** there is concern that the expansion of oil palm in the past was frequently, though not exclusively, accompanied by violence and displacement.

[40] Jong, Hans Nicholas (2016), 'Landmark court ruling expected to serve as deterrent'. The Jakarta Post, 18 Nov 2016, http://www.thejakartapost.com/news/2016/11/18/landmark-court-ruling-expected-to-serve-as-deterrent.html, accessed 21 June 2017.

3. Glossary

$: *US Dollars*, unless otherwise stated.

ACOP: RSPO's *Annual Communication on Progress*.

B&C: *Book & Claim* system whereby a buyer buys a certificate equivalent to a volume of certified palm oil, palm kernel oil or palm kernel expeller. The value of the certificate is transferred to a certified producer but there is no trading of physical products between the two parties. For RSPO certified products, GreenPalm was the trading platform for these paper credits until the end of 2016, and this has now shifted to a consolidated trading platform, RSPO PalmTrace (traceability system cum market place), and GreenPalm certificates are now called RSPO Credits.

CB: *Certification Body* the organisation responsible for verifying compliance with a standard.

CGM: *Consumer Goods Manufacturer*.

Commercial Agriculture. The producer (a corporate or an individual) is farming with intent to sell some or all of the production and participating in commerce. This can be contrasted with subsistence agriculture.

CPO: *Crude palm oil.* Vegetable oil produced from the fleshy mesocarp of the fruit of the oil palm. It is naturally semi-solid at room temperature with a melting point between 33ºC and 39ºC. It does not require artificial hardening, via hydrogenation, for use as a food in hard fat applications, e.g., baking and in spreads.

CPKO: *Crude Palm Kernel Oil* is obtained by crushing Palm Kernels. The oil composition is very different from that of CPO. It includes a high proportion of lauric fatty acids, the only other major source of which is coconut oil. Its composition makes it the primary feedstock for the production of natural fatty alcohols, which are widely processed into products such as shampoos and liquid detergents.

CPOPC: The *Council of Palm oil Producing Countries* was established by the Governments of Indonesia and Malaysia in November 2015. One of its stated goals is to harmonize sustainability standards.

CSPK: RSPO's *Certified Sustainable Palm Kernels.*

CSPO: *Certified Sustainable Palm Oil*.

CSPKO: RSPO's *Certified Sustainable Palm Kernel Oil.* The RSPO allows a 45% conversion rate from CSPK. Most producers use this rate, as it is higher than most actual palm kernel oil yields. CSPKO credits is RSPO CSPKO production supported via the B&C Credits system. CSPKO-MB and CSPKO-SG are RSPO CSPKO physically traded via the mass balance and segregated chain of custody options.

Deforestation: Conversion of forested land to other land uses. See definition of forest, below.

DM: *Developed market.*

EM: *Emerging market.*

Equator Principles: A risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in project financing.

ESG: *Environmental, Social and Governance criteria* are considerations that are commonly used to assess investments, in addition to financial return.

Estate management. The operations of a commercial plantation estate managed for good agricultural practices and sustainability.

FFB: *Fresh Fruit Bunch* are the bunches of fruits harvested by hand from the oil palm. A single bunch weighs up to 50kg and can contain up to 1,500 individual fruits.

FPIC: *Free prior and informed consent*. It is the principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use.

Forest: The United Nations Food and Agriculture Organisation defines forest as 'land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.'

FSC: The *Forest Stewardship Council*, which was the first sustainability certification system, focusing on forest products. The certification process and standards of subsequent sustainability certification systems, such as the RSPO, are heavily based on the FSC.

GHG: *Greenhouse gases* that absorb and emit radiation within the thermal infrared range. This process is the cause of the greenhouse effect, which leads to global warming or climate change. Many policies strive to contain the rise in global temperature by limiting and reducing greenhouse gas net emissions. Refer to HCS.

GP: *GreenPalm* was the sole authorised trading platform for the trading of RSPO credits linked to the production of sustainable palm oil, palm kernel oil and palm kernel expeller certified under RSPO Principles & Criteria until end 2016. Users could trade the credits on-line or off-line (reporting transactions to GreenPalm). The new system to trade RSPO Credits is called RSPO PalmTrace. Also refer to B&C.

HGU: The *Hak Guna Usaha* is a vital final stage in the allocation of land rights in Indonesia that can be granted only on state-owned land, and only for the purposes of agriculture, fisheries, or animal husbandry.

HCS: *High Carbon Stock.* This refers to areas such as peat lands of forested areas that contain large amounts of carbon, the conversion of which to agricultural land uses releasing significant quantities of greenhouse gases. Defined in various ways by different organisations and standards. Also refer to LUC.

HCV: *High Conservation Values.* A policy instrument that seeks the identification and maintenance of biological, ecological, social or cultural values of outstanding significance or critical importance.

HPC: *Home & Personal Care* is a major non-food end-use sector for palm products.

ILUC: *Indirect land Use Change*. While biofuels are important in helping countries meet their GHG reduction targets, biofuel production typically takes place on cropland which was previously used for other agriculture such as growing food or feed. Since this agricultural production is still necessary, it may be partly displaced to previously non-

cropland such as grasslands and forests. This process is known as indirect land use change [41].

Inti-Indonesia. According to Indonesian plantation law, plantation companies are required to enter a partnership with the farmers in the local community. This partnership is defined as a *plasma* scheme. The plantation area that is owned and operated by the plantation company is defined as *inti* in Indonesian and in English it is nucleus.

IP: *Identity Preserved*. Chain of custody mechanism in which sustainable palm oil from a single identifiable certified source (one palm oil mill) is kept separate from other palm oil throughout the supply chain. This is more exacting than SG.

IS: *Independent smallholder*.

ISCC: *International Sustainability & Carbon Certification* is a certification system for sustainability based mostly on greenhouse gas emissions. Within the oil palm sector, it is used to ensure the sustainability of biofuels derived from palm oil.

ISPO: *Indonesian Sustainable Palm Oil* is a mandatory national palm oil certification programme in Indonesia.

Izin Lokasi. A Plantation Business Licence required in Indonesia. It is a written business licence issued by the relevant authority and must be obtained by a company engaged in the plantation business that is integrated with business of processing plantation crops.

LUC: *Land Use Change*. Particularly used with regard to climate change, in the context of oil palm it refers to the difference in carbon sequestration between the palm oil plantation and the land use it replaces.

MB: A *Mass Balance* chain of custody or supply chain system allows sustainable certified palm oil to be mixed with non-certified palm oil, with the proportion of certified going in to a production or aggregation process claimed at the end. Mass balance does not allow physical traceability of palm oil.

MSPO: *Malaysian Sustainable Palm Oil*. Introduced as a voluntary palm oil certification system, but now changed to a mandatory requirement by 2018-2019.

NCR: *Native Customary Rights* set special land rights for indigenous local peoples in Sarawak and other jurisdictions.

NPP: RSPO's *New Planting Procedures* require growers to make public their oil palm estate development plans before proceeding to work the site. HCV assessment, social impact analysis, carbon assessment (to minimise GHG emissions), avoidance of peat land (and peat drainage studies for replanting), and obtaining Free Prior and Informed Consent (FPIC) of local peoples are main components and principles of this exercise.

NGO: *Non-governmental organization*.

OEM: *Original Equipment Manufacturer* - companies that manufacture products for third-parties: an original equipment manufacturer, or OEM, makes products that are bought by another company and sold under the purchasing company's brand name. OEM refers to the company that originally manufactured the product.

[41] http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/land-use-change

Oleochemicals: These are fatty acids and fatty alcohols produced by splitting RBD PKO, CPKO and RBD palm stearin, in particular, into their individual fatty acids, and then processing the acids into fatty alcohols, mainly used in liquid detergents and personal care products, including shampoos.

Peatland: this is land where the underlying soil is peat. The International Peatland Society states: 'Peat is a heterogeneous mixture of more or less decomposed plant (humus) material that has accumulated in a water-saturated environment and in the absence of oxygen...Peat is sedentarily accumulated material consisting of at least 30% (dry mass) of dead organic material.' In practice, the definitions and hence maps of peatland vary between authorities, and are contested. Drainage of peatlands for agriculture, including oil palm cultivation, causes the peat to oxidize, resulting in significant greenhouse gas emissions. The original vegetation of deep peatland is peat swamp forest.

P&C: *Principles and Criteria* of a standard

PK: *Palm kernel*. The edible seed of the oil palm fruit, which is processed to produce palm kernel oil.

PKO: *Palm kernel oil.* The oil produced from crushing of palm kernels.

PMF: *Palm mid-fractions*. A co-production from the fractionation of palm kernel stearin used as a confectionery fat.

Refined Palm Oil. Nearly all Crude Palm Oil (CPO) is refined, bleached and deodorised for subsequent use. Refined palm oil is usually fractionated into a two fractions, a more liquid one (olein), favoured in deep frying, and a harder faction (stearin) favoured for baking and in margarine, for example.

RSPO: The *Roundtable on Sustainable Palm Oil* is a multi-stakeholder organization that has developed a popular voluntary certification scheme for sustainable palm oil.

TFT: *The Forest Trust* is an organization that offers traceability systems (customised for processors and plantation groups) that track sustainable (certified or otherwise) palm oil along the entire supply chain.

SCC and **SCCS**: *Supply chain certification* and *supply chain certification standards*. This is the process of verifying the provenance of sustainably certified material.

SG: A *segregated* chain of custody or supply chain system allows sustainable palm oil to be kept separate from conventional palm oil throughout the entire supply chain. This is more exacting than MB, but less exacting than IP.

4. Study background and introduction

The European Commission's DG Environment commissioned this study in December 2016, as part of the Commission's wider work on understanding the impacts of EU consumption of agricultural commodities on deforestation. The study is to inform work on global deforestation, including in relation to a feasibility study on an EU Action Plan on deforestation, which is scheduled to be finalized in 2017. That study will include an assessment of different policy options and will be used as an input for future consideration by the Commission of possible new initiatives being introduced to help address global deforestation and forest degradation. As such, this study on palm oil will complement the broader deforestation feasibility study (which is set at a higher level and covers a wider range of agricultural commodities); and its focus is largely analytical.

The policy context for this palm oil study is the 2008 European Commission Communication on Deforestation, which set out the EU's response to the challenge of climate change and called for a halt to global forest cover loss by 2030 at the latest and for a reduction in gross tropical deforestation of at least 50% by 2020 from current levels. This was followed in 2013 by the publication of a comprehensive study to assess the impact of EU consumption on forest loss at a global scale. This study introduced the concept of 'embodied' deforestation.

More recently, on 17 March a report from the European Parliament on palm oil and deforestation of tropical rainforests was published[42], raising the level of political interest in the topic. The European Parliament adopted a non-legislative resolution, based on this report, during its plenary session on 4 April 2017[43].

This resolution called for a clampdown on imports of unsustainable palm oil; and for the European Commission to take measures to phase out the use of vegetable oils that drive deforestation, including palm oil, as a component of biofuels, preferably by 2020. It also advocated the creation of a single certification scheme to guarantee that only sustainably produced palm oil enters the EU market. In its formal reply to this Resolution, the European Commission stressed the need for a balanced approach to the matter and focused on the importance of working together with producing countries, the private sector and other stakeholders. Furthermore, it pointed at the possible shortcomings of certain restrictive proposals and recalled the importance of ensuring consistency with the rules of the World Trade Organisation (WTO), in particular non-discrimination.

The EU does not have a specific policy on palm oil. More information on EU and UN policies which are not product-specific but may also be relevant for a discussion on the environmental and socio-economic impacts of oil palm cultivation, palm oil production and consumption; and their associated impacts and benefits can be found in this report.

As such, this palm oil study aims to provide a clear picture of the economic, environmental and social impacts – positive and negative – that are associated with oil palm cultivation, production and consumption; and the role and potential of existing palm oil sustainability certification schemes, legislative and regulatory regimes and voluntary initiatives in improving the sustainability performance of palm oil.

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[42] Report on palm oil and deforestation of rainforests – European Parliament, Committee on Environment, Public Health and Food Safety (2016/2222 (INI)) dated 17 March 2017.

[43] MEPs call for clampdown on imports of unsustainable palm oil and use in biofuel - European Parliament Press Release, 4 April 2017.

This study will also summarise considerations regarding the pace and scale of change needed to meet existing EU policy objectives; and on how to reconcile the current differences and factors driving producer and consumer behaviour (noting that there is currently an imbalance between sustainable palm oil supply and demand and that new ways of driving demand will need to be found).

5. Study Methodology

The study comprises a comprehensive examination of the issues relating to palm oil. The study looks at sustainability in a broad manner, encompassing the traditional concerns over the environmental impact of oil palm, such as deforestation, and social dislocation, such as land disputes, but also the socio-economic benefits accruing from development.

Taking such a comprehensive view of sustainability provides a particular challenge, as it recognises that the decision on whether or not to develop oil palm often involves the need to find a balanced approach that supports economic development at the same time as protecting the environment and the rights of local communities, workers and indigenous peoples.

The central challenge is that the values involved in ensuring such a balanced approach are incommensurable. This means there is not always a common, uncontested unit of measurement. In other words there is no clear way in which to reflect the often not easily quantifiable or non-monetary value of the environment and ecosystem services against the utilitarian value of additional income to smallholder farmers. The Stern Review, for example, had to deal with this issue when it attempted to provide a cost-benefit analysis of tackling climate change, whilst natural capital accounting seeks to reconcile the multiple uses of the landscape with the protection of natural resources and ecosystem services.

Decisions involving incommensurable values are intractable; there is no single basis on which the decision can be made. This problem provides three main methodological challenges:

1. Establishing a clear narrative **structure** is difficult, as our coverage flows across a variety of different topics, which are usually situated in their own context and cannot be easily compared.
2. In a related manner, ensuring comprehensive **coverage** is a challenge as issues are often restricted to certain disciplines.
3. Providing objective **conclusions** regarding the outcomes of our analysis requires a nuanced approach, given the different value systems and assumptions of the different disciplines.

We will now describe how we dealt with each challenge.

5.1. Structure

To ensure that the document is manageable as well as comprehensive the report has been split into a series of discrete sub-tasks. It is very difficult to avoid some overlap, but these sub-tasks provide a helpful structure with which to navigate the text. In addition, they allow readers to establish where the different parts of the subject have been dealt with.

5.2. Coverage

To ensure that our coverage is comprehensive we have taken a broad view on the type of studies, sources and approaches permissible:

- Cited studies are, with few exceptions, ones **published since 2000**, and indeed the majority of cited studies are published after 2011 (see Appendix 1 for further details). Work published up to November 2017 is included.
- For the sections on social and environmental issues in particular, we have **preferentially used peer-reviewed literature**, using other sources only when peer-reviewed work was not available.

- We have taken an **inter-disciplinary approach**, combining literature from development studies, economics, ecology and a number of other disciplines. This is necessary to ensure that we present all sides of the argument.
- We have allowed our scope of inquiry to include **non-peer-reviewed information**, such as annual reports, media articles and websites. This was necessary to ensure that we are covering topics that have only just emerged and not had time to pass through editing, peer review and academic publication.

We have also relied on expert **interviews**. While they come with their own biases, industry experts provide an additional technical understanding of the topic which otherwise cannot be achieved, such as understanding how sustainability certification works in practice rather than theory.

- We have not shied away from using **case studies** where we view them as the most useful means of understanding a topic. While a narrative is the most basic approach to analysis, for topics that have competing values it remains the best way of ensuring that we are capturing the full range of issues.
- At the same time, we have used a **quantitative approach** where appropriate. This is clearly particularly the case for historical production, yield and trade data.
- We supplement publicly available data with **company data**. While these have a smaller sample size, they have proved invaluable in supplementing publicly available data for regions or topics that are not well covered (such as plantation wages in West Africa).

5.3. Conclusions

While in most cases academic work can be situated in a single discipline, as we have taken a broader approach, which combines different disciplines, sources and value judgements, we face different challenges when developing our conclusions. This is particularly the case as we are, by necessity, using information which has not passed peer review.

In order to provide a value judgement, which is not situated within a single discipline, in this study we have developed a **Research Quality Assurance Framework** that helps us to quality assure and rank the underpinning data and research information used during the course of the study.

The Research Quality Assurance Framework provides the reader with a summary of the likely value of the information. This leaves the reader with more autonomy in terms of their interpretation than they would usually be allowed. This is deliberate and in line with the original aim of the report.

More information on the Research Quality Assurance Framework can be found at of this report. Where sections of the report rely heavily on socio-economic and market and other forms of data and information (e.g. population data, market analysis and stakeholder interviews) rather than published studies, we have sought to provide an indication of the data used and its credibility and robustness. A summary of data and information sources for these sections can be found at **Appendix 2**. Wherever possible, we have sought to use the most up-to-date references available.

Finally, we conducted an expert validation workshop, in which the preliminary findings of the study were shared with a range of experts from producer and consumer countries, and their knowledge, skills and expertise drawn upon in order to improve the evidence presented in the study. A summary of this workshop can be found in **Appendix 14**.

6. Introduction to the oil palm and its products

What is palm oil?

Palm oil is produced from the fruit (fresh fruit bunches (FFB) of the oil palm. A single bunch weighs up to 50kg and can contain up to 1,500 individual fruits. Fruits are processed to produce two types of oil:

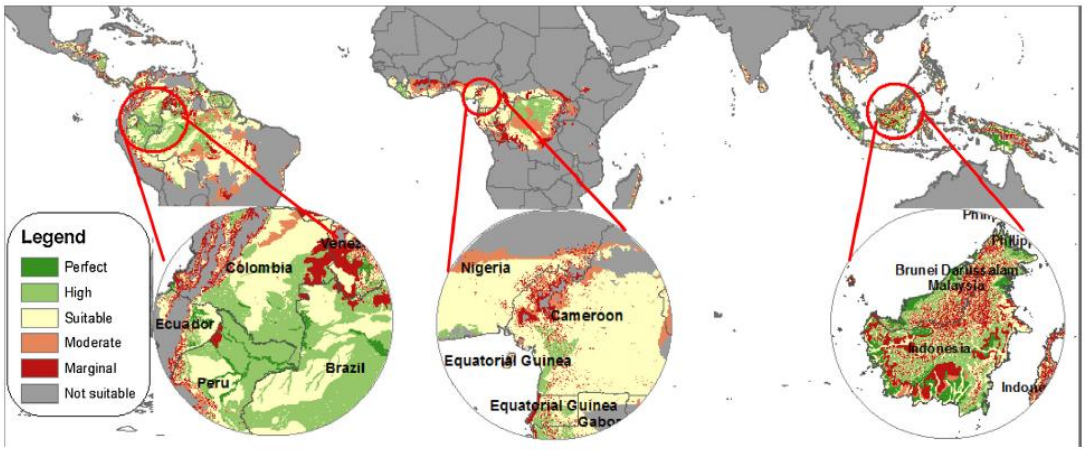
1. **Crude Palm Oil** (CPO) from the fibrous mesocarp around the outside of the fruits and;
2. **Crude Palm Kernel Oil** (CPKO) from the kernels at the centre of the fruits.

Although both oils originate from the same fruit, palm kernel oil is chemically and nutritionally distinct from palm oil.

Where is the oil palm grown?

The oil palm grows predominantly within the 5-10° belt from the Equator. This tends to be where the monsoon is relatively weak, and rainfall in the most suitable growing areas averages close to 200 mm per month. The further an area is from the Equator and the more marked the distinction between the rainy and dry seasons, the lower the yields tend to be. Figure 2 shows all the regions suitable for the oil palm cultivation and highlights those regions, which are considered most suited. The most important variable is climatic, with topography also playing a role.

Figure 2: Area suitable for planting oil palm



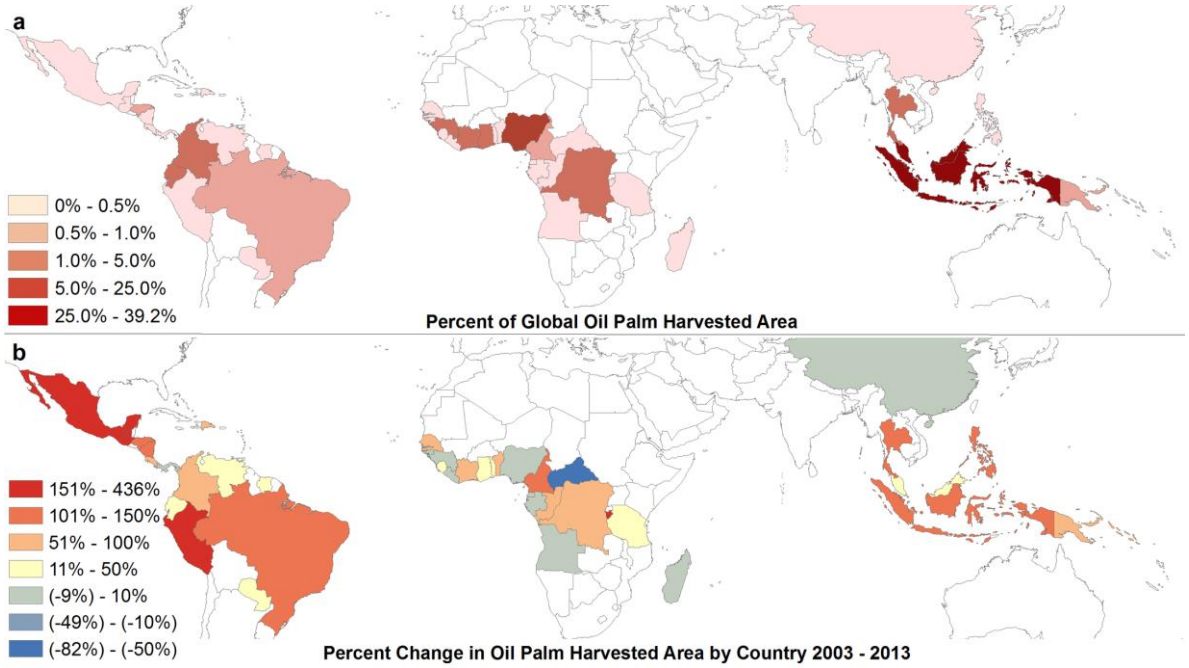
Source: Pirker et al (2016), p. 76[44]

Figure 3 demonstrates which countries currently have the largest share of oil palm area. Indonesia and Malaysia dominate with close to 90% of world output. Expansion within South East Asia is focused on Kalimantan. Growth has also occurred in West Africa and Central America. However, in the case of West Africa expansion has been very slow.

For a detailed discussion of the production of palm oil by country see **Section 7.4.1.**

[44] Pirker J., Mosnier A., Kraxner F., Havlik P. and Obersteiner M., 'What are the limits to oil palm expansion?', Global Environmental Change, 40, (2016), 73-81

Figure 3: Share of oil palm area (a) and growth in area under oil palm (b)



Notes: (a) Per cent of UN FAO reported total global oil palm harvested area in 2013. (b) Per cent changes in FAO reported oil palm harvested area by country from 2003–2013.

Source: Vijay et al. (2016)[45]

Who grows oil palm?

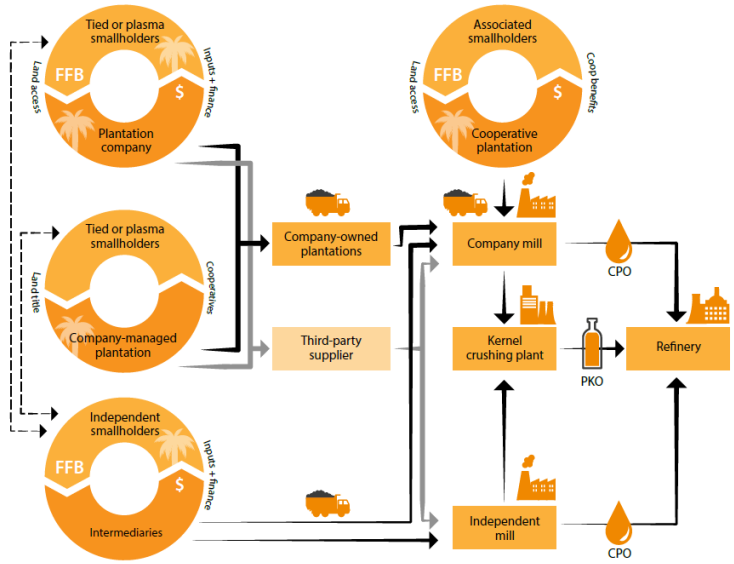
The production of oil palm is split between plantations and smallholders. In many countries it is a requirement that plantation companies develop a proportion of their land for smallholders. For example, in Indonesia plantation law stipulates that plantation companies are required to enter into partnerships with farmers and local communities around the plantation (who are known as *plasma* in Indonesian).

The relationship between plantations and smallholders exists because the FFB produced from these smallholders' land is processed in company mills alongside the FFB produced from the company's plantations. In addition, the company may provide smallholders with better seedlings, technical support and subsidised inputs, such as fertiliser and pesticides, whose large applications are required to maintain yields once harvesting commences.

The share of smallholders differs depending on the country. In South East Asia roughly 60% of the palm oil comes from the larger plantation companies (privately owned estates) and 40% from smallholders.

[45] Vijay V., Pimm S.L., Jenkins C. and Smith S.J., 'The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss', Accessed 05/07/2017, https://doi.org/10.1371/journal.pone.0159668

An important distinction therefore needs to be made between *labourers on the plantation*, who do not own their own plots, and *smallholders* who have their own plots



but also often work for the plantations. This is discussed in **Section 7.3**.

Figure 4: Interrelation of smallholders and plantation companies

Source: Pacheco et al (2017)[46]

How is oil palm grown?

Both smallholders and plantations should follow the same process for establishing and maintaining an oil palm plantation. In practice, smallholders often suffer from poorer management and lower capital availability and consequently their yields tend to be lower.

Establishing the plantation

Plantation development starts with land clearing and the establishment of a nursery. In the nursery the oil palm seeds are carefully selected and germinated under controlled conditions.

The germinated seeds are transferred into polybags and grown out of doors in nurseries for the next 12-15 months before planting in the field. Healthy, well-selected seedlings are a pre-condition for early and sustained high yields. In most cases granular multi-nutrient compound fertilisers are the preferred nutrient source for seedlings in the nursery.

The newly planted palm takes around three years to yield its first crop, and yields build to a peak eight years after planting and remain close to this peak for ten years. Oil palm can continue to be economically productive for many years, but agronomists recommend replanting after 25 years, by which age the palms become too tall for easy harvesting and yields start to decline.

Maintenance

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[46] Pacheco P., Gnych S., Demawan A., Komarudin H. and Okarda B. 'The palm oil global value chain: Implications for economic growth and social and environmental sustainability', *Working Paper 220*, CIFOR 2017.

Nutrient uptake by the young oil palm is low during the first year, when the plant is very small, but increases steeply between years one and three (when harvesting commences) and stabilises at a high level around years five to six. High and consistent fertiliser applications are required to maintain yields.

To maintain good fertiliser response and high yields in older palms, selective thinning of palms is often necessary. In addition, constant attention to improving the soil, suppressing weeds, reducing water-logging and limiting erosion are required. This is particularly important to avoid nitrogen deficiency.

Pest management is also important, though in South East Asia oil palm is fortunate that there are fewer natural pests, as the crop is not native to the region. Some plantations have introduced the barn owl as a natural solution to rats that feed on the loose oil palm fruits that lie on the ground. The Rhinoceros beetle is a serious pest of both oil palm and coconut, which can be managed by destroying breeding sites and trapping the adults.

Finally there are a number of diseases that can severely damage production.

- *Fusarium wilt*, a soil born pathogen, is one of the most destructive diseases of oil palm in Africa, causing severe losses in some areas.
- *Bud rot disease* (BRD) is caused by a complex of fungal organisms and its development is regulated by interactions between the plant, pathogens, and the environment. Bud rot is a big problem on oil palm plantations in South America where it affects fresh fruit bunch yields, as well as the quality of the oil in that continent.
- *Ganoderma Basal Stem Rot* (BSR) disease is an incurable oil palm disease, caused by the bracket fungus *Ganoderma*. It is lethal, and has been known for more than 50 years in South East Asia.

Harvesting

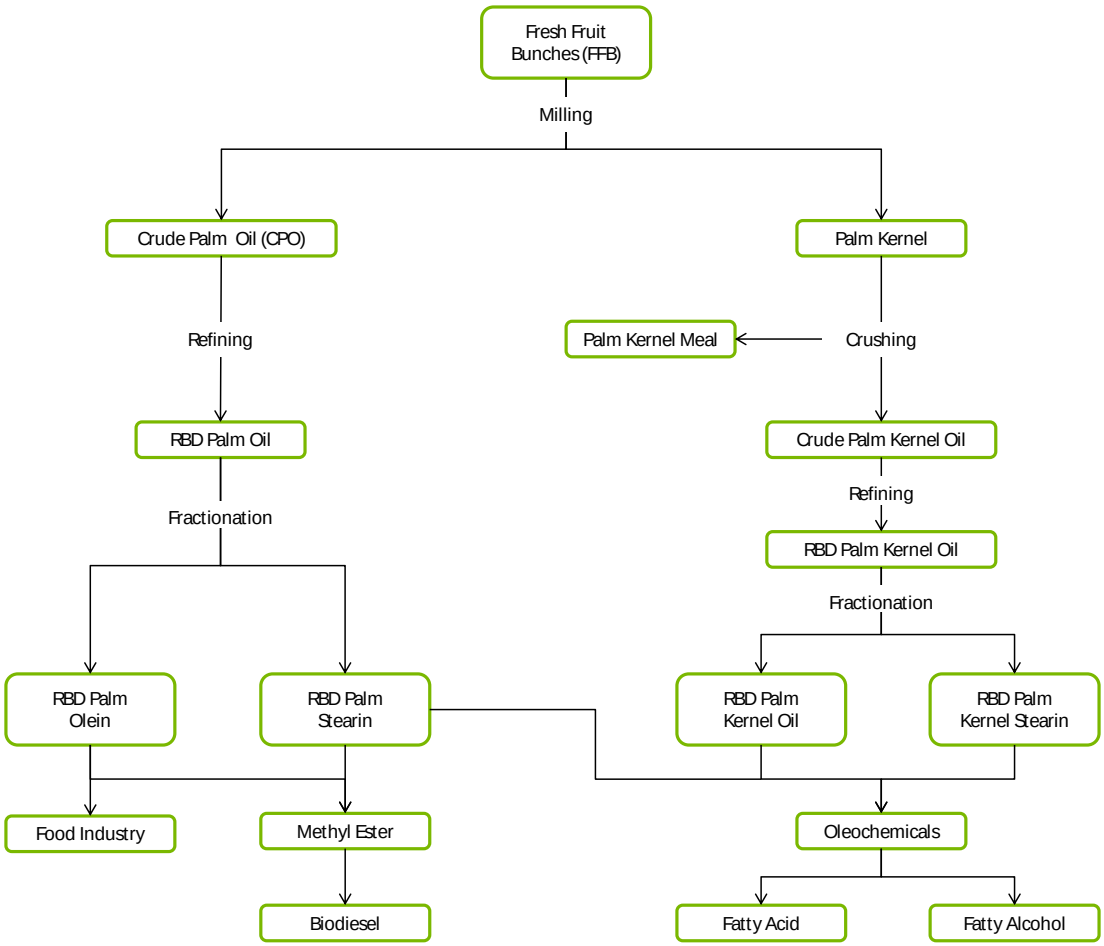
The oil palm produces fresh fruit bunches (FFB) which are harvested at intervals that are ideally 7 to 10 days in duration throughout the economic life of the palm. In order to maximise the oil extraction rate and ensure optimum oil quality, stringent harvesting standards are practised (including paying particular attention to the ripeness of fruits, the implementation of regular harvesting rounds and handling the fruits with minimum bruising).

Harvesting oil palm is very labour intensive. The harvesters are skilled workers, able to manipulate long poles with sharp knives at the end. The collection process can either be manual, using wheelbarrows or buffaloes/oxen or mechanised by using a mechanical buffalo (a small tractor). If the availability of skilled labour is inadequate, the plantation might not be able to maintain harvesting rounds as short as 7-10 days. However, there is a cost. In order to maximise oil yields per hectare, it is important to harvest FFB at the right time. Otherwise, the FFB delivered to the mill could be under- or over-ripe, leading to a reduced oil extraction rate.

How is palm oil processed?

Palm oil is notable for the complexity of its processing. Figure 5 shows a schematic version of the steps involved in processing the fresh fruit bunches (FFB) harvested from the oil palm.

Figure 5: Flow diagram of FFB processing



Source: LMC International

Milling

After harvesting, the heavy fresh fruit bunches (FFB) are transported to a mill. The FFB deteriorate quickly after harvesting, and are typically processed within 24 hours. This limits the distance they can be transported. Most mills receive FFB from a mixture of their own estates and outside smallholders and estates.

In the conventional milling process, the FFB is sterilised and the fruit stripped off. The loose fruits are then pressed to extract the CPO. The kernels are separated from the outer fibrous mesocarp. They are transported to a separate PK crushing plant, which may process PK from as many as 30 mills.

We will first look at how the CPO is processed before returning to look at the palm kernels.

Processing the CPO

Refining

Almost all vegetable oils in the world are refined to remove undesirable by-products or impurities and to improve their taste, smell and appearance. However, there are major differences between the refining process for seed oils (such as soybean, rapeseed or sunflower oil) and pulp oils (such as palm oil and olive oil).

The reason for this is that seed oils are less sensitive to spoilage than crude palm oil. With the advent of large scale palm oil refining in Malaysia in the 1970s, new physical

refining technologies that do not use chemicals to neutralise the FFA (free fatty acid) and that use distillation at high temperature and low vacuum to remove the FFA.

Fractionation

After refining, to purify and bleach the oil, fractionation separates oil into liquid and solid fractions. Palm oil is fractionated into liquid (*olein*) and solid (*stearin*) components.

Palm olein is the liquid fraction obtained by the fractionation of palm oil after crystallisation at controlled temperatures. The physical characteristics of palm olein differ from those of palm oil. It has a lower melting point than palm oil itself and so is fully liquid in warm climate.

Palm stearin is the hard fraction obtained by fractionation of palm oil after crystallisation at controlled temperatures. It is therefore a co-product of palm olein. It is nearly always traded at a discount to palm oil and palm olein, making it a cost effective ingredient in several applications.

In addition to palm olein and stearin, there are many other more *specialised fractions*. These include *double fractionated palm olein* (known as superolein) with a lower melting point than olein and *palm mid-fractions* (whose melting point lies between those of olein and stearin).

Processing the palm kernels

Crushing of the palm kernels produces palm kernel oil (PKO). Alongside the PKO it also produces a fibrous residue after the extraction of the oil called palm kernel meal, which is used as animal feed.

As with CPO, this PKO can then be refined and further fractionated.

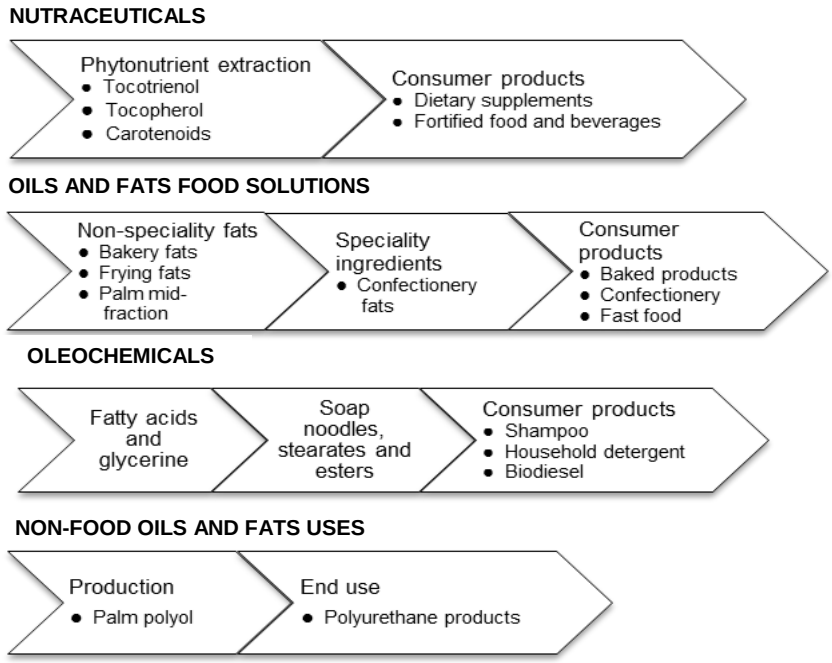
- *Palm kernel olein* is the liquid component of palm kernel oil obtained from fractionation.
- *Palm kernel stearin* is the more solid fraction of palm kernel oil after fractionating the oil.

End Uses

- As the above section on processing demonstrated, what is commonly referred to as palm oil encompasses two chemically distinct oils (palm oil and palm kernel oil), as well as a variety of different fractions. As a result, the oil palm's products have a very wide variety of different potential end-uses, including as a feedstock for biodiesel, in food and chemical manufacturing, which are summarised in Figure 6**.**
- *Palm olein* is widely used as cooking oil. It is popular due to its resistance to oxidation and the formation of breakdown products at frying temperatures and for the longer shelf life of the finished products it is used in, notably snack foods and instant noodles. It also blends well with other popular vegetable oils that are traditionally used in many parts of the world.
- The physical characteristics of *palm stearin* differ significantly from those of palm oil and it is available in a wider range of melting points and iodine values. Palm stearin is a very useful source of fully natural hard fat component for products such as shortening and pastry and bakery margarines. It is also a major ingredient for the production of fatty acids.
- Where pourability and clarity are issues for olein, notably in temperate countries, *superolein* can be used as a frying oil and cooking oil, usually in blends with seed oils.

- *Palm mid-fraction* is commonly used as a highly versatile natural ingredient in the manufacture of tub margarine and as a replacement for cocoa butter in chocolate.

Figure 6: End uses of different PKO and CPO fractions



Source: LMC International

The oil composition of palm kernel oil is very different from that of palm oil. Palm kernel oil is used as a specialist food ingredient and as a raw material for oleochemicals.

- Palm kernel oil, palm kernel olein and palm kernel stearin find uses in margarine, confectionery, coffee whiteners, biscuit cream and coating fats; and in these uses they require little or no further processing. There is a growing trend to use palm kernel oil products as an ingredient in the production of non-hydrogenated trans-fat free margarine.
- Palm kernel oil is also used in the manufacture of oleochemicals, such as fatty acids and alcohols, which are important intermediate feedstocks for the manufacture of products such as detergents, shampoos and other personal care products in a liquid or cream form.
- Palm kernel stearin is widely used to substitute for the more expensive cocoa butter in many of its traditional applications. In some instances, particularly when hydrogenated, palm kernel stearin exhibits performance superior to that of cocoa butter in chocolates in tropical climates.

Substitution of different oils

There are large degrees of substitution between different vegetable oils, which makes it difficult to establish at any given point which vegetable oil is being used for which end-use. In addition, the complexity of the value chain makes it hard to establish exactly what volumes of palm oil are processed into which product. There are, however, some restrictions on the substitutability of different oils:

- The high proportion of lauric fatty acid in palm kernel oil makes it the primary feedstock for the production of natural fatty alcohols, which are widely processed into products such as shampoos and liquid detergents.

- As CPO is naturally semi solid at room temperature with a melting point that lies between 33ºC and 39ºC, it does not require artificial hardening, via hydrogenation, for use as a food in hard fat applications, including baking and in spreads. Since hydrogenation creates trans-fats, which are considered unhealthy and have stringent incorporation limits in many markets, such as Denmark and the US, palm oil is widely used as a naturally hard fat in food products and is indispensable in the production of baked goods.

While it is difficult to establish with an certainty the split between different end-uses for palm and palm kernel oils, based on LMC market reports we estimate that in 2015-16 8% was used for oleo-chemicals, a further 15% was used in biofuels and the remainder was consumed in food end use sectors.

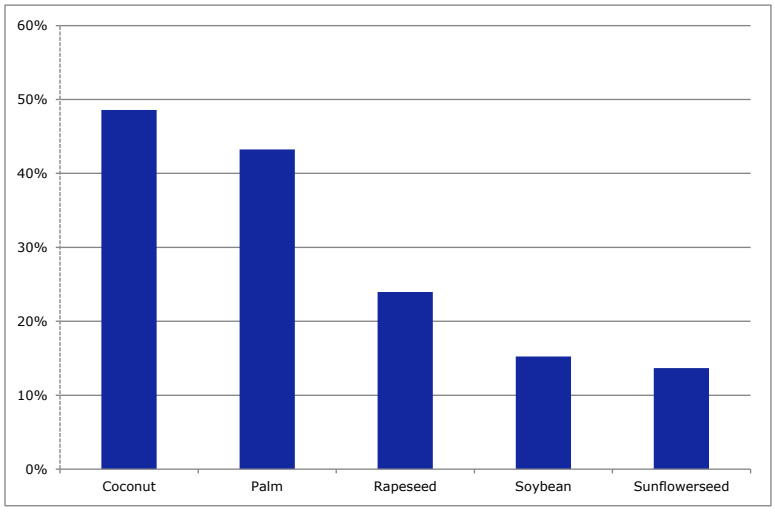
The economics of the oil palm

In the main oil palm areas of South East Asia, palms are harvested every day of the year, which makes oil palm an attractive source of income for farmers. It is a very productive crop, with yields of oil per hectare per annum that are very much greater than for other oil crops. This is its major financial attraction to producers. Its financial disadvantage is its labour intensity.

The absence so far of cost-competitive systems of mechanical harvesting makes oil palm heavily dependent on labour inputs, and labour costs represent a much greater share of its production costs than for other major oil crops, such as soy beans, rapeseed and sunflower (

Figure 7).

Figure 7: Indicative share of labour in total costs by oil crops



Source: LMC International

The overall production costs of palm oil per tonne are inevitably affected by yield: the higher the yields of FFB and CPO, the lower the associated production costs, other things being equal. In Southeast Asia, potential FFB yields per hectare under ideal conditions in southern Thailand are 16-22 tonnes per hectare, which is relatively far from the Equator and has a long distinct dry season. Its yields compare with a typical potential of 22-26 tonnes in Central Sumatra, Indonesia; 24-28 tonnes in Peninsular Malaysia and Sarawak,

Malaysia; and 26-32 tonnes in Sabah, Malaysia, as well as North Sumatra and northern Central Kalimantan, Indonesia.[47]

[47] A.H. Ling, Ganling, Sandakan, Sabah, Malaysia, *Personal communication.*

7. Environmental, social impacts and market aspects of palm oil

Given the broad scope of environmental, social and market aspects relating to palm oil, we have broken it down into more manageable sub-tasks. The environmental impacts include deforestation; biodiversity loss (partly from forest degradation); peat land conversion; greenhouse gas emissions from land use change, the use of palm oil as a feedstock for biodiesel, mills and other plantation activities; the use of fire and its impacts; air pollution (including haze), and water pollution. The main social impacts are land use rights; smallholders (including livelihoods, income and wellbeing); forced and child labour; and terms and conditions of labour (including wages and health and safety). The sections on market information include analysis of incomes and wealth distribution, and illustrate how markets have developed differently in Indonesia, Malaysia and a selection of other producer countries.

Readers should also refer to the introduction to the production and processing of oil palm products in **Section 4** above, and the Glossary of the terms in **Section 3**.

7.1. Environmental impacts

7.1.1. Deforestation

Indonesia and Malaysia alone have increased the area cultivated for oil palm from 2.6 million hectares in 1990 to over 15 million hectares in 2014 (with Indonesia counting for just over 10 million hectares).[48] This expansion has resulted in oil palm being considered a major contributor to tropical deforestation.[49,50,51,52]

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48 Cramb, R, and McCarthy, J.F. 'Characterising Oil Palm Production in Indonesia and Malaysia', in Cramb, R, and McCarthy, J.F., eds., *The Oil Palm Complex* (Singapore, 2016) pp.27-77.

49 Casson, A. 'The Hesitant Boom: Indonesia's Oil Palm Sub-Sector in an Era of Economic Crisis and Political Change'. *CIFOR Occasional Paper 29* (2000).

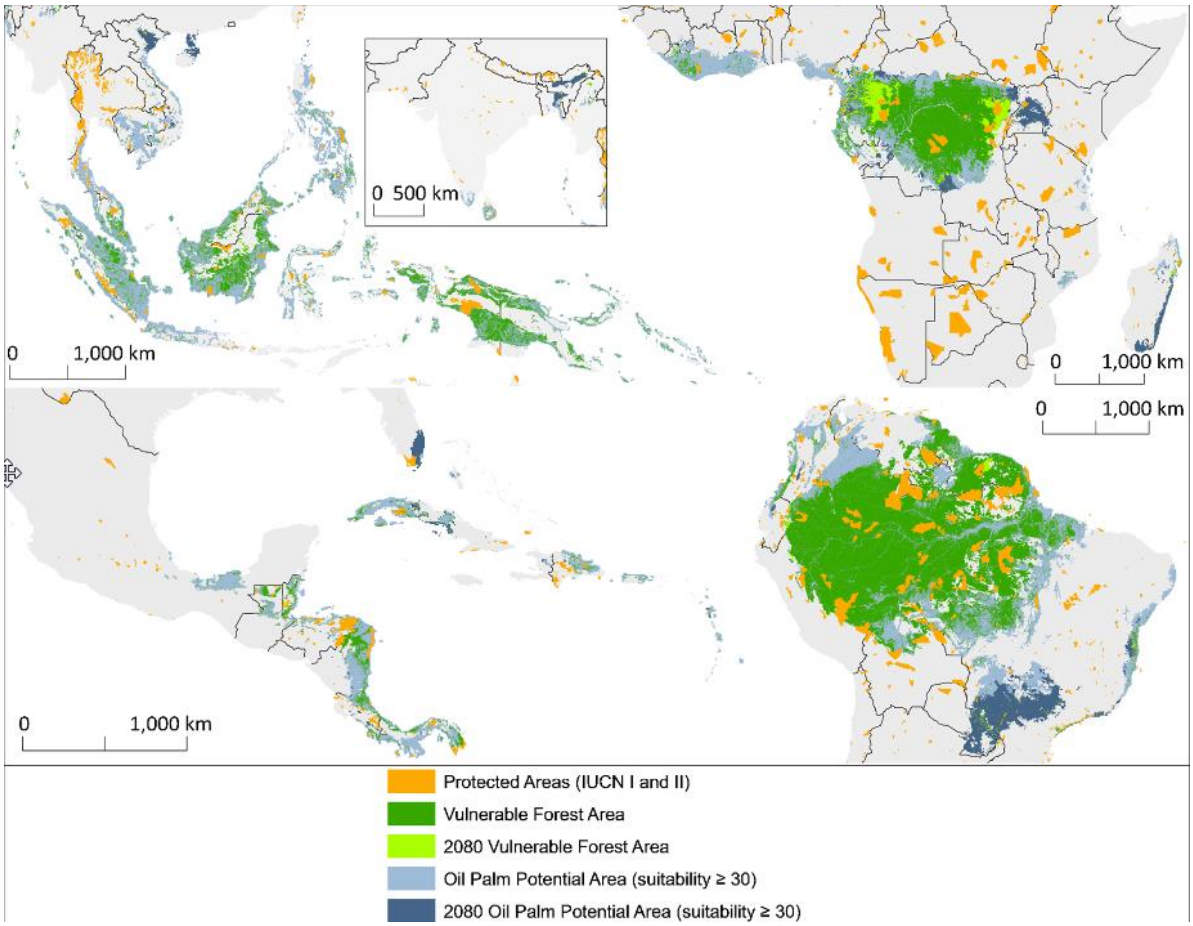
50 Gibbs, H.K., Ruesch, A.S., F. Achard, F., Clayton, M.K., Holmgren, P., Ramankutty, N. and Foley, J. A. (2010). 'Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s'. *Proceedings of the National Academy of Science* 107 (2010), 16732–16737.

51 Dieter Cuypers, D., Geerken, T., Gorissen, L., Lust, A., Peters, G., Karstensen, J., Prieler, S., Fisher, G., Hizsnyik, E. and van Velthuizen, H. 'The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation'. *European Union Technical Report* - 2013 - 063 (2013).

52 Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S. & Saxon, E. *The root of the problem: what's driving tropical deforestation today?* The Union of Concerned Scientists (2011).

Figure 8 depicts areas vulnerable to potential deforestation caused by oil palm out to 2080. This is based on an assessment of the areas that are outside IUCN I and II protected areas, and in which oil palm could be planted. The map demonstrates that the areas most under threat from deforestation are Borneo, Indonesian Papua, Papua New Guinea, parts of Central America and large swathes of West Africa and South America.

Figure 8: Current and forecasted (2080) forest areas vulnerable to deforestation from oil palm



Source: Vijay et al. (2016)[53]

The most recent peer-reviewed scientific evidence of the relationship between deforestation and palm oil expansion consider land use change up to 2015[54] and the following section considers evidence up to that date. Readers interested in deforestation statistics should also note that global datasets on overall deforestation rates – though without analysis of its causes and hence not directly relevant to palm oil – are available.[55] [56]

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53 Vijay V., Pimm S.L., Jenkins C. & Smith S.J. (2016). 'The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss', Accessed 05/07/2017, https://doi.org/10.1371/journal.pone.0159668

54 Austin, K.G., Mosnier, A., Pirker, J., , McCallum, I., Fritz, S., & Kasibhatla, P.S. (2017). Shifting patterns of oil palm driven deforestation in Indonesia and implications for zero-deforestation commitments. Land Use Policy, 41-48

55 Food and Agriculture Organisation of the United Nations (2016). Global Forest Resources Assessment 2015 How are the world's forests changing? Second edition. http://www.fao.org/forest-resources-assessment/en/

56 http://data.globalforestwatch.org/

Estimates for the proportion of deforestation caused by the expansion of palm oil cultivation in Indonesia range from 11% (between 2000 and 2010)[57] to a maximum of 16% (between 1990 and 2005).[58] These estimates include both direct deforestation (where forest is replaced by oil palm) and indirect deforestation (where oil palm replaces other land uses, which relocate to a forest area). A recent estimate suggests that the area of forest replaced by palm oil in Indonesia remained almost constant between the periods 2005-2010 and 2010-2015.[59]

Several lines of research have sought to establish the strength of the direct link between the expansion of oil palm cultivation and deforestation. Remote sensing studies of a subset of plantations in 20 countries showed that 45% of oil palm plantations in Southeast Asia came from areas that were forests in 1989.[60] For Indonesia and Malaysia, the estimates were 54% and 40% respectively. There were large regional differences; with 31% of South American plantations studied having been forest in 1989 (including 39% in Brazil and 0% in Colombia), but only 2% in Central America and 7% in Africa. A study of Latin America gave similar results for that region: 79% of oil palm expansion was estimated to have occurred on lands that had already been under some production system (predominantly cattle ranching), while 21% came from land that had previously had forest cover. The areas of forest conversion were concentrated in the Amazon regions of Peru, Ecuador and Brazil. [61]

The estimate by Vijay *et al.* (2016)[62] for Southeast Asia is remarkably similar to an earlier estimate for Indonesia and Malaysia, which was based on industry data and which suggested that 48% of oil palm plantation area present in 2002 in the two countries had been established on converted forest.[63] The same author provides additional rationale based on official statistics that this is likely to be an underestimate. A later study using similar data estimated that 55-59% of Malaysia's and at least 56% of Indonesia's palm oil expansion between 1990 and 2005 could be attributed to forest conversion, with the remaining expansion on pre-existing croplands.[64] An estimate from the earlier period of 1980-2000 gave higher figures: that intact (60%) and disturbed forests (30%) were the sources of ~90% of new plantations between 1980 and 2000 in South East Asia, but those estimates include other plantation crops (e.g. rubber), as well as oil palm.[65]

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57 Abood, S. A., Lee, J. S. H., Burivalova, Z., Garcia-Ulloa, J., and Koh, L.P. 'Relative contributions of the logging, fiber, oil palm, and mining industries to forest loss in Indonesia'. Conservation Letters 8 (2015), 58-67.

58 Fitzherbert *et al.*, (2008). *Op. cit.*

59 Austin, K.G., Mosnier, A., Pirker, J., McCallum, I., Fritz, S., & Kasibhatla, P.S. (2017). Shifting patterns of oil palm driven deforestation in Indonesia and implications for zero-deforestation commitments. Land Use Policy, 41-48

60 Vijay V., Pimm S.L., Jenkins C.N., & Smith S.J. 'The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss'. *PLoS ONE* 11/7 (2017), 1-19.

61 Furumo, P.R. & Aide, T.M. (2017). Characterizing commercial oil palm expansion in Latin America: land use change and trade. Environmental Research Letters. 12, 024008

62 Vijay *et al.* 2016). *Op. cit.*

63 Wakker, E. *Greasy palms: The social and ecological impacts of large-scale oil palm plantation development in Southeast Asia.* Friends of the Earth (London, 2005).

64 Koh, L.P. & Ghazoul, J. 'Spatially explicit scenario analysis for reconciling agricultural expansion, forest protection, and carbon conservation in Indonesia'. *Proceedings of the National Academy of Science*, 107/24 (2010), 11140–11144.

65 Gibbs, H.K., Ruesch, A.S., F. Achard, F., Clayton, M.K., Holmgren, P., Ramankutty, N. & Foley, J. A. (2010). 'Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s'. *Proceedings of the National Academy of Science* 107 (2010), 16732–16737.

Future expansion of palm oil cultivation may result in different deforestation patterns to those seen in the past. A large proportion of the suitable oil palm planting area in Malaysia is now utilised, meaning that further deforestation is likely to be focused on Sarawak, where the provincial government is promoting plantation expansion,[66] whilst also promoting the 'Heart of Borneo' initiative that aims to protect significant areas of forest. The proposed further doubling of palm oil output in Indonesia[67] could theoretically be achieved without further loss of forestland and without compromising rice production,[68] but it remains to be seen whether such a course will be followed.

Higher palm oil yields per hectare could reduce the pressure to expand palm areas to meet demand growth. There is a strong desire to increase yields on existing palm areas, but world average yields have not risen since 2005. This might be because expansion has occurred in marginal areas, or because of the difficulties in recruiting workers to perform the main field tasks, but translating the planting of improved varieties into higher average recorded yields on the ground is not proving an easy task.

In Thailand, official data[69] indicate that the total area under oil palm grew from 412,000 to 693,000 hectares from 2005 to 2014, while the area under rubber expanded from 2,041,000 to 3,504,000 hectares, and the national forest area fell from 15,712,000 to 15,343,000 hectares. Some of the land planted to oil palm was converted from rubber, with planting subsidies, while rubber plantings were encouraged further north, in regions which were not suitable for oil palm cultivation, with the benefit of planting subsidies. There are no large oil palm plantations in Thailand; the average farm size in the southern region producing 85-90% of the country's palm oil is 3.2 hectares[70].

Globally, an estimated 234 million hectares of suitable and available land are available for palm oil cultivation, a significant proportion of which is in the Amazon.[71] In Brazil, initiatives from the federal government to restrict oil palm expansion to already deforested areas (the Sustainable Palm Oil Production Program and the Agro-Ecological Zoning of Oil Palm in Deforested Areas of the Amazon) have apparently had some initial success in reducing the environmental impacts of palm oil expansion.[72] Similarly, in Thailand, most (but not all) of the expansion of oil palm cultivation in recent decades has been on previously abandoned agricultural land.[73] However, in countries such as

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66 Cramb, R. 'The Political Economy of Large Scale Palm Oil development in Sarawak', in Cramb, R, and McCarthy, J.F., eds., *The Oil Palm Complex* (Singapore, 2016) 189-246.

67 Jakarta Post (December 2, 2009) 18 million hectares of land for palm oil. Jakarta Post. http://www.thejakartapost.com/news/2009/12/02/indonesia-allocates-18- million-hectares-land-palm-oil.html

68 Koh, L.P. & Ghazoul, J. 'Spatially explicit scenario analysis for reconciling agricultural expansion, forest protection, and carbon conservation in Indonesia'. *Proceedings of the National Academy of Science*, 107/24 (2010), 11140–11144.

69 Annual data from the series of *Agricultural Statistics of Thailand*, Office of Agricultural Economics, Bangkok. Thailand.

70 *Ibid*.

71 Pirker, J., Mosnier, A., Kraxner, F., Havlík, P and Obersteiner, M. 'What are the limits to oil palm expansion?' *Global Environmental Change*, 40 (2016) 73–81.

72 Brandão, F. and Schoneveld, G. 'The state of oil palm development in the Brazilian Amazon: Trends, value chain dynamics and business models.' Centre for International Forestry Research Working Paper 198. CIFOR (2015), Bogor, Indonesia.

73 Dallinger, J. 'Oil palm development in Thailand: economic, social and environmental considerations.' In Colchester, M. and Chao, S. Oil Palm Expansion in South East Asia: Trends and Implications for Local Communities and Indigenous Peoples. (Forest People's Programme and SawitWatch (2011), Moreton-in-Marsh, UK and Bogor, Indonesia.

Cameroon, much of the appropriate land for oil palm cultivation is still forested and there is therefore a risk that expansion of oil palm cultivation will lead to deforestation.[74]

Two-thirds of the forest area converted to palm oil plantations is estimated to be embodied in global trade in palm oil.[75] The EU alone was estimated to be responsible for 0.9 million hectares of embodied deforestation through its imports of palm oil between 1980 and 2000.[76]

In summary, we conclude that whilst there are other drivers of deforestation in producer regions, there is a high degree of confidence that the expansion of oil palm cultivation has resulted in significant deforestation in Indonesia and Malaysia in particular[77]. This is a consistent finding of several appropriate, rigorous studies, (Table 5). Global trade, including EU imports, appears to drive a significant proportion of this deforestation. Estimates of conversion of natural vegetation types other than forest are limited.

This conclusion must be set against the environmental implications of alternative means of meeting the growth in world demand for vegetable oils. The expansion of soybean cultivation in South America is the main alternative source of large tonnages of vegetable oil, but on average eight hectares of soybeans produce the same amount of vegetable oil as one hectare of oil palm, worldwide (see **Appendix 5** and **Section 7.4.2**).

Table 5: Information quality assessment for oil palm cultivation as a major driver of deforestation[78]

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Deforestation	9	0.8	0.8	1.0	0.9

7.1.2. Biodiversity loss

The world is facing an unprecedented rate of species extinctions, driven by human activities.[79] The major cause of this extinction is commercial agriculture.[80,81] The lowland

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74 Hoyle, D. and Levang, P. Oil Palm Development in Cameroon. *Ad hoc working paper*, WWF (2012).

75 Henders, S., Persson, U.M. & Kastner, T. (2015). 'Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities'. Environmental Research Letters 10/12 (2015), 125012.

76 Cuypers, D., Geerken, T., Gorissen, L., Lust, A., Peters, G., Karstensen, J., Prieler, S., Fisher, G., Hizsnyik, E. and van Velthuizen, H. 'The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation'. European Union Technical Report - 2013 - 063 (2013).

77 Self-evidently, future increases in palm oil production may have different patterns and the extent to which they will continue to be associated with deforestation is unknown

78 Based on assessment of Casson (2000), *op. cit.*; Wakker (2005), *op. cit.;* Fitzherbert *et al.* (2008), *op. cit.*; Koh & Wilcove (2008), *op. cit.*; Gibbs *et al.* (2010), *op. cit.*; Aboud *et al*. (2015), op. cit.; Henders *et al.* (2015), *op. cit.;* and Vijay *et al.* (2016), *op. cit..*

79 De Vos, J.M., Joppa, L.N., Gittleman, J.L., Stephens, P.R., and Pimm, S.L. 'Estimating the normal background rate of species extinction'. *Conservation Biology*, 29/2 (2014), 452–462.

80 Rudel, T.K., Defries R., Asner G.P., and Laurance, W.F. 'Changing drivers of deforestation and new opportunities for conservation'. *Conservation Biology* 23/6 (2009), 1396-405.

tropics, which is the cultivation area of the oil palm,[82] contain the most species rich forests on earth.[83] Those of Southeast Asia are amongst the most biodiverse of all, contain high levels of endemism[84] and include charismatic and endangered fauna, such as orang-utan, Asian elephant, Sumatran tiger, birds of paradise, and three species of rhinoceros. Indonesia, for example, covers just 1.3% of the globe's land surface, yet its forests are home to around 10% of all species of flowering plants, 17% of all species of birds, 12% of all species of mammals, 16% of all species of reptiles, and 16% of all species of amphibians.[85]

Conversion of forest to other land uses and degradation of forest reduces the extent and quality of habitat, thus causing a loss of biodiversity. In the previous section, we established the evidence that the expansion of palm oil has resulted in the conversion of millions of hectares of forest to plantation. The remaining critical question is whether these conversions are likely to have had a significant impact on biodiversity, in other words whether the assertion that "oil-palm agriculture is the greatest immediate threat to biodiversity in Southeast Asia (and a growing threat elsewhere)" is justified.[86]

It is well established and uncontested that the conversion of tropical forest to agriculture, plantations and other land uses causes a significant loss of species.[87] It is estimated that Southeast Asia may lose three quarters of its original forests by 2100, and as a result up to 42% of its biodiversity.[88]

Loss of species occurs whether or not the forest converted to plantations has been previously logged, because selectively logged forest typically retains a significant proportion of the biodiversity of unlogged, primary tropical forest.[89,90,91] This is a point

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81 Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S. & Saxon, E. *The root of the problem: what's driving tropical deforestation today?* The Union of Concerned Scientists (2011), USA.

82 Corley, R.H.V. and Tinker P.B. (eds.) *The Oil Palm* (Oxford, 2003).

83 Whitmore, T.C., *Introduction to Tropical Rain Forests* (Oxford, 1998).

84 Whitmore, T.C., *Tropical Rain Forests of the Far East* (Oxford, 1988).

85 Collins, N., Sayer, J.A. and Whitmore, T.C. *The Conservation Atlas of Tropical Forests: Asia and the Pacific.* International Union for the Conservation of Nature (IUCN) (London, 1991).

86 Wilcove, D.S and Koh, L.P. 'Addressing the threats to biodiversity from oil-palm agriculture'. *Biodiversity and Conservation* 19 (2010), 99-1007.

87 Brook, B.W., Sodhi N.S., Ng P.K.L. 'Catastrophic extinctions follow deforestation in Singapore'. *Nature* 424 (2003), 420–423.

88 Sodhi, N.S., Koh L.P., Brook B.W., Ng P.K.L. 'Southeast Asian biodiversity: an impending disaster'. *Trends in Ecology and Evolution* 19 (2004), 654–660.

89 Barlow, J., Gardner T.A., Araujo I.S., Ávila-Pires, T.C., Bonaldo, A.B., Costa, J.E., Esposito, M.C., Ferreira, L.V., Hawes, J., Hernandez, M.I.M., Hoogmoed, M.S., Leite, R.N., Lo-Man-Hung, N.F., Malcolm, J.R., Martins, M.B., Mestre, L.A.M., Miranda-Santos, R., Nunes-Gutjahr, A.L., Overal, W.L., Parry, L., Peters, S.L., Ribeiro-Junior, M.A., da Silva, M.N.F., da Silva Motta, C., and Peres, C. A. 'Quantifying the biodiversity value of tropical primary, secondary and plantation forests'. *Proceedings of the National Academy of Science* 104 (2007), 18555–18560.

90 Gardner, T.A., Ribeiro-Junior, M.A., Barlow, J., Avila-Pires, T.C.S., Hoogmoed M.S., and Peres C.A. 'The value of primary, secondary, and plantation forests for a neotropical herpetofauna'. *Conservation Biology* 21 (2007), 775–787.

91 Putz, F.E., Zuidema, P.A., Synnott, T., Pena-Claros, M., Pinard, M.A., Sheil, D., Vanclay, J.K., Sist, P., Gourlet-Fleury, S., Griscom, B., Palmer, J. and Zagt, R. 'Sustaining conservation values in selectively logged tropical forests: the attained and the attainable'. *Conservation Letters* 5 (2012), 296–303.

worth reiterating: previously selectively logged tropical forests harbour significant biodiversity that is imperilled by conversion to other land uses.

Specific studies comparing the biodiversity within palm oil plantations to that of logged or unlogged forest have given similar results to these general patterns. The diversity of birds,[92,93,94,95] butterflies,[96] mammals,[97,98] and fungus[99] within oil palm plantations is a fraction of that within forest. Forest specialist species are particularly vulnerable. For example, Malaysian forests that were selectively logged at least 30 years ago contained only 73–75% of the 159 species of extant primary forest birds, but rural habitats dominated by oil palm plantations had only 28–32% of these primary forest species.[100]

The RSPO certification standard includes provision for conserving biodiversity within plantation companies' land holdings, including retaining patches of forest. Forest patches within plantations were found to have an abundance of rare bird species that was 60 times lower than in contiguous forest, but that was far higher than oil palm plantations where the abundance of rare bird species was 200 times lower than in large forest areas.[101]

In summary, there is high confidence that the conversion of forest – primary or selectively logged – to oil palm cultivation causes a significant loss of biodiversity, with forest specialist species particularly affected. This is the consistent finding of a large body of rigorous research that examines conversion of tropical forest in general, as well as specific comparisons of the diversity of a range of taxonomic groups within oil palm plantations compared with logged or unlogged forest (Table 6).

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92 Danielsen, F. and Heegaard, M. 'Impact of logging and plantation development on species diversity: a case study from Sumatra'. Management of tropical forests. *University of Oslo, Centre for Development & the Environment; SUM Occasional Paper*, 1/95 (Oslo, 1995).

93 Peh, K.S.-H., de Jong, J., Sodhi, N.S., Lim, S.L.-H and Yap, C.A.-M. Lowland rainforest avifauna and human disturbance: persistence of primary forest birds in selectively logged forests and mixed-rural habitats of southern Peninsular Malaysia. *Biological Conservation* 123 (2005) 489–505.

94 Peh, K.S.-H., Sodhi N.S., de Jong J., Sekercioglu C.H., Yap C.A.-M., Lim S.L.-H. Conservation value of degraded habitats for forest birds in southern Peninsular Malaysia. *Diversity and Distributions* 12 (2006) 572–581.

95 Edwards, D.P., Hodgson, J.A., Hamer, K.C., Mitchell, S.L., Ahmad, A.H., Cornell, S.J., and Wilcove, D.S. 'Wildlife-friendly oil palm plantations fail to protect biodiversity effectively'. *Conservation Letters* 3 (2010) 236–242.

96 Koh & Wilcove (2008). *Op. cit.*

97 Danielsen, F. & Heegaard, M. (1995). *Op. cit.*

98 Laidlaw, R.K. 'A Comparison between Populations of Primates, Squirrels, Three Shrews and other Mammals inhabiting Virgin, Logged, Fragmented and Plantation Forests in Malaysia'. Conservation, Management and Development of Forest Resources. *Proceedings of the Malaysia-United Kingdom Programme Workshop, 21 – 24 October 1996*. Forest Research Institute Malaysia (Kuala Lumpur, 1998).

99 Kerfahi, D., Tripathi, B.M., Lee, J., Edwards, D.P. and Adams, J.M. 'The Impact of Selective-Logging and Forest Clearance for Oil Palm on Fungal Communities in Borneo' *PLoS ONE* 9/11 (2014): e111525.

100 Peh, K.S.-H. *et al.* (2005). *Op. cit.*

101 Edwards, D.P. *et al.* (2010). *Op. cit.*

Table 6: Information quality assessment for oil palm cultivation as a significant cause of biodiversity loss[102]

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Biodiversity loss	7	1.0	0.8	1.0	0.9

7.1.3. Peat land conversion

Malaysia, Indonesia and Papua New Guinea support some of the most extensive tropical peatlands in the world, covering around 27.1 million hectares.[103] Only 36% of the historical peat swamp forest area in the region remains, with only 9% currently in designated protected areas,[104] and the majority of the remaining areas are now degraded.[105] Other large areas of tropical peat swamp forest occur in the Congo Basin.[106]

Peat swamp forest vegetation is a critically endangered category of forested wetland characterised by deep layers of peat soil (histosols) and highly acidic water. Apart from some fish, few species are confined to peat swamp forests but they nonetheless provide habitat for a large number of globally threatened species.[107] Peat contains a high proportion of carbon, and the major role that Indo-Malayan peatlands play in carbon sequestration is well established.[108] Once drained, decomposing organic matter by oxidation results in carbon dioxide emissions, and drained peat is highly flammable: once alight, peat fires can burn for months or even years. The cultivation of palm oil on peatlands therefore presents a specific case of several environmental themes, especially deforestation, biodiversity, burning, and greenhouse gas emissions from land use change.

The degree to which conversion of peat lands to cultivation exacerbates these environmental issues is partly dependent on the depth of peat. Peat thickness in Indonesia (Sumatra, Kalimantan and Papua) ranges from less than 1 metre to over 12 metres, with 42% of the peatland area being two metres deep, with similar depth distributions assumed for other parts of the region.[109] However, there does not appear to a body of research describing oil palm planted by peat depth.

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102 Based on assessment of Danielsen and Heegaard (1995), *op. cit.*; Laidlaw (1998), *op. cit.*; Peh *et al.*, (2005), *op. cit.*; Peh *et al.*, (2006), *op. cit.*; Koh & Wilcove (2008), *op. cit.*; Edwards *et al.* (2010), *op. cit.*; and Kefahi *et al.* (2014).

103 Hooijer, A., Silvius, M., Wösten, H. and Page, S. 'PEAT-CO2, Assessment of CO2 emissions from drained peatlands in SE Asia'. *Delft Hydraulics report Q3943* (2006), Delft, Netherlands.

104 Posa, *et al.,* (2011). *Op. cit.*

105 Yule, C.M. 'Loss of biodiversity and ecosystem functioning in Indo-Malayan peat swamp forests'. *Biodiversity and Conservation* (2010) 19:393–409.

106 Dargie, G.C., Lewis, S.L., Lawson, I.T., Mitchard, E.T.A., Page, S.E., Bocko, Y.E., & Ifo, S.A. Age, extent and carbon storage of the central Congo Basin peatland complex. Nature 542, 86–90 (2017).

107 Posa, *et al.,* (2011). *Op. cit.*

108 Page *et al. (2006). Op. cit.*

109 Hooijer et al. (2006). Op. cit.

An estimated 10% of the oil palm cultivated in Peninsular Malaysia, Borneo and Sumatra in 2000 was on peat land.[110] The estimated area of oil palm cultivation on peat (880,000 hectares) is equivalent to 6% of the 14.7 million hectares of peatland in the area, and 38% of the total area of cleared peatland. However, there is significant variation in the proportion of peatland converted to oil palm cultivation in different parts of the region. For example, analysis of official land use data in Peninsular Malaysia showed that 222,000 hectares of oil palm was on peatlands by 2006, which is equivalent to 9.5% of the total oil palm area, and over one third of the total area of peat.[111] [112] This was an increase of over 18,000 hectares (or 3% of total peatlands) from 2002. Another study estimated a smaller area of 207,458 hectares of oil palm in Peninsular Malaysia, 21,405 hectares in Sabah, and 437,174 hectares in Sarawak.[113] 27% of peatlands in Peninsular Malaysia, Sumatra and Borneo (i.e. virtually the entire oil palm area in Indonesia and Malaysia) were covered by industrial plantations in 2015, of which 73% (3.1 million hectares) was oil palm.[114] Future oil palm development is likely to encroach more extensively on peatlands, even though it has been considered historically as marginal land for cultivation,[115] and drainage of peatlands for cultivation can cause subsidence and that in turn increases the risk that land becomes unsuitable for cultivation due to flooding.[116] An enumeration of the extent and current land use of peat lands based on Miettinen *et al (2016)*[117] is summarised in Table 7**.**

This land-use change also contributed to the loss of ≈140 million tonnes of aboveground biomass carbon, and annual emissions of ≈4.6 million tonnes of below ground carbon from peat oxidation.[118] Between 1997 and 2006, peatland fires in the Indo-Malayan region are estimated to have caused average yearly carbon dioxide emissions of 1,400 million tonnes, with 90% of this originating in Indonesia, mostly from Riau Province, Sumatra.[119] This is equivalent to almost 8% of global emissions from fossil fuel burning. When emissions from oxidisation of drained peat (600 million tonnes per year) and deforestation are included, approximately 3,750–5,400 tonnes of carbon dioxide will be emitted for each hectare of peatland converted to oil palm over the next 25 years.[120] Danielsen et al. (2008) estimated that it would take over 600 years for the carbon emissions saved through use of biofuel to compensate for the carbon lost through conversion of peat swamp forest, whether for oil palm or other crops.

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110 Koh, L.P., Miettinen, J., Liew, S.C., and Ghazoul, J. 'Remotely sensed evidence of tropical peatland conversion to oil palm'. Proceedings of the National Academy of Science 108/12 (2011) 5127–5132.

111 Wetlands International. *A Quick Scan of Peatlands in Malaysia*. Malaysia 2010.

112 Wahid et al (2010) reported 207,458 ha of oil palm on peat in Peninsular Malaysia in 2009.

113 Wahid O., Nordiana A.A., Tarmizi A.M., Haniff M.H., & Kushairi A.D. (2010) Mapping of oil palm cultivation in peatland in Malaysia. MPOB information series. MPOB TT no. 473

114 Miettinen, J., Shi, C., and Liew, S.C. Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990' Global Ecology and Conservation, Volume 6, (2016), Pp 67–78.

115 Koh *et al.* (2011). *Op. cit.*

116 Uda, S.K., Hein, L. & Sumarga, E. Wetlands Ecol Manage (2017). https://doi.org/10.1007/s11273-017-9544-0

117 Miettinen *et al*.(2016)*. Op. cit.*

118 Koh *et al.* (2011). *Ibid.*

119 Hooijer *et al.* (2006), *Op. cit.*

120 Yule (2010), *Op. cit.*

Koh *et al*. (2011) also estimated that the observed conversion of peat swamp forest to oil palm plantation could have resulted in the loss of 1% of Borneo's biodiversity, 3.4% in Sumatra, and 12.1% in Peninsular Malaysia.

On October 23, 2015, Indonesian President Joko Widodo announced a moratorium on new peatland concessions and a cancellation of existing concessions that have not been developed, thereby halting the legal conversion of peatland and peat swamp forests into agricultural land. The impact of this moratorium can already be seen in the slowdown in the area growth in Indonesia in 2016 and 2017 (**Figure 11** in Section 7.1.8), which occurred despite the increase in the local palm oil price, which has usually been linked with an expansion in new plantings.

Table 7: Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 (`000 hectares), adapted from Miettinen et al. (2016) and others

	Pristine PSF	Degraded PSF	Secondary forest to ferns/ low shrub	Others	Small-holder area	Industrial plantation	Total	Industrial oil palm	Ind. oil palm, % of Total	Peat depth indicators, % of Total	Note on peat depth
Peninsular Malaysia	41	152	892	69	267	279	892	276	31%	17% <1.5m	For West Johor
Sarawak	8	383	1,449	27	141	725	1,449	718	50%	5.9% <1.5m	For Sarawak
Sabah	3	43	191	9	26	66	191	66	35%		
Total Malaysia	**52**	**579**	**2,532**	**105**	**434**	**1,071**	**2,532**	**1,060**	42%		
Brunei	82	19	123	5	3	0	123	-	0%		
Riau	295	686	4,062	151	1,502	1,210	4,062	591	15%	44% <2m	1990 data
Jambi	72	100	672	10	241	178	672	115	17%	42% <2m	
South Sumatra	11	77	1,457	47	272	618	1,457	209	14%	96% <2m	
Total Sumatra	**436**	**957**	**7,230**	**241**	**2,393**	**2,405**	**7,230**	**1,316**	**18%**	53% <2m	For 8 Provinces (1990)
West Kalimantan	69	766	1,752	117	198	352	1,752	309	18%		
Central Kalimantan	327	1,058	3,042	158	304	244	3,042	244	8%	50% < 2m	
South Kalimantan	-	8	303	5	144	83	303	77	25%		
East Kalimantan	30	178	684	98	35	131	684	101	15%		
Total Kalimantan	**426**	**2,010**	**5,782**	**378**	**681**	**810**	**5,782**	**731**	**13%**		
Total study area	**996**	**3,564**	**2,581**	**729**	**3,510**	**4,286**	**15,667**	**3,106**	**20%**		
% of total	6%	23%	16%	5%	22%	27%	100%	20%			

Notes: PSF: peat swamp forest. Others: Water, seasonal water, mangrove, urban, clearance areas.
Industrial Oil Palm is a sub-set of Industrial plantation. Shallow peat versus deep peat information is only readily available for certain areas. Refer to Wetlands International (2010) for Malaysia and Wahyunto et al. (2008) for Indonesia. Please refer to sources for details about the accuracy of estimates.

In summary, peatlands in Indonesia and Malaysia are threatened, and their conversion to other land uses has disproportionate impacts on biodiversity and greenhouse gas emissions. There is consistent evidence (Table 8[121]) that expanding palm oil cultivation contributes towards the environmental problems of peat swamp deforestation, the resulting biodiversity loss and carbon emissions. There is insufficient information to assess the likelihood of significant future expansion of oil palm cultivation onto peatlands, and hence whether its contribution to global greenhouse gas emissions is likely to grow.

Table 8: Information quality assessment for oil palm cultivation contributes towards environmental problems associated with peatland conversion.

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Peatland conversion	8	1.0	0.8	1.0	0.9

7.1.4. Greenhouse gas emissions

Greenhouse gas emissions from palm oil cultivation and initial processing derive from two main sources: land use change (with additional emissions if fire is used to clear land for cultivation), and plantation and mill activities. Additional consideration is given to the consequences of emissions from these sources when palm oil is used as a feedstock for biofuel, because biofuel use has been promoted as an emissions reduction measure.

Land use change

The largest determinant of oil palm cultivation's contribution to greenhouse gas emissions through land use change (LUC) is the difference in carbon sequestration between the palm oil plantation and the land use it replaces.[122]

Tropical forests store around 46% of the world's living terrestrial carbon,[123] and 25% of total net global carbon emissions may stem from deforestation.[124]

Unlogged forest Asian tropical forests store up to 400 tonnes of carbon per hectare above ground, with additional carbon stored in mineral soils as yet poorly quantified.[125] This is up to four times the amount of aboveground carbon of a fully mature oil palm plantation (91 tonnes per hectare). If forest vegetation were cleared with fire, compounds that have a net greenhouse effect equal to 207 tonnes per hectare of carbon would be emitted, although some estimates are considerably higher (around 650 tonnes carbon dioxide

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121 Based on an assessment of Wetlands International (2011), *op. cit.*; Koh *et al*. (2011), *op. cit.*; Hooijer *et al.* (2006), *op. cit.*; Danielsen *et al.* (2008), *op. cit.*; Yule (2010), *op. cit.*; and Koh *et al*. (2011), *op. cit.*; Miettien *et al,* (2016), *op. cit..,* Hein *et al.* (2017). *Op. cit.*

122 Chase, L.D.C., and Henson, I.E.. 'A detailed greenhouse gas budget for palm oil production'. International Journal of Agricultural Sustainability 8 (2010) 199-214.

123 Soepadmo, E. 'Tropical rain forests as carbon sinks'. *Chemosphere* 27 (1993), 1025–1039.

124 Skutsch, M., Bird, N., Trines, E., Dutschke, M., Frumhoff, P., de Jong, B., van Laake, P., Masera, O., and Murdiyarso, D. 'Clearing the way for reducing emissions from tropical deforestation'. *Journal of Environmental Science and Policy* 10 (2007), 322–334.

125 Lucey, J., Hill, J. van der Meer, P., Reynolds, G. & Agus, F. (2014). Change in carbon stocks arising from land-use conversion to oil palm plantations: A science-for-policy paper for the Oil Palm Research-Policy Partnership Network. Available at: www.sensorproject.net/outputs

equivalent per hectare).[126] A recent review of the evidence concluded that there was high confidence in the evidence for large net greenhouse gas emissions from forest conversion.[127]

If the original habitat were peat swamp forest, then a soil carbon stock as high as 1,550 tonnes per hectare would be added to emissions from the oxidisation of drained peat soil,[128] or a total of 1,300 tonnes carbon dioxide equivalents during the first 25-year cycle of oil palm growth (depending on peat depth and characteristics and drainage regime).[129] Lucey et al. (2014) concluded that there was high confidence in the evidence for very high carbon loss from peat swamp forest conversion.[130]

In practice, a large proportion of forest converted to oil palm plantations is logged forest, grassland, or land previously used for agriculture. The standing carbon stock of these vegetation types has been reported as between 187-361 tonnes per hectare.[131]

Oil palm plantation established on grassland will replace the released carbon within approximately 10 years, as grassland has an above ground carbon stock that has been estimated at less than that of a mature oil palm plantation: 39 tonnes per hectare.[132] This suggests that oil palm plantations established on grassland would result in the net removal of about 135 tonnes carbon dioxide per hectare from the atmosphere over a 25-year period.[133] Lucey et al. (2014) concluded that there was high confidence in the evidence that converting grassland to oil palm would result in no carbon loss, and may in fact result in some carbon capture.[134] Similarly, establishing oil palm plantations on scrublands is likely to result in net carbon sequestration (Lucey *et al*., 2014).[135]

A complete life-cycle carbon model, based on palms grown in established plantations, estimates that growing and refining each metric ton of crude palm oil (CPO) produces the equivalent of 0.86 metric ton of carbon dioxide.[136]

In summary, there is consistent and rigorous evidence that converting forests to palm oil plantations results in net greenhouse gas emissions (Table 9)[137]. Emissions are extremely high if the forest being converted is peat swamp forest, high from unlogged forest on mineral soils, and variable from selectively logged forest. Conversion of grasslands, however, can see a net uptake of carbon dioxide. These findings are wholly consistent

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126 Germer J. and Sauerborn, J. 'Estimation of the impact of oil palm plantation establishment on greenhouse gas balance'. *Environment Development and Sustainability* 10 (2007), 619-716.

127 Lucey *et al.* (2014), *op. cit.*

128 Hooijer *et al.* (2006), *op. cit.*

129 Germer and Sauerborm (2007), *op. cit.*

130 Lucey *et al.* (2014), *op. cit.*

131 Morel, 2009, cited in Klaarenbeeksingel, F.W. 'Greenhouse Gas Emissions from Palm Oil Production: Literature review and proposals from the RSPO Working Group on Greenhouse Gases'. Final report, 9 October 2009.

132 Murdiyarso *et al.* (2002), *op. cit.*

133 Germer and Sauerborm (2007), *op. cit.*

134 Lucey *et al.* (2014), *op. cit.*

135 Lucey *et al.* (2014), *ibid*

136 Chase and Henson (2010), *op. cit.*

137 Based on an assessment of Murdiyarso *et al.* (2002), *op. cit.*; Hooijer *et al*. (2006), *op. cit.*; Germer & Sauerborn (2007), *op. cit.*; Danielsen *et al.* (2008), *op. cit.*; and Chase & Henson (2010), *op. cit.*

with a recent review of the evidence.[138] **Appendix 3** further reviews published consequential life cycle analyses.

Table 9: Information quality assessment for greenhouse gas emissions from conversion of various vegetation types to oil palm plantations

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
GHG emissions (LUC)	5	1.0	0.9	1.0	1.0

Mills and other plantation activities

In addition to land use change, greenhouse gas emissions from palm oil production include those from treatment of palm oil mill effluent (POME), fertiliser use, energy inputs to mills, and fossil fuel use for vehicles, machinery and power generation during day-to-day activities. Of these, the first two are likely to produce the highest emissions.[139]

POME, a liquid waste from the initial processing of fresh fruit bunches, has to be treated in a series of anaerobic and aerobic digestion ponds to make it safe for release into watercourses. Methane emissions from the anaerobic treatment are a major concern due to the global warming potential of methane (CH_4) 34 times that of carbon dioxide over a 100-year period. Methane emissions from POME are the second largest source of GHG emissions from oil palm production after land use change[140]. Emissions from treatment ponds reach 1,043 kg per day per pond.[141] A growing number of mills now capture the methane emitted during anaerobic digestion of POME, either for flaring, as a boiler fuel or for electricity generation. Significant efforts are underway in Malaysia to install biogas plants in new and existing mills under the Economic Transformation Programme[142]. Using the methane in mill boilers results in substantial reductions in carbon dioxide emissions and releases biomass to return as organic matter to fields or as fuel for boilers.[143]

A further potential source of greenhouse gas emissions from oil palm cultivation is nitrous oxide (N_2O), released due to the use of nitrogen fertiliser (including the use of nitrogen fixing cover crops), which has a global warming potential of 298 relative to carbon dioxide. Nitrous oxide emissions from palms using fertiliser have been estimated at 4.4 kg N_2O-N per hectare per year, although the authors recognise significant

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138 Lucey *et al.* (2014), *op. cit.*

139 Acton, J. and Hewit, N. *Greenhouse gas and volatile organic compound emissions from oil palm: A science-for-policy paper by the SEnSOR programme* (2016). Available from: http://www.sensorproject.net/outputs

140 Chase, L.D.C., and Henson, I.E.. 'A detailed greenhouse gas budget for palm oil production'. *International Journal of Agricultural Sustainability* 8 (2010) 199-214.

141 Yacob, S., Hassan, M. A., Shirai, Y., Wakisaka, M. & Subash, S. 'Baseline study of methane emission from anaerobic ponds of palm oil mill effluent treatment'. *Science of the Total Environment*, 366 (2005), 187 -196.

142 Loh, S.K., Nasrin, A.B., Mohamad Azri, S., Nurul Adela, S.B., Muzzammil, N., Daryl Jay, T., Stasha Eleanor, R.A., Lim, W.S., Choo, Y.M., & Kaltschmitt M. (2017). 'First Report on Malaysia's experiences and development in biogas capture and utilization from palm oil mill effluent under the Economic Transformation Programme: Current and future perspectives.' Renewable and Sustainable Energy Reviews, 74, 1257-1274.

143 Chase & Henson (2010), *op. cit.*

uncertainty with this result.[144] A more recent study estimated nitrous oxide emissions at 19–22 kg N_2O-N per hectare, with decreasing emissions as plantations matured.[145]

Mills meet much of their power requirements through the combustion of oil palm crop residues.[146] In a pilot study with nine RSPO members, fossil fuel consumption at the mill stage was low, at 0-2% of total GHG emissions.[147] Carbon dioxide is also emitted from oil palm estates through fossil fuel combustion (i.e., vehicle and machinery use, power generation) during estate maintenance (0.06 tonnes CO_2 equivalent per hectare per year) and harvesting (2.27 tonnes CO_2 equivalent per hectare per year.[148]

In summary, while land use change is in many cases likely to be the largest source of greenhouse gas emissions associated with palm oil production and processing, plantation management and mill operations result in greenhouse gas emissions regardless of previous land use.[149] However, there is limited empirical evidence and significant uncertainty around greenhouse gas emissions from estate management (Table 10[150]), which suggests that further research is required to quantify methane and nitrous oxide emissions from oil palm cultivation in particular.

Table 10: Information quality assessment for greenhouse gas emissions from mills and plantation activities

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
GHG emissions (mills & plantations)	4	0.7	0.7	N/A	N/A

Note: As the cited papers are estimating different parameters, no consistency score is given and hence no overall score for information quality.

Use of palm oil as biofuel feedstock

144 Fowler, D., Nemitz, E., Misztal, P., Di Marco, C., Skiba, U., Ryder, J., Helfter, C., Cape, J. N., Owen, S., Dorsey, J., Gallagher, M. W., Coyle, M., Phillips, G., Davison, B., Langford, B., MacKenzie, R., Muller, J., Siong, J., Dari - Salisburgo, C., Di Carlo, P., Aruffo, E., Giammaria, F., Pyle, J. A. & Hewitt, C. N. 'Effects of land use on surface –atmosphere exchanges of trace gases and energy in Borneo: comparing fluxes over oil palm plantations and a rainforest'. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, 366 (2011), 3196 -3209.

145 Kusin, F.M., Akhir, N.I.M., Mohamat-Yusuff F., and Awang, M. 'Nitrous oxide emission from nitrogen fertiliser application in oil palm plantation of different stages'. *International Journal of Global Warming*, 9/4 (2016). 629-541.

146 Hosseini, S. E. & Wahid, M . A. 'Utilization of palm solid residue as a source of renewable and sustainable energy in Malaysia'. Renewable and Sustainable Energy Reviews, 40 (2014), 621 - 632.

147 Bessou, C., Chase, L. D. C., Henson, I. E., Abdul -Manan, A. F. N., Milà i Canals, L., Agus, F., Sharma, M. & Chin, M. 'Pilot application of PalmGHG, the Roundtable on Sustainable Palm Oil greenhouse gas calculator for oil palm products'. Journal of Cleaner Production, 73 (2014), 136 -145.

148 Chase & Henson (2010), *op. cit.*

149 Chase & Henson (2010), *ibid*

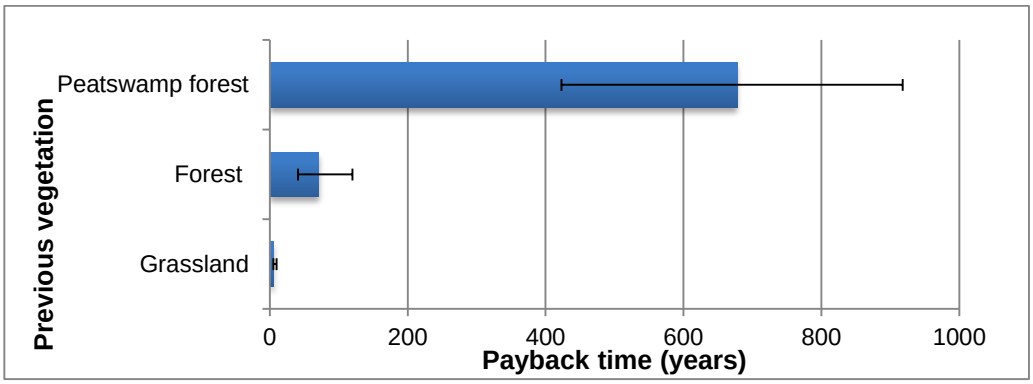
150 Based on an analysis of Chase & Henson (2010), *ibid.*; Fowlser *et al.* (2011), *op. cit.*; Bessou *et al.* (2014), *op. cit.*; and Kusin *et al.* (2016).

Biofuel can replace use of fossil fuels, and hence potentially contribute to a net reduction in greenhouse gas emissions. This occurs not only through the production of biodiesel, but from the direct use of vegetable oils and palm biomass in boilers for power generation. This is commonly expressed as a 'payback time', that is, the time taken for the greenhouse gas emissions saved through using a renewable source (in this case palm oil) rather than fossil fuels to equal the carbon emissions from production of the biofuel.

Estimates of the payback time from biofuels produced by plantations on converted forestland are far from uniform, at 39 years,[151] 30-120 years,[152] 75 years,[153] and 86 years[154], see Figure 9**.** This increases by 18 years if the forest was cleared by fire,[155] which was a frequent practice in Indonesia. If the original habitat was peat land, recapture of the emitted carbon would take 692 years,[156] between 420-840 years depending on the depth of the peat,[157] or 918 years.[158] In addition, this does not take into account the indirect land use effect of switching area between different crops.

If the original habitat were degraded grassland, the plantation would have compensated for emissions within 10 years[159] or fewer,[160] because palm oil plantations can increase ecosystem carbon storage compared with degraded grassland and scrublands, while simultaneously offsetting fossil carbon emissions.

Figure 9: Greenhouse gas payback time for biodiesel from oil palm plantations converted from different vegetation types.



Note: Bars indicate the maximum and minimum estimates from the literature.

[151] Souza, S.P. de, Pacca, S. Márcio Turra de Ávila, M.T. de, Borges, J.L.B. 'Greenhouse gas emissions and energy balance of palm oil biofuel'. *Renewable Energy* 35/11 (2010), 2552–2561.

[152] Gibbs, H.K., Johnston, M., Foley, J.A., Holloway, T., Monfreda, C., Ramankutty, N., and Zaks, D. 'Carbon payback times for crop-based biofuel expansion in the tropics: the effects of changing yield and technology'. Environmental Research Letters 3 (2008), 034001 (10pp).

[153] Danielsen *et al.* (2008), *op. cit.*

[154] Fargione, J., Hill, J., Tilman, D., Polasky, S. & Hawthorne, P. 'Land clearing and the biofuel carbon debt'. Science, 319 (2008), 1235 -1238.

[155] Danielsen *et al.* (2008), *op. cit.*

[156] Danielsen *et al.* (2008), *Ibid.*

[157] Fargione *et al.* (2008), *op. cit.*

[158] Gibbs *et al.* (2008), *op. cit.*

[159] Danielsen *et al.* (2008), *op. cit.*

[160] Gibbs *et al.* (2008), *op. cit.*

Note that the EU Renewable Energy Directive (EU RED) sustainability criteria do not allow biofuels that are produced from areas that used to be forest or peatlands that were further drained to count towards EU RED targets.

In summary, the length of time taken for palm oil based biofuels to result in carbon reductions is highly dependent on the previous land use of the plantations. Only vegetation types such as degraded grassland yield net carbon savings within a decade of conversion. Biofuels derived from palm oil grown on land that was previously forested are unlikely to achieve a net carbon gain for at least 30 years (and probably far longer) and the payback period from peat land is likely to run to several hundred years. These findings are consistent across a small number of studies (Table 11).[161]

Table 11: Information quality for the carbon payback time of palm oil biofuels on original vegetation type

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
GHG emissions (biofuels)	4	1.0	1.0	1.0	1.0

7.1.5. Use of fire and its impacts

Fire is considered a cheap and effective method to clear and maintain land for agricultural and plantation development, especially in Kalimantan and Sumatra.[162] However, the practice of burning damages biodiversity, reduces carbon storage, and can severely degrade regional air quality.

Burning takes place annually, peaking in droughts associated with El Niño, when fuel sources become more flammable. Drained peat land represents a particular fire hazard: it is highly flammable and once alight peat fires can burn for months or even years.

This can result in globally significant greenhouse gas emissions. Global greenhouse gas emissions from vegetation fires were 2,000 million tonnes of carbon per year between 1997 and 2009, 10% of which were from equatorial Asia. This share rose to 40% in 1997, an El Niño year, mostly due to fires in Indonesia.[163] Fires in peat forest in 1997 were particularly severe, releasing between 810 and 2,570 million tonnes of carbon into the atmosphere, equivalent to 13–40% of the average annual global carbon emissions from fossil fuels.[164] Similarly, the El Niño event of 2015 was associated with over 100,000 manmade fires that burned 2.6 million hectares of Indonesian land between

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161 Danielsen *et al.* (2008), *op. cit.*; Gibbs *et al.* (2008), *op. cit.*; Fargione *et al.* (2008), *op. cit.;* and Souza *et al.* (2010), *op. cit.*

162 Marlier, M. E., DeFries, R.S., Kim, P.S., Koplitz, S.N., Jacob, D.J., Mickley, L.J. and Myers, S.S. 'Fire emissions and regional air quality impacts from fires in oil palm, timber, and logging concessions in Indonesia'. *Environmental Research Letters* 10 (2015), 085005.

163 van der Werf, G.R., Randerson, J.T., Giglio, L., Collatz, G. J., Mu, M., Kasibhatla, P. S., Morton, D. C., DeFries, R. S., Jin, Y., and van Leeuwen, T.T. 'Global fire emissions and the contribution of deforestation, savanna, forest, agricultural, and peat fires (1997–2009)'. *Atmospheric Chemistry and Physics*, 10 (2010), 11707–11735.

164 Page, S.E., Siegert, F., Rieley, J.O., Boehm, H-D. V, Jaya, A. and Limin, S. 'The amount of carbon released from peat and forest forest in Indonesia during 1997'. *Nature* 420 (2002), 61–65.

June and October,[165]. 33% of the total area burned was peat land. These 2015 fires in Indonesia caused emissions of between 1.62[166] and 1.75[167] billion tonnes of CO_2 equivalent and effectively tripled Indonesia's greenhouse gas emissions for that year.

In addition to carbon emissions, burning results in significant transboundary air pollution and regional health impacts, even in non-drought years.[168] This is assessed in the section on haze. The remainder of the present section will focus on evidence for the role of palm oil cultivation in burning, and the instruments employed to reduce it.

Analysis of the extent to which oil palm cultivation is responsible for burning is not available for all countries where oil palm is cultivated. There are several smaller-scale studies using different methods that together provide an indication of the degree to which oil palm cultivation is responsible for fires. Approximately 19% of the land burned in Indonesia in 2015,[169] and 16.6% of fires between 2012-15 in Sumatra and Kalimantan, occurred within oil palm concessions.[170] Most fires and related greenhouse gas emissions between 2003 and 2013 in Sumatra and Kalimantan occurred outside concessions, but oil palm plantations were a greater source than timber plantation or logging concessions in Kalimantan and second to timber plantations in Sumatra.[171] There is significant uncertainty in attribution of fires to concession-owning companies, as the methods used do not account fully for fires that have been started by communities living within concession boundaries.[172]

The health and environmental issues associated with burning have given rise to several regulatory and voluntary initiatives. At a regional level, the 1999 Association of Southeast Asian Nations' (ASEAN) Policy on Zero Burning and the 2002 ASEAN Agreement on Transboundary Haze Pollution have to date failed to stop the fires. In 2015, President Widodo of Indonesia instructed government agencies to revoke the permits of any palm oil companies involved in the burning of forests and urged the arrest of those responsible. In 2014, the Singapore Parliament passed the Transboundary Haze Pollution Act (THPA), allowing fines to be imposed on companies that cause or contribute to transboundary haze pollution in Singapore.[173] On a voluntary level, Criterion 5.5 of the

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165 World Bank 'The Cost of Fire An Economic Analysis of Indonesia's 2015 Fire Crisis'. *Indonesia Sustainable Landscapes Knowledge Note: 1*. The World Bank Group (2016), Jakarta.

166 Chamorro, A., Minnemeyer, S., and Sargent, S. *Exploring Indonesia's Long and Complicated History of Forest Fires*. World Resources Institute, February 16, 2017 http://www.wri.org/blog/2017/02/exploring-indonesias-long-and-complicated-history-forest-fires

167 World Bank (2016), *op. cit.*

168 Gaveau, D.L.A., Salim, M.A., Hergoualc'h, K., Locatelli, B., Sloan, S., Wooster, M., Marlier, M.E., Molidena, E., Yaen, H., DeFries, R., Verchot, L., Murdiyarso, D., Nasi, R., Holmgren, P., and Sheil, D. 'Major atmospheric emissions from peat fires in Southeast Asia during non-drought years: evidence from the 2013 Sumatran fires'. *Scientific Reports* 4 (2014), 1-7.

169 Recalculated from figure on page 1 of World Bank (2016), *op. cit.*

170 Cattau, M.E., Marlier, M.E., and DeFries, R. 'Effectiveness of Roundtable on Sustainable Palm Oil (RSPO) for reducing fires on oil palm concessions in Indonesia from 2012 to 2015'. *Environmental Research Letters* 11 (2016), 105007.

171 Marlier *et al.* (2015), *op. cit.*

172 Gaveau *et al.* (2014), *op. cit.*

173 Lee, J.S.H., Jaafar, Z., Tan, A.K.J., Carrasco, L.R., Ewing, J.J., Bickford, D.P., Webb, E.L. and Koh, L.P. 'Toward clearer skies: challenges in regulating transboundary haze in Southeast Asia'. *Environmental Science and Policy* 55 (2016), 87–95.

RSPO Principles and Criteria[174] forbids burning as a means of land clearance, other than in those situations specified in the ASEAN Policy on Zero Burning. This appears to have had some success in reducing the incidence of fires in wetter periods, but none during droughts.[175] Carbon payments are considered unlikely to be an effective mechanism for promoting zero burning approaches, as they only match the value of the agriculture, including oil palm cultivation, that is enabled by burning on peat soils.[176,177]

In summary, fires used to clear forest in Kalimantan and Sumatra (and particularly peat lands) for agriculture are a major source of greenhouse gas emissions and air pollution. Oil palm cultivation could be responsible for perhaps 16-19% (and 52% in Sumatra in 2013) of these fires, although there is significant uncertainty due to the small number of rigorous studies available and the methodology used to attribute fires (Table 12).[178]

Table 12: Information quality assessment for the contribution of palm oil cultivation to forest fires

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Burning	3	0.6	0.7	1.0	0.7

7.1.6. Air pollution

Haze

Haze pollution has been an occasional but sometimes severe problem in Southeast Asia over the past 20 years.[179] Haze pollution consists of airborne particles, including fine ($PM_{2.5}$) and ultrafine (PM_{10}) particles generated from fires. The principal source of haze in Southeast Asia is fires started in order to clear land for agriculture, especially on peat lands, with Sumatra and Kalimantan the main source locations.[180,181]

The 1997 haze event was the first to elicit widespread public attention. Hospital admissions in Singapore for haze-related conditions rose by 30% in that year.[182]

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174 RSPO 'Principles And Criteria For The Production Of Sustainable Palm Oil'. The Roundtable on Sustainable Palm Oil (2013), Kuala Lumpur.

175 Cattau *et al.* (2016), *op. cit.*

176 Gaveau *et al.* (2014), *op. cit.*

177 Chisholm, R.A., Wijedasa, L.S. and Swinfield, T. 'The need for long-term remedies for Indonesia's forest fires'. *Conservation Biology* 30 (2016), 5–6.

178 Based on an assessment of Marlier *et al.* (2015), *op. cit.*; Cattau *et al.* (2016), *op. cit.*; and World Bank (2016), *op. cit.*

179 Gaveau *et al.* (2014), *op. cit..*

180 Sastry, N. 'Forest fires, air pollution, and mortality in Southeast Asia'. *Demography* 39 (2002), 1–23.

181 Reddington, C., Yoshioka, M., Balasubramanian, R., Ridley, D., Toh, Y., Arnold, S. and Spracklen, D. 'Contribution of vegetation and peat fires to particulate air pollution in Southeast Asia'. *Environmental Research Letters*, 9 (2014), 094006.

182 Emmanuel, S.C. 'Impact to lung health of haze from forest fires: the Singapore experience.' *Respirology* 5 (2000), 175–82.

Extensive fires in 2015 drove the longest haze event on record, lasting three months.[183] The health effects of haze include potential *in utero* deaths,[184] respiratory ailments and exacerbation of existing heart and lung conditions.[185][186][187] Haze in 2015 resulted in an estimated 100,300 excess deaths across Indonesia, Malaysia and Singapore.[188]

Other economic impacts include disruption to transport and tourism.[189][190] The economic impacts are felt most strongly in Indonesia and neighbouring Singapore and Malaysia, but can also extend to Vietnam, Thailand and the Philippines.[191][192][193] The economic impact of haze pollution have been estimated at US$ 643.5 million per year in Singapore,[194] US$91 million per year in Malaysia[195] and regional costs of US$760 million in 1997 and 1998 combined.[196] The disparities between these valuations reflect variation in the severity of events, as well as the different accounting methods used.

In summary, there is a body of evidence **(Table 13**[197]) that transboundary haze pollution, causes economic and health damage in Southeast Asia. Forest fires, especially those on peat lands, which are started to clear land for agriculture are the main cause of haze. Oil palm cultivation contributes to these fires, but the proportion that can be attributed to palm oil is not known with certainty (see previous section).

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183 Lin, Y., Wijedasa, L.S. and Chisholm R A. 'Singapore's willingness to pay for mitigation of transboundary forest-fire haze from Indonesia'. Environmental Research Letters 12 (2017), 024017.

184 Jayachandran, S. 'Air Quality and Early-Life Mortality During Indonesia's Massive Wildfires in 1997' *California Center for Population Research, On-Line Working Paper Series,* University of California (2005), USA.

185 Emmanuel (2000), *op. cit..*

186 Kunii, O., Kanagawa, S., Yajima, I., Hisamatsu, Y., Yamamura, S., Amagai, T. and Ismail, I.T.S. 'The 1997 haze disaster in Indonesia: its air quality and health effects'. Archives of Environmental Health: An International Journal 57 (2002), 16–22.

187 Sastry (2002), *op. cit..*

188 Koplitz, S.N., Mickley, L.J., Marlier, M.E., Buonocore, J.J., Kim, P.S., Liu, T., Sulprizio, M.P., DeFries, R.S., Jacob, D.J., Schwartz, J., Pongsiri, M. and Myers, S.S. 'Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure'. *Environmental Research Letters*, 11 (2016), 094023.

189 Lee, J.S.H., Jaafar, Z., Tan, A.K.J., Carrasco, L.R., Ewing, J.J., Bickford, D.P., Webb, E.L. and Koh, L.P. 'Toward clearer skies: challenges in regulating transboundary haze in Southeast Asia'. Environmental Science and Policy 55 (2016), 87–95.

190 Lin *et al.,* (2017), *op. cit.*

191 Chisholm, R.A., Wijedasa, L.S. and Swinfield, T. 'The need for long-term remedies for Indonesia's forest fires'. Conservation Biology 30 (2016), 5–6.

192 Lee *et al.,* (2016), *op. cit.*

193 Lin *et al.,* (2017), *op. cit.*

194 Lin *et al.,* (2017), *ibid.*

195 Othman, J., Sahani, M., Mahmud, M., Sheikh Ahmad, M.K. 'Transboundary smoke haze pollution in Malaysia: inpatient health impacts and economic valuation'. *Environmental Pollution*, 189 (2014), 194–201.

196 Tacconi, L. *Fires in Indonesia: Causes, Costs and Policy Implications*. Center for International Forestry Research (2003), Bogor, Indonesia.

197 Based on assessment of Emmanuel (2000), *op. cit.*; Kunii *et al*. (2002) *op. cit.*; Sastry (2002), *op. cit.*; Tacconi (2003), *op. cit.*; Jayachandran (2005), *op. cit.*; Othman *et al.* (2014), *op. cit.*; Koplitz et al. (2016), *op. cit.*; and Lin *et al.,* (2017), *op. cit.*;

Table 13: Information quality assessment for the impact of transboundary haze on health and economic activity in Southeast Asia

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Air pollution (haze)	8	1.0	0.8	1.0	0.9

Other air pollution

Empty fruit bunches, waste fibres and shells are commonly burnt to provide the power requirements for mills. This can result in the emission of particulate matter, nitrogen and sulphur oxides, unburned hydrocarbons, carbon volatile organic compounds and polycyclic aromatic hydrocarbons.[198] Emissions from mills in Malaysia in the 1980s were within legal limits,[199] but there is scant modern research on the extent of pollution emitted by mills.

7.1.7. Water pollution

Major risks of water pollution may occur during the clearing and establishment phase of plantations (especially sedimentation); discharge of palm oil mill effluent (POME); and release of agrichemicals through run-off and leaching.

Sedimentation of water bodies is considered a particular risk during the clearing and establishment phases of plantation management, when the soil is largely uncovered.[200] [201] However, streams draining palm plantations later in their development have been shown to have hydrological, physical, and biochemical alterations that differ from those draining forest.[202] For example, palm plantations in West Kalimantan had sediment concentrations that are on occasions hundreds of times above those in streams draining forest.[203]

POME has high acidity, and high biological oxygen demand (BOD) and chemical oxygen demand (COD). When discharged into waterways it can contaminate drinking water and be harmful to aquatic life through acidity or eutrophication (where excessive nutrients

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198 Hosseini & Wahid (2014), *op. cit.*

199 Yaccob, M., Rahman, K.A., and Yusef, R.M. 'Air Pollution Control in Palm Oil Mill Industry in Malaysia'. Presented at the Symposium on Environmental Perspectives towards the Year 2000 and Beyond, Bangkok, Thailand, 1989. Available at http://eprints.utm.my/3932/1/SKMBT_60007061915393.pdf

200 Goh, K. J., Härdter, R., and Fairhurst, T. 'Fertilizing for maximum return'. In *Oil Palm: Management for Large and Sustainable Yields* (T. Fairhurst and R. Hardter, Eds.), pp. 279–306. Potash & Phosphate Institute/Potash & Phosphate Institute of Canada and International Potash Institute (PPI/PPIC and IPI), 2003, Singapore.

201 Lord, S. and Clay, J. *Environmental Impacts of Oil Palm – Practical Considerations in Defining Sustainability for Impacts on the Air, Land and Water*. New Britain Palm Oil (n.d.). Available at http://www.nbpol.com.pg/wp-content/uploads/downloads/2011/02/EnvironmentalImpactOfOilPalm.pdf

202 Carlson, K.M., Curran, L.M., Ponette-González, A.G., Ratnasari, D., Ruspita, Lisnawati, N., Purwanto, Y., Brauman, K.A., Raymond, P.A. 'Influence of watershed-climate interactions on stream temperature, sediment yield, and metabolism along a land use intensity gradient in Indonesian Borneo'. *Journal of Geophysical Research: Biogeosciences* 119 (2014), 1110–1128.

203 Carlson *et al.* (2014) *ibid.*

result in over-abundant algal growth). Most mills treat POME before discharge, in digestion ponds or with methane capture. Producer countries typically have legislation pertaining to standards of discharge,[204] which is implemented with some success in Malaysia,[205] but with less in Indonesia.[206]

Fertiliser is typically applied to the base of oil palms once or twice per year. Significant nutrient losses into groundwater or surface water are expected from palm oil plantations,[207] caused by run-off and erosion (particularly when the soil is exposed at clearing and planting stages, and by the die-back of ground cover vegetation due to low light levels near the ground) and leaching (exacerbated in coarse-textured soils in the humid tropics where rainfall exceeds evapotranspiration). Reviews of studies conducted in Malaysia in the 1980s and 1990s concluded that losses of nutrients to run-off and erosion are higher than those lost to leaching. 2.0-15.6% of the nitrogen fertiliser applied to palms is lost to run-off and 0.5-6.2% to erosion.[208] [209] For potassium the combined losses range from zero to 15.4%. Nitrogen losses to leaching are 1.0-4.8% of the applied fertiliser, rising to 10.9-26.5% in immature plantations, with equivalent potassium losses 2.7% and 10.0%.

Although oil palm plantations lose nutrients to the environment, measured groundwater concentrations of leached ammonium, nitrate and potassium did not exceed World Health Organisation quality standards in one of the few studies that have measured them.[210] There appears to be little research into the effect of nutrient loss from palm oil plantations into surface water bodies,[211] although rivers in agricultural landscapes (i.e., including oil palm) in Malaysia have been shown to be slightly polluted with ammonium, nitrate and extremely contaminated with phosphate.[212]

In summary, the dominance of palm cultivation and milling in some landscapes means that watershed-scale impacts on surface and ground water could occur. These impacts include sedimentation caused by soil erosion, high acidity and oxygen demand, and release of nutrients. The limited available evidence of impacts on ground or surface water

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204 Wu, T.Y., Mohammad, A.W., Jahim, J.M., and Anuar, N. 'Pollution control technologies for the treatment of palm oil mill effluent (POME) through end-of-pipe processes'. *Journal of Environmental Management*, 91 (2010) 1467e1490.

205 Igwe, J.C. and Onyegbado, C.C. 'A Review of Palm Oil Mill Effluent (Pome) Water Treatment'. *Global Journal of Environmental Research*, 1/2 (2007): 54-62.

206 McCarthy, J., and Zen, Z. 'Regulating the Oil Palm Boom: Assessing the Effectiveness of Environmental Governance Approaches to Agro-industrial Pollution in Indonesia'. *Law & Policy*, 32 (2010): 153–179.

207 Goh *et al.* (2003) *op. cit.*

208 Comte, I., Colin, F., Whalen, J.K., Grünberger, O. and Caliman, J-P. 'Agricultural Practices in Oil Palm Plantations and Their Impact on Hydrological Changes, Nutrient Fluxes and Water Quality in Indonesia: A Review'. Advances in Agronomy, 116 (2012), 71-124.

209 Pardon, L., Bessou C., Nelson, P. N., Dubos, B., Ollivier, J., Marichal, R., Caliman, J. -P. & Gabrielle, B. 'Key unknowns in nitrogen budget for oil palm plantations. A review.' *Agronomy for Sustainable Development* (2016), 36:20.

210 Ah Tung, P.G., Yusoff, M.K., Majid, N.M., Joo, G.K., and Huang, G.H. 'Effect of N and K fertilisers on nutrient leaching and groundwater quality under mature oil palm in Sabah during the monsoon period'. *American Journal of Applied Science*, 6 (2009), 1788–1799.

211 Carlson *et al.* (2014) *op. cit.*

212 Al-Badaii, F. Shuhaimi-Othman, M., and Gasim, M.B. 'Water Quality Assessment of the Semenyih River, Selangor, Malaysia'. *Journal of Chemistry* 2013 (2013), Article ID 871056, 10 pages.

in Malaysia and Indonesia (Table 14[213]), implies that oil palm cultivation and milling does cause water pollution, but also that it is not necessarily outside national or international guidelines.

Table 14: Information quality assessment for the evidence that oil palm cultivation and milling causes significant water pollution

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Water pollution	4	0.8	0.7	0.5	0.7

7.1.8. Impact of changes in commodities prices on deforestation and peatland drainage

The growth in oil palm areas is driven by the crude palm oil (CPO) price. In order to understand the growth of oil palm on area formerly under peat we look at two main studies. The first is Gunarso et al (2013), which was commissioned by the RSPO. Importantly this study includes a data supplement (with land use change data for forest and peat conversion up to 2010). We combine that analysis with data from analysis of more recent peat conversion by Miettinen et al (2016) [214].

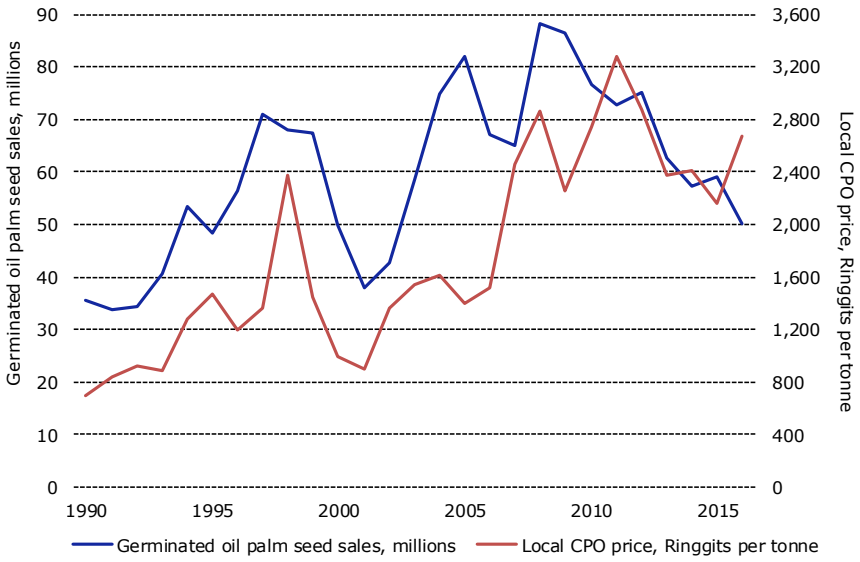
[213] Based on an assessment of Igwe & Onyegbado (2007), *op. cit.*; Ah Tung *et al.* (2009), *op. cit.*; Al-Badaii *et al.* (2013), *op. cit.*; and Carlson *et al.* (2014) *op. cit.*;

[214] Miettinen, Jukka, Chenghua Shi, Soo Chin Liew (2016), 'Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990' *Global Ecology and Conservation*, Volume 6, April 2016, Pages 67–78, http://dx.doi.org/10.1016/j.gecco.2016.02.004.

Figure 10 illustrates the rapid feedback from CPO prices to the demand for seeds for planting in Malaysia as a whole, using official data on germinated oil palm seed sales for planting**.**

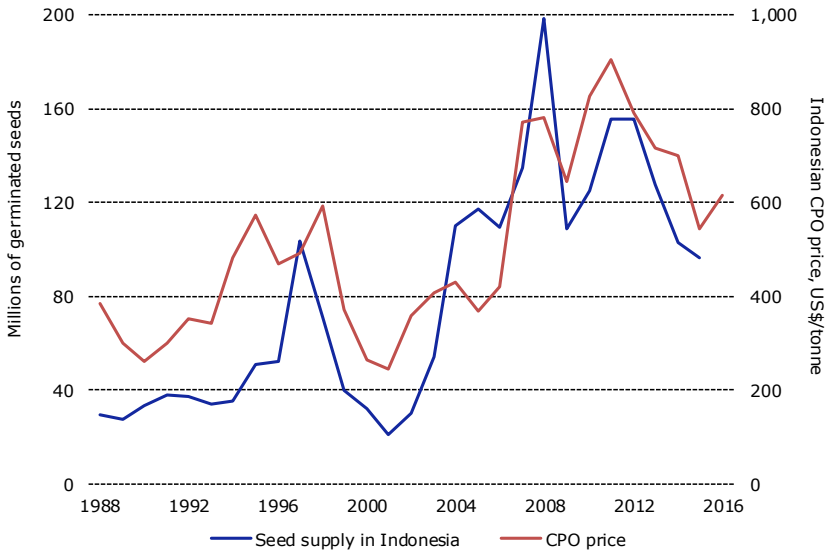
Corresponding Indonesian data in **Figure 11,** obtained through enquiries to all the individual seed companies, demonstrates that, as with Malaysia, the most important single influence upon the purchase of oil palm seeds for planting is the local price of CPO. The subsequent increase in planted areas should be accurate, as long as companies have the legal right to develop the land. If land rights are unclear when seeds are bought, area figures will be less precise.

Figure 10: Malaysian demand for germinated seeds vs. the local CPO price



Sources: Bursa Malaysia Derivatives (for prices) and Malaysian Palm Oil Board (for seed sales).

Figure 11: Indonesian demand for oil palm seeds vs. the local CPO price



Sources: PT Kharisma Pemasaran Bersama Nusantara (for prices) and private seed companies.

Figure 12 and

Figure 13 plot the changes in oil palm areas in Indonesia and Malaysia, respectively, using five-year averages to give a picture of the average growth in each period. The blue lines track the total growth in oil palm areas[215][216]. The dotted brown lines depict annual oil palm area growth in Indonesia (LMC data) and Malaysia (MPOB).

The lines follow broadly parallel paths, but there is considerable inter-annual variation. The estimates of changes in land use differ as a result of differences in methodology and interpretation. It is not unusual for land area estimates to vary by 10% and estimates of annual change to vary by 60% between different satellite imagery studies[217].

Alongside the total area under oil palm, the figure shows the expansion that occurred on to peat in the orange line, based on data from Gunarso et al (2013) and Miettinen et al. In addition, in both diagrams stacked areas are used to indicate the split between different types of land from 1990 to 2010 based on the data from Gunarso et al (2013). In each case the more detailed data for each of the two countries distinguishes between land that was formerly swamp, agricultural and other degraded land, agro-forest or forest.[218]

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[215] For 1990-2010 the area data are from Gunarso, Petrus, Manjela Eko Hartoyo, Fahmuddin Agus, Timothy J. Killeen (2013), *Palm oil and Land Use Change in Indonesia, Malaysia, and Papua New Guinea*, Roundtable on Sustainable Palm Oil, November 2013 and Supplement (data table) http://www.rspo.org/key-documents/supplementary-materials, accessed 21 Mar. 2017.

[216] For 2010-2015 the data are from Miettinen, Jukka, Chenghua Shi, Soo Chin Liew (2016), 'Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990' *Global Ecology and Conservation*, Volume 6, April 2016, Pages 67–78, http://dx.doi.org/10.1016/j.gecco.2016.02.004.

[217] Gunarso et al. (2013), Op. cit..

[218] [1a] Gunarso et al. (2013) for 1990-2010 from land category analysis.

[1a] This includes data for upland forest and mangroves, excluding swamp forest (peat) and agroforestry & plantations. Oil Palm (OP) from agroforest & plantation; Timber, mixed tree crop & crop plantations. OP from agriculture, degraded & other; Agriculture, shrub & grassland, bare soil & other. OP from swamp; Swamp forest and open swamp. OP on peat.

[1b] Gunarso et al. (2013) uses a separate analysis using an existing data set providing maps for peat soils. The spatial distribution and extent of peat soils was obtained from Wetlands International for Indonesia and from a Harmonised World Soil Map for Malaysia.

[2] Miettinen et al. (2016) for 2010-2015 oil palm on peat data

[3] For 2010-2015 oil palm area, MPOB data for Malaysia and LMC estimates for Indonesia.

Figure 12: Net change in oil palm areas and land use conversion – Indonesia[219]

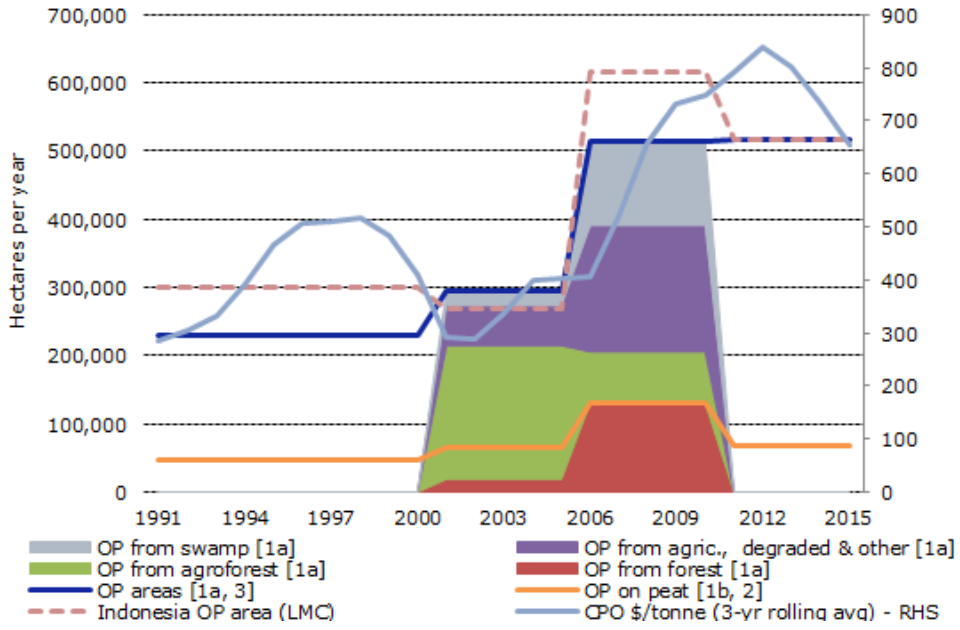
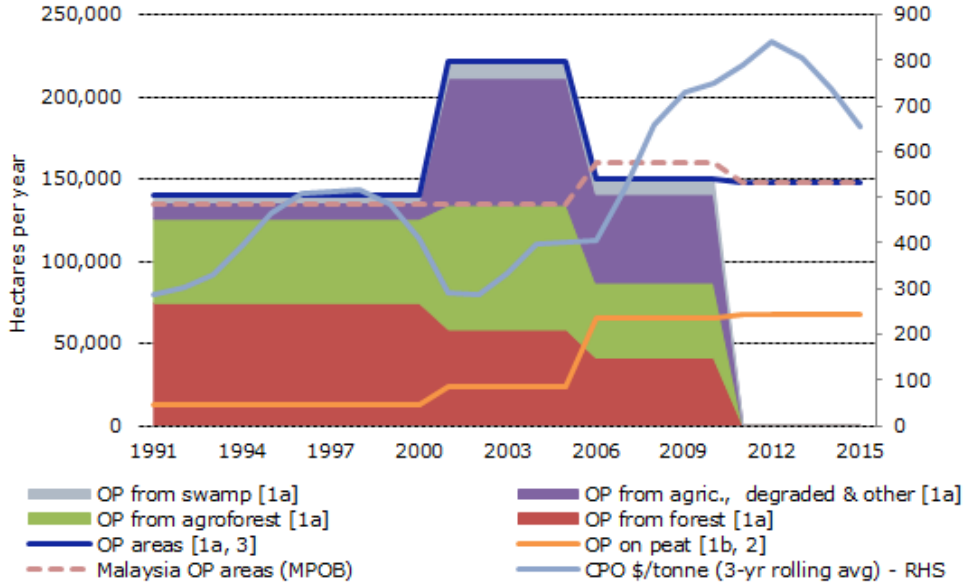


Figure 13: Net change in change in oil palm areas and land use conversion - Malaysia[220]



The main conclusions to be drawn from the five and ten-year averaged data[221] are:

[219] Ibid.

[220] Ibid.

[221] Land use change is often presented on this basis, with lack of data on annual changes.

- On rising palm oil prices during the period from 2000 to 2010, oil palm plantings stepped up from the region of 300,000 hectares per year to 500,000 in Indonesia.
- In Malaysia, there was a step up and then step back down to annual average area developed to oil palm at about 150,000 hectares per year. (Note: in Malaysia, unlike Indonesia, a large area of oil palms is over 25 years old. This area is due to be replanted, and the official data on newly planted areas will include these replanted areas.)
- Indonesia saw a significant rise in oil palm planting on land previously classified as peat, forest, swamp and agriculture in 2005-2010, when prices were higher than in the previous five-year period. Data for 2010-2015 are needed for more complete observations.
- In the period from 1990 to 2010, Malaysia saw a reduction in conversion from forest, but a step up, and subsequent step down, particularly of conversion from agriculture, degraded and other land and to a less marked degree from conversion of agroforestry. Conversion from peat appeared to have remained quite high (the graphs present peat land as a whole without sub-types). As with Indonesia, detailed data for 2010-2015 are needed for more complete observations.

Overall, while one can see a link between palm oil prices and new plantings, it is hard to discern a clear link between the palm oil price and oil palm conversion from peatland.

7.2. Social Impacts

The social impacts of palm oil production are complex, and almost certainly apply more generally to other forms of agricultural development in the same economies. Oil palm cultivation has provided livelihoods for many rural people, including smallholders, but has also often been associated with social concerns, the most important of which are land use rights, forced and child labour, and issues relating to the terms and conditions of labour, such as wages, health and safety and gender discrimination. These are the core issues that will be assessed in the next sections.

7.2.1. Land use rights

In some cases, oil palm expansion, as with mining and logging earlier, has been accompanied by disputes over land rights, in which the creation of large-scale plantations has resulted in local and indigenous peoples losing their customary land, and along with, it part of their traditional livelihoods and cultural reference. This has been documented in Indonesia,[222] [223] [224] [225] [226] and to a lesser extent in Malaysia,[227] [228] Papua New Guinea,[229]

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[222] Siscawati, M. 'The Case of Indonesia: Under Soeharto's Shadow'. *In The bitter fruit of oil palm: dispossession and deforestation.* World Rainforest Movement (2001), UK.

[223] Colchester, M. and Jiwan, N. *Ghosts on our own land: Indonesian oil palm smallholders and the Roundtable on Sustainable Palm Oil*. Forest People's Programme & Sawit Watch (2006), Moreton-in-Marsh, UK and Bogor, Indonesia.

[224] Colchester, M., Jiwan, N., Andiko, Sirait, M., Firdaus, A.Y., Surambo, A., and Pane, H. *Promised Land: Palm Oil and Land Acquisition in Indonesia: Implications for local communities and indigenous peoples*. Forest People's Programme, Sawit Watch, HuMa and World Agroforestry Centre (2007), Moreton-in-Marsh, UK and Bogor, Indonesia.

[225] Marti, S. *Loosing ground: the human rights implications of palm oil plantation expansion in Indonesia*. Friends of the Earh & Sawit Watch (2008), London and Bogor.

[226] Colchester, Marcus and Sophie Chao (Eds.) (2013) *Conflict or Consent? The Oil Palm Sector at a Crossroads*, Forest Peoples Programme, Moreton-in-Marsh

[227] Dayang Norwana, A.A.B., Kunjappan, R., Chin, M., Schoneveld, G., Potter, L. and Andriani, R. 'The local impacts of oil palm expansion in Malaysia: An assessment based on a case study in Sabah State'. *Working Paper 78*. CIFOR (2011), Bogor, Indonesia.

Cambodia,[230] the Philippines,[231] Nigeria,[232] Liberia,[233] Cameroon,[234] and Colombia.[235,236] These disputes are in fact disagreements about how rural development is carried out rather than about oil palm *per se*.[237]

Indonesia's National Land Bureau of Indonesia estimated that around half of the country's 8,000 land conflicts are within the oil palm sector in 2012.[238] The sequence of events follows a general pattern. The government sees its role as 'opening up' land for development[239] and grants concession licences to companies for oil palm development. Due to differences between the national and customary tenure systems, many licences are located on land owned or claimed by local and/or indigenous groups, although their use rights are rarely formally identified. Use rights between the company and local communities are therefore unclear, ambiguous or competing.[240] Depending on the nature of the licence, a proportion of the land is returned to community members to manage, or, increasingly communities become shareholders in part of the land.[241]

Under Indonesian law, indigenous peoples and local communities are typically entitled to compensation for land passed over to a plantation company, following a negotiation

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228 Chao, S. 'Malaysia: the Murut struggle against palm oil, for land and life'. *The Ecologist* (12th December 2016). Available at: http://www.theecologist.org/campaigning/2988442/malaysia_the_murut_struggle_against_palm_oil_for_land_and_life.html

229 Numapo, J. *Commission Of Inquiry Into The Special Agriculture And Business Lease (SABL).* Chief Commissioner Port Moresby 24th June, 2013, Papua New Guinea.

230 Sokhannaro, H.E.P, 'Oil palm development in Cambodia.' In Colchester, M. and Chao, S. Oil Palm Expansion in South East Asia: Trends and Implications for Local Communities and Indigenous Peoples. (Forest People's Programme and SawitWatch (2011), Moreton-in-Marsh, UK and Bogor, Indonesia.

231 Harbinson, R. *Broken Promises: Communities in Philippine island take on palm oil companies*. Mongabay (23 October 2015).

232 Friends of the Earth. *Exploitation and empty promises: Wilmar's Nigerian land grab.* Friends of the Earth (2016), USA and Nigeria.

233 RAN. *Conflict Palm Oil in Practice: Exposing KLK's role in Rainforest Destruction, Land Grabbing and Child Labor*. Rainforest Action Networm (2014), San Francisco.

234 Christopher Fon Achobang, C.F., Nguiffo, S. & Schwartz, B. 'SG Sustainable Oils Cameroon PLC (SGSOC) in South West Cameroon'. Chapter 15 in Colchester, Marcus and Sophie Chao (Eds.) (2013) *Conflict or Consent? The Oil Palm Sector at a Crossroads*, Forest Peoples Programme, Moreton-in-Marsh, UK

235 Miroff, N. 'In Colombia, a palm oil boom with roots in conflict.' The Washington Post (December 30, 2014).

236 Van Dorp, M., Kuijpers, K., Abdala Y.S., & Roa, P.A. (2015). Reconquering and dispossession in the Altillanura The case of Poligrow. SOMO and INEPAZ, Amsterdam.

237 Levang, P., Riva, W.F., Orth, M.G. 'Oil palm plantations and conflict in Indonesia: evidence from West Kalimantan' in Cramb, R, and McCarthy, J.F., eds, *The Oil Palm Complex* (Singapore, 2016), 283-300.

238 Badan Pertanahan Nasional (National Land Bureau, Indonesian Government): presentation to RSPO 2012

239 Cramb & McCarthy (2016), *op. cit.*

240 Casson (2000) *op. cit.*

241 Cramb & McCarthy (2016), *op. cit.*

aimed at achieving agreement. However, compensation may be perceived to be inadequate, leave some individuals out, or may not be forthcoming.[242] [243]

Grievances on legality of land acquisition and the perceived fairness of compensation can sometimes escalate to conflict and occasionally violence. For example, in West Kalimantan, land rights was the most common cause of conflict between local communities, including indigenous Dayak groups, and plantation companies, responsible for 53 of 119 (45%) recorded conflicts between 1999 and 2009.[244] Although accurate figures for the total number of land rights issues associated with oil palm plantations are not available, an indication can be given by the report that in January 2008, Sawit Watch (an Indonesian NGO specialising in palm related social issues) was monitoring 513 active conflicts between local communities and companies, involving 135 companies,[245] and that all 81 palm oil companies in South Sumatra in 1998 had land disputes with local communities.[246]

Malaysia has a less complicated regulatory environment than Indonesia. The clearing of protected land requires the forest to be "degazetted" and the clearing sanctioned by the relevant state's government. While the Federal Government has strong control over Peninsular Malaysia's 11 state governments, the states on Borneo (Sabah and Sarawak) are more independent. This is particularly true of policy on forestry, land allocation forestry and agriculture; thus there are regional differences in regulations and enforcement. The most controversial aspect of land use concerns the application of Native Customary Land Rights (known as NCR) in Sarawak. Local tribes have long been considered to have rights over both their farmland and primary forest on communal land, with a sizeable proportion on deep peat soils. A Federal court ruled in 2016 that their rights did not apply to primary forest, putting the State government under pressure to change the Land Code to permit the development of such primary forest.[247] Forty of the more than one hundred land rights cases in the courts of Sarawak reportedly concerned the palm oil sector.[248]

Since oil palm is the most popular crop after the clearance of this primary forest, there are fears that the political importance of NCR for local tribes will allow Sarawak to sustain rapid growth in its oil palm areas, exceeding 100,000 hectares per annum in 2010-2016, much of it in environmentally sensitive areas.

The RSPO Principles and Criteria include criteria that cover compliance with the law including respect for customary law, a demonstrable right to use the land, absence of legitimate land conflicts, and no diminution or loss of customary rights without free, prior

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242 Colchester *et al.* (2007), *op. cit.*

243 Levang *et al.* (2016), *op. cit.*

244 Levang *et al.* (2016), *ibid*

245 Marti (2008), *op. cit.*

246 Kartodihardjo, H. & Supriono, A, 'The Impact of Sectoral Development on Natural Forest Conversion and Degradation: The Case of Timber and Tree Crop Plantations in Indonesia'. *CIFOR Occasional Paper No. 26*(E), Centre for International Forestry Research (2000), Bogor, Indonesia.

247 Davidson, Desmond (2017), 'Sarawak native rights defender wants change to Land Code now", The Malaysian Insight, 13 July 2017.

248 Colchester, Marcus, Wee Aik Pang, Wong Meng Chuo and Thomas Jalong (2007) *Land is Life: Land Rights and Palm Oil Development in Sarawak.* Forest Peoples Programme and SawitWatch, Bogor.

and informed consent (FPIC).[249] However, there are allegations that even within RSPO certified plantations these rules are broken, and that communities can lose their customary land use rights without FPIC.[250]

Land rights issues are complex. Colchester *et al.*[251] warn against a simplistic apportioning of blame to companies for disputes: '*many oil palm companies operating in Indonesia have acquired land by doubtful means and many have not adhered to legal requirements or procedures, as much due to lax administration by government officials as to poor performance or dishonesty on the part of the companies themselves.*' It is also true that individuals within communities can be complicit in exacerbating land rights issues, by, for example, making personal settlements that go against the interests of others in the community.[252]

In summary, there is strong evidence that oil palm has expanded on to land traditionally used by indigenous peoples and local communities, and in particular in Indonesia (

Table 15[253]). This can result in grievances that sometimes escalate into conflict, and occasionally violence between plantation companies and local people. It should be noted that most of the evidence is in the form of individual case studies.

Table 15: Information quality assessment for evidence that oil palm has expanded on to lands traditionally used by indigenous and local people in Indonesia.

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Land use rights	18	0.7	0.6	0.9	0.7

7.2.2. Smallholders

Smallholders are taken here to mean family-based enterprises cultivating up to 50 hectares of oil palm (the definition used by the Roundtable on Sustainable Palm Oil). In Indonesia and Malaysia, smallholders account for 40% of the total area of planted oil palm and as much as 33% of the output. In West Africa, smallholders produce up to 90% of the palm oil for domestic and regional markets. There is significant variation in the way that smallholder oil palm cultivation is organised (Table 16). For many smallholders, oil palm is one of several sources of livelihoods.

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249 RSPO 'Principles And Criteria For The Production Of Sustainable Palm Oil'. The Roundtable on Sustainable Palm Oil (2013), Kuala Lumpur.

250 EIA (2015). Who Watches the Watchmen. Auditors and the Breakdown of Oversight in the RSPO. Environmental Investigation Agency (2015), London.

251 Colchester *et al.* (2007), *op. cit.*

252 Levang *et al.* (2016), *op. cit.*

253 Based on an assessment of Kartodihardjo & Supriono (2000), *op. cit.*; Siskawati (2001), *op. cit.*; Colchester *et al.* (2007), *op. cit.*; Marti (2008), *op. cit.*; Numapo (2013), *op. cit.*; Dayang Norwana *et al.* (2011), op. cit.; RAN (2014), *op. cit.*; EIA (2015), *op. cit.*; Chao (2016), *op. cit.*; Friends of the Earth (2016), *op. cit.*; Harbison (2016), *op. cit.*; Levang *et al.* (2016).

Table 16: Modes of oil palm production (after Cramb & McCarthy, 2016)[254]

Mode of production	Variants	Where found
Estates	Private and/or state-owned National and/or foreign company State land (with or without customary land claims)	Malaysia Indonesia
Managed smallholder schemes	Resettlement schemes for landless/land poor or in situ schemes for existing landholders Landholders manage own lots or agency manages whole scheme on an estate basis Large-scale or small scale schemes (mini-estates)	Malaysia
Nucleus estate and smallholder schemes	Private or state-owned plantation company as nucleus (providing mill and other infrastructure) "Plasma" smallholders comprising settlers and/or local (customary) landholders (70% of land) Smallholder cooperatives dealing directly with plantation company (70% of land)	Indonesia
Joint-venture schemes	Customary land is consolidated in a trust held by a government agency which forms a joint-venture company with a private investor (Sarawak model) Customary landlords issued with command title, conditional on development by a private or state-owned plantation company (Sabah model) Partnership schemes whereby company develops and manages 20% of land for farmers and pays "rent" on basis of land contributed (Indonesia model)	Malaysia Indonesia
Assisted smallholders	Smallholders given planting grants (subsidized inputs) and technical advice Smallholder groups linked to input supplies, credit, technical advice, fruit bulking facility, and processor	Malaysia
Independent smallholders	Self-managed and self-funded (may receive some inputs on short-term credit but many unable to afford inputs) Smallholders who have graduated from NES schemes and have become independent	Malaysia Indonesia,

Managed smallholders

Malaysia's FELDA scheme is the largest and most successful example of managed smallholders. FELDA began opening up land for settlers in 1960, using a model that relies upon developing state land for landless settlers or the land poor, or development of a consolidated block of land for existing landholders, each of whom contribute a portion of their land to the scheme. FELDA was able to settle 122,000 families between 1959 and 1990, developing about 470,000 hectares (ha) of settler smallholdings and 340,142 ha of commercial plantations[255] in Pahang, Johor, and Negeri Sembilan (comprising 80% of Felda settler areas) and other Peninsular Malaysia states. Title to land is only given to farmers once they have repaid the debts incurred to finance the costs of agricultural inputs; it takes most settlers on existing schemes at least of 15 years to do so.

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254 Cramb & McCarthy (2016), *op. cit.*

255 Khor, Yuleng (2016), Socio-economic parameters for peat restoration policy makers [presentation], 15th International Peat Congress (Kuching: 17 Aug. 2016).

The income obtained by FELDA smallholders is considerable, and is generally higher than that from alternative crops.

Nucleus Estate and Smallholder schemes

An equally important, long lasting, model is Indonesia's Nucleus Estate and Smallholder (NES) model. A central estate and mill provide services to smallholders, who were often migrants. The central estate typically helps to convert the land to oil palm, provides a market for smallholders' palm crop, and may support smallholders with technical advice and inputs. Establishment costs and input costs are repaid by the smallholders over time.

In later variants, smallholders had to form a cooperative to manage the land and receive credit. The aim was to allocate 70% of the land to smallholders with 30% retained by the estate, but the quality of land allocated to smallholders and the competence of the company to support smallholders were variable, and so the outcomes of NES schemes also varied.[256]

Nonetheless, NES schemes can be far more profitable for smallholders than alternatives, especially when labour requirements are taken into account **(**

Table 17). They raised the incomes of over 500,000 farmers,[257] but it is reported that some smallholders remain in persistent debt to the nucleus company,[258] and that incomes can be lower than other alternatives.[259] Some early NES schemes resulted in smallholders having insufficient land and time to feed their families. Practices such as intercropping, land allocation to smallholder food crops, and flexible labour schemes, were introduced as a result.[260]

Table 17: **Returns on oil palm cultivation for smallholders expressed in terms of land and their labour inputs compared to other crops in Bungo District, Indonesia, 2007-9 (after Feintrenie *et al.*, 2010)[261]**

Crop	Return on land (€/ha)	Return on labour (€/man-day)
Oil Palm	2,100	36
Clonal Rubber	1,600	17
Agroforestry rubber	1,300	21
Paddy rice	200	1.7

256 Zen, Z., Barlow, C., Gondowaristo, R. and McCarthy, J.F 'Interventions to Promote Smallholder Oil Palm and Socio-economic Improvement in Indonesia' in Cramb, R, and McCarthy, J.F., eds, *The Oil Palm Complex* (Singapore, 2016), 78-108.

257 Zen, Z., Barlow, C. and Gondowarsito, R. 'Oil palm in Indonesian socioeconomic improvement: a review of options'. Working Paper in Trade and Economics 11 (2005). Research School of Pacific and Asian Studies, Australian National University.

258 Colchester *et al.* (2007), *op. cit.*

259 Wakker (2005), *op. cit.*

260 Vermeulen, S. and Goad, N. 'Towards better practice in smallholder palm oil production' Natural Resource Issues Series No. 5. International Institute for Environment and Development (2006). London, UK.

261 Feintrenie, L., W. K. Chong, and P. Levang.. 'Why do farmers prefer oil palm? Lessons learnt from Bungo district, Indonesia'. Small-scale Forestry 9/3 (2010), 379–396.

Assisted smallholders

In Malaysia, various government agencies have assisted smallholders with planting grants, inputs (especially seedlings), and technical advice. The best known of these is the Malaysian Palm Oil Board (MPOB), which provides technical advice to members of farmer's organisations, and arranges a mechanism with fertiliser companies and mills for farmers to receive credit. These assisted smallholders improved their yields and incomes significantly.[262] Indonesian agencies, by contrast, do comparatively little for smallholders.

Independent smallholders

In parts of Indonesia and Malaysia where road and mill infrastructure are in place, independent smallholders have invested their capital and labour in cultivating oil palm. The yield obtained by independent smallholders is often lower than that of estates of other types of smallholders, with this difference being particularly marked where inferior planting stock is used (Table 18). Independent cultivation of oil palm has nonetheless often generated increased incomes for smallholders. Independent smallholders in Indonesia in 2002-05 were reported to gain a net return of US$422 per hectare per year if they had high yielding palms or US$163 per hectare per year for low yielding ones.[263]

Outside Indonesia and Malaysia, independent smallholders are often the norm. For example, most of Thailand's oil palm production is by independent smallholders.[264] In West Africa, independent smallholders have traditionally produced palm oil for domestic markets. With the expansion of estates in this region some smallholder outgrower schemes are emerging, but these still represent only a minority of growers.[265]

Table 18: Comparison of smallholder and estate yields of fresh fruit bunches in Malaysia[266] and Indonesia[267]

Mode of production	Yield (tonnes per hectare)	% of maximum estate yield	Notes
Estates	21	100%	Malaysia and Indonesia
Managed smallholder schemes	19	90%	Malaysia (FELDA, etc.)
Nucleus estate and smallholder schemes	19	90%	Indonesia (NES)

262 Cramb & McCarthy (2016), *op. cit.*

263 Vermeulen & Goad (2006), *op. cit.* (recalculated from Zen *et al.*, 2005).

264 Dallinger, J. 'Oil palm development in Thailand: economic, social and environmental considerations.' In Colchester, M. and Chao, S. Oil Palm Expansion in South East Asia: Trends and Implications for Local Communities and Indigenous Peoples. (Forest People's Programme and SawitWatch (2011), Moreton-in-Marsh, UK and Bogor, Indonesia.

265 Hoyle, D. and Levang, P. Oil Palm Development in Cameroon. Ad hoc working paper, WWF (2012).

266 Ismail, A., Simeh, M.A. and Noor, M.M. 'The production cost of oil palm fresh fruit bunches: the case of independent smallholders in Johor'. *Oil Palm Industry Economic Journal* 3/1 (2003): 1-7.

267 Zen *et al.* (2005), *op. cit.*

Mode of production	Yield (tonnes per hectare)	% of maximum estate yield	Notes
Independent	10-17	47%-80%	Malaysia: 16 tonnes per hectare Indonesia: 10-17 tonnes per hectare largely dependent on whether improved planting stock is used

The introduction of joint venture models of plantation development in Malaysia and Indonesia has led to local people receiving a lower proportion of the land allocation (from 70% to 20% in Indonesia), with that land being managed by the estate company and the communities receiving a share of the profits[268]. This represents a significant shift, with local people now becoming shareholders, rather than smallholders.

Whilst many households benefit, there is also significant complexity in the social and economic outcomes of palm oil expansion. Secure land tenure, the availability of livelihoods to tide smallholders over the 3-5 years when crops mature, and the extent of debt are amongst the factors that can lead to positive outcomes for smallholders. On the other hand, Zen et al. (2015) showed in Indonesia that existing socio-economic divisions and related power structure can be exacerbated as poorer households sell their plots to those households who have greater access to capital.[269] This serves to increase the number of landless labourers, often women, with very limited livelihood options, whose wage and labour conditions in the plantations may be undermined as a result (Li 2015).[270]

In summary, smallholders play a significant role in the oil palm sector in Malaysia, Indonesia and elsewhere. There is diversity in the ways that smallholders are organised, from highly managed schemes to independent smallholders. The yields obtained by smallholders are variable; the highest yields are linked to the support that smallholders receive in terms of planting stock, credit, fertiliser and technical advice. Overall, there is reasonable confidence (

[268] Cramb, & McCarthy (2016), *op. cit.*

[269] Zen, Z., McCarthy, J., Chalil, D., Sitorus, H., Shahputra, M. A. (2015). High Carbon Stock (HCS) and the socio-economics of palm oil: Towards improving the sustainability of the palm oil sector in Indonesia. Consulting Study 14 of the High Carbon Stock Science Study.

[270] Li, T.M. (2015) *Social Impacts of Palm Oil in Indonesia: a gendered perspective from West Kalimantan*, CIFOR, Bogor

Table 19) that where the right conditions are in place, oil palm cultivation can and does provide a decent and often higher income than alternatives.[271] However, this is not always the case, and particularly for poorer households and those unable to cope with debt.[272]

[271] Ismail, A. *et al.,* (2003), *op. cit.*; Zen, Z., *et al.,* (2005), *op. cit.;* Vermeulen and Goad, 2006, *op. cit.;* and Feintrenie *et al.*, 2010; *op. cit.*

[272] Wakker (2005), *op. cit.*; Colchester *et al.*, 2007, *op. cit.*; Vermeulen and Goad, 2006, *op. cit...,* Zen *et al,* (2015) *op. cit;* Li *(2015) op. cit.*

Table 19: Information quality assessment for smallholders receiving a decent income from oil palm cultivation

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Smallholders	8	0.8	0.8	0.5	0.7

7.2.3. Forced and Child labour

Forced labour is any work or service that is exacted from a person under the threat of penalty, and for which that person has not offered himself or herself voluntarily. The International Labour Organisation has two principal international conventions covering forced labour: the Forced Labour Convention No. 29 and the Abolition of Forced Labour Convention No. 159. These conventions are included within the eight 'Fundamental Conventions' of the ILO:[273] those that are regarded as fundamental to the rights of human beings at work, irrespective of the level of development of a country.

The term 'child labour' is defined by the International Labour Organisation Convention No.182 as '*work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development*.' This Convention is one of the ILO's Fundamental conventions.[274]

There is limited official data on the incidence of forced and child labour within the palm sector in major producing countries. The ILO and UN Agencies often rely on secondary sources. The United Nations Children's Fund notes "there are limited available statistics on the prevalence of child labour in the palm oil sector in Indonesia".[275]

The US Department of Department of Labor's List of Goods Produced by Child Labor or Forced Labor includes palm oil produced in Malaysia (both forced and child labour[276]), Indonesia (child labour) and Sierra Leone (child labour).[277] NGO and press reports of child and forced labour surface sporadically,[278] [279] [280] and in December 2016, Amnesty International published the results of an investigation into Wilmar, the world's largest processor of palm oil, finding serious human rights abuses in the plantations of Wilmar

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273 ILO 'The International Labour Organisation's Fundamental Conventions'. ILO (2003), Geneva, Switzerland.

274 ILO (2003). *ibid.*

275 UNICEF 'Palm Oil and Children in Indonesia'. United Nations Children's Fund (2016)

276 The US Department of Labor's conclusion is disputed by the Government of Malaysia: see https://www.mpic.gov.my/mpic/index.php/en/media-release/21-kenyataan-akhbar-tahun-2014/415-response-to-allegations-of-child-labour-and-forced-labour-in-the-oil-palm-industry-by-us-department-of-labor-report-2014

277 Bureau of International Labor Affairs. *List of Goods Produced by Child Labor or Forced Labor*. US Department of Department of Labor (2014), USA.

278 World Vision 'Forced, child and trafficked labour in the palm oil industry'. World Vision Australia (2012).

279 Skinner, E.B. 'Indonesia's Palm Oil Industry Rife With Human-Rights Abuses: The hidden human toll of the palm oil boom'. Bloomberg Business Week, 2013). https://www.bloomberg.com/news/articles/2013-07-18/indonesias-palm-oil-industry-rife-with-human-rights-abuses

280 Al-Mahmood, S.Z. (2015), 'Palm-Oil Migrant Workers Tell of Abuses on Malaysian Plantations', The Wall Street Journal (26 Jul. 2015), https://www.wsj.com/articles/palm-oil-migrant-workers-tell-of-abuses-on-malaysian-plantations-1437933321, accessed 1 Feb. 2017.

and its suppliers.[281] These included forced labour and child labour, gender discrimination, exploitative and dangerous working practices that put the health of workers at risk.

It is less straightforward to estimate how common child and forced labour might be within the sector. An analysis of ninety-seven RSPO audits[282] revealed three major non-conformities, one minor non-conformity and three observations against the RSPO Standard's criterion against child labour (Criterion 6.7)[283]. Companies seeking RSPO certification may not be representative of the sector as a whole, but it is nonetheless instructive that 7% had some degree of issue with child labour and 3% a serious one. Forced and child labour has also been reported from RSPO certified plantations by independent researchers.[284] The labour profile of the sector in Southeast Asia creates an underlying vulnerability to exploitation,[285] with an estimated 2.5 million international or internal migrant labourers in Southeast Asia (largely Indonesian, but also Bangladeshi, Filipino, Thai, etc.), which includes both legal and illegal migrants.[286] In general, migrant workers are unlikely to raise grievances with their employers or authorities, especially if they are undocumented, they could lose their only source of income, and face imprisonment and deportation.

In summary, incidences of forced and child labour in palm oil plantations have been reported in some producer countries. The reports tend to relate to individual or a small number of plantations, companies or geographical areas and are not sector wide. They range from press reports to meticulous interviews. Whilst noting that systematic information on forced and child labour can be extremely difficult to obtain, and that the incidence of these practices therefore tends to be under-reported, there is insufficient information to conclude with a high degree confidence how widespread these practices are (Table 20[287]).

Table 20: Information quality assessment for the presence of widespread forced and child labour within the palm oil sector

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Forced & Child Labour	8	0.6	0.6	0.8	0.7

281 Amnesty International (2016), *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names* (London: Amnesty International, 7 Dec. 2016), https://www.amnesty.org/en/documents/asa21/5184/2016/en/, accessed 1 Feb. 2017.

282 Lord & Durham (2013), *op. cit.*

283 Note that up until 2013, the RSPO Principles and Criteria did not contain a criterion specifically concerning forced labour.

284 International Labour Rights Forum & Sawit Watch. *Empty Assurances: RSPO Labor Case Studies*. International Labour Rights Forum & Sawit Watch (2013), Washington D.C. & Bogor.

285 Sanderson, S. 'Malaysian Oil Palm and Indonesian Labour Migration: A Perspective from Sarawak', in Cramb, R, and McCarthy, J.F., eds., The Oil Palm Complex (Singapore, 2016), 378-408.

286 Cramb, & McCarthy (2016), *op. cit.*

287 Based on an assessment of Lord & Durham (2013), *op. cit.*; World Vision (2010), *op. cit.*; Skinner (2013), *op. cit.*; International Labour Rights Forum & Sawit Watch (2013), *op. cit.*; Bureau of International Labor Affairs (2014), *op. cit.*; Al-Mahmood (2015), *op. cit.*; Sanderson (2016), *op. cit.*; and Amnestry International (2016), *op. cit.*

7.2.4. Terms and conditions of labour

The terms and conditions of labour ('working conditions') cover a broad range of issues, including hours worked, wages, leave, health and safety and the right to assembly.

An estimated two-thirds of palm oil workers in Malaysia and Indonesia, over 2.5 million people, are internal or international migrants[288]. The international migrants are principally Indonesian, but also include migrants from Bangladesh, the Philippines, Thailand and Myanmar. Migrant workers, and particularly those who are unregistered, typically have less legal protection on labour rights issues than nationals.

Migrant workers have been crucial to the development of oil palm estates in Malaysia and Indonesia and the managed smallholder schemes in Malaysia, in large part because they are cheap: Indonesian oil palm workers in Malaysia reportedly receive only two thirds of the wage of a Malaysian, and just one third if they are unregistered.[289] There is however evidence that "casual workers" (children, wives, neighbours, migrants, hired by company employees themselves or by intermediaries in order to reach productivity targets set by companies) do not enjoy the same level of protection as contracted agents, and remain largely tolerated, in good part due to the lack of regulatory controls and enforcement.[290]

An analysis of where auditors reported non-compliance with the RSPO Principles and Criteria[291] provides some indication of the frequency of issues with terms and conditions of labour. The two RSPO Principles at the time of this study that covered aspects of the terms and conditions of labour were Principle 4 (use of appropriate best practices by growers and millers) and Principle 6 (responsible consideration of employees and of individuals and communities affected by growers and mills). Within these Principles, the relevant criteria include Criteria 4.7-4.8 (covering occupational health and safety and training) and Criteria 6.5-6.9 (covering pay and conditions, the right to free assembly, child labour, discrimination and sexual harassment).

These criteria attracted a total of 63 major non-compliance cases (an average of 0.65 per management unit). Major non-compliances are generally understood to require corrective action within 60 days for a management unit to be issued with an RSPO certificate. In addition, 132 minor non-compliances (1.4 per management unit) and 148 observations (1.5 per management unit) were also recorded. Although companies seeking RSPO certification may not be representative of the sector as a whole – in general certification tends to attract already well-performing companies – it is therefore instructive that auditors often reported issues about terms and conditions of labour.

A recent Amnesty International report found a system of wage payment that is based on complex targets and deductions that are applied without explanation or documentation that resulted in pay below the legal minimum wage in all five of the plantations in Indonesia they investigated.[292] The same investigation revealed potential breaches of regulations on overtime pay, insufficient training on use of hazardous chemicals and

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288 Cramb, R, and McCarthy, J.F. 'Characterising Oil Palm Production in Indonesia and Malaysia', in Cramb, R, and McCarthy, J.F., eds., *The Oil Palm Complex* (Singapore, 2016) 27-77.

289 Cramb, R, and McCarthy, J.F. (2016) *ibid.*

290 Personal Communication, EU Delegation Jakarta

291 Lord, S., and Durham, K. *Analysis of RSPO certification and surveillance audit reports across Indonesia, Malaysia and the Rest of the World*. Global Sustainability Associates (2014), Singapore.

292 Amnesty International. *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names*, Amnesty International (2016), London.

inconsistent use of safety equipment (also reported elsewhere[293]), and in two of the companies, potential exclusion of women from permanent employment. Three of the five companies investigated had RSPO certification. In Malaysia, following complaints, ASI, the organisation that accredits RSPO certifiers, found pay below the minimum and insufficient leave at an RSPO certified FELDA estate.[294] In Indonesia, it has been reported that some labourers have been kept as causal labourers for extended periods (years), without the terms and conditions to which permanent employees are entitled[295].

In summary, evidence from analysis of RSPO audits and NGO investigations suggests that there is medium confidence that issues with terms and conditions of oil palm plantation workers are reasonably widespread in Indonesia and Malaysia (Table 21[296]). Issues identified include wages, gender discrimination, exposure to unsafe working practices and insufficient leave entitlements. Most of this evidence comes from Malaysia and Indonesia. While it is unlikely to be representative, these are also issues that are likely to be under-reported.

Table 21: Information quality assessment for the terms and conditions of labour for oil palm estate workers being below norms

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Terms & Conditions of Labour	4	0.7	0.6	1.0	0.8

7.3. Economic issues and economic sustainability of palm oil production

7.3.1. Micro-economic case studies on income and wealth distribution

The key conclusions of the economic and broader welfare issues of income and wealth distribution among people and companies working within the oil palm sector are as follows. First, overall oil palm is more profitable than other crops, and this has been good for income levels, but the nature of the crop (high capital cost and the need to process immediately) means that it favours wealthier farmers and large processors. Second, there are issues revealed by case studies that are separate from the economics of the crop (poor labour laws and corruption). Third, smallholder systems have helped to alleviate poverty, e.g., through the FELDA scheme in Malaysia and corporate-led development of smallholder schemes in Indonesia.

Table 22 below summarises the most important positive and negative effects on income growth and inequality from oil palm cultivation.

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293 International Labour Rights Forum & Sawit Watch. *Empty Assurances: RSPO Labor Case Studies*. International Labour Rights Forum & Sawit Watch (2013), Washington D.C. & Bogor.

294 EIA. *Who Watches the Watchmen? Auditors and the Breakdown of Oversight in the RSPO*. Environmental Investigation Agency (2015), London.

295 International Labour Rights Forum & Sawit Watch (2013) *op. cit.*

296 Studies included: International Labour Rights Forum & Sawit Watch (2013) *op. cit.*. EIA (2013), *op. cit.;* Lord and Durham (2014), *op. cit.;* and Amnesty International (2016), *op. cit.*

Table 22: Positive and negative implications of oil palm on income and wealth distribution

Positive	Negative
Oil palm is labour intensive, providing large amounts of employment.	Oil palm growers are highly dependent on external processors due to the need to process the fruit from the palms within 24 hours.
Oil palm has consistently been more profitable than competing crops.	Oil palm has high capital costs for entry (the costs of waiting 3-4 years for the first income). This is a barrier to poorer farmers.
Oil palm is a cash crop providing revenue for schooling and medical care.	Monoculture oil palm farming can create over-dependence on one crop with volatile prices.
Oil palm plantations require large workforces, giving work to those without their own farms.	Labours conditions and workers' rights have been violated on some plantations.

7.3.2. Incomes and poverty

There are no major data sets allowing for a strong statistical analysis. In addition, it is difficult to generalise as there are different farming systems in different regions. Here we focus on case studies to understand the potential impact of the oil palm on incomes.

> Smallholder income estimates by Khor (2016)[297] compare a Malaysian Felda smallholder with 4 hectares of oil palm with that of an Indonesian smallholder (Riau Province), typically with 2 hectares. Table 23 compares smallholder incomes, indicating how land area (2 or 4 hectares) and yields affect oil palm income, and the importance of other income in the picture. It also shows that even with a 50% yield or fire-damage that palm oil was likely to provide better income than the minimum wage in Riau. In Malaysia, larger oil palm areas (4 ha) and full yields generated income over 2.5 times more than minimum wages[298].

Figure 14 uses the FELDA smallholder example to show how income varies with CPO price (brown line) and variance in income outcome for different oil palm holding sizes. Pre-settlement family income (for settlers emplaced, up to 1979) was RM 200 (yellow line). The income improvement has been close to double even in periods of low CPO prices (later 1980s) and sometimes over five times higher (during the mid-1980s).

Table 23: Smallholder income indicators for Indonesia and Malaysia

Smallholder income indicators - benchmarks		Indonesia, Riau with 2 ha oil palm (OP)			Malaysia, Felda with 4 ha OP
		Full yield, 2016	Half yield, 2016	Riau peat site, 2011#	Full yield, 2016
Income from oil palm	$ per year	1,767	884	723	5,400
Other income		1,402	1,402	1,285	2,070

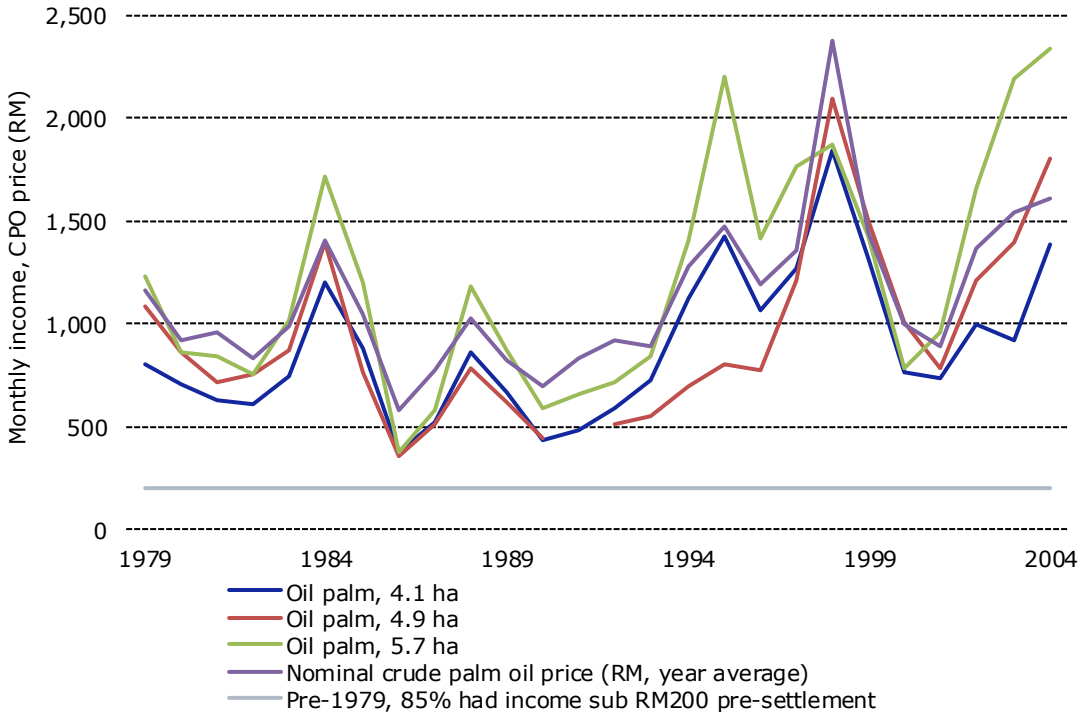
[297] Khor, Yuleng (2016), Socio-economic parameters for peat restoration policy makers [presentation], LM International Ltd, 15th International Peat Congress (Kuching: 17 Aug. 2016).

[298] Khor, Yuleng (2016), *Op. cit.*

Estimated annual	**income**	**-**	3,169	2,285	2,008	7,470
Estimated monthly	**income**	**-$ per month**	264	190	167	623
		Minimum wage, $/mth	160	160		225
		Income vs. 2 ha at full yield	**100%**	72%	30%##	236%

Note: #Assumes "fair prices" or benchmark price achieved. CPO price $600 per tonne for 2016 indicator. CPO price indicator for 2010-2011 $750 per tonne.
#Adapted from Mizuno and Masuda's (2016) 2010-2011 Riau site survey. Benchmark for 2 ha oil palm and other income is estimated at $264/month.
##30% of benchmark for its year.

Figure 14: National Felda settlers' average net monthly income (1979-2004)[299]



Note: 4.1 ha Feld1a settler earns 9.3x CPO price, 4.9 ha holding earns 9.5x and 5.7 ha holding earns 12.4x CPO price.
Source: Settler smallholding data from Lee and Bahrin (2006, p.37), Malaysia CPO price from MPOB[300].

The World Bank Group Framework and IFC Strategy for Engagement in the Palm Oil Sector[301], reported under the heading of Poverty Reduction: "The recent rapid expansion of oil palm activity in Indonesia is associated with significant poverty reduction. For example, in 2005 and 2008, reported national headcount poverty rates in Indonesia were roughly equal at 15.7 and 15.4 percent, while districts with increases in palm oil production saw significant poverty declines over the same period (World Bank Staff

299 Lee, Boon Thong and Shamsul Bahrin (2006). *Felda's fifty years: land pioneers to investors* (Kuala Lumpur:FELDA).

300 Malaysian Palm Oil Board (MPOB) website, http://www.mpob.gov.my/, accessed 3 Jun. 2015.

301 The World Bank Group Framework and IFC Strategy for Engagement in the Palm Oil Sector (2011)

Estimates)." [302] It found at the district level, that a 1 percent increase in the hectares in oil palm production contribute to a reduction of between 0.15 to 0.25 percentage points of those in poverty; with larger poverty-reduction in areas that expanded oil palm production by 50 percent or more (especially if it is increased smallholder activity rather than private and state-owned enterprises) and where poor households are concentrated in agriculture.

7.3.3. Wealth distribution

The potential effect of oil palm on incomes and wealth distribution is very complicated. In addition, to understanding the effect of oil palm plantations on income and inequality it is often necessary to situate the debate within a broader understanding of workers' rights and governance issues (see **Section 7.2**).

The complexity and nuances of these issues means that the topic is best illuminated from a micro-economic perspective via case studies. As a result, we present here selected case studies about oil palm projects in different countries under different types of ownership.

7.3.4. Malaysia's FELDA scheme

We start by reviewing the quintessential smallholder palm oil success story of the Federal Land Development Authority (FELDA) scheme for organised settlers. The FELDA project began in 1956 as a resettlement scheme for landless peasants. Over five decades, the FELDA scheme succeeded in raising smallholder household incomes considerably above the national poverty line, prompting some observers to characterise it as 'one of the most successful land settlement organisations in the world'[303]. From the settler and institutional perspectives, the primary goal of FELDA, which was poverty eradication and raising incomes by resettling landless peasants, was a major success.

Table 24 demonstrates how FELDA oil palm settler incomes have improved substantially[304] and how primary incomes fluctuate with CPO prices.

Table 24: Estimated monthly income sources for 4 ha oil palm settler (RM), Khor et al. (2015)[305]

	1986	1998	2005	2014
Net income from CPO	220	2,325	492	1,800
Income from other sources	166	767	702	673
Total	386	3,092	1,193	2,473

Note: In 1986 the net monthly income for a 4ha oil palm plot was RM376; gross income was RM750 (net income plus typical monthly obligation amount), for 50% net income margin in year when the CPO price was relatively low. There may have been top-ups and/or loan deferment. Most settlers joining Felda had monthly incomes below RM200 (1979 data for all settlers). Malaysia's minimum monthly wage was RM800 in 2014.

Sources: Monthly settler costs in 1986 from Bahrin and Lee (1986)[306], in 1998 from Bukit Wa Ha scheme in Kota Tinggi, Johor (Wong 2000)[307],, in 2005 from Lee and Bahrin (2006, p.43)[308],, and 2014 costs and returns from Barlow (2015)[309].

302 World Bank (2011), Ibid.

303 Sutton, K. (1989), Malaysia's FELDA (Federal Land Development Authority) land settlement model in time and space, *Geoforum*, Volume 20, Issue 3, 1989, Pages 339-354.

304 Most settlers joining Felda had monthly incomes below RM200 (1979 data for all settlers). Malaysia minimum monthly wage was RM800 in 2014.

305 Khor, et al. (2015)., Op. cit.

For other income, the FELDA target is for secondary income of 20-30% as are added incentives including investment returns from private equity investment in the Koperasi Permodalan FELDA (co-owner of FELDA corporations involved in transportation, palm oil milling and other downstream activities).

7.3.5. Indonesia smallholder and corporate-led growth

Reviewing the wealth and land distribution of the palm oil sector in Indonesia, Kasryno (2015)[310] writes: "*[The] oil palm farming system (is) a major vehicle for rural socio-economic development. This has been done largely through outgrower schemes, where farmers transfer a portion of their land to a palm oil company for inclusion in an estate plantation (referred as nucleus estate).*" describing the policy shift from smallholder to private sector-led expansion. From 1977, in a more structured approach the first Nucleus Estate and Smallholder Project (NES) was an Indonesian Government - foreign donor scheme and "the second major agricultural intervention in Indonesia, following on from the rice intensification program"[311]. This involved resettling locals from areas surrounding the project with 3-4.4 ha each (2 ha for oil palm, 0.8- 1.9 ha for food crops, plus 0.2–0.5 ha for home gardens). There were different smallholder (plasma) to estate (nucleus) areas for different schemes; with World Bank's NES IV (1980 start) having 75% plasma-25% nucleus, and an ADB financed scheme financed at 64 to 36% respectively. From 1980, it was further adjusted down to 60 to 40%. Newer schemes came to focus on transmigration of landless peoples from Java and Eastern Indonesia, instead of local peoples. With economic decentralization and greater regional autonomy from 1999, a new "partnership model" (Pola Kemitraan) offered smallholders only 20% of the total area developed. Although owned by the smallholder, the plasma areas has been increasingly developed and managed directly by the estate, where the smallholder does not actively participate but receives a monthly payment.

In Indonesia, the situation was influenced by post-Asian Financial Crisis policy reforms for economic liberalisation and regional decentralisation driven by the IMF and the World Bank. This ended policies reserving a large share of land development for smallholders. A larger share of new oil palm development areas was available to private companies (80%, up from 40% and below earlier), and regulations on forests were eased.

A further factor promoting land development was the interests of local government. Palm oil tax and duty revenues hardly reach local government coffers (oil and gas, forestry and mining revenues are better distributed), and official taxes and tax incentives for

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306 Bahrin, Shamsul and Lee, Boon Thong (1988). *FELDA, 3 decades of evolution* (Kuala Lumpur: FELDA).

307 Wong, Siew Tow (2000). Felda and Settler Development: A Socioeconomic Study of Felda Bukit Wa Ha, Kota Tinggi, Johor. [Academic exercise].(Kuala Lumpur: Universiti Malaya).

308 Lee and Bahrin (2006), Op. cit.

309 Barlow, Colin (2015b), 'Malaysian Agriculture In Transition: Felda Settler Schemes and Felda Global Ventures: An Outside Appraisal' [Presentation], Seminar at IKMAS (Institute of Malaysian and International Studies), UKM (National University of Malaysia). 16 Apr. 2015.

310 Kasryno, Faisal (2015), *The Economic Impacts of Palm Oil in Indonesia*, Consulting Paper 15, The High Carbon Stock Science Study 2015 (December 2015), http://www.simedarbyplantation.com/sustainability/high-carbon-stock, accessed 7 Feb. 2017.

311 Kasryno, Faisal (2015), Ibid.

Indonesia's palm industry promote land expansion[312], since local government may rely significantly on revenues arising from land development, which is under their control.

The situation is similar in Malaysia where state governments also rely on revenue from land conversions and sales of state land.

Despite the shift away from a high smallholder share in new developments, Indonesia smallholder oil palm areas (some converted from other crops due to the significantly higher returns for oil palm than from rice, rubber and maize in 1980-2013[313]) grew strongly alongside private estates. Smallholders expanded to reach 3.77 million ha (41.6% of the total palm oil area) by 2012, with 4.62 million ha of private estates (50.9%), while state-owned plantations owned the remaining 7.5%.

7.3.6. Nigeria dominant smallholder sector contrasts with Liberia's plans

In their review of oil palm, Ayodele et al. (2015[314]), find that it has been of socio-economic benefit to Nigerian smallholders: "The results for incomes per hectare in ex-post studies are broadly consistent. They place the incomes from average sized farms in Nigeria (1.5 hectare) at the level of average incomes for the country as a whole and higher than rural incomes generally." Pointing to independent oil palm smallholder farming having a poverty alleviation role despite a low yields, and is optimistic of a positive role for investors (private estates have under 4% of the palm area)[315] [316] to enhance productivity and lower costs for the benefit of 4 million smallholders who operate on wild groves, supplying local markets via traders and small-scale processors. What Ayodele et al.[317] note of Nigeria may ring true for many other palm oil regions: that "extensive community consultation" have achieved better results, but "there will always be levels of dissatisfaction …constructive management of these conflicts is essential."

Typical gains for smallholders from engagement with plantations include access to higher yielding planting materials, fertiliser, material inputs and technical support. For instance, Olam reports on its large-scale oil palm project in Gabon, its efforts to secure land tenure, supply improved planting materials, and its training of environmental and social teams.[318] Atkinson (2015)[319] reviews the historic and recent (post-conflict) issues of large-scale plantation development in Liberia where some 15-22% of total planted area

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312 Falconer, Angela, Tina Mafira, and Guntur Sutiyono (2015), *Improving Land Productivity through Fiscal Policy: Early Insights on Taxation in the palm oil supply chain, A CPI Report*, *December 2015*, https://climatepolicyinitiative.org/wp-content/uploads/2015/12/Full-Report-English-Early-Insights-on-Taxation-in-the-Palm-Oil-Supply-Chain.pdf, accessed 2 Feb. 2017.

313 Kasryno, Faisal (2015), Op. cit., p.10-11.

314 Ayodele et al. (2015, Ibid, p.33).

315 Oil Palm Area in Nigeria, 2004: Wild grove 2,300,000 hectares, Smallholder 117,625, Estate 96,465, Total 2,514,090 hectares. Source: Raw Materials Research and Development Council (Ibid, p. 20).

316 The authors write of two private estates with outgrower schemes that offer opportunity for employment and better farmer training (Ibid, p. 33).

317 Ayodele et al. (2015), Ibid. p.5.

318 Interview by LMC International Ltd, 6 Mar. 2017.

319 Atkinson, Philippa (2015), *Palm oil in Liberia: Missed opportunities and second chances*, Consulting Study 17, The High Carbon Stock Science Study 2015 (December 2015), http://www.simedarbyplantation.com/sustainability/high-carbon-stock, accessed 10 Feb. 2017.

expected to be set aside for smallholder out-grower development. There were major delays and hurdles to launching palm oil projects, due to investor versus local people's conflicts relating to land and economic distribution. Concession agreements, lasting up to 65 years, were granted covering a total of over 700,000 hectares. She notes special problems with '*their most important (concessions) clause (which is the obligation on the part of the government to provide land to the companies that is 'free of encumbrances'*. This clause singularly failed to take account of the complex existing customary and private land claims across the vast areas concerned, and has been the source of many subsequent problems. Moreover, "While the three major companies are all members of the Roundtable on Sustainable Palm Oil (RSPO), some of its core regulations were implemented either insufficiently or badly." [320]

7.3.7. Conclusions on wealth distribution in smallholder schemes

Smallholders farming oil palm can expect higher incomes than those with similar rice and rubber holdings. Smallholders in Indonesia, even with a half yielding 2 hectares or a fire-damaged site in Riau, would do better than minimum wage with hope for better incomes. For Malaysia, the larger palm areas generated incomes over 2.5 times higher than minimum wages. Other sources of income are important for most smallholders.

Smallholders need help from corporate plantations for extension services and access to higher-yielding planting materials. In the case of Nigeria, some advocate such assistance to improve output and incomes in its dominant-smallholder (underinvested) palm oil sector. It is not anticipated that the high-investment cost large scale Felda model can be undertaken today under a state-led development approach.

The nature of the crop (high capital cost and the need to process immediately) also means that it favours wealthier farmers and large processors. Some wealth distribution indicators suggest wide disparities at a national level.

In summary, we may conclude that there is a good degree of confidence that the expansion of oil palm cultivation has improved incomes and yet contributed to wealth inequality (see Table 25 and Table 26 below).

Table 25: Information quality assessment for improved income from oil palm cultivation[321]

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Income	16	0.8	0.7	0.7	0.7

Table 26: Information quality assessment for rising income inequality from oil palm cultivation[322]

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score

[320] Atkinson, Philippa (2015), Ibid., p.11-13.

[321] From Cramb and McCarthy (Editors) (2016), Falconer et al. (2015), Feintrenie et al. (2010), Gibson (2017), Grieg-Gran (2008), Kasryno (2015), Khor et al. (2015), Ryan et al. (2016), Sinaga (2013), Susila (2004), Mizuno and Masuda (2016), Zen et al. (2005) and others.

[322] From Gibson (2017), Falconer et al. (2015), Hanafiah (2017), Purnomo (2017), Mizuno and Masuda (2016), WALHI Riau et al. (2016), Winters (2012) and others.

Income/Wealth inequality	8	0.6	0.6	0.9	0.7

7.3.8. Including Socio-economic Considerations in the High Carbon Stock (HCS+) Study

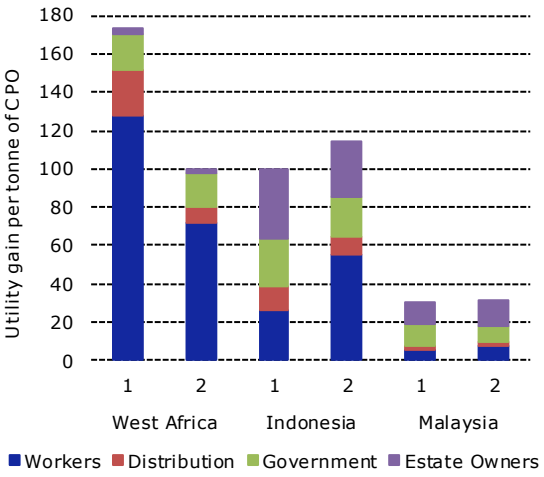
One approach to evaluating the socio-economic impact of oil palm developments uses traditional welfare economics theory. This attributes a greater benefit to increasing by $1 the daily income of a poor person by $1 than that from raising the income of a richer person. Layard, Mayraz and Nickell,[323] using data from over 50 countries from 1972 to 2005, estimate the best way to compare the welfare gains ("marginal utility") from raising incomes for different beneficiaries. Applying their results, an extra $1 for someone on a daily income of only $1 has 8 times the welfare benefit of an extra $1 for someone earning $5. Their estimate of total utility (U) at an income per day of Y is given by:

$U = \frac{\left[Y^{-0.26} - 1\right]}{\left[-0.26\right]}$ $U = \frac{\left[Y^{-0.26} - 1\right]}{\left[-0.26\right]}$, which yields a marginal utility of income of $dU/dY = (Y)^{-1.26}$ $dU/dY = (Y)^{-1.26}$.

As an illustration of this approach, in **Figure 15** we compare the welfare gains per tonne of CPO for two projects in each of three countries, Indonesia, Malaysia and one in West Africa. These welfare gains are divided between workers, input suppliers, the government (via taxes), and the estate owners. It will come as no surprise that the biggest welfare gains are received by West African workers, whose alternative sources of income are very limited.

In summary, it is possible to incorporate socio-economic aspects into an evaluation of the overall impact of oil palm development. Inter-personal utility comparisons have been developed to permit such comparisons, attributing much higher welfare gains to income increases for very low income residents than from raising incomes for people on higher incomes. The ratio is 8 to 1 for an identical increase in income for someone on $1 a day vs. someone on $5 a day.

Figure 15: Composition of welfare gains per tonne of CPO produced by two plantations (numbered 1 and 2) in West Africa, Indonesia and Malaysia



[323] Richard Layard, Guy Mayraz, Stephen J. Nickell, *The marginal utility of income - revised version*, *SOEP (Socio-Economic Panel) papers on Multidisciplinary Panel Data Research*, Deutsches Institut für Wirtschaftsforschung, Berlin April 2008. Available from: http://www.diw.de/soeppapers.

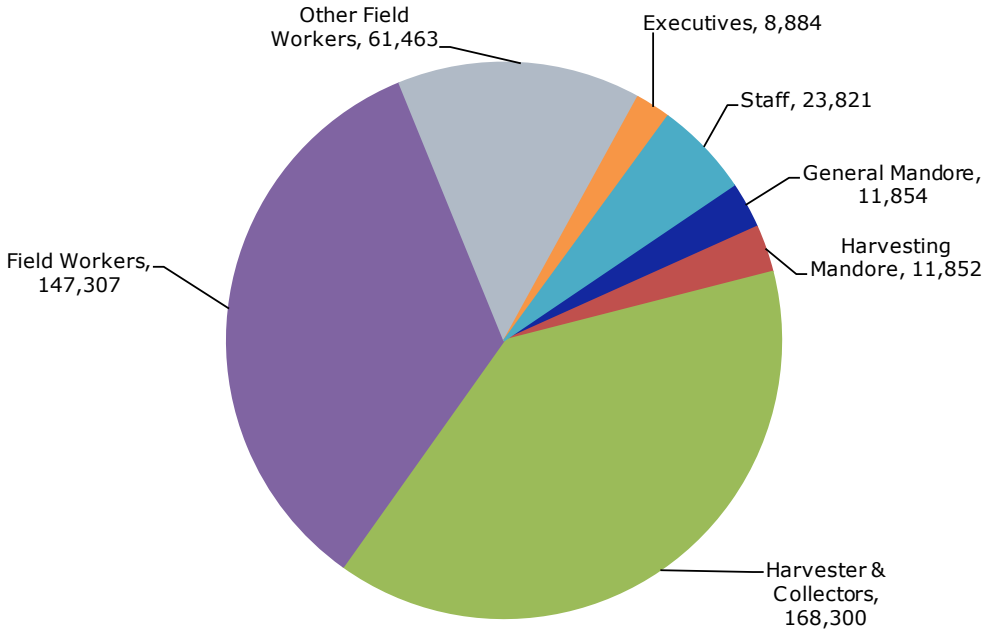
7.3.9. Plantation employment in Malaysia

For Malaysia (based on 2014 data) the share of the labour force employed in the plantation sector is 5.2%. By comparison, based on the most recent data from 2016 around 1.5% of the labour force in Indonesia is employed in the oil palm industry.

Figure 16 below demonstrates that the vast majority of workers on plantations are working in the field. The plantation sector provides a large number of jobs for manual labourers, but proportionately relatively few managerial or executive level jobs. This is not surprising given the labour-intensive nature of the crop and relatively limited success at mechanisation to date.

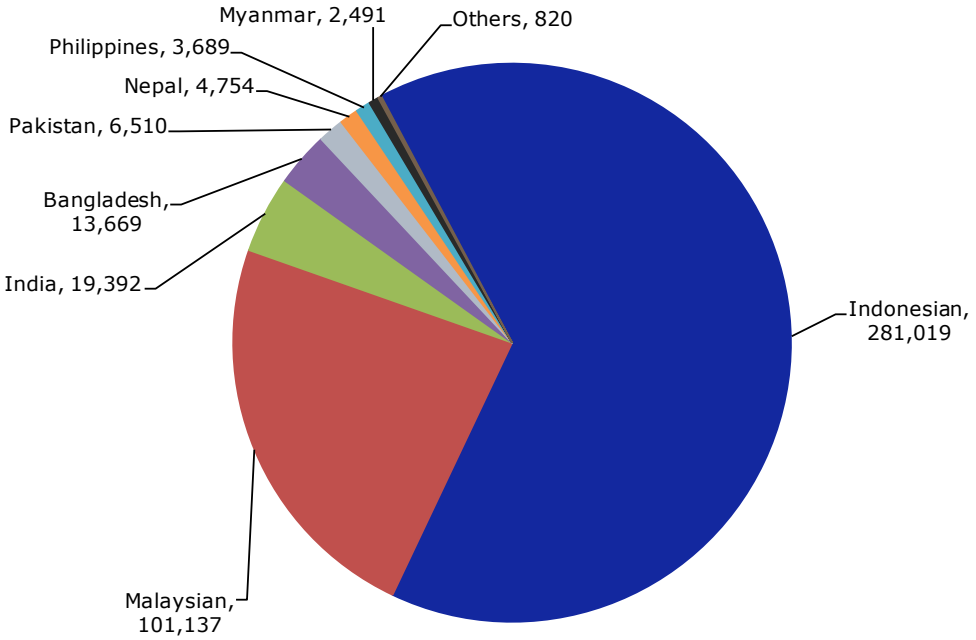
Figure 17 lists the origins of the workers. Indonesian workers are crucial. The sector is a heavy user of migrant labour, most of them generating remittances to its neighbouring country. Yet it creates potential issues with exploitation and migrant worker rights (see **Section 7.2**).

Figure 16: Employment by job category on Malaysian plantations, 2012



Sources: Malaysian Departments of Labour and Immigration.

Figure 17: Nationality of workers on Malaysian plantations, 2012



Sources: Malaysian Departments of Labour and Immigration.

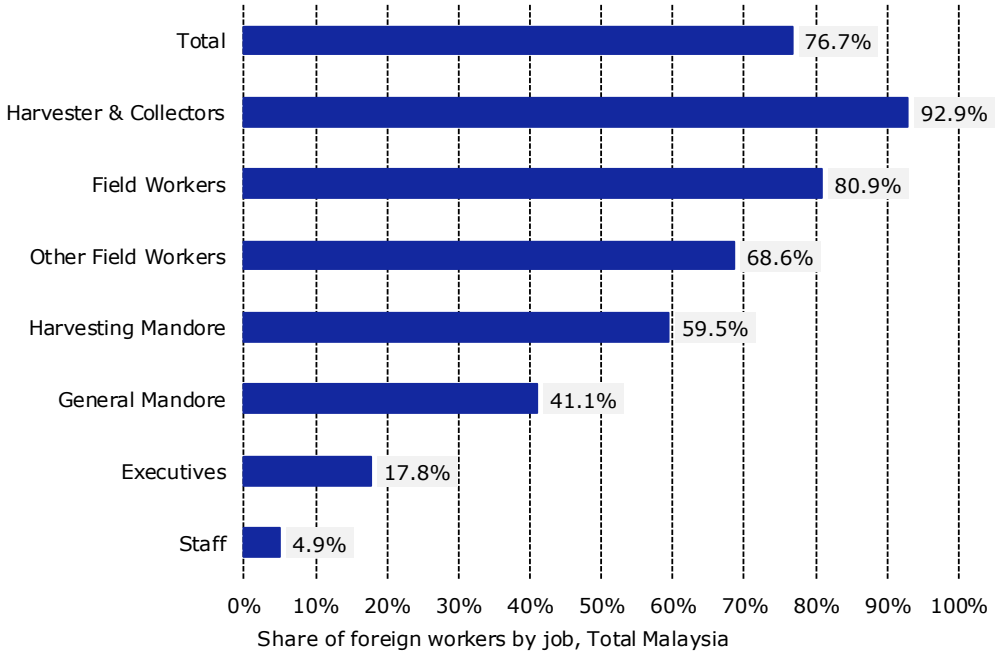
Figure 18 below describes the share of different tasks performed by foreign workers on plantations in Malaysia.

Foreign workers are critically important in the most physically demanding field task, harvesting, which is almost entirely dependent on foreign (in practice, Indonesian) workers, accounts for the highest share of employment by role. General field workers, come next in both absolute numbers and in their dependence on migrant foreign workers.

The foreign workers hold very few executive or management positions. This is partly the result of the labour laws in Malaysia, which require foreign plantation workers to return home after five years, with an interval before they may apply to return. There is, therefore, no incentive for plantations to give much training to their foreign employees.

The estimates shown here have a number of drawbacks. They do not include (illegal) foreign workers without permits. The wives of foreign workers who themselves have permits, are not provided with work permits (apart from in Sabah), yet they often work on estates and are not recorded in official statistics. Finally, smallholders with less than 10 hectares cannot get a legal work permit for foreign workers. Their foreign worker numbers are therefore certain to be unrecorded. As a result, the Malaysian employment data are likely to underestimate the actual dependence of the plantation sector on foreign employees.

Figure 18: Shares of foreign workers in different tasks, Total Malaysia, 2012



Sources: Malaysian Departments of Labour and Immigration.

7.3.10. The Indonesian plantation sector and its employment

Area under oil palm in Indonesia is split between smallholders, estates and government area. In this section we review the trends between these three sectors – this is important as they have different structures resulting in different employment opportunities:

Table 27 shows the planted area of mature oil palm area by sector in Indonesia. It highlights the rapid growth in area under oil palm, with the total nearly trebling from 2000 to 2015. The growth was relatively evenly split between smallholdings and estates, with the government estates' area growing only a small amount. The share of oil palm area under smallholdings rose, moving from around a third to close to two-fifths of the total area.

Table 27: Planted areas of mature oil palm by sector, Indonesia (hectares)

	Smallholdings	Government	Estates	Sum
2000	800,199	489,752	1,303,551	2,593,502
2001	1,077,565	520,288	1,498,022	3,095,875
2002	1,253,820	540,790	1,619,754	3,414,364
2003	1,288,861	547,338	1,667,270	3,503,469
2004	1,561,324	523,932	1,805,853	3,891,109
2005	1,706,433	548,789	1,968,141	4,223,363
2006	1,821,964	580,836	2,283,907	4,686,707
2007	2,021,555	528,002	2,426,185	4,975,742
2008	2,115,942	529,348	2,576,483	5,221,773
2009	2,216,872	532,793	2,579,661	5,329,326
2010	2,309,507	542,788	2,591,190	5,443,485
2011	2,728,937	553,985	3,377,016	6,659,938
2012	2,739,749	555,102	3,409,634	6,704,485
2013	3,227,043	590,852	4,191,868	8,009,763
2014	3,372,069	607,371	4,405,836	8,385,276
2015	3,752,480	678,378	4,561,966	8,992,824

Source: Directorate General of Estates, Direktorat Jenderal Perkebunan, annual reports.

Table 28: **Palm oil output by sector, Indonesia (tonnes)**

	Smallholdings	Government	Estates	Sum
2000	1,905,653	1,460,954	3,633,901	7,000,508
2001	2,798,032	1,519,289	4,079,151	8,396,472
2002	3,426,740	1,607,734	4,587,871	9,622,345
2003	3,517,324	1,750,651	5,172,859	10,440,834
2004	3,847,157	1,617,706	5,365,526	10,830,389
2005	4,500,769	1,449,254	5,911,592	11,861,615
2006	5,783,088	2,313,729	9,254,031	17,350,848
2007	6,358,389	2,117,035	9,189,301	17,664,725
2008	6,923,042	1,938,134	8,678,612	17,539,788
2009	7,517,716	2,005,880	9,800,697	19,324,293
2010	8,458,709	1,890,503	11,608,907	21,958,119
2011	8,797,924	2,045,562	12,253,055	23,096,541
2012	9,197,728	2,133,007	14,684,783	26,015,518
2013	10,010,728	2,144,651	15,626,625	27,782,004
2014	10,205,395	2,229,336	16,843,459	29,278,190
2015	10,572,791	2,346,822	18,195,402	31,115,015

Source: Directorate General of Estates, Direktorat Jenderal Perkebunan, annual reports.

However, **Table 28** reveals that the estate sector remained the dominant producer, accounting for close to 60% of palm oil output. The smallholders' share of output increased but not as dramatically as their share of the area. This is due to the much lower yields on smallholder area, as demonstrated in

Table 29.

Table 29 translates these trends into their impact on employment. In 2000-2015 the oil palm sector added 1.2 million jobs. Of these the majority of around 670,000 jobs were added on smallholder areas. By contrast the estate sector added approximately 540,000 jobs. Around 30,000 jobs were also added in the government sector.

Table 29: Yields of CPO per hectare, by sector, Indonesia, tonnes per mature hectare

	Smallholdings	Government	Estates	National
2000	1.63	2.48	1.51	1.68
2001	1.79	2.49	1.60	1.78
2002	1.89	2.55	1.75	1.90
2003	1.90	2.64	1.87	1.98
2004	1.73	2.67	2.18	2.05
2005	1.91	2.74	2.30	2.17
2006	2.27	3.37	2.76	2.63
2007	2.31	3.49	2.70	2.61
2008	2.40	3.21	2.24	2.38
2009	2.46	3.18	2.34	2.45
2010	2.50	2.99	2.66	2.62
2011	2.34	3.02	2.69	2.57
2012	2.22	3.12	3.09	2.72
2013	2.30	2.95	2.90	2.65
2014	2.31	3.06	3.01	2.72
2015	2.33	3.15	3.04	2.76

Source: Directorate General of Estates, Direktorat Jenderal Perkebunan, annual reports.

Table 30: Direct employment in the Indonesian palm sector

	Smallholdings	Government	Estates	Sum
2000	233,352	102,922	360,479	696,753
2001	312,206	106,741	381,369	800,315
2002	361,685	110,524	394,060	866,269
2003	370,879	115,991	414,954	901,823
2004	444,068	106,026	368,778	918,872
2005	471,379	92,724	385,060	949,164
2006	509,914	120,300	503,687	1,133,901
2007	550,434	106,093	511,262	1,167,790
2008	576,380	105,519	581,848	1,263,746
2009	612,283	110,340	627,205	1,349,828
2010	677,451	110,516	654,993	1,442,960
2011	750,496	118,716	684,295	1,553,507
2012	827,524	119,565	712,780	1,659,869
2013	871,217	127,359	807,175	1,805,752
2014	884,473	127,579	840,512	1,852,564
2015	907,080	130,181	897,147	1,934,409

Source: Directorate General of Estates, Direktorat Jenderal Perkebunan, annual reports.

Note: Employment per hectare is set at 0.2 years for smallholders; 0.175 for government estates; 0.15 for private estates.

7.3.11. Worker incomes in the palm oil sector vs. traditional incomes

Table 31 uses data gathered from a number of different plantation groups and anonymised as part of the High Carbon Stock Study to show the relative income for plantation workers and how much they earned prior to joining the plantation. The table reveals that the wages are much higher for plantation workers, though the differential is higher in Indonesia than West Africa. This is because plantation work is relatively highly skilled and therefore does command a premium. The lower West African ratio is because the workers on the plantation have not yet been fully trained and are therefore often shadowing Indonesian workers as they learn the ropes.

Table 31: Comparison of incomes in two West African examples and two Indonesian examples, US$ per day

West African example	1	2	Indonesian example	1	2
Prior income	1.00	2.00	Prior income	0.91	0.91
Minimum plantation wage	5.35	5.35	Minimum plantation wage	6.90	8.76
plus fringe benefits	6.49	6.61	Plus fringe benefits	9.57	11.19

Source: Data provided by plantation companies during the High Carbon Stock Study.

7.3.12. Input-output analysis and multipliers for oil palm

In order to understand the value of the oil palm to the economy, we should look not only at the direct value of the sector, but also the indirect value, income and employment the sector creates (in economics these are known as the multiplier effect).

Input-output analysis for the Malaysian economy demonstrates that the 'oils and fats' sector has the highest output multiplier. When oils and fats production increases by 1,000 Ringgits, this adds 2,760 ringgits to GDP.

This is because the sector includes downstream processing: from basic refining to the production of speciality fats. Oil palm estates have a much higher than average income and employment multipliers, by virtue of their labour intensity.

Input-output analysis for Indonesia reveals a lower output multiplier for oils and fats than Malaysia's, but higher income and employment multipliers. There are two potential causes of this interesting divergence. The first is that the lower wages in Indonesia lead some companies to substitute labour for capital. The second is that there is excessive processing capacity in Indonesia as a result of investment incentives, raising the relative share of labour in output.

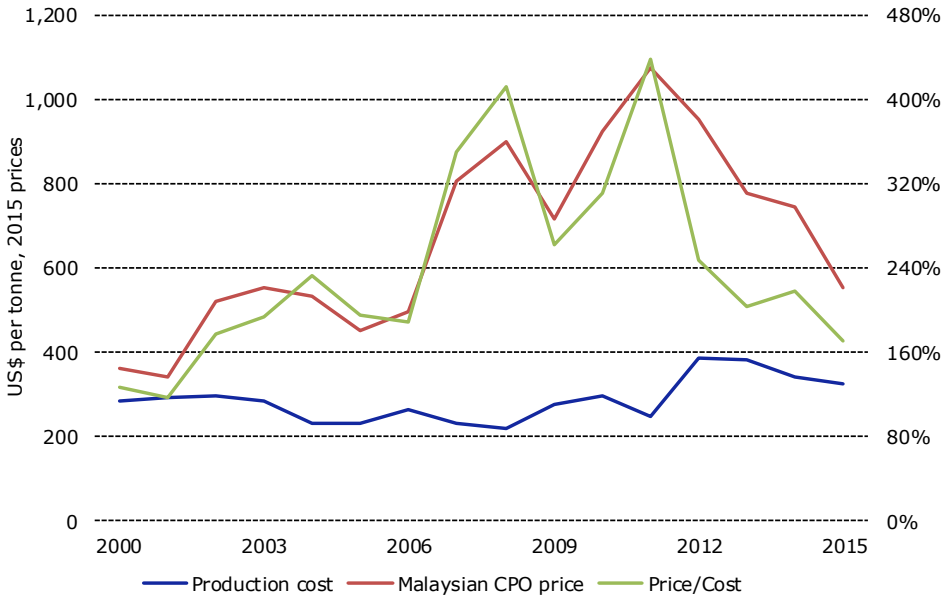
In summary, the oil palm industry, by virtue of its high labour intensity, is among the top agricultural sectors in both its income and employment multipliers. Downstream oils and fats industries are the best performing sector in terms of output multipliers, thanks to its direct link to the upstream plantation and milling activities.

This explains the economic importance of palm oil to governments in developing countries, who also eye foreign exchange earnings from commodities that offer a comparative advantage in the global economy, as well as supporting national policies to improve education and health. The Government of Indonesia also notes that its palm oil industry also indirectly supports another 12 million people largely in the rural areas, and generates US$20 billion a year in export earnings. The use of biodiesel within its mandatory B20 policy saves around $2 billion of foreign exchange spending on fuel oil imports; provided tax revenue of around $72.4 million in 2016, added value from palm oil downstream industry of around $329.7 million, and reduced diesel consumption by about 40 million barrels (112,000 barrels a day).

7.3.13. Historical costs, palm oil prices vs. production costs

Figure 19 below plots the production cost of CPO against the price since 2000. We have also calculated the ratio of the price and production cost. The diagram reveals that, broadly speaking, the price has followed production costs. The diagram also indicates that the oil palm industry's average ex-mill production costs worldwide, after subtracting revenues from sales as palm kernel as a credit, are consistently below the price of palm oil, which explains the continual desire for expansion in the sector.

Figure 19: World average CPO production costs, ex-mill, vs. prices, US$ per tonne



Sources: Bursa Malaysia Derivatives and LMC production costs reports.

7.4. Analysis of palm oil statistics, trade flows, trends and end users of palm oil, including comparison with other vegetable oils

7.4.1. Supply and demand of major palm oil producers

In this section we present the global picture of palm oil production, consumption and trade, identifying the major producers and consumers. In **Appendix 4** we review the demand and supply balances for the major countries producing or consuming palm oil and palm kernel oil over the past decade to understand the relative size of their markets and the trends in their output.

The dominance of South East Asian countries in world production is very clear. The distribution of palm oil consumption is more evenly shared among the leading countries and regions. India and Indonesia are the two largest users, though some Indonesian demand is processed into higher value products for export. Among high-income consumer markets, only the EU (ranked third) and the US (ranked tenth) appear in the top ten consumers. All high-income countries together consume one sixth of world palm oil output. The remaining five sixths are consumed by middle and low-income countries. Asia alone consumes exactly two thirds of the world's palm oil supply.

Figure 20 and Figure 21 illustrate the production of palm oil by country[324], with the largest at the bottom.

Figure 22 and

Figure 23 are the counterparts for palm oil consumption[325.] The other major consumers (not shown) are in West Africa (most notably Nigeria and Ghana), South East Asia (the Philippines and Myanmar), East Africa (Kenya) and Russia.

Figure 20: Palm oil production by country

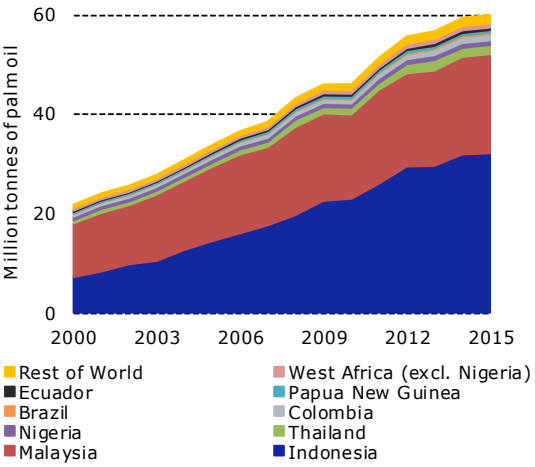
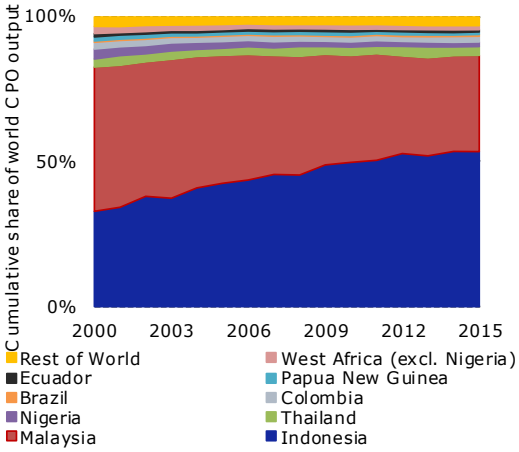


Figure 21: Share of world palm oil production by country



[324] The data are drawn from the *USDA PSD database*, https://apps.fas.usda.gov/psdonline

[325] *Op. cit.*

Figure 22: Palm oil consumption by country

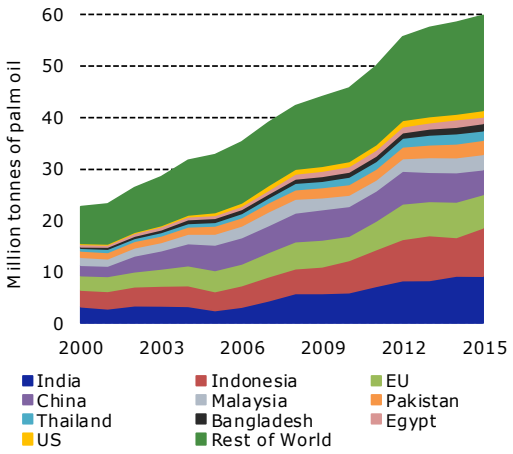


Figure 23: Share of world palm oil consumption by country

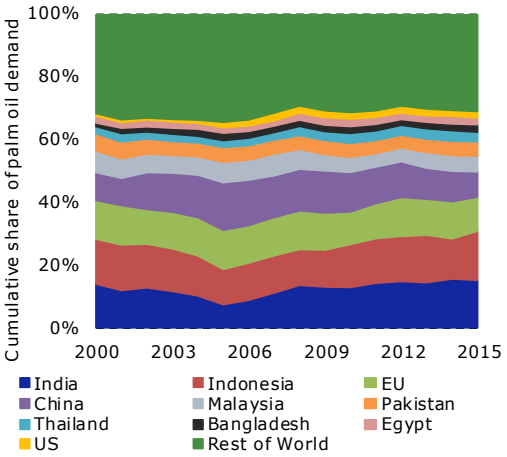


Figure 24: Palm oil exports by country

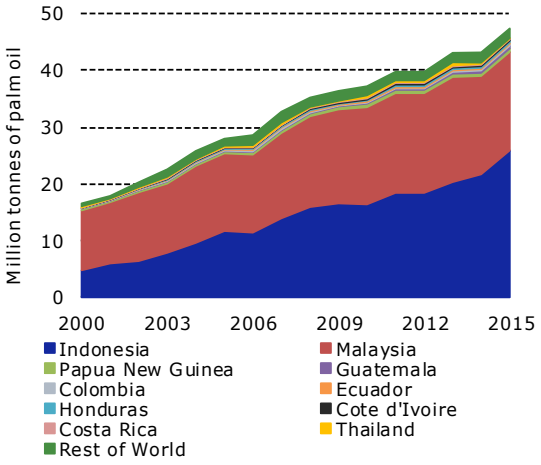


Figure 25: Share of world palm oil exports by country

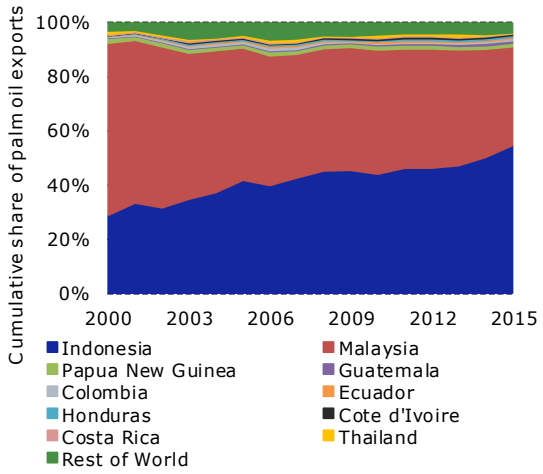


Figure 26: Palm oil imports by country

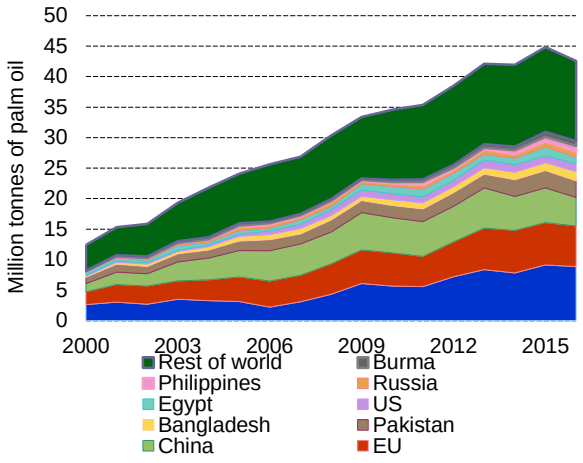
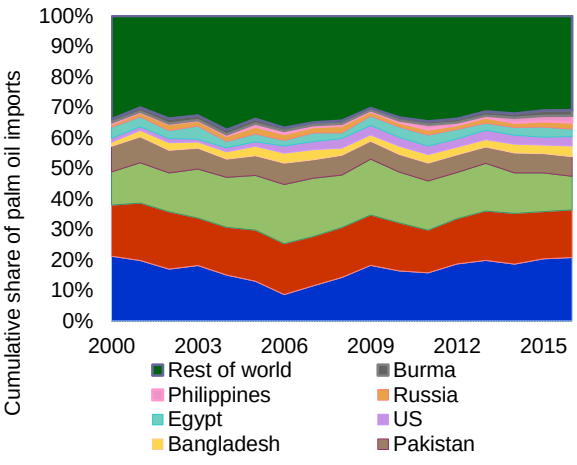


Figure 27: Share of world palm oil imports by country



Sources: Figures 20-27 United States Department of Agriculture

(Note that there are many countries round the world that are palm oil producers, consumers, exporters and importers. The countries mentioned by name in the diagrams are the most important individual countries and regions in each case. All the other countries on the world are grouped together as "Rest of World" in the diagrams).

Figure 24 and **Figure 25** depict the concentration of world palm oil exports[326] in the hands of the two South East Asian countries, with Indonesia overtaking Malaysia in recent years. **Figure 26** and **Figure 27** are the corresponding diagrams for palm oil imports[327], which are shared much more evenly among a large number of countries.

7.4.2. Vegetable oil supply and demand forecasts

Figure 28 depicts the consumption of the different vegetable oils in the main consuming countries with forecasts to 2030. The figure reveals some interesting differences in the type of vegetable oils being consumed:

- The **US** consumes predominantly soybean oil, with rapid growth in palm oil. The reason for the large consumption of soybean oil is the large domestic production and crushing of soybeans. However, the discovery of the dangers of trans-fatty acids has reduced the use of hydrogenated soybean oil. This has created a growing market for palm oil.
- The **EU** divides its consumption between soybeans, rapeseed, sunflower and palm oil. Rapeseed and sunflower are produced locally (with sunflower augmented by supplies from the Ukraine). Palm oil has found increasing uses in the EU in biodiesel.
- **Japanese** consumers focus on rapeseed oil, as they view it as a superior oil. Soybean oil consumption has been declining along with soybean crushing in Japan. In its place there have been some increased imports of palm oil.
- **China** relies on rapeseed oil, from domestically grown rapeseeds, and soybean oil, from imported soybeans. Palm oil use is also significant in end-uses such as instant noodle production and catering.
- **India** has a small feed sector supplied with the meal from crushing oilseeds. Instead, end-users rely heavily on palm oil for their oil needs. As the cheapest oil, palm oil is also well suited as consumers are on very low incomes and are very price sensitive.
- By contrast, **Brazil,** which is one of the largest soybean producers in the world and has a large domestic crushing sector, can rely almost entirely on soybean oil to meet its vegetable oil needs.

One of the important facts of the vegetable oil market is that different vegetable oils are to a large extent interchangeable. Some consumers prefer specific oils, but in general the vegetable oil preferred in a country is a result of availability and relative prices. Oils produced locally, whether from crushing domestic or imported crops, are used first to meet demand, noting that these are not subject to import tariffs. The remainder is met from imports of oils, the cheapest of which is usually palm oil. This cheapness is because, as a crop harvested every day and processed immediately after harvest, palm oil is produced daily and has to price itself into the market to keep oil shipped daily and prevent the stocks of CPO in mill tanks from overflowing.

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326 *Op. cit.*
327 *Op. cit.*

As a result, the outlook for vegetable oil consumption is predominantly driven by supply factors. Figure 29 shows the production of the main vegetable oils since 1975. Until around 2006, soybean oil was the primary vegetable oil in the world (See **Appendix 5** for more information under soybean and other annual crops). Since then palm oil has become the most important vegetable oil. Neither of these sources of vegetable oil reacts to short-term demand signals. In the case of soybean oil this is because it is produced as a co-product from crushing soybeans for meal. For palm oil production it is the result of planting decisions made four years earlier (as it takes four years for the oil palm to start yielding). Our projections of consumption by country in Figure 28 therefore are related to the availability of vegetable oils.

In **Appendix 5**, we also analyse the areas implied by projections of oil crop output to 2026. First, the impact of extrapolating past trends in oil crop areas, assuming the continuation of past growth rates in demand and yields, is depicted. **On past trends, 73 million hectares of oil crops would be added between 2013 and 2026; 42 million would be soybeans, 21 million rapeseed, 13 million palm and 4 million sunflower.**

We then considered the implications for the areas needed to be brought into cultivation at actual 2013 yields to meet rising oil demand if **no increase occurred in the palm area**, keeping it at 19 million hectares, rather than 31 million on trend. **If all the forgone palm oil were replaced with soybean oil, the most likely replacement, an additional 98 million hectares of soybeans would be needed, on top of the 42 million simply following trend.** This implies a world soybean area of 257 million hectares in 2025, up from 117 million in 2014.

The high yield of oil palm per hectare means that the area requirement is lower than that of competing crops. To increase vegetable oil production by the same amount, therefore, by relying on competing oilseeds (the most important of which is soybeans) instead of oil palm will require 5-8 times larger areas of land.

Figure 28: Forecast of food oil consumption by type of oil for major markets

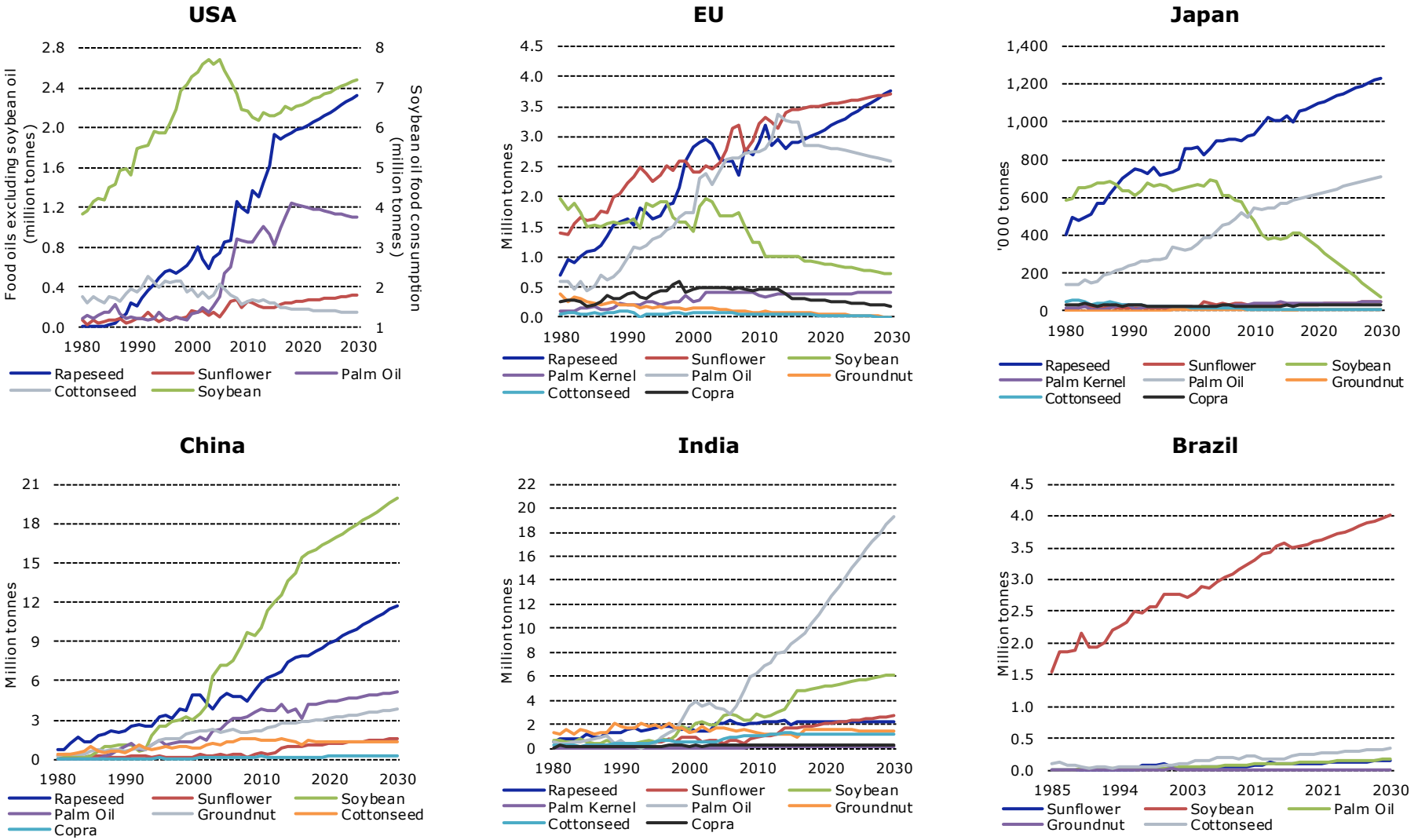
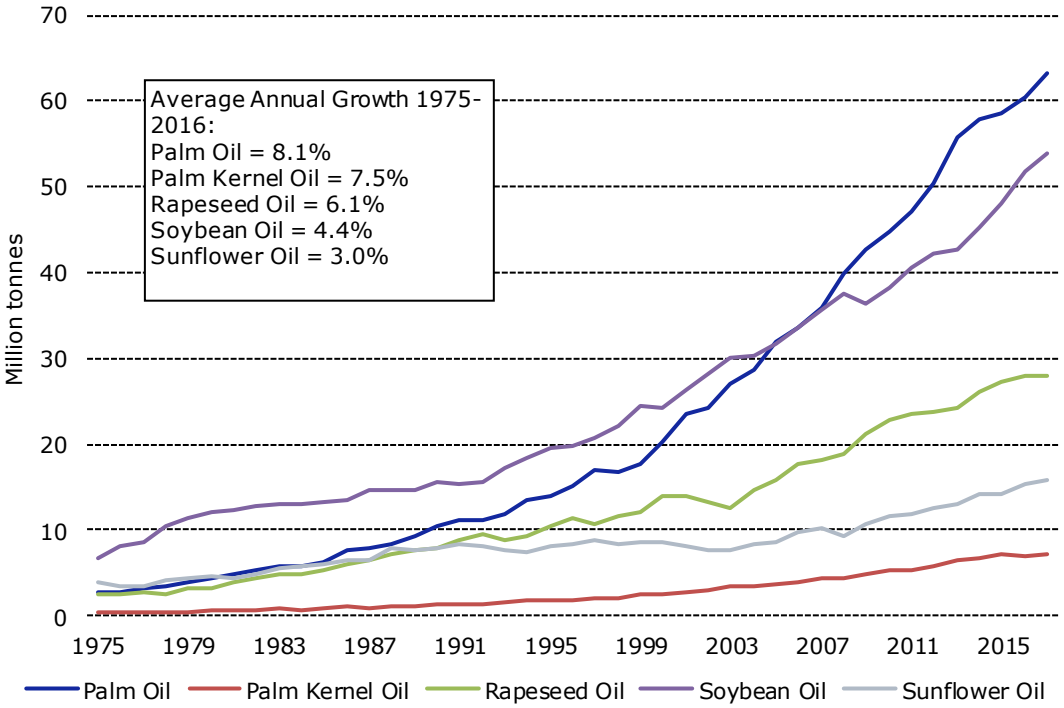


Figure 29: Growth in global demand for vegetable oils, 1974/75-2016/17



7.5. Current forecasts for vegetable oils world market & projected evolution of end uses

In this section we present our forecasts of vegetable oil demand by major end use (Table 32) and supply by major crop (Table 33).

In terms of vegetable oil demand we distinguish between three main drivers:

1. Food use is determined by income and population growth. Income is the strongest determinant of per capita consumption.
2. Biofuel demand is driven by the evolution of policy, which determines the share of biodiesel being blended and diesel consumption, which is determined by income growth and crude oil prices. (Higher household income levels are leading consumers to drive more, as do lower crude oil prices, increasing fuel demand).
3. Other uses, such as oleochemicals, are also determined by income with consumption growing rapidly at low levels of income and then plateauing.

The summary in **Table 32** is for the world, built up from country-level projections. Food use will be the largest driver of demand, unlike the past decade in which biodiesel led demand growth for vegetable oil. The more modest outlook for biodiesel reflects the waning political support for biofuels in Europe and the US, as well as the lower crude oil price. Other uses like oleochemicals will grow the most rapidly, but from a small base.

Though oils have some functional differences, they are broadly interchangeable. As a result, we forecast total vegetable oil demand. We then determine which vegetable oil will meet that demand. The forecasts in Table 33 are derived as follows:

Soybean oil is a co-product of meal demand, which is related to meat demand. The consumption of meat is a function of dietary changes related to income and population growth. Improvements in feed conversion ratios or differences in the type of meat being consumed also affect the outlook for meal demand.

The area planted to oil palm is determined by the feedback from CPO prices to plantings. In the long run the availability of land for planting on a sustainable basis will determine the growth in output, since yield growth is low (there has been no underlying increase in yields in Southeast Asia since 2007) and with a perennial crop cannot change quickly.

Coconut oil output is constrained by minimal yield and area growth. Production of palm kernel oil, as a by-product, will grow in line with the expansion in oil palm.

Demand that cannot be met by these sources will be met by sunflower or rapeseed oil, both of which are annual crops that can respond rapidly to vegetable oil price signals.

Table 33 forecasts the demand of vegetable oil, including stock changes, by crop to 2050.

Table 32: World forecast of vegetable oil demand by end use (million tonnes)

	2015	2016	2017	2020	2030	2040	2050
Food	136.8	141.9	146.7	158.7	199.0	248.1	309.4
Policy-Driven Biofuels	25.0	29.6	31.3	38.3	41.2	44.6	48.2
Other Industrial	11.6	12.0	12.4	13.5	18.4	22.6	27.8
Total	**173.5**	**183.5**	**190.3**	**210.6**	**258.5**	**315.2**	**385.3**

Table 33: World forecasts of demand for major vegetable oils (million tonnes)

	2015	2016	2020	2030	2040	2050
Soybean	48.0	51.7	59.9	74.3	91.5	113.0
Sunflower seed	14.1	15.1	17.4	19.0	20.6	22.4
Rapeseed	27.2	28.1	30.4	37.5	46.1	56.7
Coconut	3.3	3.2	3.5	3.8	4.0	4.3
Palm Oil	58.6	59.9	69.5	89.6	113.3	142.2
Palm Kernel Oil	7.2	6.8	7.8	10.0	12.7	15.9
Total incl others	**173.5**	**183.5**	**210.6**	**258.5**	**315.2**	**385.3**

8. Certification schemes, legislation and voluntary initiatives

8.1. Analysis of existing palm oil sustainability certification systems

This section provides a description and analysis of oil palm sustainability certification schemes, focusing on the four most widely used schemes: the Roundtable on Sustainable Palm Oil (RSPO), the International Sustainability and Carbon Certification (ISCC), the Indonesian Sustainable Palm Oil (ISPO) scheme and the Malaysian Sustainable Palm Oil (MSPO) scheme. Other certification schemes that are relevant to the palm oil sector are also discussed.

The section takes a systems approach, describing and then comparing a selection of key elements of these certification schemes (see Table 34): the standard, the certification process, measures to build credibility (accreditation, complaints procedures and transparency) and claims (chain of custody and labelling). It also includes evidence on the effectiveness of the systems, where that exists.

Analysis of the schemes focuses on how each scheme addresses the environmental and social sub-themes more prominent in the debate and literature on palm oil (i.e. those included in **Section 7)**.

Table 34: Architecture of sustainability certification

Although the precise details vary from scheme to scheme, the basic system for most sustainability certification is as described below[328]. This is a system of rules, processes, and separation of powers that are all designed to promote consistency of approach and minimise the risk of poor practice.[329]

The standard: These are documents that set out the requirements which must be met by the plantation and against which certification assessments are made.

The certification process: includes the processes of confirming that the requirements of the standard have been met by the entity seeking certification, and ensuring confidence in that decision.

Assessments follow requirements established by the schemes organisation and certification body. Auditors must collect objective evidence that a company's plans are adequate, that they are implemented and (where the standard specifies performance) that the outcome meets the requirements of the standard. This evidence is collected through a visit to the company, with documents scrutinised, the plantation examined, and managers, workers, local people, and other stakeholders interviewed. A decision is then made whether the requirements of the standard have been met in full, whether it has been largely met with only minor corrective actions required, or whether the company's performance has major deficiencies that must be corrected before it can be certified.

All of the main sustainability schemes, including FSC, RSPO and RTRS, specify that the certification body is independent of the company being assessed: known as 'third party independent audits'. Certification bodies must also fulfil general requirements of

[328] Based on: Nussbaum, R., Jennings S., & Garforth M. '*Assessing Forest Certification Schemes: A Practical Guide*.' ProForest (2002), UK.

[329] See for example the ISEAL Code of Good Practice for Assuring Compliance with Social and Environmental Standards, http://www.isealalliance.org/online-community/resources/assurance-code-version-10

Table 34: Architecture of sustainability certification

impartiality, a quality management system, and requirements on the conditions for granting certificates, as described by the International Organisation for Standardisation (ISO). The competence of the personnel conducting the audits is also covered by these guides: a team leader that is adequately trained; and a team with the combined expertise to assess all aspects of the standard, and who are able to interpret the standard being assessed.

The accreditation process: one way to build confidence in certification is the process of accreditation or 'certifying the certifier', in which an independent organisation provides assurance that a certification body is competent. Accreditation bodies also have requirements defined by ISO, including the organisation of the accreditation body, and the way in which they carry out accreditation.

Complaints procedure: A second mechanism for building confidence in certification is having a complaints procedure that gives third parties a response to concerns about a certification decision. ISO guidelines specify that certification bodies should have procedures to resolve complaints, appeals and disputes.

Transparency: The third mechanism for building confidence is transparency. This is ensured by allowing interested parties direct access to non-confidential information about the process and results of certification assessments. This usually involves making public available information on the certification body, consultation with stakeholders, and providing a summary of the audit findings.

Traceability and Claims: If claims will be made on the products coming from certified companies, then mechanisms to control the claims are also required. The type of claim depends on the level of traceability of the palm oil, of which there are four basic options:[330]

- *Identity preserved* (where the provenance of the certified palm oil is known to the purchaser);
- *Segregated* (certified palm oil is kept segregated from non-certified, however the plantation of origin may be unknown to the purchaser as a result of multiple transportation, bulking and processing stages);
- *Mass balance* (certified and uncertified palm oil are mixed, with the proportion of certified palm oil entering a process known, therefore a purchaser has on average that proportion of certified palm oil);
- *Book and claim* (the purchaser buys certificates corresponding to a volume of certified palm oil produced and redeems the value of the certificate to a certified producer, but buys oil on the open market).

Certification schemes may include mechanisms to verify traceability (identity preserved, segregated and mass balance) that are, in the more rigorous certification schemes, verified by independent third parties (certification bodies). The rules governing the labelling of those products are set out by the standards body.

330 ISEAL Alliance (2016). Chain of custody models and definitions A reference document for sustainability standards systems, and to complement ISEAL's Sustainability Claims Good Practice Guide Version 1.0, September 2016

8.1.1. Description of certification schemes relevant to oil palm

8.1.1.1. The Roundtable on Sustainable Palm Oil (RSPO)

The first scheme specific to oil palm, the RSPO, was formally established in 2004 (Table 35).[331] It remains the most prominent global scheme in the sector, being the favoured certification scheme for uses other than biofuel (**see Section 8.2**).

The RSPO was catalysed by WWF and major companies, including Unilever, and was established as a multi-stakeholder organisation, with a membership of 3,413 organisations in mid-2017[332]. The board includes representatives from growers, traders, manufacturers and retailers, social and environmental NGOs, banks and investors.

The RSPO certification scheme contains all of the major elements required by ISO, and built upon lessons from the Forest Stewardship Council (FSC), such as verification of compliance with the standard through third party, independent audits. The auditors compile a report that is used as the basis for a decision by the certification body on whether the plantation or processing plant, such as a mill, should be awarded a certificate. RSPO requires full compliance with all criteria in order to be certified, or an approved time-bound plan for addressing minor non-compliances. Surveillance audit visits are conducted annually.

Confidence in the process is given by a number of elements. Certification bodies must be accredited by Accreditation Services International (ASI). Accreditation is given on the basis of compliance with rules specifying the competence of audit teams, and the systems and processes used by the certification body to make decisions. Other mechanisms for increasing faith in the system include making summaries of audit reports publicly available, and providing a complaints and grievance procedure that allows public tracking of progress.

Four options for tracing certified palm oil are allowed under RSPO rules: identity preserved, segregated, mass balance and book & claim. Different product claims are allowed by RSPO rules, depending on the traceability option is used. The RSPO principles and criteria include detailed environmental and social requirements (see **Appendix 6**). These Principles and Criteria (P&C) include and go beyond compliance with applicable laws and regulations. In general, the RSPO P&C are regarded as being clearly explained, with indicators, guidance, and a thorough treatment of social issues, but the criteria concerning deforestation and peatland development leave a degree of flexibility and ambiguity.[333] Certified plantation companies with a mill have a mandatory time bound plan whereby all incoming fresh fruit bunches need to come from certified sources within three years. This distinguishes RSPO from other voluntary schemes.

In addition, the RSPO has developed a set of more stringent 'add on' criteria, referred to as RSPO NEXT. This provides independent, third party verification of a company's actions beyond the current P&C, including zero deforestation, zero burning, zero planting on peat, reductions in GHG emissions, respect for human rights and transparency. Uptake of RSPO NEXT has thus far been minimal. The RSPO has developed a further 'add on' to its

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331 Roundtable on Sustainable Oil Palm. '*About*'. June 2017. http://www.rspo.org/about/about

332 Roundtable on Sustainable Oil Palm. '*Impacts*'. Accessed 26 June 2017. http://www.rspo.org/about/impacts

333 Yaap, B. & Paoli, G. 'A Comparison of Leading Palm Oil Certification Standards Applied in Indonesia'. Daemeter, 2014.

Principles and Criteria designed to be consistent with the EU Renewable Energy Directive, RSPO-RED.[334]

Since its inception, the RSPO has seen a slow but steady uptake, which now certifies roughly 20% of the total global palm oil supply (See **Section 8.2**). However, only around half of that figure is sold as certified,[335] with the rest sold onto the general market due to limited demand for certified material from major consumer countries such as India and China. Few smallholders are RSPO certified, due to the high cost, high level of technical achievement needed for compliance and limited opportunity to gain a premium. There are suggestions that productivity benefits could accrue to smallholders who operate sustainably,[336] and the RSPO has created a smallholder fund (financed from 10% of the revenue generated by trading CSPO), and a strategy to complement certification for smallholders.[337]

Despite the coverage of its standard, with a system designed to allow for robust decisions, and its penetration of the world market, the RSPO has faced a number of criticisms (see **Section 8.1.2.3**).

[334] RSPO (2012). 'RSPO-RED Requirements for compliance with the EU Renewable Energy Directive requirements'. Version 4 – 10 February 2012 (final version). Last accessed on 24 October 2017 from https://www.rspo.org/key-documents/certification/rspo-red

[335] Roundtable on Sustainable Oil Palm. '*Impacts*'. Accessed 26 June 2017. http://www.rspo.org/about/impacts

[336] Molenaar, J.W., Meri Persch-Orth. M., Lord, S. Taylor, C., & Harms, J. (2013). Diagnostic study on indonesian oil palm smallholders Developing a better understanding of their performance and potential. IFC

[337] RSPO (2017). RSPO Smallholder Strategy: Objectives, Outputs and Implementation. RSPO.

Table 35: RSPO at a glance

Theme		Characteristics			
Overview	Date initiated:	2004			
	Coverage:	Global			
	Motivation:	Initiated by WWF and leading supply chain companies in response to concerns in western countries over environmental and social practices in the sector			
	Oversight:	Board has representatives from growers, supply chain actors, environmental and social NGOs			
	Mandatory or voluntary:	Voluntary			
	Market penetration:	21% of global market			
Standards	Principles and Criteria:	8 Principles and 43 criteria			
	Additional standards:	RSPO NEXT, RSPO-RED			
Certification process	Verification mechanism:	3rd party independent audits, annual surveillance			
	Corrective action	Within 60 days			
	Certificate:	Certificate issued by accredited certification body			
	Accreditation:	Certification bodies accredited by Accreditation Services International (ASI)			
	Transparency:	Public summaries of audit reports available on websites of accredited certification bodies			
	Complaints/grievance procedure:	Yes, with status of complaints publicly available on RSPO website			
Supply chain		Identity Preserved	Segregated	Mass balance	Book & Claim
		✓	✓	✓	✓
Further information		http://www.rspo.org/about			

8.1.1.2. International Sustainability and Carbon Certification (ISCC)

The EU Renewable Energy Directive (Directive 2009/28/EC) (EU RED) establishes sustainability criteria for biofuel feedstocks (including biodiesel derived from palm oil). While crop-based biofuels can be placed on the EU market irrespective of these sustainability criteria, only those that meet the criteria can account towards the EU renewable energy targets and be eligible for the related fiscal incentives. The ISCC certification system responded to this by creating a standard based on the sustainability criteria of the EU RED, the ISCC EU standard (Table 36). The scheme covers 6-7% of world palm oil supply, with producers who are part of the largest palm oil conglomerates in Malaysia and Indonesia forming the majority of certificate holders. [338] The ISCC system is not specific to palm oil, nor to biofuel.

The certification system includes independent, third party auditing and accreditation. The system includes an 'Integrity Programme' to independently monitor the performance of certification bodies and certified companies.

Under the ISCC system, only a subset of specified criteria must be met for certification. These include the sustainability criteria set out in the EU-RED. ISCC divides its criteria into 'major' and 'minor' musts, where all major and at least 60% of minor musts shall be met to achieve certification. This makes it difficult to draw any conclusions about the impact of the ISCC certification system on the ground, when compared with other schemes that require all criteria to be met in order for certification to be granted.[339] The ISCC system also recognises material that has been certified by other schemes, so long as these schemes are officially recognised by the European Union under the RED, including RSPO-RED.

The ISCC certification criteria fall into three categories, requirements: for sustainability; concerning GHG emission savings; and for traceability and the methodology for mass balance calculations. More information on the ISCC's Principles can be found at **Appendix 6**. The ISCC EU standard is used as the reference point for all subsequent analyses in this document.

[338] Pacheco P, Gnych S, Dermawan A, Komarudin H and Okarda B. 2017. '*The palm oil global value chain: Implications for economic growth and social and environmental sustainability*'. Working Paper 220. Bogor, Indonesia: CIFOR

[339] Yaap, B. & Paoli, G. 'A Comparison of Leading Palm Oil Certification Standards Applied in Indonesia'. Daemeter, 2014.

Table 36: ISCC at a glance

Theme		Characteristics			
Overview	Date initiated:	2010			
	Coverage:	Global (but aligned specifically with the EU Renewable Energy Directive) and covering other markets used mostly in biodiesel.			
	Motivation:	The ISCC was created to provide an internationally oriented, practical and transparent system for the certification of biomass, biofuel and all processing steps and supply chains up to final markets for biomass, biofuel, food, feed, and industrial use			
	Oversight:	ISCC is a multi-stakeholder initiative governed by an association of around 90 members			
	Mandatory or voluntary:	Voluntary			
	Market penetration:	6-7% of global palm oil production			
Standards	Principles and Criteria:	6 principles and 45 criteria, with land use and GHG principles based on the EU Renewable Energy Directive			
	Additional standards:	ISCC Plus (for biofuels outside EU), ISCC Non-GMO (GMO free feed and food)			
Certification process	Verification mechanism:	3rd party independent audits, annual surveillance. Additional independent audits to monitor certification body and certified company performance.			
	Corrective action	Within 40 days			
	Certificate:	Certificate issued by accredited certification body			
	Accreditation:	Certification bodies accredited by American National Standards Institute (ANSI).			
	Transparency:	Audit reports available on ISCC website as from 16 October 2017			
	Complaints/grievance procedure:	Yes, but no requirement for process to be publicly available			
Supply chain		Identity Preserved	Segregated	Mass balance	Book & Claim
		✓	✓	✓	No
Further information		https://www.iscc-system.org/			

8.1.1.3. Indonesian Sustainable Palm Oil

The Indonesian Government launched its Indonesian Sustainable Palm Oil (ISPO) scheme in 2011 (Table 37). More information on the ISPO's Principles can be found at **Appendix 6**.

ISPO is mandatory for companies producing and/or processing palm oil, except for smallholders and for plantation companies producing palm oil for renewable energy. The standard was introduced to ensure the adherence of oil palm plantations to government laws and policies, demonstrate that adherence to Indonesian regulations could deliver sustainable production, and support the Indonesian Government's commitment to reduce national GHG emissions.

The standard is based on existing Indonesian regulations that pertain to palm oil cultivation and processing. Certification includes independent, third party verification. There is less separation of decision-making and transparency than in the certification systems discussed above: certification bodies are appointed by the ISPO Commission as the scope of the national accreditation body (the Indonesian Accreditation Committee, KAN) does not yet include sustainability, and there is no requirement for summary audit reports to be publicly available.

Currently, 543 companies hold ISPO certificates,[340] and it has been argued that the initiative has failed to reassure consumers, NGOs and foreign governments of its effectiveness in reducing negative environmental and social impacts. At present, coverage remains limited. In December 2017, 16.7% of Indonesian production was approved as complying with the ISPO standard.

To address these concerns and perceived weaknesses, the position in December 2017 was that significant political commitment is being put into revising the ISPO scheme. These include the ISPO Strengthening Team, under the Coordinating Ministry of Economic Affairs (CMoEA), aiming at a Presidential Decree to repeal the current Ministerial Decree on ISPO for late 2017/early 2018. In addition, the *Forum Kelapa Sawit Berkelanjutan Indonesia* (FoKSBI), a multi-stakeholder forum led by the Indonesian government and facilitated by UNDP, aims to increase the coordination, sustainability and efficiency of the palm oil sector, including developing a National Action Plan. These processes are expected to result in significant revisions to the ISPO standard and certification processes that may address some of the weaknesses that have been identified by stakeholders. Although it is not possible to know what changes will occur at the time of writing, some of the innovations being considered include:

- The certification of aggregated entities the (villages, cooperatives of even districts) to be certified as a whole, on behalf of individual farmers within their boundaries;
- The scheme becoming mandatory to all producers;
- A new principle and criteria on transparency and supply chains; including as regards access to information for independent monitoring;
- A revised governance structure inspired by the FLEGT multi-stakeholder, consultative process;

[340] ISPO '*Sertifikasi*'. Last accessed 29 June 2017 at http://www.ispo-org.or.id/index.php?option=com_content&view=article&id=79&Itemid=225&lang=ina

- A clarification of defining "deforestation", possibly informed by parallel progress of the national REDD+[341] policy as regards the National Forest Monitoring System and Reference Levels.

Finally, there have been attempts to find common ground between public and private schemes. A recent joint study between ISPO and RSPO identifies significant scope for alignment, particularly in the auditing process, whilst also highlighting some key differences in the treatment and definition of High Conservation Value (HCV) areas within concessions, and the rules for developing new plantations.[342] It is not clear what steps will be taken by the two parties in order to promote greater alignment.

[341] http://redd.unfccc.int/files/frel_submission_by__indonesia_final.pdf

[342] Ministry of Agriculture, Roundtable on Sustainable Oil Palm, Indonesian Sustainable Palm Oil, Mutuagung Lestari and United Nations Development Programme. '*Joint study on the similarities and differences on the ISPO and the RSPO certification systems*.' RSPO, ISPO, UNDP (2015), Bogor, Indonesia.

Table 37: ISPO at a glance

Theme		Characteristics			
Overview	Date initiated:	2011			
	Coverage:	Indonesia			
	Motivation:	Designed to ensure that all Indonesian oil palm growers, not just those exporting to foreign markets, conform to higher agricultural standards			
	Oversight:	Indonesian Ministry of Agriculture, ISPO Commission			
	Mandatory or voluntary:	Mandatory for companies producing and/or processing crops. Voluntary for smallholders, and for plantation companies producing palm oil for renewable energy			
	Market penetration:	16.7% of Indonesian palm production, a slight increase on ISPO certified production of 4.85 million tonnes of CPO in mid-2015			
Standard	Principles and Criteria:	7 principles & 28 criteria for plantations, covering Indonesian laws and regulations			
	Additional standards:	Standards for integrated plantation and mills; integrated plantation and mills producing biofuels; plasma smallholdings; and independent smallholdings.			
Certification process	Verification mechanism:	3rd party independent audits, annual surveillance			
	Corrective action	ISPO is based on existing legislation, so if there is non-compliance there will be sanctions determined directly by the judiciary			
	Certificate:	Decision made by ISPO Commission, certificate issued by certification body			
	Accreditation:	Certification bodies accredited by national accreditation body and approved by the ISPO Commission (see above)			
	Transparency:	Audit reports not publicly available			
	Complaints/grievance procedure:	Yes, but no requirement for process to be publicly available			
Supply chain		Identity Preserved	Segregated	Mass balance	Book & Claim
		No	✓	✓	✓
Further information		http://ispo-org.or.id/index.php?lang=ina			

8.1.1.4. Malaysian Sustainable Palm Oil

The Malaysian Sustainable Palm Oil (MSPO) scheme was introduced in 2013 and formally launched in 2015 for Malaysia as a whole (Table 38). Originally a voluntary scheme, it is expected to become mandatory by the end of 2019. However, Sabah's state government has announced its intention to become fully RSPO certified by 2025, six years later than the MSPO target. MSPO aims to help all of the country's growers operate sustainably. More information on the MSPO's Principles can be found at **Appendix 6**.

The MSPO standard is split into four parts: universal: for smallholders; for palm plantations and organised (supported) smallholders; and for palm oil mills. The indicators for each user group vary, although the general principles are the same throughout. These are organised around seven principles that cover: commitment to MSPO, transparency, compliance with laws, social responsibility, environmental protection, best management practices and new plantings. MSPO requires that internal audit procedures and results are documented and evaluated, in order to implement necessary corrective action through continuous improvement action plans.

At the end of November 2017, the total area certified under the MSPO standard was 294,000 hectares (under 6% of the total palm area in the country), of which just 4,000 hectares were farmed by independent smallholders[343].

A supply chain standard is currently being developed.

Finally, it is worth noting that in 2015, The Council of Palm Oil Producing Countries (CPOPC) was formed by Malaysia and Indonesia, with membership open to all oil palm cultivating countries. Among the objectives of CPOPC is to promote cooperation among oil palm cultivating countries and the development of a framework for sustainable palm oil, with the potential to harmonise ISPO and MSPO.

[343] Please see: https://www.mpocc.org.my/facts-and-figures, updated 14th December 2017.

Table 38: **MSPO at a glance**

Theme		Characteristics			
Overview	Date initiated:	2015			
	Coverage:	Malaysia			
	Motivation:	According to the Malaysian Palm Oil Board, the standard was launched in order to help small and medium-sized growers, who cannot afford RSPO, to operate sustainably			
	Oversight:	Malaysian Palm Oil Certification Council (MPOCC)			
	Mandatory or voluntary:	Voluntary, but expected to be mandatory by 2019			
	Market penetration:	MSPO reported over 294,000 hectares certified as of November 2017 which was under 6% of the national total.			
Standard	Principles and Criteria:	7 principles, 33 criteria (for plantations and organised smallholders)			
	Additional standards:	Standards for independent smallholders; plantations & organised smallholders; and mills.			
Certification process	Verification mechanism:	Audits, with annual surveillance			
	Corrective action	Internal audits are documented and evaluated with corrective actions implemented through continuous improvement action plans			
	Certificate:	Decision made by the certification body			
	Accreditation:	Certification bodies accredited by the Department of Standards Malaysia (DSM), the national standards and accreditation body. DSM is a member of the International Accreditation Forum and uses ISO guidelines.			
	Transparency:	Public summary of audit report available on certification body websites			
	Complaints/grievance procedure:	Documented procedures required			
Supply chain		Identity Preserved	Segregated	Mass balance	Book & Claim
		No	✓	✓	No
Further information		https://www.mpocc.org.my/mspo-certification-scheme			

8.1.1.5. Other relevant schemes

The Palm Oil Innovation Group (POIG) certification was initiated in 2013. POIG has several producer members, NGOs, food manufacturers and retailer members. It is intended to provide a rigorous, outcome-focused standard for palm oil production. Perhaps most importantly, it has more rigorous requirements than the RSPO Principles and Criteria (P&Cs) and so can be used to operationalize the 'zero deforestation' commitments that have been made by major retail and manufacturing companies (see **Section 8.6** for more information on these voluntary commitments). Its members cover an estimated 2% of global palm oil production.

The Rainforest Alliance (RA) was established in 1987, aiming to change land-use and business practices to reduce their impacts on biodiversity and local people. Working together with the Sustainable Agriculture Network (SAN), it operates a global system for certifying the sustainability of farms in a variety of sectors. The SAN Sustainable Agriculture Standards covers areas such as wildlife protection, water conservation, ecosystem conservation, and community relations, among others. SAN does not allow clearance of primary or secondary (logged or burned) natural forest after 1 November 2005. If plantation management destroyed natural ecosystems between 1 November 1999 and 1 November 2005, then the impacts must be mitigated with set-asides on the plantation.

A final consideration is the traceability processes developed and led by the Tropical Forest Trust (TFT). This approach tracks palm oil along the entire supply chain. It does not include social and environmental criteria, and is not a form of certification, although it is widely used by processor-trader groups, including most major importers of palm oil into the EU. The approach has been questioned by some environmental groups for not delivering sustainability outcomes, and by some users who have found it more costly than expected in relation to the benefits that it brings.

8.1.2. Comparison of RSPO, ISCC, ISPO and MSPO

This section compares the process requirements for the four main certification schemes. It then assesses the degree to which their standards cover the key environmental and social themes described in **Section 7** of this report.

The following analyses are of the current processes and standards. It is important to note, however, that all of these certification schemes are in stages of revision: the ISPO is undergoing a thorough review, the RSPO is in the process of revising its Principles and Criteria, MSPO is developing a supply chain standard; and the ISCC began to make summaries of its audit reports publicly available in October 2017. The specific standards assessed are:

- The RSPO Principles and Criteria for the Production of Sustainable Palm Oil;[344]
- ISCC (EU) 202 Sustainability Requirements;[345]
- ISPO Principles And Criteria Of Indonesian Sustainable Palm Oil for Plantation Company Operating Cultivation;[346] and (for those issues specific to mills) Principles And Criteria Of Indonesian Sustainable Palm Oil (ISPO) For Plantation Companies Operating Processing Of Palm Oil/Mill

[344] RSPO (2013). RSPO Principles and Criteria for the Production of Sustainable Palm Oil.

[345] ISCC (2016). ISCC EU 202. Sustainability requirements, Version 3.0.

[346] Ministry of Agriculture of the Republic of Indonesia (2015). Principles and criteria of Indonesian sustainable palm oil/ISPO for plantation company operating cultivation. Regulation Number 11/Permentan/OT.140/3/2015

- MSPO General principles for oil palm plantations and organised smallholders.[347]

The RSPO and ISCC EU standards are included because these are by far the most commonly used schemes for imports of palm oil into the EU for food and oleochemical use (RSPO) and biofuels (ISCC). The ISPO and MSPO are included as the national schemes for the two main producing countries.

8.1.2.1. Certification process

Certification schemes comprise a series of processes, the main ones being the certification process (who verifies compliance, how, and who decides whether performance has reached the standard); accreditation; complaints procedures; transparency; and claims (please see Table 34). The way that these processes are undertaken provides a greater or lesser prospect of independence of decision-making and confidence in the system. The tried and tested best practice for each of the processes within certification is codified by the International Organisation for Standardisation (ISO). This provides a convenient mechanism for comparing certification schemes,[348] with the following elements defined by Nussbaum *et al.* (2002)[349] as among the key ones:

Who verifies: Does the scheme require certification by an independent, third party certification body, or is first or second party assessment accepted?

How is compliance verified: For all assessments it is important to establish not only that plans are assessed, but also that there is collection of objective evidence that the plans are implemented in practice, in the form of an audit.

How often is it done: Certification schemes must include a requirement for regular and adequate monitoring of certificate holders and mechanisms to remove certificates if the standard is no longer being met or if Corrective Action Requests have not been met. In the context of certification of agricultural crops, an annual surveillance audit is common practice.

Who decides: The decision whether an audited estate has met the requirements of the standard should be made impartiality, with a separation of responsibility for certification decision and audit, and with freedom from pressure that may influence decisions. The decision is typically made by staff from the certification body who have not been involved in the audit.

Confidence in the certification system is enhanced by **accreditation** of the certification body, complaints and grievance procedures and transparency. The certification body should be accredited by a credible accreditation body is fundamental to credible third-party certification independent organization provides assurance that a certification body is competent. Credibility of an accreditation body can be increased by adherence to international standards on accreditation, mutual recognition between national accreditation bodies, or using an international accreditation body, having adequate complaints procedure mechanisms and by making its activities transparent.[350]

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[347] MSPO (2013). Malaysian Sustainable Palm Oil (MSPO) Part 3: General principles for oil palm plantations and organised smallholders . MS 2530-3:2013

[348] Nussbaum, R., Jennings S., & Garforth M. '*Assessing Forest Certification Schemes: A Practical Guide*.' ProForest (2002), UK.

[349] Nussbaum *et al.* (2002). *Op. cit.*

[350] Nussbaum *et al.* (2002). *ibid.*

Certification bodies should have documented **complaints and grievance** procedures which, when implemented, are able to resolve any complaints, appeals and disputes. Ideally, documentation on complaints and grievances, including their status, should be publicly available.

Transparency, the third element of building confidence in certification, has a number of different aspects. The key one considered here is the public availability of audit reports, which contribute significantly to transparency, but reduce confidentiality for the plantation company and increase the cost of the scheme, as a public summary of the audit report must be produced.

The final element of most certification schemes regards **traceability and the claims** that can be made about certified products. Depending on the supply chain model, such claims must be supported by effective chain of custody certification (Table 34). Its elements are the standard, certification and accreditation. The scheme should cover product identification, product segregation and documentation.

Key elements of the certification process of RSPO, ISCC (EU), ISPO and MSPO are compared in **Figure 30.** In general terms, RSPO and ISCC follow ISO specifications closely.

Figure 30: Summary of certification processes within four palm oil certification schemes

Certification scheme element		Standard			
		RSPO	ISCC	ISPO	MSPO
Certification	Who: independent 3rd Party				
	How: audit				
	How often: annual surveillance				
	Who decides: certification body				
Accreditation	Fully independent accreditation				
Complaints	Documented procedures available				
Transparency	Audit reports publicly available				
Claims	Supply chain verification				

Note: Dark shading indicates that the process reaches best practice, pale shading indicates absence of the process; mid-shade implies an intermediate state.

The ISPO has third party independent audits with annual surveillance, but the ISPO Commission decides whether a certificate should be issued (rather than the certification body) and accredits the certification body (rather than an independent accreditation body). Documented complaints and grievance procedures are required (but complaints processes are not publicly available) and audit findings are not publicly available. The MSPO system includes most of the required elements, other than independent supply chain verification (though procedures for this are under development).

8.1.2.2. Content of the standards

Table 39 summarises the coverage of the environmental themes within the RSPO, ISCC (EU), ISPO and MSPO standards. There are significant differences between the requirements of the standards on most key environmental issues. The ISCC standard has requirements that restrict deforestation, peat land conversion and greenhouse gas emissions to a greater degree than the other standards, while conserving biodiversity. The RSPO standard contains the next most restrictive requirements on all aspects except biodiversity conservation and greenhouse gas emissions, with the requirements of the MSPO standard being similar or less restrictive than those of the RSPO. The ISPO is

officially mandatory, and the MSPO will be mandatory from end-2019. RSPO and ISCC are voluntary schemes.

The ISCC, RSPO and MSPO have similar degrees of restriction on the use of fire for land clearance. Regarding air pollution (other than GHG), the RSPO and MSPO standards have the greatest restrictions for plantation and mill operators. The ISPO standard is essentially based on existing Indonesian regulations governing palm oil cultivation and processing, whereas the RSPO and ISCC (and to a lesser degree the MSPO) standards go beyond existing legal requirements; therefore the ISPO standard typically has less restrictive requirements on environmental issues than the others. The MSPO has comprehensive requirements on the maintenance of the quality and availability of surface and ground water, which include assessment and monitoring of water resources, water use efficiency, water harvesting, protection of water courses, a prohibition on obstructions of rivers and streams, and measures to prevent and reduce soil erosion. The other three standards have broadly similar requirements regarding water resources.

The standards of the four schemes differ markedly regarding deforestation. The ISCC in effect excludes production from primary forest, and forests of high biodiversity value (Criterion 1.1), and degraded forest (Criterion 1.3). Degraded forest is defined conservatively, with a high proportion of logged forest included in the restriction. These are both classed as 'major' criteria; thus compliance is necessary in order to achieve certification. The RSPO standard has the less exacting requirement that forest clearance is legal, but primary forest and High Conservation forest are not to be cleared for oil palm cultivation.[351] However, this still provides significantly more safeguards that the ISPO standard, which permits forest clearance provided it is zoned for agriculture; is allowed under the environmental impact assessment; and the government has given the necessary permits. The MSPO standard is broadly similar to ISPO, but with additional requirements on Environmentally Sensitive Areas and areas with high biodiversity value.

The RSPO standard provides some of the most restrictive requirements on social issues, such as land use rights, forced labour, child labour, the terms and condition of employment, treatment of smallholders, and the rights and wellbeing of people affected by plantations (**Table 40**). The ISCC has similar requirements for terms and conditions of labour and rights and wellbeing, and the MSPO is similar in terms of land use rights. It should be noted that neither the ISPO nor the MSPO standard has specific provision to exclude forced labour from palm oil production, instead requiring compliance with national labour laws in general. These results are summarised in **Figure 31**.

Figure 31: Summary of provisions within four palm oil certification standards against environmental and social themes.

	Standard			
Theme	**RSPO**	**ISCC**	**ISPO**	**MSPO**
Deforestation				
Biodiversity				
Peat land conversion				

[351] 'High Conservation Value' was first articulated in the Forest Stewardship Council's Principles and Criteria to define and maintain the world's most important forests for biodiversity, ecosystem services, culture and society. The notion has been extended to include other, non-forest ecosystems, and within other sectors, such as oil palm.

GHG emissions				
Burning				
Air pollution				
Water pollution				
Rights & Wellbeing				
Land use rights				
Treatment of smallholders				
Forced and Child labour				
Terms and conditions of labour				

Note: Dark shading indicates that the standard provides the greatest restrictions on activities; pale shading indicates the fewest restrictions; mid-shade indicates an intermediate state.

8.1.2.3. Implementation of schemes

Limited independent research has been conducted on the implementation of schemes within the palm oil sector. The studies that do exist have largely been focused on the RSPO. These include concerns that it is not delivering significant environmental outcomes, such as reduced deforestation and biodiversity conservation,[352] and that the auditing process is inadequate to detect (or in some cases colludes in) serious breaches of the standards on issues such as deforestation, land rights,[353] forced and child labour, and terms and conditions of labour.[354,355,356] Local communities and smallholders find it difficult to influence debate and decision within the RSPO, resulting in marginalisation of some viewpoints.[357] This body of research neither covers a wide enough range of standards, nor a large enough sample of RSPO certified companies to draw overall conclusions on the implementation of the schemes within the sector, other than that the requirements of the standards are sometimes not met by certified organisations.

It is increasingly recognised that voluntary schemes are not well equipped to resolve some of the issues found within the sector, such as land rights violations, for which national law (and legal reforms) are necessary.[358]

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352 Ruysschaert, D. & Salles, D. '*Towards global voluntary standards: Questioning the effectiveness in attaining conservation goals: The case of the Roundtable on Sustainable Palm Oil (RSPO)*'. Ecological Economics, Volume 107, 2014, Pp. 438–446

353 EIA. '*Who Watches the Watchmen. Auditors and the Breakdown of Oversight in the RSPO*'. Enviromental Investication Agency International, 2014, London.

354 Amnesty International '*The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names*'. Amnesty International, 2016, London https://www.amnesty.org/en/documents/asa21/5184/2016/en/.

355 Amnesty International (2016), *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names* (London: Amnesty International, 7 Dec. 2016), https://www.amnesty.org/en/documents/asa21/5184/2016/en/, accessed 1 Feb. 2017.

356 International Labour Rights Forum & Sawit Watch. Empty Assurances: RSPO Labor Case Studies. International Labour Rights Forum & Sawit Watch (2013), Washington D.C. & Bogor.

357 Cheyns, E. (2014). Making "minority voices" heard in transnational roundtables: The role of local NGOs in reintroducing justice and attachments. Agriculture and Human Values, 31(3), 439-453.

358 Colchester, Marcus, Wee Aik Pang, Wong Meng Chuo and Thomas Jalong (2007) *Land is Life: Land Rights and Palm Oil Development in Sarawak.* Forest Peoples Programme and SawitWatch, Bogor.

8.1.2.4. Conclusions

There are significant differences between certification schemes used in the palm oil sector (principally RSPO, RSPO, ISCC (EU), ISPO and MSPO, but also POIG, RSPO Next, and SAN). These differences include the processes underpinning certification as well as the requirements of the standards.

Based on the methodology used in this study, the RSPO and ISCC schemes have the most robust processes around verification, certification, accreditation, and supply chain certification, ISPO the least, with MSPO intermediate. These processes should separate roles and responsibilities, and provide confidence in decisions and transparency.

A high degree of transparency in certification is provided by making summaries of audit reports publicly available, as practiced by RSPO, MSPO and since October 2017, ISCC. Further transparency is given by stipulating that information should be public regarding complaints and grievance procedures, which can occur at all levels: plantation, certification body, accreditation body, and scheme owner. The RSPO is the only one of the major schemes that provides publicly available information of complaints at all these stages.

The schemes also differ in how they handle environmental and social issues. This includes what is covered and how. For example, forced labour is explicitly prohibited in RSPO and ISCC, but is not referred to directly in ISPO or MSPO, and requirements on deforestation range from legal compliance (ISPO) to significant restrictions going well beyond the requirements of national legislation (ISCC).

Whilst the content of the underlying standards and the process requirements of the certification system indicate what should happen on the ground, the actual practices may be quite different. This is illustrated by the claims of serious social and environmental issues within RSPO certificated plantations covering practices that are not compatible with the RSPO P&Cs. However, there is almost no information available with which to compare the practices found in plantations certified by other schemes, and hence it is not possible to conclude whether any of the schemes results in more effective environmental and social practices on-the-ground than the others.

Table 39: Summary of coverage of environmental themes in the standards of the main palm oil certification schemes

Theme / Scheme	RSPO	ISCC (EU)	ISPO	MSPO
Deforestation	New plantings since November 2005 have not replaced primary forest or any area of HCV (P7) The New Planting Procedure allows deforestation of HCV areas in certain cases so long as compensation is made.	Excludes materials produced from land that was primary forest or of high carbon stock in January 2008 (P1)	Permits must be obtained and the plantation is in accordance with the spatial plan (P1), HCV areas identified and not converted to oil palm (P3)	No planting on land with high biodiversity value or on Environmentally Sensitive Areas (P7), plantings allowed on land gazetted for agricultural use.
Biodiversity	Populations of rare, threatened and endangered species identified and conserved (P5)	Excludes materials produced from land with high biodiversity value (P1)	Preserve biodiversity according to the plantation permit (P4)	Rare, threatened and endangered species identified and maintained if present (P5)
Peat land conversion	Extensive planting on peat is avoided (P7)	Excludes materials produced from land that was peat land in January 2008 (P1)	Oil palm planting on peat lands should not destroy ecosystem functioning (P2)	Planting on peat land according to guidelines/industry best practice (P7)
GHG emissions	Efficiency of fossil fuel use and use of renewable energy, and GHG emissions reduced (P5)	Excludes materials produced from land that had High Carbon Stock in January 2008 (P1)	Sources of GHG emissions are identified and mitigated (P4)	Assessment and reduction of GHG emissions (P5)
Burning	Use of fire avoided, with exceptions as per ASEAN guidelines or equivalent (P5, P7)	Burning as part of land clearance is prohibited (P2)	Fire prevention and mitigation systems and activities in place (P3)	Use of fire avoided, with exceptions as per ASEAN guidelines (P5)
Air pollution	Pollution is reduced (P5)	Included in the Environmental Impact Assessment with mitigation actions if required (P2)	Air pollution measurement from mills (P2)	Sources of pollution documented and reduced (not specific to air pollution) (P5)
Water pollution	Responsible pesticide use, control of soil erosion, and maintenance water resources (P4)	Use of best practices to maintain and improve water quality and quantity (P2)	Water quality and source conservation (P2), management of mill waste in accordance with applicable regulations (P2), conservation of areas with high erosion potential (P3)	A water management plan to maintain the quality and availability of surface and ground water, no contamination of water from waste (P5)

Table 40: Summary of coverage of social themes within the standards underlying the main palm oil certification schemes

Theme	Scheme RSPO	ISCC (EU)	ISPO	MSPO
Rights & Wellbeing	Social impact assessment (P6, P7), open and transparent communication with communities (P6), complaints and grievance procedure (P6), contribution to local development (P6) and respect for human rights (P6)	Social impact assessment, declaration of adherence to human rights, avoiding negative impacts on food security, access to basic services (including child education) for people living on plantations, complaints and grievance procedure and mediation (P4)	A minimum of 20% of the total plantation area is developed for the community (P1), commitment to developing local knowledge, welfare of indigenous communities (P6) and prioritising local procurement (P6)	Social impact assessment, transparent complaints and grievance procedure, contribution to local development (P4). Social benefits offered to the community (P4)
Land use rights	The right to use land must be demonstrated, not legitimately contested, and the rights of others not diminished without FPIC (P2, P7). Compensation negotiations are documented (P6)	Biomass production shall not violate land rights (P4) and the right to use land must be demonstrated (P5)	Permits and land titles must be obtained, agreement of hand over from and compensation to customary use rights holders obtained (P1)	The right to use land must be demonstrated, should not diminish the rights of others without FPIC; compensation negotiations are documented; and the land mapped and demarcated (p4)
Treatment of smallholders	Dealings with smallholders are fair and transparent (P6)	(No specific provisions)	(No specific provisions)	(No specific provisions)
Forced and Child labour	Children are not employed or exploited, and no forced or trafficked labour is used (P6)	No minors to be employed, children of school age must not be employed within school hours (P4). Forced labour prohibited (P4).	Employment of under-age workers prohibited (P4). (No specific provision for forced labour)	Children and young persons shall not be employed or exploited (P4) (No specific provision for forced labour)
Terms and conditions of labour	Covers occupational health and safety, training, pay (legal and providing a decent living), the right to free assembly, discrimination, harassment	Covers fair worker contracts, discrimination, treating employees with respect, collective bargaining and representation, a living wage, and communication (P4), and health and safety (P5).	Minimum wage regulations implemented, plantation management facilitate formation of trade unions, and equal opportunity implemented and no discrimination (P4)	Compliance with occupational health and safety laws, workers' pay and conditions, housing and amenities meets legal requirements, fair working hours and overtime payment, no sexual harassment, and the right to join a trade union (P4)

8.2. Supply and demand of certified oil palm products

8.2.1. Certification of palm products by country and end-use

The market for sustainable products is broadly divided into two parts. The first is related to sustainability in food, oleochemicals, home & personal care (HPC) end-uses, dominated by the RSPO for certification and by non-certification traceability mechanisms. The second relates to sustainability markets for biodiesel. In order to be counted towards EU Renewable Energy targets, biodiesel feedstocks imported into the EU must satisfy the sustainability criteria established under the RED, with certification used to ensure compliance. The International Sustainability and Carbon Certification (ISCC) scheme is the main scheme used to demonstrate compliance in the EU biodiesel sector.

We review market and trade trends for the RSPO[359]. This relies on data releases by the RSPO, which publishes the most comprehensive data, as well as market research interviews.

8.2.1.1. The global picture

The RSPO's summary of Certified Sustainable Palm Oil (CSPO) and Certified Sustainable Palm Kernel (CSPK) supply in 2017 revealed that its certification system covered 11.6 million and 2.6 million tonnes, respectively, equivalent to 19% of world output, from 310 mills and 2.3 million certified hectares. In 2016 CSPO and CSPK certification covered 12.2 million and 2.8 million tonnes, respectively, which were down from 12.9 and 3.0 million tonnes, respectively, in 2015.

Demand from Consumer Goods Manufacturers (CGMs) accounts for 48%[360] (Table 41) of RSPO members' supply of certified CPO in 2015 (leaving 52% of available supply from certified suppliers being bought as conventional or under other certification schemes, such as the ISCC). This share would drop to 31% with full certification of RSPO producer members' output, unless demand for certified products rises in the interim. In other words, there is apparent oversupply due to limited demand for certified materials. Considering that many mills have two types of certification (both RSPO and ISCC), the combined (overlapping) picture for certified palm oil is a relative balance of supply and demand for certified sustainable palm oil.

Table 41: Market uptake or RSPO and ISCC certified palm oil in 2015

	Number of mills	Estimated capacity, '000 tonnes	Estimated sales, '000 tonnes	% take-up
RSPO	327	12,890	6,183	48%
ISCC	226	8,814	4,250	48%

In 2016, the RSPO was hit by uncertain supply during the year due to the suspension of certification of one major supplier from Malaysia as a result of failures by its RSPO

[359] LMC International's regular reports on sustainability. In the last three years (2014-2017), this includes annual reviews of sustainability trade data and semi-structured survey interviews (about 50 per year) on sustainability premia and commercial trends among key global sustainability market participants (suppliers, ingredient manufacturers and consumer goods manufacturers).

[360] CSPO market uptake recently plateaued at just over 45% (from 2011 to 2015).

auditors; and the voluntary temporary withdrawal from the RSPO system of another major supplier from Malaysia while it addressed potential deficiencies in its labour practices. There has been a simultaneous rising commercial interest in non-certified traceability mechanisms, and geographic diversification of supply, to enhance the security of supply (especially for specialist and chain-of-custody segregated products).

8.2.1.2. By country

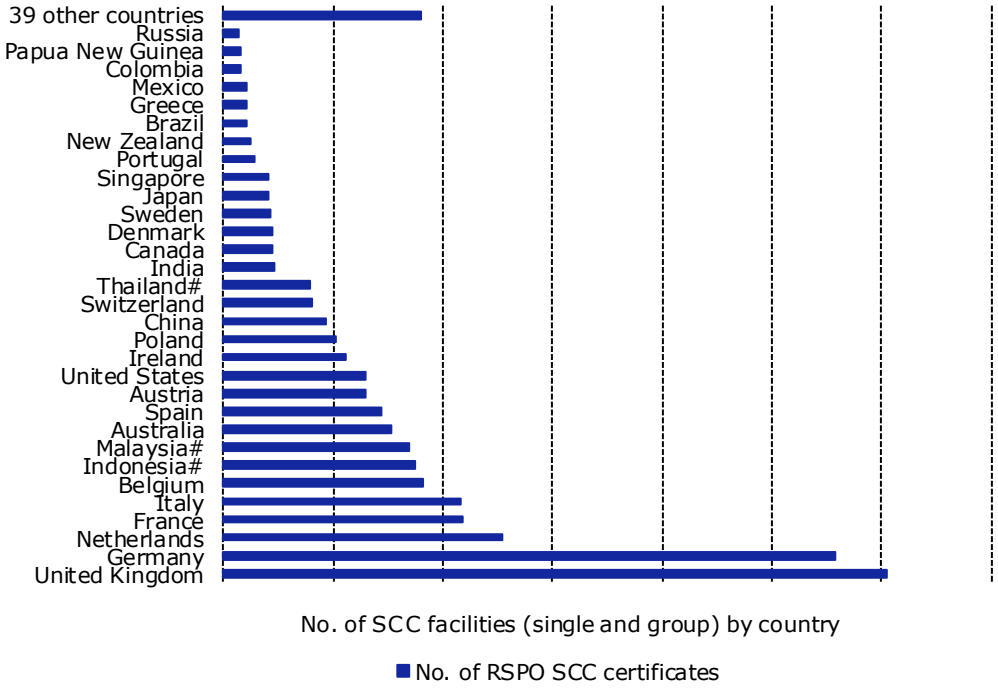
RSPO Supply Chain Certification is concentrated in developed markets (Figure 32). In 2015, the top five countries were: the UK, Germany, Netherlands, France and Italy.

RSPO does not provide trade data for destination markets. However, it is useful to examine some indicators for the top five RSPO CGM buyers; Unilever, P&G, PepsiCo, Nestlé and Mondelez International. We estimate that 48% of their overall tonnage is sold in developing or emerging markets. Thus, 1.72 million tonnes of all palm products handled are for developed markets and 1.58 million for emerging markets.

These five companies in 2014 had 2.61 million tonnes of palm products certified out of a total of 3.30 million tonnes of palm-derived purchases. These palm product inputs may be allocated as follows:

- Certified, developed markets: 1.40 million tonnes; leaving 0.32 million tonnes to be certified to reach 100% certification in developed markets.
- Certified, emerging markets: 1.21 million tonnes; leaving 0.37 million tonnes to be certified to reach 100% certification in emerging markets.

Figure 32: RSPO Supply Chain Certified facilities, 2015



Note: Indonesia, Malaysia and Thailand SCC facilities are export-oriented.

Demand for certified palm oil is based predominantly in the key sensitive markets of the EU and the US. If the total (with energy use included) is considered, then even for the leading German and UK markets, tonnages indicate certified ratios in the region of 61-63%. This means that in the most advanced markets, including all certification schemes,

a third of palm oil is still entirely uncertified. The RSPO reported CSPO sales of 6.2 million tonnes in 2015, 5.6 million tonnes in 2016, and 7.0 million tonnes in 2017, representing 60% of the total certified tonnage.

8.2.1.3. By end-use

Turning to trends among end-uses in the EU and US, we see that the EU market has shifted steadily away from food to non-food uses of palm oil within a total volume that has grown since 2010. Palm oil use in food in every large EU market was lower in 2014 than it had been in 2010. Food sectors that managed to avoid declines were confectionery, margarine and dairy products. All others shrank, most notably snacks.

EU palm kernel oil demand has been flat. Within this total, non-food demand (almost entirely for oleochemicals) has increased its share. However, suppliers to food companies and to the large HPC companies, e.g., for surfactants, are worried by analysis that compares PKO poorly against coconut oil as a sustainable feedstock.

For the US, growth in palm oil food use between 2009 and 2014 was mainly due to the restrictions on the consumption of trans-fats and the large scale shift away from partially hydrogenated soybean oil in baking and frying applications in particular. In terms of the physical chain of custody, the US market was not far ahead of China, Poland and Ireland.

Table 42 summarises the available evidence on the extent of certification for various food sub-sectors by RSPO members (62 to 98% certified tonnages), with more detail for the Netherlands food industry (54 to 82% certification). In Table 43, we review data reported by companies on their sustainability status for selected food and non-food end-uses for raw materials or products used, certification rates and chain-of-custody options used. For selected RSPO members in the food segment, the certification rate was 35 to 98% (low for fried foods and high for bakery and dairy/non-dairy) and for non-food sector, it was 51% for Home and Personal Care and 86% for cosmetics.

For the entire RSPO CGM sector, reported raw materials were divided into 46% palm oil, 15% PKO and 40% fractions and derivatives in 2014. The certification ratio was 67%, and chain of custody adopted was 67% B&C, 17% MB and 17% SG/IP.

In terms of attainment of general RSPO certification, the food sectors that were most advanced were bakery, dairy/non-dairy and the slowest was fried foods. However, a large missing end-use category in RSPO membership and volumes is the restaurant and catering sector. Chain of custody analysis reveals that the chocolate sector has moved furthest to SG/IP, led by Ferrero. The raw material profile differs for each end-use sector. The progression in certification for the three raw material sectors differed by end-use.

The large volume of over 2 million tonnes of palm kernel expeller (PKE) in the dairy sector warrants some explanation. PKE is a high fibre feed, which is ideal for dairy cattle as it typically includes around 8% fat content.

Also in the same table, we review indicators for the home and personal care and cosmetics sectors. In this context, the home and personal care sector (non-food) lagged the food sector in its certification rate in 2014. Cosmetics had a higher general RSPO certification attainment, but relied greatly on B&C certificate credits.

A review of the key RSPO buyers in the CGM segment reveals the dominance of the global brand names and a couple of regional companies. It is arguable that the processor-traders should be included as they retail cooking oil in China, India and other developing markets. It is noticeable that large Asian consumer goods makers have yet to reach the top volume category at the RSPO, for example, makers of instant noodles.

Table 42: EU food sector volume (2010-2014) and RSPO indicators for the Netherlands and selected companies, 2014

Food sectors	EU-28 2014 vs. 2010 tonnage	Netherlands food certification progress, 2014		RSPO member certification progress#	
Biscuits/baking^	78%	82%	Bakery and confectionery; with 28% SG/IP	98%	98% certified with 38% reaching SG/IP
Snack food	64%	78%		35%	35% certification rate, with 2% reaching SG/IP
Margarine	101%	60%	With 33% SG		
Chocolate	111%			76%	76% certification rate with SG/IP 60%
Sugar-based confectionery^	106%	82%	Bakery and confectionery; with 28% SG/IP	.	.
Ready-made meals & meats	79%	.	.	.	.
Dairy & dairy replacers	99%	78%	.	98%	98% certified, with 26% reaching SG/IP
Soups & sauces	59%	54%	.	.	.
Other	84%	77%	Potato processors 80% sustainable, with 12% SG	.	.
All	85%	72%	with 39% SG	62%	with 27% SG

Note: EU-28 data do not include PKO. Tonnages refer to palm oil tonnages in each food sector. ^Bakery and confectionery for the Netherlands. Netherlands does not report certification chain of custody progression for every food sector. #Selected segments are represented by aggregate data for key companies in these food sectors; but excludes data for the largest diversified CGM companies e.g. Unilever which is 100% certified and achieved 11% SG progression in 2014.

Pledges in China's and India's markets are led by individual companies, typically global brand names such as Unilever and McDonald's. Refiners in these markets are dominated by RSPO members, but they only supply certified oil in response to market demand and these RSPO members practice limited certification for their consumer pack cooking oils. India is regarded as lagging and had very few RSPO certified facilities by 2015, while China lagged Poland and Ireland in this respect. While China has a high sounding pledge on sustainable palm oil, it only pertains to upstream development by Chinese companies and does not cover palm oil use. It is likely that these large emerging markets will become increasingly concerned about traceability (transparency of the supply chain) in reaction to greater worries around basic local concerns about food safety, adulteration and contamination. Thus, RSPO supply chains seem likely to remain of secondary concern to traceability for food safety in these large emerging markets. Key players in India and China include Wilmar International (controlling a majority market share in refining-trading in both markets), COFCO (China), Adani and Godrej in India and others.

Table 43: Various end-uses and RSPO certification indicators for key companies, 2014

	Raw materials					Certification rate			Chain of custody				Selected companies
	Palm oil	PKO	Fractions & derivatives	All* (tonnes)	PKE (tonnes)	Palm oil	PKO	Fractions & derivatives	All*	B&C	MB	SG/IP	
Food													
Chocolate	25%	13%	62%	374,988	-	78%	64%	77%	76%	2%	38%	60%	7 companies, including Ferrero and Mars.
Fried foods	96%	1%	2%	642,700	-	34%	32%	90%	35%	86%	12%	2%	6 companies, including PepsiCo and Aviko.
Dairy / non-dairy	70%	26%	26%	240,113	2,006,299	97%	56%	57%	98%	24%	50%	26%	7 companies, including Royal Friesland Campina, Arla Foods and Fonterra.
Bakery	71%	7%	22%	544,980	60	85%	88%	40%	98%	27%	49%	38%	20 companies, including United Biscuits, CSM Bakery Solutions and others.
Non-food													
Home and personal care (HPC)	24%	37%	40%	1,327,736		64%	37%	55%	51%	85%	13%	2%	24 companies, including P&G, Colgate-Palmolive and Lion Corp (and cosmetics).
Cosmetics	1%	1%	98%	128,836	2,102	100%	41%	87%	86%	94%	5%	0%	7 companies, including L'Oreal and Avon.

Note: *Total volume of all palm oil and palm oil derived products = total volume of palm oil (CPO and refined palm oil) + total volume of palm kernel oil (PKO) + total volume of other palm oil derivatives and fractions. Certification rate is certified tonnes divided by total tonnage handled (certified and non-certified products).

8.2.2. Demand for products and types of certification

Annual supply comprised certified sustainable palm oil (CSPO) production of nearly 13 million tonnes (21% of world CPO output). CSPO stearin (calculated as a stearin share of 18.8% of CSPO: roughly 2.5 million tonnes; Certified Sustainable Palm Kernel (CSPK): 3.00 million tonnes; Certified Sustainable Palm Kernel Oil (CSPKO, defined as 45% of the CSPK supply): 1.35 million tonnes.

RSPO's Certified Sustainable Palm Oil (CSPO) is the largest certified palm product in demand, with sales of 5.6 million tonnes in 2016, down from 6.2 million in 2015, as output was hit by El Niño. Market uptake was 44% of CSPO supply. Within the 2016 total, 65% were Identity Preserved (IP), Segregated (SG) or Mass Balance (MB), up from 44% in 2015. In 2016, the remaining 35% were Book and Claim (B&C) credits.

8.2.3. RSPO premia, costs & margins

For the purpose of this review, we examine compliance with the RSPO Principles and Criteria for its major product, CSPO, and review added cost and issues for both plantations and smallholder suppliers[361]. The major finding of a regressive cost structure (relatively high unit costs for smallholders) is consistent with similar findings in 2012 by WWF. Large estates and companies are able to achieve economies of scale in their RSPO implementation costs, and thus experienced lower barriers to entry. For mid-sized firms, implementation costs vary based on the number of smallholders, amount of HCV, and pre-existing practices. The desire for sales premiums was universally expressed as the primary interest of smallholders in RSPO, as smallholders have no strategic relationships with large buyers, and also face relatively higher implementation costs. They are therefore highly price sensitive.

LMC's review[362] identified two main costs in achieving RSPO compliance: Principles & Criteria (P&C) certification by growers, based on mills and their supply base; and supply chain certification by processors and traders, for each downstream plant. The costs of compliance with the P&Cs, include costs that are both direct (membership, audit) and indirect (some upgrades to capital and operating expenditure). Large plantations faced costs of up to $5 per tonne in 2015; small producers' and smallholders' costs were significantly higher per tonne, at $8-12,[363] equivalent to

RSPO premia have ranged from $2 per tonne for tradable certificates to $300 for integrated plantation suppliers of RSPO products, able to supply specialist products, such as PKO, with segregated chain-of-custody that require more sophisticated supply chains. The RSPO prices within easy reach of smallholders have only ranged up to $12, barely covering their costs without a subsidy from a buyer.

Evidence about profitability in the first year after certification is inconclusive; GreenPalm traded certificate premia are very small, at only 1-4% of CPO prices. This would sometimes, but not always, be sufficient to cover recurrent costs.

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361 LMC International's March 2016 review of palm oil sustainability covered producers and manufacturers based in Southeast Asia, Latin America, Europe and the US.

362 LMC International, *op. cit.*

363 Sime Darby (2015), "Outlook for certified palm oil trade - are premiums realistically traded?" Panel discussion with Haris Arshad, Sime Darby Plantation Sdn Bhd, MPOC Reach & Remind Friends of the Industry Seminar 2015 & Dialogue, 12 Feb. 2015, Putrajaya, Malaysia.

As the RSPO's financial appeal is uncertain (in premia and uptake of certificates), the selling point to smallholders for certification has to be indirect. Negative reasons include diminished market access and/or lower product prices for those not certified. Positive reasons include higher yields and/or lower input costs via better management practices, which are not unique to RSPO, and a feel / do good factor.

The hope is that large companies (plantations and/or buyers) will support the effort and costs of their smallholders certifying to RSPO. Against this must be set the less than robust growth in RSPO volumes.

The main practical conclusion is that the additional costs for sustainable certification by smallholders have typically been higher than the potential premia for smallholder farmers, who are at a distinct disadvantage to large integrated plantations that are able to exploit economies of scale. These are the consistent finding of a handful of appropriate and rigorous studies.

8.2.3.1. RSPO smallholders sign-on and drop-out problems

While it is relatively easy (although not simple) to get a company's own estates and associated smallholders certified, the problem of independent suppliers is greater.

An RSPO-associated study[364] on independent smallholders found that upfront costs of certification were equivalent to 5%-14% of mean annual revenue from oil palm; recurrent costs at cooperative level were €21-65 per farmer for groups of 200-400 farmers (including annual RSPO fee and surveillance audit, but excluding costs for group management); operational cash costs increased by 5-20% of mean annual revenue (though one group reported lower costs).

Cost of certification to smallholders have been cited in the region of $12 per tonne,[365] with a cost of $8 per tonne often cited more recently. This roughly matches the premium they receive. However, if the smallholders are unable to sell 100% of the certificates, there would be a financial shortfall.

The RSPO's direct appeal is not self-evident to many smallholders and the premia and levels of demand are uncertain. The hope is that large companies (plantations or buyers) would support the effort and costs of their smallholders certifying to RSPO. The rise in smallholder certified areas reported indicates that this is starting to happen. It is said to focus on the highly organised smallholder sector (likely to include fully-managed or cooperative-managed smallholder schemes). As large plantation groups may earn $10-15 per tonne on average on certified products, it may make sense for the large companies to subsidise these smallholders, as the cost guidance is now at about $8 per CPO tonne (for outside FFB) compared to about $5 for their own produce. However, less than robust recent growth in total RSPO volumes and a growing preference for alternatives to RSPO may dampen this.

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364 Rietberg, Petra and Maja Slingerland (2016), 'Costs and benefits of RSPO certification for independent smallholders, A science-for-policy paper for the RSPO,' (May 2016), http://www.sensorproject.net/sensorwp/wp-content/uploads/2015/04/Costs-and-benefits-of-RSPO-certification-for-independent-smallholders-FINAL.pdf, accessed 9 Mar. 2017.

365 Sime Darby (2015), "Outlook for certified palm oil trade - are premiums realistically traded?" Panel discussion with Haris Arshad, Sime Darby Plantation Sdn Bhd, MPOC Reach & Remind Friends of the Industry Seminar 2015 & Dialogue, 12 Feb. 2015, Putrajaya, Malaysia.

The high costs of certification for less organised smallholders remain a problem for their inclusion in sustainability. In September 2016, Solidaridad reported that its West Africa oil palm smallholder sustainability project was costing €147 per smallholder[366]. If one supposes that the average plot size was 2 hectares per smallholder, with a yield of 3 tonnes of CPO per hectare, this is approaching $30 of added costs per tonne of CPO. This is higher than $12/tonne added cost observed for fairly large (50 hectare) smallholders in Malaysia in 2015, and $8/tonne for the new wave of highly organised smallholders.

Larger groups of organised "independent" and settler scheme smallholders and subsidised smallholders are being added to RSPO certification, but there remains some pessimism about the rapid and cost-effective inclusion of more (less organised) smallholders[367] and re-certification of existing RSPO smallholders.

The problem for smallholders is succinctly summarised by an expert on independent smallholder supply-chains interviewed in 2017. "*Small growers who put themselves forward for certification (or are persuaded by NGOs and aid agencies to go along with it) are the early adopters, the innovators, or the progressive farmers. Our belief is that these farmers became certified because they were helped (and induced) by millers and donors to cope with the RSPO bureaucracy. They did not have to make major changes to their farming practices and we do not believe that their productivity has improved at all. Initially there was certainly an improvement to their household incomes because they were able to sell their GreenPalm certificates for as much as $25/tonne each. Then GreenPalm came under attack from large corporates or ill-informed NGOs and was eventually shut down by the RSPO itself (GreenPalm ended with 2016 certificates trading at end March 2017). I'm sure there are many more smallholders being certified somewhere in the world, judging by the vast sums of aid being thrown in that direction, but a smallholder certification field expert reports that after several years as certified growers, this year only 60% of a group of pioneer certified smallholders have bothered to file RSPO returns. It is no longer worth it, and their more conservative neighbours watching over the fence will be nodding wisely*".

The outlook is for some changes, notably the RSPO's move to develop a jurisdictional approach (with its plans for Ecuador and an awaited Sabah model) to ease the entry of new suppliers. Also, the RSPO has a policy to be more inclusive of smallholders and is directed towards reform to assist smallholders. These efforts may help to rebalance the disadvantage that small suppliers and smallholders face; but deficient demand is a core problem, with only half of available RSPO certificates bought as such. More supply may add to the existing supply glut.

We may conclude that the cost of sustainability leaves no or low margins for smallholder farmers. One might expect a price incentive or robust demand to emerge for independent smallholder certified material from big buyers who would like to be inclusive of smallholders. Unfortunately, demand is poor. Reasons include demand for online traded independent smallholder credits has been overshadowed by buyers' desire to move towards traceable, physically traded RSPO products, leaving smallholders at a disadvantage; and buyers fear association with fires and deforestation and find it safer to buy from large companies with sizeable sustainability monitoring teams[368].

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366 Solidaridad (2016), Presentation by Rosemary Addico, Solidaridad, 9 Jun. 2016, at RSPO's 4th European Roundtable, Milan, Italy.

367 Interview with a supplier sustainable palm oil, Sep. 2016.

368 From studies by Rietberg and Slingerland (2016), Sime Darby (2015), and WWF (2012), along with data from Solidaridad (2016).

Table 44 lists costs and premia for different forms of certification in 2015. When estimating basic RSPO compliance costs, we apply ex-mill RSPO Principles and Criteria for existing plantation companies or those with significant areas before the deforestation cut-off dates. These include regular direct RSPO costs (membership, audit) and indirect (including some upgrades to capital and operating costs).

Table 44: RSPO cost and premia indicators ($ per tonne), 2015

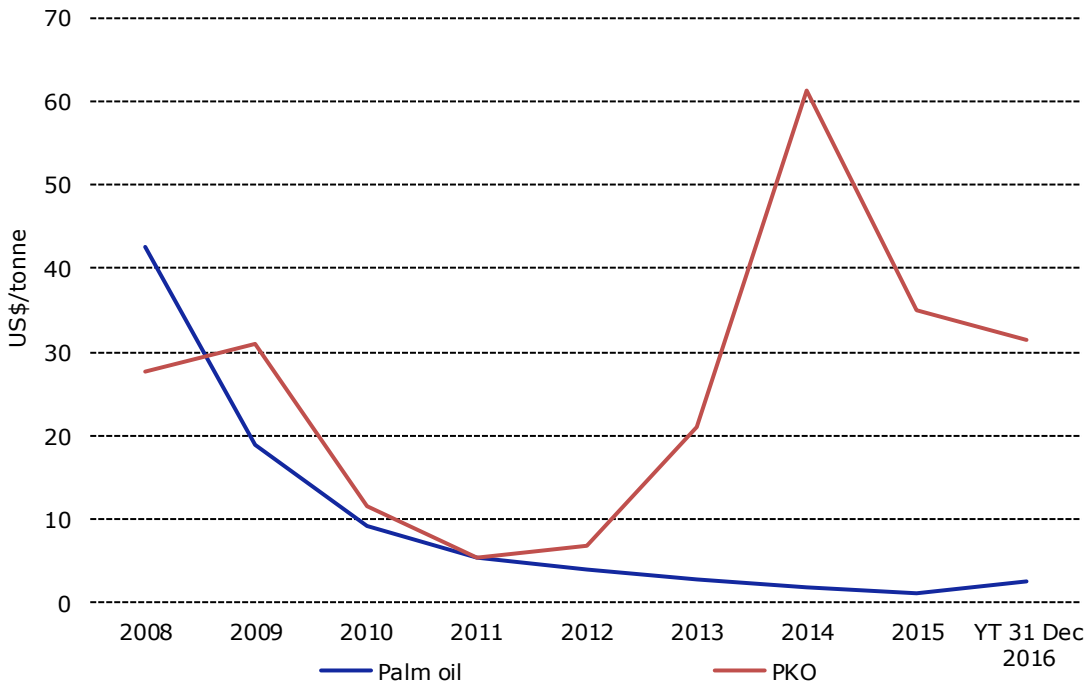
	Book & Claim (B&C)	Mass Balance (MB)	Segregated (SG)
Premia for certified sustainable palm oil (CSPO)	**$4**	**$10**	**$20**
Compliance cost/floor	Large plantation: $2-5 Smallholders: $8-12	Floor price set by ISCC	$9-15, field to refinery
Premia for certified bleached (RBD) stearin	**n/a**	**$50**	**$90-100**
Compliance cost/floor		= CSPO/18.8% stearin yield	= CSPO/18.8% stearin yield
Premia for certified sustainable palm kernel oil	**$65 (earlier $80)**	**$60-80**	**$80-100**
Compliance cost/floor	(P&C cost loaded onto CSPO)	= Cost of a small PK crusher	Faces inelastic supply

Note: CSPO costs are ex-mill. SG cost includes higher FFB transport cost, tank washing, transport in small vessels, new tanks.
Source: Industry interviews.

Annual B&C premia are plotted in

Figure 33. Premia for 2016 averaged $2 and $26.50/tonne for CSPO and CSPKO. The higher CSPKO B&C premia may reflect supply problems in segregated CSPKO for the oleochemical sector. With limited available segregated CSPKO premia went as high as $200/tonne but supplies were limited. Hence, end-users had no option but to bid up prices for Book and Claim to find supplies.

Figure 33: RSPO B&C Credits: CSPO and CSPKO (on-market trades) premia



8.2.3.2. Integrated companies benefited from rising margins

Margins on certified products were considered good by the large integrated plantations in 2015 and were even better in 2016, as premia spiked due to the four-month suspension of IOI, a major supplier of value-added specialist products. However, some lead suppliers of certified and value-added processed palm products report that the multi-year cumulative cost of investment in certification has yet to be recouped[369].

Large RSPO certified product suppliers can cover their direct and indirect costs and earn a market premium on certificates sold. These margins can boost their overall financial profits, and the margins are not required by policy to be directed toward conservation programmes (but companies may voluntarily spend on corporate social responsibility efforts). Where payments are made to compensate for the loss of HCV areas, the RSPO is said to direct plantation companies to fund conservation projects with additionality and which go beyond RSPO standards[370].

[369] Interview with RSPO certified products supplier (speciality products), Dec. 2016.

[370] Interview with RSPO certified product supplier, Feb. 2017.

8.3. Analysis of palm oil certification systems and EU/UN environmental objectives

8.3.1. Review of policy instruments[371] and analysis of principal objectives

8.3.1.1. Policy context

Several EU, UN and other regional policy instruments include objectives related to sustainable development and environmental issues, which are relevant for a discussion on the impacts and contribution of palm oil production and consumption. None focus specifically on palm oil.

In this section, we identify key UN and EU social and environmental policy objectives, and investigate the alignment and inter-linkages between the different policy instruments.

8.3.1.2. Structuring the research

A systematic search identified policy instruments that relate to the key environmental, social, economic and trade and development aspects concerning palm oil.[372] These policy instruments are organised under three main headings:

- UN policy instruments;
- EU policy instruments; and
- Other regional policies and agreements.

The list was further refined to those instruments that have the greatest legislative power, coverage of environmental and social impacts, direct relevance to palm oil, inter-linkages and alignment between policy instruments. Reports and studies were excluded from the summary table due to their lack of legislative power but are included in the annex given their role in providing the evidence to support policy development or implementation.

A full list of the policy instruments identified, and short names used to refer to the instruments throughout the narrative are provided in

[371] The term 'policy instrument' is a widely used term that that covers a broad range of instruments that can be used to deliver policy objectives. Policy instruments can include: legislation, regulation, taxation and voluntary initiatives and agreements.

[372] EU and UN policy instruments included were those defined in the ToR for this study, with a revised list agreed with the project steering group.

Table 45. Policy instruments reviewed in the summary table are indicated by an asterisk (*). A more detailed summary of the policy instruments can be found in **Appendix 7**.

Table 45: Summary of identified policy instruments and abbreviations

Policy Instrument	Date	Abbreviation
EU policy instruments		
Directive 2009/28/EC - On the promotion of the use of energy from renewable sources	23/04/09	EU RED*
Directive (EU) 2015/1513 - Amendment of Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of energy from renewable sources	09/11/15	EU RED Amendment*
Regulation (EU) No 233/2014 - Establishing a financing instrument for development cooperation for the period 2014-2020	01/01/14	EU Financing Instrument*
COM (2008) 645: Addressing the challenges of deforestation and forest degradation to tackle climate change and biodiversity loss	17/10/08	Commission Communication on Deforestation*
COM (2015) 497 - Trade for all – Towards a more responsible trade and investment policy	14/10/15	Trade for all*
COM (2016) 501 - A European Strategy for Low-Emission Mobility	20/07/16	EU Low-emission Mobility Strategy*
COM (2011) 244 – 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020' and subsequent updates	03/05/11	EU Biodiversity Strategy*
COM (2013) 659 Final - 'A new EU Forest Strategy: for forests and the forest-based sector.'	20.9.2013	EU Forest Strategy[373]
EU 7th **Environment** Action Programme	01/01/14	EU 7th EAP
The new European Consensus on Development 'Our world, our dignity, our future'	N/A	European Consensus on Development*
COM (2003) 251 - Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan	21/05/03	FLEGT
Report on palm oil and deforestation of rainforests and European Parliament resolution of 4 April 2017	17/03/17	European Parliament Palm Oil

[373] The EU Forest Strategy is intended to ensure a coordinated, coherent and holistic approach towards forests and the whole forest sector, in the EU and worldwide. Within its objective to strengthen the EU's effort to promote sustainable forest management, it aims at the reduction of deforestation at global level through promoting sustainable production and consumption of forest products. The EU FLEGT Action Plan is considered a key initiative contributing to the specific objectives of the EU Forest Strategy, and thus they are duly considered in the EU Forest Strategy Multiannual Implementation Plan.

Policy Instrument	Date	Abbreviation
on palm oil and deforestation of rainforests (2016/2222(INI))		Report[374]
UN policy instruments		
The 2030 Agenda (UN Sustainable Development Goals)	01/01/16	UN 2030 Agenda*
The United Nations Convention to Combat Climate Change (UNFCCC) – Paris Agreement	04/11/16	UNFCCC (Paris Agreement)*
The Convention on Biological Diversity (CBD)* and Strategic Plan for Biodiversity	29/12/93	CBD and Strategic Plan*
ILO Fundamental and Other Conventions (referenced by number)	Various	ILO Conventions*
UN Non-Legally Binding Instrument on All Types of Forest	22/12/15	UN Forest Instrument*
UN Strategic Plan for Forests (2017-2030)	20/01/17	UN Strategic Plan
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security	11/05/12	FAO Voluntary Guidelines*
OECD FAO Guidance for Responsible Agricultural Supply Chains	13/07/16	OECD Guidance*
International Arrangement on Forests	18/05/15	Forest Arrangement
Voluntary Guidelines for Responsible Management of planted forests	2006	Planted Forests Guidelines
Principles for responsible investment in agriculture and food systems	15/10/14	Responsible Investment Principles
Other regional policies and agreements		
ASEAN Zero Burning Policy ASEAN Agreement on Trans-boundary Haze Pollution ASEAN Programme on Sustainable Management of	01/04/99 25/11/03 01/09/13	ASEAN Agreements*

[374] The European Commission responded to the European Parliament's non-legally binding resolutions on 7 September 2017. A copy of this response can be found at: http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2016/2222(INI)&l=en#tab-0

Policy Instrument	Date	Abbreviation
Peatland Ecosystems 2014-2020 (APSMPE)		
Amsterdam Declaration Towards Eliminating Deforestation from Agricultural Commodity Chains with European Countries	07/12/15	Amsterdam Declarations*
The Amsterdam Declaration in Support of a Fully Sustainable Palm Oil Supply Chain by 2020	07/12/15	

8.3.1.3. Policy instrument coverage, interactions and alignment

Table 46 provides a summary of the key social and environmental objectives in each of the identified instruments.

These instruments operate within a wider policy landscape, referencing other instruments that provide coverage of the same environmental and social issues and reinforcing many of the same objectives.

Figure 34 illustrates that there are a few key policy instruments that tend to underpin several others. The UN CBD and the ILO Conventions provide some of the earliest coverage of environmental and social issues of direct relevance to the palm oil industry. The ILO Conventions define acceptable labour practices in the UN and EU policy landscapes and also within sustainable palm oil certification standards, whilst the UN CBD provides concrete targets for the protection of global biodiversity by 2020 (via the Aichi targets), which are then reflected elsewhere (e.g. in the EU's Biodiversity Strategy to 2020). As a result, later policy instruments covering the issues of labour rights and biodiversity reference both of these policy instruments.

In contrast, the UN 2030 Agenda is a relatively new instrument, adopted by world leaders in September 2015. The Agenda is being included in a growing number of regional and national policy frameworks, legislation and regulatory regimes. As a result, it is already being referenced in several more recent EU policy instruments to illustrate how the EU is integrating the UN's sustainable development agenda into its own policy landscape, including commitments on deforestation and ethical trade.

Similarly, the UNFCCC Paris Agreement only came into force in late 2016 but the objectives must be implemented in national strategies to tackle climate change. The negotiation and implementation of the Paris Agreement is at the EU level, and so the objectives of the agreement are reflected in some of the most recent policy instruments, including the EU Consensus on Development.

The FAO voluntary guidelines provide comprehensive guidance on many of the issues surrounding land use rights and land tenure. The implementation of these guidelines is recommended in the EU RED amendment as appropriate action to ensure good governance and respect for human rights, and the guidelines are incorporated into the OECD-FAO Guidance for Responsible Agricultural Supply Chains. This provides a level of policy alignment on land use rights and rights and wellbeing for these policies.

The majority of commitments or objectives within the policy instruments reviewed are not time bound. Exceptions include the EU RED which includes requirements to demonstrate increasing GHG savings from biofuels and bioliquids against a set timetable; the EU Communication on Deforestation's objective to halt global forest cover loss by

2030 and to reduce gross tropical deforestation by at least 50% by 2020; and the UN Forest Instrument's objective to reverse the loss of forest cover by 2030.

To summarise: alignment between EU, UN and regional policy landscapes appears to be increasing over time as significant international conventions and agreements are reflected and embedded in EU and regional policies and legal frameworks. With recent EU policies relating to trade, the use of financial instruments to support sustainable development goals and the new EU Consensus on Development, this level of geographical policy alignment should continue to grow.

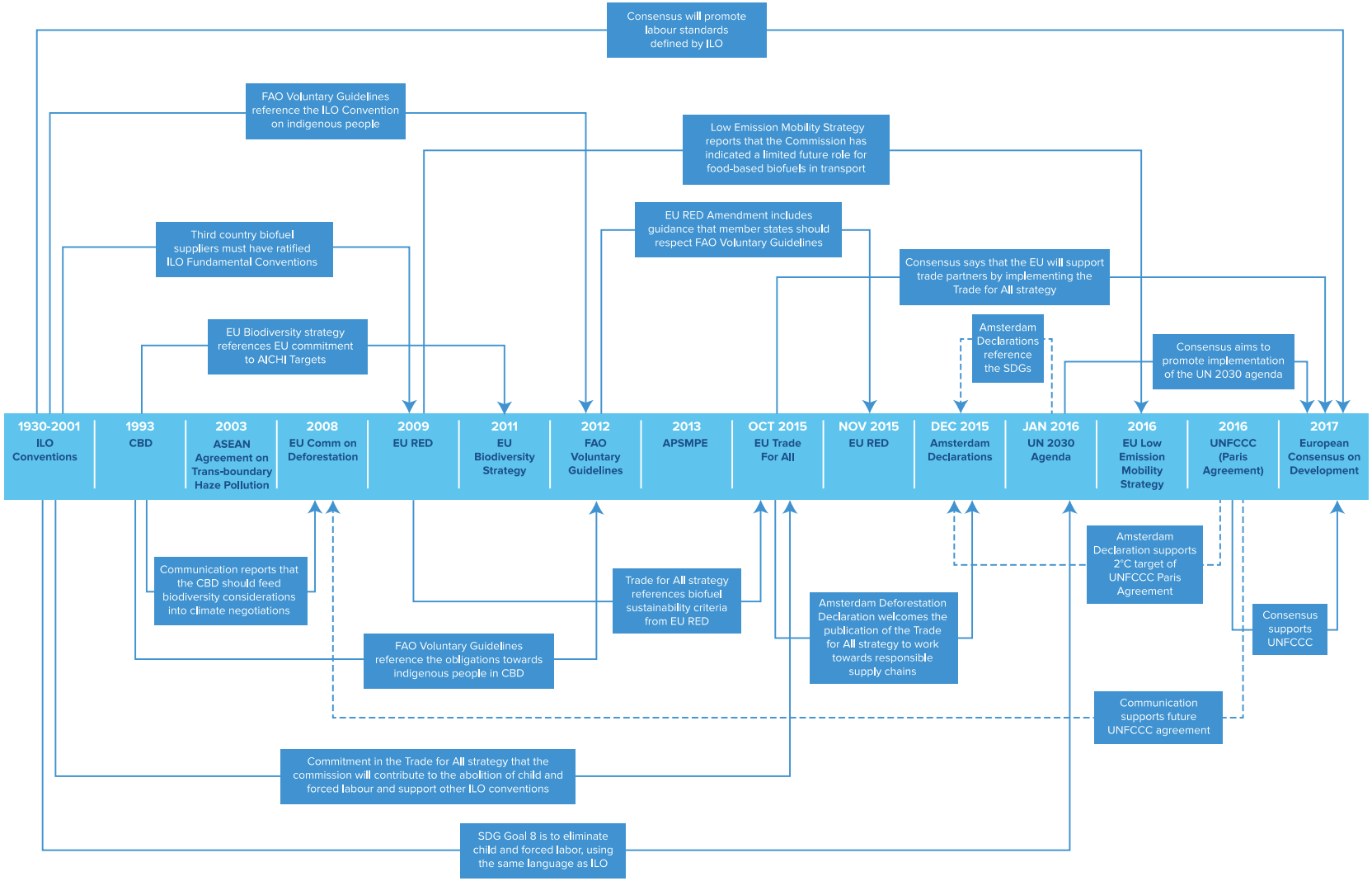
Table 46: Summary of key policy objectives by policy instrument

Theme	Summary	Environmental objectives	Social objectives
EU RED (2009/2015)	Framework for the promotion of energy from renewable sources in the EU. The 2015 amendment sets a limit of 7% for the contribution of biofuels and bioliquids produced from food crops to the final consumption of energy in transport in the Member States in 2020.	Sustainability criteria for raw materials (including palm oil) used for biomaterials and fuels include the achievement of minimum greenhouse gas emissions savings; and the protection of lands with high biodiversity value, high carbon stocks, and peatlands.	The sustainability criteria also require the monitoring of the impacts of increased biofuel production in producer countries on social sustainability, and the ratification of fundamental ILO Conventions by producer countries.
EU Financing Instrument (2014)	The regulation sets up a financing instrument (Development Cooperation Instrument) for 2014-20, specifying programmes the EU can fund to meet development objectives.	Particular focus areas for cooperation include the protection and sustainable use of biodiversity, equitable access to water and management of water resources.	Focus areas also include support for the rights of indigenous peoples and human rights, the protection of land rights and the promotion of decent work, including by combatting child labour.
EU Communication on Deforestation (2008)	The communication is part of the EU's response to climate change and deforestation. The core objective is to 'halt global forest cover loss by 2030 at the latest and to reduce gross tropical deforestation by at least 50% by 2020 compared to current levels'	The communication sets targets to reduce deforestation, supports the inclusion of biodiversity considerations into climate negotiations; and raises concerns over the possible negative impacts of biofuel production.	The communication supports effective forest governance and respect for the rights of forest-dependent people.
EU Trade for All (2015)	The European Commission's 'Trade for all' communication outlines the EU's trade and investment strategy, including a strong focus on the integration of sustainable development into trade policy.	The strategy promotes the contribution of trade policy to: the conservation of and sustainable use of natural resources (including biodiversity, water and forests).	The strategy promotes the contribution of trade policy to: human rights; the inclusion of small producers in trade opportunities; the implementation of core labour standards; and health and safety and decent working conditions.
EU Low-emission Mobility Strategy (2016)	The low-emission mobility strategy frames future initiatives on reducing emissions from the transport sector.	The strategy notes that the Commission have indicated that food-based biofuels will play a limited role in decarbonising the transport sector and should not receive public support after 2020.	This policy instrument does not include any social objectives.
EU Biodiversity Strategy (2011)	The EU Biodiversity Strategy outlines the EU's biodiversity policy to 2020, in line with meeting its international goals and objectives agreed to under the UN Convention on Biological Diversity (CBD).	Target 6 details the EU's role in tackling global biodiversity loss. The strategy targets the impact of EU consumption patterns, particularly those with significant negative impacts on global biodiversity.	This policy instrument does not include any social objectives.
European Consensus	The Consensus provides an integrated EU	The Consensus promotes the protection of	Involvement of local stakeholders; rights

Theme	Summary	Environmental objectives	Social objectives
on Development (2017)	development policy with a focus on supporting sustainable development objectives.	and sustainable use of natural resources, biodiversity and ecosystems including forests; and the attainment of climate change objectives.	of local and indigenous people; support for smallholders; and respect for human rights, tenure rights and labour standards are key concerns of the Consensus.
UN 2030 Agenda (2016)	The 2030 Agenda for Sustainable Development provides the framework for global action in support of people, planet and prosperity.	Goal 15 includes commitments to promote sustainable forest management, halt deforestation and biodiversity loss and restore degraded forests. Goals 12 and 14 include commitments for water and air protection, and Goal 6 promotes sustainable water management.	Goal 2 promotes secure access to land and increased market opportunities for smallholders, women and indigenous peoples. Goal 8 includes commitments to eradicate child and forced labour, protect labour rights and ensure decent work.
UNFCCC (Paris Agreement, 2016)	The United Nations Framework Convention on Climate Change (UNFCCC) provides the basis for intergovernmental efforts to tackle climate change. The Paris Agreement sets a target to limit global average temperature increase to 'well below 2°C', and preferably below 1.5°C.	Article 5 recommends action to conserve and enhances sinks and reservoirs of greenhouse gases, including conservation and sustainable management of forests, and recommends that Parties implement policy measures to reduce emissions from deforestation and forest degradation.	This policy instrument does not include any social objectives.
CBD (1993) and Strategic Plan for Biodiversity (2010)	The CBD has three main objectives: 1) The conservation of biological diversity; 2) The sustainable use of the components of biological diversity; 3) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Strategic Plan for Biodiversity (including the Aichi Biodiversity Targets) provides a framework for the protection of biodiversity for the 2011-2020 period.	Article 8 of the CBD commits parties to establishing protected biodiversity areas; promoting environmentally sustainable development; and rehabilitating and restoring degraded ecosystems. Targets in the Strategic Plan include halving the rate of loss of forests and reducing degradation; ensuring biodiversity conservation; restoring and protecting ecosystem services, and enhancing the contribution of biodiversity to carbon stocks.	Article 8 of the CBD commits parties to respecting the practices of indigenous and local communities. The Strategic Plan includes a target to respect the customary use of biological resources by indigenous and local communities.
ILO Conventions	The International Labour Organisation has drawn up a series of international labour conventions, which provide legally binding protections for workers and indigenous peoples.	This policy instrument does not include any environmental objectives.	The ILO Fundamental Conventions include conventions prohibiting child and forced labour. Additional relevant conventions include conventions on health and safety, wage protection, and the ILO Convention 169 on indigenous and tribal people (expanded in the UN Declaration on the

Theme	Summary	Environmental objectives	Social objectives
			Rights of Indigenous Peoples (UNDRIP)).
UN Forest Instrument	The UN Forest Instrument is formally known as the *'Non-legally binding instrument on all types of forests'* (NLBI). The Instrument extends the timeline of the global objectives of forests originally set out in the NLBI from 2015 to 2030. A UN Strategic Plan for Forests (2017-2030) was adopted in 2017, which further develops objectives and targets.	The first global objective sets out targets to 'reverse the loss of forest cover worldwide' and 'increase efforts to prevent forest degradation'.	The second global objective includes a target to improve the livelihoods of forest-dependent people. The policy sets out specific measures to support indigenous peoples and smallholders, and improve forest access by local communities.
FAO Voluntary Guidelines	The guidelines were compiled by the UN FAO and the CFS (Committee on World Food Security) to provide guidance on improving the governance of land tenure.	The guidelines recommend establishing environmental safeguards to minimise degradation and biodiversity loss, for states using readjustment approaches.	The guidelines recommend respect for and appropriate identification of legitimate tenure rights. The guidelines also support human rights, and the rights of indigenous people and smallholders.
OECD Guidance	The OECD-FAO Guidance for Responsible Agricultural Supply Chains was developed to bring together existing guidance and standards for responsible business conduct in agricultural supply chains. The guidance combines existing standards to produce a model enterprise policy.	The model enterprise policy includes commitments to minimise negative impacts on air, land, soil, water, forests and biodiversity.	The model enterprise policy includes commitments to respect human rights; share benefits with indigenous people; respect legitimate tenure right holders (including customary rights); and respect ILO labour standards including health and safety and decent wages commitments.
ASEAN Agreements	The ASEAN Agreement on Haze Pollution requires Parties to prevent, monitor and mitigate haze pollution. The ASEAN Programme on sustainable management of peatland ecosystems 2014-2020 (APSMPE) sets out six targets to promote the sustainable management of peatlands.	The ASEAN Agreements address haze pollution and burning in agricultural practices. The agreements also require parties to manage and use natural resources in an ecologically sound and sustainable manner.	This policy instrument does not include any social objectives.
Amsterdam Declarations	The Amsterdam Declarations are two non-legally binding declarations of political intent, signed by Denmark, France, Germany, the Netherlands, Norway, Italy and the UK.	The Declaration towards eliminating deforestation supports the elimination of deforestation in the agricultural commodity trade, and private and public initiatives to halt deforestation. The declaration supports reducing emissions from deforestation and forest degradation.	The declaration draws attention to the importance of forest governance and land rights, particularly of indigenous communities.

Figure 34: Schematic summary of policy instrument interactions



8.3.1.4. Key policy objectives pertinent to palm oil

The above review of key policy objectives relating to palm oil in the EU, UN and other regional policy landscapes has identified several dominant themes. Commitments to reduce or prevent deforestation, sustainably manage forests, and protect biodiversity, some of which are time-bound, are frequently included in policy instruments seeking to improve environmental protections, including the UN 2030 agenda and the European Consensus on Development. Commitments to protect or conserve water resources are also found in several of the reviewed instruments.

The majority of policy instruments also address rights and wellbeing, and to a lesser extent land use rights, in their coverage of social issues. The coverage of these two social issues often overlaps with policy commitments supporting the rights of indigenous peoples, including their land rights.

The EU RED forms the basis for action on the use of crops, including palm oil, to produce biofuel in the EU. It provides sustainability criteria that biofuels must meet in order to contribute to renewable energy targets, and a limit for such contribution. The policy instrument is adjusted periodically. Emissions from land use change are also covered by the EU RED, which excludes the use of biofuels and bioliquids made from raw materials grown on high carbon stock land from the calculations to achieve renewable energy targets. The UNFCCC Paris Agreement recognises the role forests play as carbon sinks and reservoirs, and provides recommendations for their conservation and enhancement.

Haze pollution, as a result of the use of burning in land clearance in Southeast Asian palm oil producing countries, is addressed by the ASEAN Agreement on Trans-boundary Haze Pollution. Likewise, commitments to tackle burning in agricultural practices are included in the ASEAN Agreements. The ASEAN Programme on sustainable management of peatland ecosystems provides specific guidelines on peatland management. The EU RED excludes the use of biofuels made from raw materials grown on converted peatland from the calculations to achieve renewable energy targets. There is no equivalent mechanism in EU policy that addresses peatland conversion, or the conversion of high carbon stock forests, for vegetable oils marketed in the EU for use in non-energy sectors.

The ILO Conventions prohibit forced and child labour, and define good labour practices. Other policy instruments addressing these issues reference the ILO conventions as minimum standards that must be respected. In their coverage of smallholders, the policy instruments provide several different objectives including the promotion of land and resource access and market opportunities.

The following sections provide an analysis of the potential of the four main sustainable palm oil certification schemes to achieve these policy objectives.

8.3.2. Analysis between certification schemes and EU/UN policy objectives

8.3.2.1. Assessment approach

The major elements within EU and UN policy instruments that are relevant to palm oil are identified in Table 46. This forms a basis for mapping how the content of the standards of the major palm oil certification schemes relate to the policy objectives.

Each policy objective is compared against the content of the RSPO, ISCC (EU), ISPO and MSPO standards. This comparison is done on a three-point scale:

- **Fully addressing the objective if implemented**. In some cases, the standard fully addresses or goes beyond the policy objective. These are indicated in dark blue in **Tables 48-55.**
- **Partly addressing the objective if implemented**. Standards often partly cover a policy objective, but may not cover all of its aspects. These are indicated in mid blue in **Tables 48-55**.
- **Not addressing the objective, even if implemented**. Where the standard either does not cover a policy objective or where the standard addresses an issue but in a marginal way. These are indicated in light blue in **Tables 48-55**.

The comparison is done at the level of criteria (with indicators and guidance used for clarification and only in a small number of circumstances), although as commonly numerous criteria within a standard relate to a single policy objective this is summarised at the level of Principle in **Tables 48-55**. A worked example of the categorisation, using deforestation as an illustration, is given in Table 47. A detailed analysis, which relates the relevant parts of each standard to the text from each policy instrument, is provided in **Appendix 8**.

Table 47: Comparison of EU-RED criteria on deforestation and the requirements of the RSPO, ISCC, ISPO and MSPO standards

The sustainability criteria of the EU Renewable Energy Directive are described in the EU Directive 2009/28/EC - on the promotion of the use of energy from renewable sources (RED) and EU Directive 2015/1513 - amending Directive 98/70/EC and amending Directive 2009/28/EC on the promotion of energy from renewable sources. These can be summarised as:

- EU Directive 2009/28/EC Article 17.3: In order to account towards the achievement of the EU renewable energy targets, biofuels and bioliquids shall not be made from raw material obtained from land with high biodiversity value that had one of the following statuses in or after January 2008: (a) primary forest and other wooded land, namely forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed;
- EU Directive 2009/28/EC Article 17.4: In order to account towards the achievement of the EU renewable energy targets, biofuels and bioliquids shall not be made from raw material obtained from land with high carbon stock, namely land that had one of the following statuses in January 2008 and no longer has that status.

RSPO: The relevant criterion within the RSPO Standard is Criterion 7.3, which requires that new plantings since November 2005 have not replaced primary forest or any area required to maintain or enhance one or more High Conservation Values. The RSPO standard is coherent with the EU RED requirements in that both prohibit the conversion of primary forest; there is coherence between the EU requirement prohibiting conversion of 'high biodiversity value' and the broader concept of 'high conservation value'; and the RSPO cut-off date for conversion if before that of EU RED Article 17. However, the RSPO does not also prohibit conversion of land with High Carbon Stock, which is defined in detail in the EU-RED policy documents, and which is an important part of that policy. The RSPO's New Planting Procedure allows for compensation for HCV areas deforested, which is not consistent with the requirements of EU-RED, but such instances of deforestation are excluded by the requirements of the RSPO-RED. The RSPO standard is therefore assessed as partly addressing the objective if implemented with EU-RED.

ISCC (EU): The ISCC standard has two criteria relevant to deforestation: Criterion 1.1

Table 47: Comparison of EU-RED criteria on deforestation and the requirements of the RSPO, ISCC, ISPO and MSPO standards

that prohibits production from land with high biodiversity value, and Criterion 1.3 that prohibits production on land with high carbon stock. With the definitions and cut-off dates the same, this means that the ISCC scores as 'addressing the objective if implemented' with EU-RED. This is to be expected as the ISCC standard used EU-RED as its basis.

ISPO: The ISPO Standard has two criteria relating to deforestation. Criterion 3.1: the availability of land release documents; and Criterion 3.2: availability of location permits. In addition, Principle 1 includes that the use of plantation land is in accordance with the provincial general spatial plan (RUTWP) or general regional spatial plan (RUTWK) as per applicable legislation or other policies in accordance with government or local government provisions; and Criterion 4.7: requires conservation areas with high erosion potential: Plantation managers must preserve soil and avoid erosion according to applicable regulations. None of these criteria entirely exclude deforestation from high biodiversity value and high carbon stock land as per EU-RED, and therefore ISPO is scored as not addressing this objective.

MSPO: Criterion 7.1 of the MSPO standard is relevant to deforestation. This prohibits new plantings on high biodiversity value land. This is explained further through two indicators, that further clarify that oil palm shall not be planted on land with high biodiversity value unless in compliance with National and/or State Biodiversity Legislation; and that oil palm cannot be planted on Environmentally Sensitive Areas (ESAs) and describing the thresholds for environmental impact assessments to be carried out. The MSPO standard provides no cut-off date for conversion; has a definition of 'high biodiversity value' that is similar but not identical to that of EU-RED; and does not prohibit planting on high carbon stock land. It is therefore assessed as partly addressing the objective if implemented. Note that although both MSPO and RSPO score as partly addressing the objectives, this does not imply that they are equal: in fact, the RSPO has more stringent requirements on deforestation by virtue of is cut-off date and use of the High Conservation Value Forest instrument.

Several caveats should be noted about any analysis of certification schemes against policy objectives, including the one presented in Table 47 above.

Firstly, none of the schemes were established to enact the full range of EU and UN policy instruments assessed here. It is therefore not to be expected that these schemes fully address the objectives put forward in these instruments.

Secondly, the comparison assumes that the Principles and Criteria are implemented fully. As discussed in the preceding section, even in systems with rigorous certification process requirements, this is not always the case.

Thirdly, within the same thematic area, a standard is likely to address some objectives but less so others, because of variations in the way the objectives are formulated/set. This gives rise to significant variation in how much any given scheme can address the broad suite of instruments addressed here.

Fourthly, the policy instruments and standards in the schemes use different structures and different wording to describe any given issue. It is therefore inevitable that a degree of interpretation is required in mapping their correspondences.

Finally, standards often refer implicitly or explicitly to other documents, including regulations, laws and treaties. A full analysis of all relevant legal requirements is beyond the scope of this study, and so only the content of the standards is used for the analysis.

8.3.2.2. Analysis of environmental issues

The findings of the mapping exercise on how the main palm oil certification systems relate to the environmental and social objectives in EU/UN policy instruments under consideration are summarised in **Tables 48-55** below and given in detail in **Appendix 8**. The main findings for environmental issues are as follows:

Deforestation. The ISCC (EU) standard broadly addresses most of the objectives in EU and UN policy instruments in terms of deforestation, with all except for the new European Consensus on Development, the UN SDGs, the UN Forest Instrument and the Amsterdam Declaration on Forests scoring as 'fully addresses the objectives if implemented'. This is largely because the ISCC standard has an explicit and rigorous prohibition on conversion of high carbon stock areas in addition to the more commonly found prohibitions on primary forest conversion. The RSPO standard prohibits conversion of primary forest and High Conservation Value Forest after November 2005, and scores as partly coherent with the majority of policy requirements evaluated. The MSPO standard scores similar to the RSPO with respect to the evaluated policy requirements, but as noted in Table 47**,** the requirements of the MSPO standard for deforestation are in practice significantly less restrictive than those of the RSPO. The ISPO requires little more than documented legality of clearance, which addresses only a sub-set of the objectives articulated in the instruments.

Biodiversity. The RSPO and ISCC (EU) standards rate similarly with respect to the requirements on biodiversity conservation (excluding the issue of deforestation, above), addressing the majority of the policy objectives in the reviewed instruments other than those within the SEC (2008), the UN SDGs, and the UN Convention on Biological Diversity. This is in part a theoretical consideration, in that it is impossible to prove that the certification standards do not 'jeopardise efforts to protect forests or broader biodiversity priorities' as required by SEC (2008), for example. However, the requirements of these standards to assess, manage and monitor rare threatened and endangered species means that they can be considered as addressing most of the objectives in the instruments evaluated. The MSPO standard only requires legally compliant conservation of such species, and hence is partly addressing a larger proportion of policies. The ISPO standard requires biodiversity conservation as specified by the plantation permit, which is likely to be a weaker measure than those informing the objectives in the reviewed instruments.

Greenhouse Gas emissions. The ISCC (EU) standard is addressing if implemented the majority of EU and UN policy objectives surrounding greenhouse gas emissions, whether they come from land use clearance, or when the palm oil is used for biofuel feedstock. This is perhaps to be expected as the ISCC standard is focused on biofuels, with greenhouse gas emissions a significant consideration in their sustainability. The RSPO standard is partly addressing, if implemented, the majority of policy objectives. Both the MSPO and ISPO standards are partly addressing or not addressing the objectives of the policy instruments evaluated. This is largely a result of avoidance of emissions from land use change not being specified in either standard.

Burning. The ISCC (EU) standard is the only one that prohibits burning for clearance and preparation entirely, and is therefore addressing or going beyond the objectives of all of the policy instruments evaluated. The other three standards are in line with the ASEAN zero burning guidelines, which largely prohibit burning other than in a small number of specified contexts. These standards therefore rate as partly addressing, if implemented, the majority of the reviewed instruments.

Peatland conversion. The ISCC (EU) standard prohibits biomass production from land that was peatland in January 2008 or thereafter. This is addressing, if implemented, all of the objectives in the policy instruments that have requirements on peatland conversion. The ISPO standard requires adherence to ASEAN zero burning guidelines, maintaining

ecosystem functioning and reducing GHG emissions and is addressing or partly addressing the policy instruments evaluated. The RSPO requires that 'extensive' planting on peat is avoided (Criterion 7.4) which partly meets the objectives in the policy instruments under consideration. The MSPO standard has the least explicit restrictions of all of the standards, allowing cultivation and drainage of peat if consistent with MPOB guidelines.

Haze. All four standards can be considered to broadly address, if implemented, the objectives of ASEAN Agreements on Trans-boundary Haze Pollution. This agreement calls for the mitigation of land and/or forest fires.

Water use and pollution. All four standards have broadly similar requirements to conserve water resources, control erosion, and have responsible management of waste that could pollute water sources. The standards are generally addressing, if implemented, the objectives of the evaluated policy instruments.

8.3.2.3. Analysis of social issues

The findings of the mapping exercise on how the main palm oil certification systems relate to the environmental and social objectives in the EU/UN policy instruments under consideration are summarised in **Tables 48-55**, with the detailed assessment behind this summary is provided in **Appendix 8**.

The main findings for social issues are as follows:

Rights and wellbeing. This category contains a wide range of issues, such as respect for human rights and contributions of plantation companies to the wellbeing and economic development of local communities. The RSPO standard has the most complete coverage of these issues, including requiring a social impact assessment, open and transparent communication with communities, a complaints and grievance procedure, making a contribution to local development and respect for human rights. As a consequence, the RSPO standard addresses, if implemented the majority of the objectives in the evaluated policy instruments, apart from some aspects of the UN SDGs (e.g. health) and the UN Convention on Biological Diversity (support for traditional lifestyles) for which it rates as partly addressing their objectives. The MSPO standard addresses more than half of the objectives, as it includes measures such as respect for human rights and facilitating the development of the wider community. The ISCC and ISPO standards address, if implemented, fewer objectives than either the RSPO or MSPO, with the lack of an explicit requirement to respect human rights resulting in the ISPO standard not addressing the objectives of the OECD FAO Guidance for Responsible Agricultural Supply Chains. The ISPO standard explicitly requires that plantation companies provide employment opportunities to indigenous people.

Land use rights. The RSPO standard was assessed as addressing, if implemented, all of the objectives in the EU and UN instruments evaluated. The RSPO standard – in line with most other standards – requires legal demonstration of the rights to use land for palm oil cultivation, and for negotiated compensation with existing rights holders. However, the RSPO has additional requirements that the right to use the land for palm oil is not legitimately contested and that the rights of others cannot be diminished without free, prior and informed consent (FPIC). MSPO is broadly addressing, if implemented, the majority of policy objectives, other than the New European Consensus on Development and the Convention on Biological Diversity. In common with the RSPO, the MSPO standard also specifies that a process of FPIC should occur if the rights of others are affected by proposed new oil palm developments. The ISCC (EU) standard is also addressing, if implemented, the majority of reviewed policy instruments, and like the RSPO standard, explicitly refers to indigenous peoples' land use and customary rights. It does not specify FPIC, but in common with the RSPO provides more explicit coverage of indigenous people's rights to land and other resources than either the MSPO or ISPO

standards. The ISPO standard requires land title, permits, disputes resolution and compensation, and respect for indigenous knowledge but does not specify FPIC, has limited detail on consultation processes, and does not specify other associated resource rights (such as water use rights).

Smallholders. The standards have divergent treatment of smallholders. The RSPO requires fair and transparent dealings with smallholders, and training and technical support to associated or scheme smallholders, making it address, if implemented, the objectives of the New European Consensus on Development and COM (2015) 497 (Trade for all – Towards a more responsible trade and investment policy) in this area. However, it is difficult to conclude if it fully addresses other policy objectives, partly because of a lack of clarity over what would constitute securing the full rights of smallholders (c.f. the UN FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forest), whether the policy should refer to all smallholders that a mill purchases from or just scheme smallholders (c.f. Regulation (EU) No 233/2014 - Establishing a financing instrument for development cooperation for the period 2014-2020), etc. The three other standards show to address in a limited manner objectives in EU/UN policy instruments to improve smallholder's livelihoods, productivity and rights, although in specifying fair dealings with smallholders and having developed a standard specifically with small and medium-sized growers in mind, the MSPO comes closer to addressing the objectives of the various policy instruments than the ISCC or ISPO standards.

Forced and child labour. Both the RSPO and ISCC (EU) standards prohibit the use of child labour and forced labour, and are thus addressing, if implemented, all of the assessed policy objectives. The ISPO and MSPO prohibit child labour, but neither includes explicit prohibition of forced labour and so are assessed as not addressing the majority of policy objectives in this regard in the reviewed instruments, in which forced labour is explicitly prohibited.

Terms and conditions of labour. This category covers a wide range of issues, from the presence of fair contracts, decent wages, non-discrimination, the right to free assembly and collective bargaining, occupational health and safety, etc. The RSPO, ISCC and MSPO standards have a broad coverage of these issues, are explicitly or largely based on relevant ILO conventions, and so if implemented would be expected to be broadly addressing the various policy objectives. The ISPO standard (Principle 4) requires payment of minimum wage, free association and workers' facilities, but the standard has no explicit provision for contracts of employment, reduced coverage of occupational health and safety, and specifies a minimum but not a living wage. ISPO therefore scores as partly addressing, if implemented, all the relevant objectives in the assessed instruments, except for OECD FAO Guidance for Responsible Agricultural Supply Chains (which have strong occupational health and safety requirements and a living wage) which it does not address.

Key to Tables 48-55:

Standard addressing the objectives of the assessed policy instruments if implemented	Standard addressing the issue referred to in the assessed policy instrument (without clear requirement)
Standard partly addressing the policy objectives of the assessed instruments if implemented	Standard partly addressing the issue referred to in the assessed policy instrument (without clear requirement)
Standard not addressing the policy objectives of the assessed instruments, even if implemented	Standard not addressing the issue referred to in the assessed policy instrument (without clear requirement)

Table 48: Summary table of the analysis of the RSPO standard and environmental objectives of assessed EU/UN and regional policy instruments

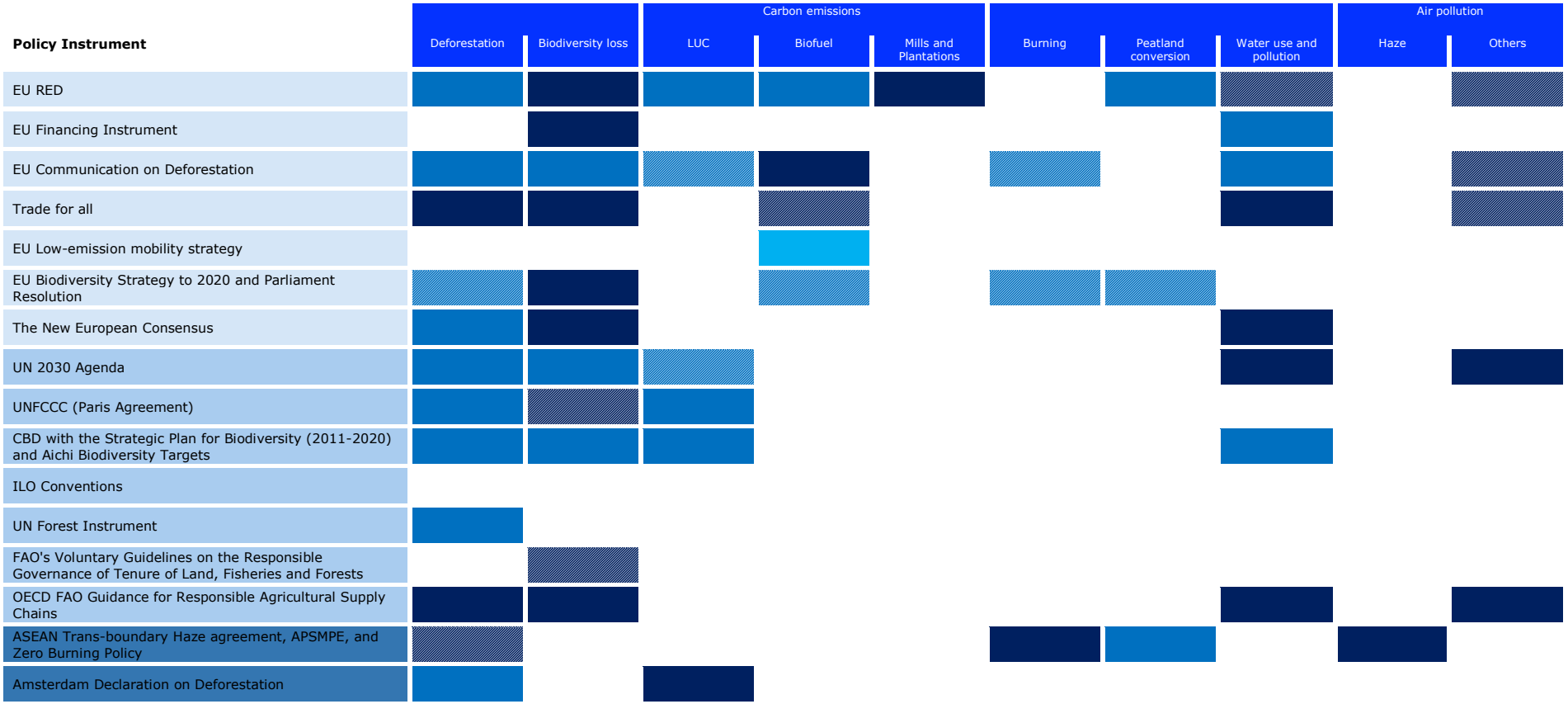


Table 49: Summary table of the analysis of the RSPO standard and social objectives of assessed EU/UN and regional policy instruments

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and Conditions of Labour
EU RED					
EU Financing Instrument					
EU Communication on Deforestation					
Trade for all					
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution					
The New European Consensus					
UN 2030 Agenda					
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets					
ILO Conventions					
UN Forest Instrument					
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests					
OECD FAO Guidance for Responsible Agricultural Supply Chains					
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation					

Table 50: Summary table of the analysis of the ISCC (EU) standard and environmental objectives of assessed EU/UN and regional policy instruments

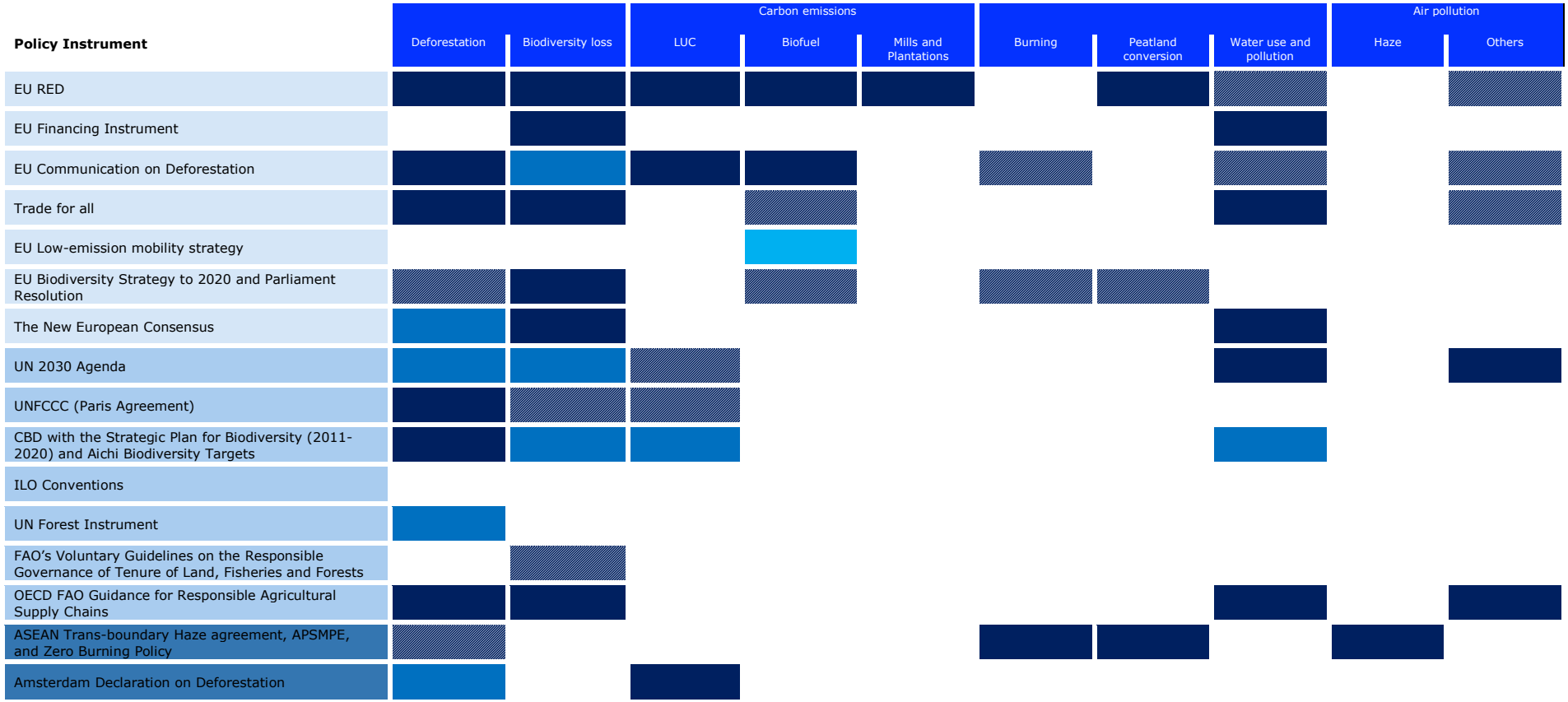


Table 51: Summary table of the analysis of the ISCC (EU) standard and social objectives of assessed EU/UN and regional policy instruments

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
EU RED					
EU Financing Instrument					
EU Communication on Deforestation					
Trade for all					
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution					
The New European Consensus					
UN 2030 Agenda					
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets					
ILO Conventions					
UN Forest Instrument					
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests					
OECD FAO Guidance for Responsible Agricultural Supply Chains					
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation					

Table 52: Summary table of the analysis of the ISPO standard and environmental objectives of assessed EU/UN and regional policy instruments

Table 53: Summary table of the analysis of the ISPO standard and social objectives of assessed EU/UN and regional policy instruments

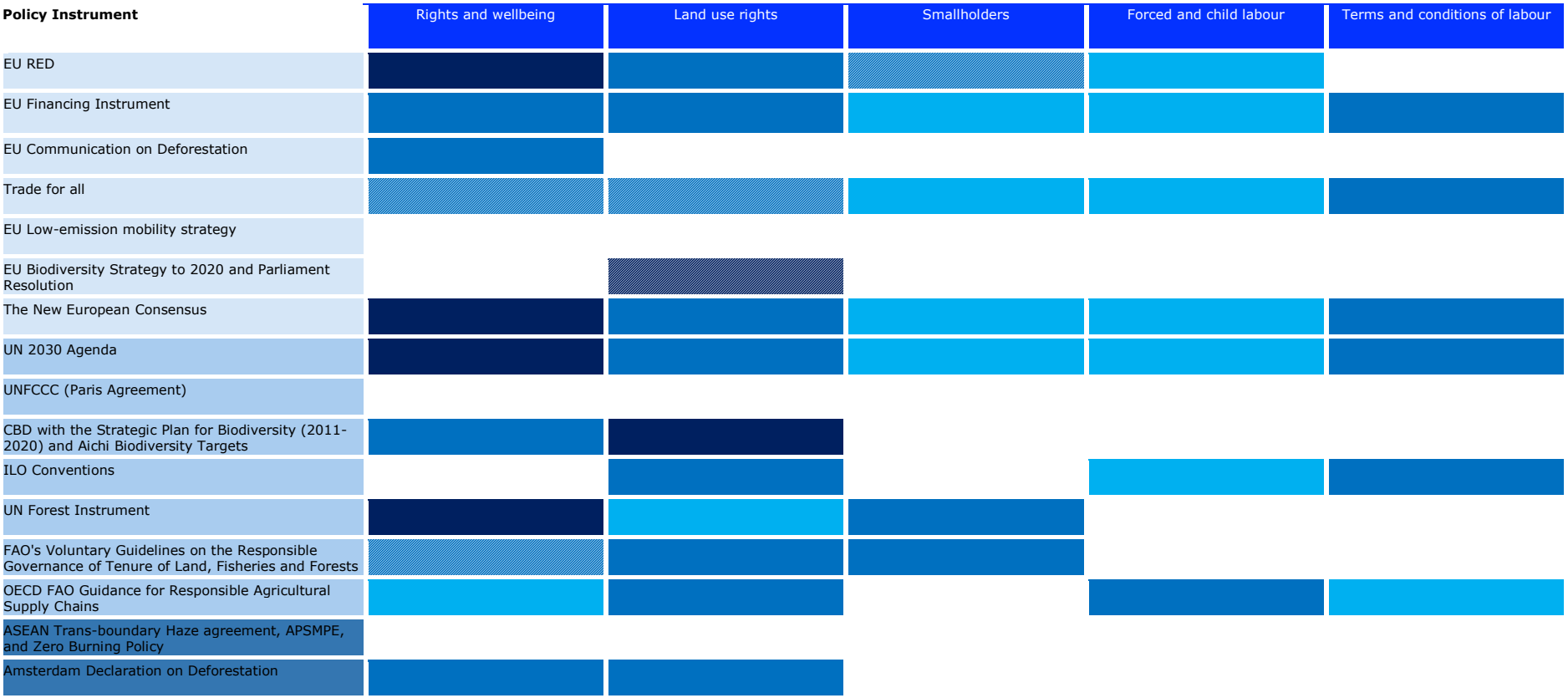


Table 54: Summary table of the analysis of the MSPO standard and environmental objectives of assessed EU/UN and regional policy instruments

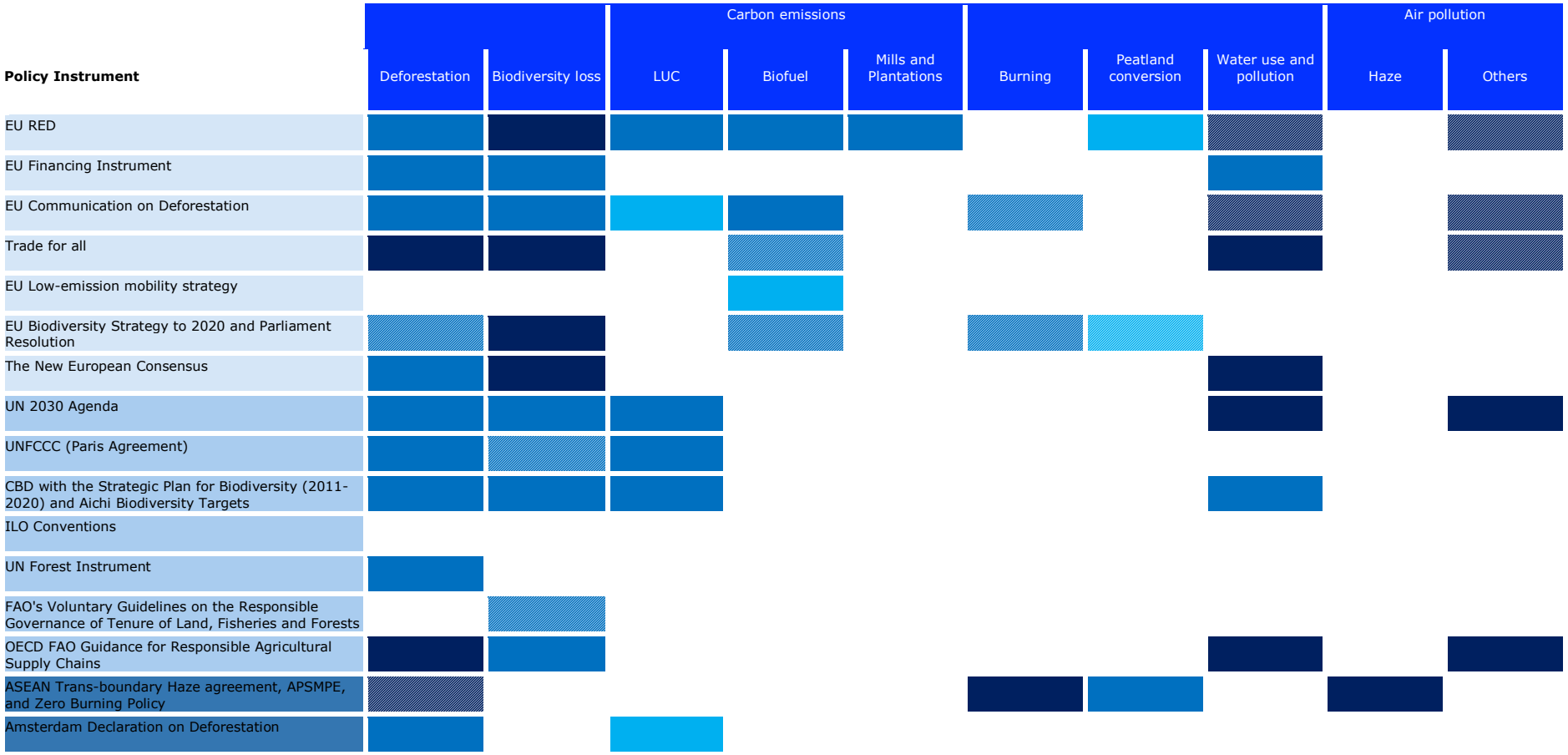
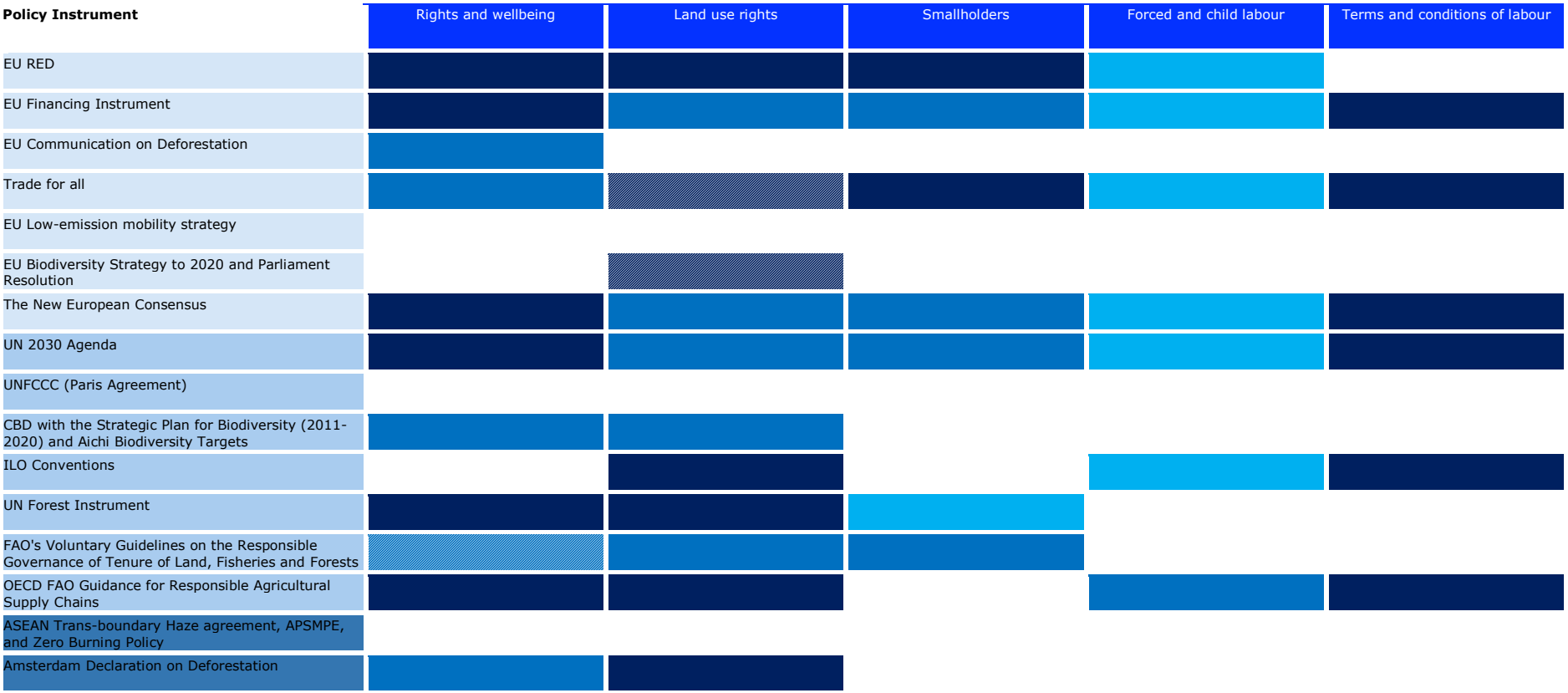


Table 55: Summary table of the analysis of the MSPO standard and social objectives of assessed EU/UN and regional policy instruments



8.3.2.4. Conclusions

The above assessment provides a first-order analysis of how the certification standards relate to the objectives of selected EU and UN policy instruments. The RSPO, ISCC (EU), MSPO and ISPO standards were assessed as addressing if implemented, partly addressing, or not addressing the objectives within each of the assessed policy instruments, organised under environmental and social thematic areas.

The variation in the objectives of the assessed policy instruments meant that there is significant deviation in the degree to which any given standard addresses the objectives under each theme. No single certification scheme addresses all of the policy objectives assessed.

In general terms, however, the ISCC (EU) standard addresses the environmental objectives of the assessed EU and UN policy instruments more closely than the other standards. This is largely a result of the restriction on converting land with high carbon stock, and the clear and conservative definition of high carbon stock within the standard, that in effect prohibits conversion of all but the most degraded secondary forest. This resulted in the standard fully addressing the objectives on deforestation and greenhouse gas emissions from land use change in particular.

The RSPO standard generally addresses the social objectives of the assessed EU and UN policy instruments to a greater extent than do the other standards. The RSPO standard has broader and more tightly defined requirements on rights and wellbeing, land rights, terms and conditions of labour and responsibilities towards smallholders than the other standards.

The ISPO standard addresses the objectives of the assessed EU and UN policy instruments to a lesser degree than either RSPO or ISCC standards, with the MSPO standard intermediate. However, it should be noted that this does not mean that the ISPO (or any other of the standards assessed here) are 'poor': with the partial exception of ISCC, none of them was designed to address the suite of objectives in the assessed EU and UN instruments and divergence between the content of the standards and the objectives of these instruments is therefore not surprising.

8.4. Evaluation of existing legislation and enforcement regimes (or lack thereof) of direct interest to oil palm cultivation, production and trade in major producing countries

8.4.1. Case Study Countries

This section focuses on six case study countries: Indonesia, Malaysia, Brazil, Colombia, Gabon and Liberia. They include two countries in each producing region, varying in size from Indonesia and Malaysia to the smaller West African producers. The production area data in Table 56 below excludes the traditional artisanal groves found in Africa and Brazil.

Table 56: Case study countries' oil palm areas in 2016 (in hectares)

	South East Asia		Central/South America		West Africa	
Country	**Indonesia**	**Malaysia**	**Colombia**	**Brazil**	**Liberia**	**Gabon**
Hectares	11,650,000	5,740,000	550,000	113,000	60,000	38,000

This section reviews environmental and social legislation in each country, the way in which it is evolving, and an assessment of whether the legislation is adequate and/or suitably enforced. **Appendix 9** provides an overview of the key enforcement issues to emerge from our literature review and stakeholder interviews, with positive and negative examples of enforcement issues for each of the six case study countries.

8.4.2. The influence of government legislation on sustainable production

Government agencies in palm oil producing countries influence the supply of sustainable palm oil in two main ways: via land use rights through land allocation policies and programmes; and the extent to which they establish and enforce social and environmental laws, certification systems, and land use and production standards.[375]

We review here the domestic legal and regulatory framework in the six countries, in relation to international sustainability criteria for palm oil production.

We examine what could be considered desirable in terms of sustainability, noting how the socio-economic and regulatory systems may intervene. This recognises that a central problem with assessing the quality of the legal framework governing sustainability is that it includes topics, some of which may be at odds with each other or differ in importance for different groups of stakeholders.

We then study the application of sustainability policies in the six case study countries, identifying the major issues in legislation and/or enforcement.

[375] ZSL (2017), Governments in Sustainable Palm Oil Transparency Toolkit (SPOTT), http://www.sustainablepalmoil.org/governments/.

8.4.3. The reality of the legal framework governing sustainability

Butler (2012)[376] offers a useful summary of NGO views on sustainable palm oil, explaining that for a plantation to be sustainable it should have few chemical inputs, little run-off into waterways, methane capture to generate electricity, and well-protected HCV/HCS areas and riparian forests, with no encroachment. However, this may conflict with rural development.

It is instructive to consider the limits to government legislation. Butler laments that a major barrier to forest conservation is that the profit from oil palm is much greater than that from informal markets for forest goods and services. In these cases the government has little control over the markets for these goods and services. In addition, weaknesses in the government structure can have counterintuitive implications: Butler notes that Indonesia's "*Ministries of Forestry and Agriculture tend to dole out large forested areas rather than degraded land for palm oil development... (as) companies are more interested in the forested land so that they can get a clear title to it and do not have to deal with local communities... (and) use the proceeds from logging to help kick-start their plantations. The natural progression is for logging companies to become plantation companies*."

Butler suggests that the way to get companies address land tenure and land rights issues and develop degraded grassland would be where communities have equity stakes in mills. In some recent thinking, there is concern about how conservation policy can accommodate native customary rights against pressures to create native-free conservation zones where natives may be regarded as trespassers and poachers[377] [378]. This is against a background where local people (lured by the profits from oil palm) may be actors in land degradation, fires and (legal or illegal) deforestation, especially when there is population pressure.

An alternative market-based proposal backed by NGOs including Conservation International[379] and The Nature Conservancy, as well as some large palm oil using companies, is the introduction of a flat a $40 carbon tax to do away with "*all major climate regulations, including the (US) Environmental Protection Agency's authority over CO2 emissions and an "outright repeal" of the clean power plan*"[380].

8.4.4. Regulatory context

While the regulatory context for palm oil varies, often significantly, between one country and another, based on interviews with plantation companies that have achieved a high level of certification for their operations and a literature review we believe that, based on

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[376] Butler, Rhett (2012), 'Legislation and palm oil: South America and Southeast Asia', ZSL interview, 4 Oct 2012, http://www.sustainablepalmoil.org/case-studies/mongabay/.

[377] Barkham, Patrick (2017), 'Human rights abuses complaint against WWF to be examined by OECD', The Guardian, 5 Jan 2017: https://www.theguardian.com/environment/2017/jan/05/oecd-to-examine-complaint-against-wwf-over-human-rights-abuses-in-cameroon.

[378] Sangka Chuka & Anor v. Pendtadbir Tanah Daerah Mersing, Johor & Ors, Malaysian law Review, 11 Jan: 2016: http://malaysianlawreview.com/sample/MLRH_2017_2_286.pdf.

[379] Which it does not see this as an alternative to also addressing environmental challenges by conveying more rights and power to local communities and indigenous peoples.

[380] Milman, Oliver (2017), 'Exxon, BP and Shell back carbon tax proposal to curb emissions' 20 Jun 2017, https://www.theguardian.com/environment/2017/jun/20/exxon-bp-shell-oil-climate-change.

global best practice, there are four main stages of regulation for palm oil plantation developments.[381]

At the award of the concession, there should be a public stakeholder consultation (including free prior and informed consent of the most directly affected populations), as well as a competitive bidding process. This is not covered by RSPO regulations.

At the project evaluation stage, before the plantation is developed, there is usually a mandatory Environmental Impact Assessment. This should be done after public consultation and have a plan to mitigate consequences on natural and built environments, and on health and safety. This is akin to New Planting Procedures in the RSPO Principles & Criteria (P&C).

National laws and regulations, as well as the extent to which those laws are enforced locally, governing the operations of a plantation concession are part of the RSPO P&C, but there is wide divergence between countries and the RSPO, including in mill and estate licensing.

The enforcement of transparency procedures and monitoring of compliance are covered by the RSPO P&C and its Complaints Procedure[382].

This ideal of four fully implemented stages of regulation, as outlined above, is hard to achieve. Different regulations are often the purview of different departments, creating or aggravating difficulties in enforcement and oversight. For example, Leiserson et al. (2017)[383] note in their review of Liberia that the jumble of regulations create enforcement issues which are typical of many countries, and while "some countries have adopted stronger regulations to govern agricultural concessions, including stringent legal and procedural protections for communities… laws and procedures are not always followed in practice… (even in Australia)." Moreover, in some cases enforcement can also be sought through private or international arbitration, in addition to national courts.

Decentralisation adds to the scope for regulatory confusion and gaps. In Indonesia, Bland (2017) notes that various economic sectors contend with "multiple approvals from local and national government departments that are often in conflict in a heavily decentralised nation"[384]. Similar inconsistency arises on occasion in Brazil, Malaysia and Colombia.

The complexity of the legal system works in the favour of established plantations, reinforcing the concentration of ownership. Stakeholders[385,386] point to the problem of lobbying power (if not corruption) in drafting and enforcing rules and regulations. The Transparency International Corruption Perception rankings of the six countries covered

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381 Leiserson, Elizabeth et al. (2017), 'Governance of Agricultural Concessions in Liberia: Analysis and Discussion of Possible Reforms', Allard K. Lowenstein International Human Rights Clinic, Yale Law School, https://law.yale.edu/system/files/area/center/schell/document/liberia_final_2017.pdf.

382 https://rspo.org/members/complaints

383 Leiserson, Elizabeth et al. (2017), Ibid.

384 Bland, Ben (2017), 'Chinese investors hesitate over Indonesia investment', The Financial Times, 15 Jun 2017, https://www.ft.com/content/bb1a9658-4517-11e7-8519-9f94ee97d996.

385 Interview with NGO specialist on Liberia, 16 Jun 2017.

386 Interview with legal specialist, 23 Jun 2017.

by the case studies for 2016 were: Malaysia 55, Brazil 79, Colombia 90, Indonesia 90, Liberia 90, and Gabon 101 (a high score representing a more critical situation)[387].

Dividing policy between different departments and regions can also result in poor capacity to collect data and insufficient transparency. One of the few successful efforts to halt large-scale deforestation is in Brazil's Legal Amazon, with substantial data and effective targeting. "Sophisticated monitoring system provides real-time information about land use change to Brazil's environmental enforcement agency, the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA)"[388] adds to measures on the ground to implement a policy to reduce deforestation implemented from 2004 (Action Plan to Prevent and Control Deforestation in the Amazon or PPCDAm). During 2002-2010, several protected areas were designated, and new policies in 2007 and 2008 targeted a "federal blacklist" of municipalities with critical deforestation rates. Lastly, demand-side efforts (including multi-stakeholder round tables, zero-deforestation agreements and the soy moratorium) also helped slow down Brazil's unprecedented deforestation rate.

One aspect where information is often very scarce is land registration. It was notable that up to 1995 only about 7% of land in the Indonesian Land Administration Project (for land registration) had been registered, while central administration of the National Land Agency had been dismantled and its functions decentralised to the provincial level. A systematic registration of all land is costly[389]. Brazil has one of the most advanced programmes for the registration of land the *Cadastro Ambiental Rural*. There is some evidence that this has helped reduce deforestation rates.[390]

It is difficult to divorce legislation from the socio-economic context. An NGO specialist[391] highlighted the role of civil society in enforcement and improved governance, contrasting Indonesia's more vibrant civil society and the FLEGT Independent Monitoring precedent to that of Malaysia. Historical factors can matter too: countries with lower population pressure may have fewer problems with forest degradation, deforestation and biodiversity than those with greater land pressure. In Malaysia the forced resettlement of farmers to semi-urban villages and native peoples from hamlets into villages during the Malayan Emergency (1948-60) accelerated urbanisation. Today some of the best-kept areas of biodiversity in Malaysia were previously out of bounds due to the insurgency.

The level of economic development also has a strong influence on the priorities and abilities of the legislature. Another NGO specialist[392] said of Liberia that the people's needs are so basic ("*think of an Indonesian outer island 20 years ago*"), without electrification and people making their own charcoal (for household use) and artisan palm oil, resulting in forest degradation and air pollution. The major community / societal

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387 Transparency International (2016), Corruption Perceptions Index 2016, https://www.transparency.org/news/feature/corruption_perceptions_index_2016#table.

388 Gebrara, Marai F. (2017), Can REDD+ help Brazil roll back rising deforestation rates? CIFOR Forest News, 23 Jun 2017, http://blog.cifor.org/50288/can-redd-help-brazil-roll-back-rising-deforestation-rates?fnl=en, accessed 26 Jun 2017

389 Slaats, H. (2000), 'Land Law in Indonesia', International Institute for Asian Studies Newsletter No. 22, http://iias.asia/iiasn/22/regions/22SEA11.html, accessed 28 June 2017.

390 Alix-Garcia, J., Rausch, L. L., L'Roe, J., Gibbs, H. K. and Munger, J. (2017), Avoided Deforestation Linked to Environmental Registration of Properties in the Brazilian Amazon. CONSERVATION LETTERS. doi:10.1111/conl.12414

391 Interview with NGO specialist on Indonesia and Malaysia, June 2017.

392 Interview with NGO specialist on Liberia, June 2017.

concern is not environmental but whether economic concessions and conservation projects could limit or block their customary land rights.

Plantation concession awards and governance for smallholders are not reviewed here, but large corporations may benefit from rising processing and trading volumes by expanding mill capacity on the back of smallholder development; "*handing over the baton of expansion to smallholders*" or "*hiding behind smallholders*" (who are often subject to less stringent rules or weaker enforcement)[393].

Laws and regulations – a brief review **Table 57** aggregates the national laws and regulations cited in the Annex sections of the RSPO National Interpretations in Indonesia, Malaysia, Colombia, Gabon and Liberia (RSPO rules require compliance and these National Interpretations are available for all these countries except for Brazil, where they have been applied by the largest palm company, Agropalma) [394].

The central benefit of the RSPO data set is that as a scheme that covers all of the countries in a harmonised manner it allows us to provide a consistent overview of the coverage of domestic legislation in **Table 57.** In subsequent sections we provide a nuanced discussion of the legislation in each country (including a series of case studies).

Table 57: Overview of legislation in the six case study countries

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Deforestation							
Biodiversity loss							
Reducing carbon emissions	Land use change (LUC)						
	Biofuel						
	Mills and plantations						
Burning							
Peatland conversion							
Water and pollution							
Air pollution	Haze						
	Others						
Indigenous people							
Smallholders							
Forced and child labour							

393 Interview with legal specialist, June 2017.

394 These are of varying quality in terms of referencing laws to sustainability criteria. While there is an attempt to cover international conventions ratified, there is little effort to map this against necessary amendments in national laws and regulations. It is probable that sustainability officials in palm oil companies drafted some lists of legislation with the help of legal compliance personnel, but without major legal expertise. Despite these limitations, this set of resources is the best available on this topic.

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Terms and conditions of labour	Health & safety						
	Wages & others						
Anti-corruption and money laundering							
Fair pricing							
Land ownership/use permit							
Licensing for palm oil estate and mill							

Source: LMC International analysis based on RSPO data. Note: A shaded box indicates that there is domestic legislation dealing with that topic.

Appendix 10 and Appendix 11 go into detail regarding specific laws. A large number of laws and regulations exist, dealing with most of the topics related to sustainability (we comment later on the efficacy of this legislation). The existence of laws does not provide any indication of the strength of their enforcement.

Some of these laws may benefit the oil palm plantations. The most obvious of these is the introduction of mandatory biodiesel blending in Indonesia, Malaysia, Brazil and Colombia. More subtly Potter (2015) has suggested that the legal system may favour large plantations when dealing with issues of access to land and the treatment of smallholders.[395] The table also reveals that there are some areas that have not yet come under legislation.

It is noteworthy that only two countries make specific reference to GHG emissions from Land Use Change.

Only in Indonesia, Malaysia and Liberia does legislation aim to reduce carbon emissions from mills and plantations. In a similar vein, burning does not appear to be a priority in some countries and neither is air pollution more broadly.

8.4.5. Case studies

In this section, we review the implementation of national policies on deforestation and sustainable palm oil production in six countries: Indonesia and Malaysia in Asia; Brazil and Colombia in South America; and Gabon and Liberia in Africa. As Indonesia has witnessed the major share of global growth in oil palm areas in recent years, we focus in more detail on its policies in this section.

8.4.5.1. Indonesia: attempts to upgrade sustainability policy

The Indonesian government is committed to tackling climate change and environmental degradation as well as ensuring that the development of oil palm plantations is socially equitable and contributes to poverty reduction.

[395] Potter, Lesley (2015). 'Managing oil palm landscapes: A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa', Occasional Paper 122, Bogor, Indonesia: CIFOR.

To achieve these goals, Indonesia has introduced a large number of regulations governing the establishment and running of oil palm plantations. These are in addition to broader legislation, such as the PROPER[396] system, which also applies to the oil palm sector.

There is detailed legislation regarding **licensing for land allocation**. However, the complexity of the regulations, the overlap in responsibility among different ministries and the problem of decentralisation render enforcement of the legislation challenging.

In terms of **protecting indigenous rights** the government has introduced new laws to safeguard customary land rights, but as they stand these cannot be enforced given the issues and delays with land allocation. In addition, the attempt to support customary land rights may come at the expense of discouraging deforestation.

To address environmental concerns and the problems created by the land allocation system, the government has introduced a **moratorium and protection of peatland areas**. However, as companies still hold land banks of concessions, which may include forest, the law is (on its own) not fully sustainable. In addition, it has proven difficult to enforce. Moreover the Indonesian Supreme Court has revoked on economic grounds Regulation (Penmerhut) No 17/2017 (adopted in April 2017) that required large plantations to vacate peat areas with a depth of more than 3 metres, or to reforest after fires.

One area where the government has had greater success is in the **legislation on haze** where Indonesia ratified the 2002 ASEAN Agreement on Transboundary Haze Pollution in 2014. This complemented Law No. 39/2014 on Plantations and Law No. 32/2009 on Environmental Protection and Management. However, enforcement is not yet comprehensive, since 'hotspots' have appeared during subsequent years during the dry season; and the mechanism could benefit from greater transparency.

Finally, day-to-day management of plantations remains only partially regulated by the **Indonesian Sustainable Palm Oil scheme,** which currently has limited coverage. However, there are attempts to improve the legislation. At present, issues such as the treatment of labour are covered by general Indonesian laws not ones pertaining directly to the oil palm industry.

Each of these areas is outlined in more detail below.

Licensing for land allocation

The system for land allocation is highly regulated. A number of permits are required:

Izin Lokasi (Location permit): is the starting basis for all the licences. This permit is granted by the head of the district (the *Bupati*) and outlines the area of the land given to a company for business purposes. The duration of the permit varies by province, but it can be extended when it expires.

AMDAL (Environmental Impact Analysis): all companies which conduct business that affects the environment must obtain an AMDAL. To obtain one, companies need to

[396] PROPER is the programme for pollution control, evaluation and rating, which requires that every company submit annual reports. Failure to meet standards for pollution control results in the company being downgraded. Below the blue rating, banks may no longer provide credit to these companies. http://www.menlh.go.id/proper/

submit an application, along with list of documents. The application is reviewed by the AMDAL assessment committee, established by the State Minister of Environment, the governor of the province (each province comprising several districts) or the regent/mayor.

The process of land allocation also involves the recognition of the need to protect areas of High Conservation Value. In areas where there is High Conservation Value the plantation either has the option of doing the conservation itself or of returning that land to the government.[397] However, there have been many cases where plantations have received different advice from the local government that wishes to develop the land.

IUP (Plantation Business Licence): This is a key licence for a plantation. It allows the companies to cultivate and process products from the plantation. This permit is granted by the governor and has no expiration date as long as the company is in the plantation business. The IUP is divided into three categories: 1) IUP-cultivation; 2) IUP-processing; and 3) IUP.

The IUP-cultivation is the licence for companies engaged in plantations. The IUP-processing is the licence for companies processing plantation crops. The IUP itself is the licence for companies that are integrated from plantations to the processing of crops. As long as a company has an IUP, there are no restrictions on its ability to conduct a plantation business.

HGU (Land Right): The HGU is a land right issued by Central Government which can be granted only on state-owned land, and only for the purposes of agriculture, fisheries, or animal husbandry.

The system for land allocation involves a full environmental and social impact assessment. It would be sustainable if it were properly enforced. The overlap in responsibilities between national and local government as well as between different ministries means it is not properly enforced. There have been a number of cases where permission was given for land conversion that was unsustainable. This has come to light as the administration has brought anti-corruption cases against several Sumatra governors, including that for Riau, on land conversion (including to oil palm).[398] [399]

Protecting indigenous rights

The granting of the HGU is not necessarily a green light for the development of an estate. Negotiations then need to occur with settlers (whether or not they actually have a long-standing connection with the land in question) on the area stipulated in the *Izin Lokasi*.

Because negotiation occurs late into the process and without clear land rights means that the process is fraught for both the developer and the traditional inhabitants. In response to these issues the Indonesian Constitutional Court has also recognised local community

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397 Menteri Agrari Dan Tata Ruang, Surat Edaran No. 10/SE/VII/2015 *Penerbitan Izin Pada Areal Hutan Konservasi Bernilai Tinggi (High Conservation Value Forest)*

398 Jakarta Globe (2013), 'Riau Governor Rusli Still in Office Despite Arrest' Jakarta Globe, 17 Jun 2013, http://jakartaglobe.id/news/rusli-still-in-office-despite-arrest-2/, accessed 21 June 2017.

399 Jakarta Globe (2014), 'KPK Arrests Riau Governor in Raid', Jakarta Globe, 26 Sep 2014, http://www.jakartaglobe.beritasatu.com/news/kpk-arrests-riau-governor-raid/.

rights to customary forests[400] [401] [402]. While this is a strong affirmation of the rights of indigenous populations, given the myriad problems associated with establishing property rights it is unclear how it might be enforced[403].

In addition, the government has indicated that it may pursue a land amnesty to regularise property rights in cases of smallholder-led deforestation, including in the upland areas. While sustainable from a social point of view this would clearly be unsustainable in terms of the signal it sends to allow further smallholder-led deforestation.

[400] Constitutional Court Decision No. 35/2012 on the recognition and protection of customary forests (hutan adat / tanah ulayat) acknowledges the ownership and the right of local communities in Indonesia to access their customary forests

[401] Gunawan, Apriadi (2017), 'Acknowledgment of customary forests shows govt support for indigenous people', The Jakarta Post, 17 March 2017, http://www.thejakartapost.com/news/2017/03/17/acknowledgment-of-customary-forests-shows-govt-support-for-indigenous-people.html, accessed 21 June 2017.

[402] Suksuwan et al. (2015), 'Consulting Study 10: Overview of existing regulatory mechanisms and relevant actors A. Institutional framework governing the palm oil sector in Cameroon: A report on laws, regulations and practices B. Community rights and environmental protection in the laws and regulations of Indonesia, High Carbon Stock (HCS) Science Study', Surin Suksuwan, David Hoyle, Pavithra Ramani, Mike Senior and Rebecca Smalley, December 2015, http://www.simedarby.com/sustainability/clients/simedarby_sustainability/assets/contentMS/img/template/editor/HCSReports/Consulting%20Report%2010.pdf, accessed 15 June 2017.

[403] Personal communication with EU Delegation in Jakarta (2018): While smaller ASEAN Member States exceed 4 million hectares of forest under social forestry (or community-based) programmes, Indonesia only has about 1 million hectares most of which has been achieved in the last 10 years. Although countries may have varying definitions for forest and social forestry, Indonesia has less than 1% of its total state forest land area under such schemes, as compared to Vietnam, which has about 30%, and the Philippines, which has 50%.

The moratorium and peat protection

In response to the problems with land allocation, outlined above, President Jokowi announced a moratorium on new palm oil concessions and a ban on peat deforestation. However, at a provincial level there have been difficulties enforcing the moratorium. As a result, record fines have been meted out on agro forestry companies for illegal forest clearing and fires (including on peatlands).[404] [405] Payment of these high fines is said to be pending still. There is also an issue with companies still holding land banks of concessions that may include forest.

Regulation on haze

The government has introduced better fire prevention regulations after the 2015 haze crisis, but companies criticise the delays in the One Map spatial planning, which would help better understand the risk of forest fires. Therefore the law is sustainable but not properly enforced at present, as it requires greater transparency.

ISPO palm oil certification scheme

While the government has made the ISPO certification scheme mandatory, few plantations have actually achieved ISPO certification. Recent statements from the Indonesian Ministry of Agriculture suggest that only 16.7% of the area dedicated to the cultivation of oil palm in Indonesia has achieved ISPO certification. [406] In addition, some consider that the initiative has failed to reassure consumers, NGOs and foreign governments of its effectiveness in reducing negative environmental and social impacts.[407]

To address these concerns, significant political commitment is being put into revising ISPO in light of these perceived weaknesses. These include the ISPO Strengthening Team, under the Coordinating Ministry of Economic Affairs (CMoEA), aiming at a Presidential Decree to repeal the current Ministerial Decree on ISPO for late 2017/early 2018. In addition, the *Forum Kelapa Sawit Berkelanjutan Indonesia* (FoKSBI), a multi-stakeholder forum led by the Indonesian government and facilitated by UNDP, aims to increase the coordination, sustainability and efficiency of the palm oil sector, including developing a National Action Plan[408]. These processes are expected to result in significant revisions to the ISPO standards and certification processes that are likely to address some of the weaknesses that have been identified by stakeholders.

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404 Jong, Hans Nicholas (2015), 'Record fine against plantation company upheld', The Jakarta Post, 13 Sep 2015, http://www.thejakartapost.com/news/2015/09/13/record-fine-against-plantation-company-upheld.html, accessed 21 June 2017.

405 Jong, Hans Nicholas (2016), 'Landmark court ruling expected to serve as deterrent'. The Jakarta Post, 18 Nov 2016, http://www.thejakartapost.com/news/2016/11/18/landmark-court-ruling-expected-to-serve-as-deterrent.html, accessed 21 June 2017.

406 Indonesia Investments (2017), 'Only 16.7% OF Indonesia's Oil Palm Plantations ISPO Certified' https://www.indonesia-investments.com/news/todays-headlines/only-16.7-of-indonesia-s-oil-palm-plantations-ispo-certified/item8143?, accessed, 18 December 2017.

407 Pacheco P, Gnych S, Dermawan A, Komarudin H and Okarda B. 2017. '*The palm oil global value chain: Implications for economic growth and social and environmental sustainability*.' Working Paper 220. Bogor, Indonesia: CIFOR

408 http://redd.unfccc.int/files/frel_submission_by__indonesia_final.pdf

In conclusion, at present, the ISPO is not yet fully implemented or applied[409].

8.4.5.2. Liberia: the development of large plantations

Liberia has a number of agencies and protocols to ensure the environmental and social sustainability of the oil palm sector.

The major law is the Environmental Protection and Management Law of Liberia (EMPL). Under this law prior to the establishment of a new plantation a full Environmental Social Impact Assessment (ESIA) has to be conducted. The ESIA needs to be presented to the Environmental Protection Agency of Liberia, as well as to a meeting of joint-stakeholders. In addition, Liberia is a signatory to the Marrakech Declaration by which they adhere to zero deforestation.

Liberia also has a strong land rights policy through the Liberia Land Rights Act, which requires large amounts of community involvement in land use decisions. In addition, worker rights are regulated through the Liberian Decent Work Bill (2015).

Liberia therefore has strong legislation and processes to protect the environment as well as indigenous communities and workers' rights. However, Liberia remains a severely impoverished country emerging from a severe civil war. As with Indonesia and Malaysia it has sought to encourage development by granting concessions. The development of these concessions has been accompanied by detailed Environmental and Social surveys and a commitment to meeting the principles and criteria of the RSPO (including Free Prior and Informed Consent).

The outcome of the high requirements for due diligence and pressure from NGOs has been to slow appreciably the development of many concessions. From an environmental sustainability perspective the laws in Liberia are both sustainable and enforced. In practice, this has come at a high cost in stopping the further development of the industry; thus, at an economic level the outcome is unsustainable. In environmental terms too, the reality on-the-ground is often unsustainable, since the main alternative source of income for rural populations in the affected areas is often slash and burn agriculture or charcoal burning.[410]

8.4.5.3. Gabon: a young oil palm sector based on large plantations

Gabon has adopted a series of impressive sustainability laws. These include, making RSPO mandatory and a commitment to 50% carbon reduction. To direct development, Gabon introduced a National Land Use Programme (NLUP), which aims to ensure that only areas with limited environmental value are developed. This is combined with a monitoring system to ensure the land use plan is enforced. In developing these mechanisms it has received substantial aid-assistance. [411]

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409 At the time of finalising this report, the Indonesian officials in charge of consolidating and revamping the ISPO standard, principles and criteria were not in a position to provide detailed information on the content of the new standard, but indicated it would be made available in 2018.

410 J. Porritt (2017) 'Dispatches from the front line: the oil palm industry in Liberia' http://www.jonathonporritt.com/sites/default/files/users/Dispatches%20from%20the%20Front%20Line.pdf, accessed 18th of December 2017

411 https://www.ec-leds.org/success/supporting-sustainable-forest-management-gabon, accessed 18th of December 2017

Uniquely Gabon's Sustainable Development Law (2014) allows for a system of credits for carbon reduction, maintaining biodiversity and accumulating community capital. While criticised for allowing companies to buy out of their environmental obligations, this also allows for a system that recognises the trade-offs between environmental protection and economic growth.

As with Liberia, the oil palm industry in Gabon is based on the concession model. Therefore to understand the level of enforcement of these laws in practice it is important examine how the concession approach has been managed.

The oil palm sector in Gabon was first developed on a relatively small scale by Agro Gabon, which was intended to meet the limited domestic market for palm oil. This market was small as a reflection of the population size. The government of Gabon sold Agro Gabon to SIAT of Belgium, which undertook replanting and some modernisation of facilities. The transformation of the palm sector came with the arrival of Olam International and the development of sizeable estates, with the government as minority partner. Olam Palm Gabon developed the industrial plantations and acquired the SIAT subsidiary, while promoting a smallholder cooperative to supply the central mills.

Since, apart from the old Agro Gabon/SIAT plantation, the oil palm sector in Gabon is a greenfield venture, developed once RSPO was well established, Olam Palm Gabon and the associated smallholder developments have been able to incorporate RSPO Principles and Criteria into the environmental impact of the estates, and social aspects of the conditions of its workers.

One respect in which conditions in Gabon, in common with those in parts of Liberia, differ from those in Southeast Asia and South America is in the limited pool of semi-skilled local plantation labour to draw upon at the start of the project. Therefore, the training of a local labour force was a priority to reduce the initial dependence upon Southeast Asian workers.

Another respect in which the development of the oil palm estates in Gabon was distinctive was in the large areas of primary rainforest near the proposed plantation sites. Therefore, a great deal of care was required to balance the viability of HCV habitats, including protecting HCV areas and ensuring they were protected with corridors conserved and buffer zones created around them. This then had to be combined with the restoration and regeneration of secondary forest on the land managed by the company while achieving logistical efficiency in the design of the estates.

Olam Palm Gabon has reported that nearly 60% of its oil palm area was previously secondary forest, and the remaining 40% savannah land. Overall Gabon appears to have enforced sustainability laws well.

8.4.5.4. Brazil: Enforcement concentrates on large plantation companies

Brazil has progressive legislative requirements for palm oil production, mandated smallholder participation and a wide variety of other environmental regulations Subsidised or low interest loans are given to plantations that abide by certain criteria, such as ensuring they are registered and compliant with regulations.

There is a zero deforestation rule, with no exceptions, in the main oil palm area. This applies to the Ecological and Economic Zone (ZEE). Plantations in the ZEE must maintain 50% of total area as protected forest reserve. For plantations outside the ZEE the reserve is 80%. This is enforced through satellite monitoring. Large plantations are *de facto* law enforcement agencies, with heavy fines levied for transgressions. Data transparency is excellent with information from real-time satellite monitoring published openly.

Companies are required to ensure their employees' wellbeing. Plantations are required to provide shelters, with tables and toilets for employees to receive food in the field (one for every 1,000 ha); toilets must be distributed throughout the plantation, or be mobile and accompany workers throughout the day. There is an extensive network of social insurance and fringe benefits that is among the most comprehensive in any palm producing country.

The state of Pará, where most of Brazil's oil palm has been planted, has large areas of degraded pastures, and on these areas plantations have increased biodiversity. Unfortunately, weaker central political control in the country has been accompanied by increasing deforestation at a national level.

In practice, the authorities rarely enforce the zero deforestation and ZEE laws on small and medium-sized palm estates. Furthermore, in 2012 the Forest Law was introduced which gave amnesty for those who deforested illegally before 2008. As with amnesties in general, this runs the risk of introducing moral hazard into the application of environmental measures and may be viewed as encouraging further transgressions. There are also signs that the government is considering the relaxation of its stringent zero deforestation policy, with the idea floated recently in public discussion that oil palm, as a "low impact crop", could be used to reforest protected areas.

Brazil therefore has two distinct oil palm systems in operation today. On the one hand, there is clear enforcement for large companies, with measures to ensure environmental sustainability, strong worker rights and transparency. On the other hand, the political crisis has led to the government increasingly turning a blind eye towards independent poorer farmers who deforest. Those small farmers who have close links with a nucleus estate/mill, along similar lines to the Indonesian plasma model, operate very much like the large nucleus plantation to which they are attached.

8.4.5.5. Colombia: little pressure for deforestation

Colombia has developed its oil palm sector with a legal framework that includes comprehensive laws (a total of 352 decrees and regulations govern the behaviour of the sector, from land rights, social security, protection of indigenous groups, maintenance of soil fertility and water quality, use of chemicals, protection of the environment including forest cover, workers' and children's rights, and land conservation). Colombia's widely diversified agricultural sector, in which the issues raised by oil palm cultivation are applicable to other crops, has meant that these laws are not designed specifically for palm oil production, but have been drafted to govern practices throughout agriculture.

The country has had a great advantage of large areas of pasture, which meant that it did not have to plant oil palm on forest. This has given Colombia some enviable sustainability credentials. As such, deforestation is a minor issue for Colombia given the large areas of low intensity, poorly performing cattle ranches that could be converted to oil palm. Furthermore, the major area of expansion of oil palm is in Los Llanos, on flat, highly acid soils, dominated by low bushes, rather than trees. When the acid is neutralised with heavy applications of lime, it becomes very suitable for oil palm. Colombia has also made strong zero deforestation commitments in the context of their Nationally Declared Contributions (NDCs) under the UNFCCC Paris Agreement. This should reinforce incentives to increase zero deforestation and sustainable commodities production in the country.

Although the industry is dominated by small producers (83% of producers have 50 hectares of palm or fewer), for whom certification and auditing is more difficult and costly than for large producers, it forecasts that by 2020, 50% of Colombian palm oil production will be certified by the RSPO.

The most sensitive areas regarding the sustainability credentials of the Colombian palm sector have been about the labour conditions and the rights of workers, in particular on small estates. The legal code is strict about these rights, but enforcement is difficult on small estates, especially where they lie in areas that have suffered many years of armed conflict. Increasing attention is being given to problems of food insecurity in these areas.

With oil palm seen as an excellent crop for small producers, providing regular incomes once the planted areas become mature, it was promoted as an attractive alternative to illegal crops (for drugs). Government support was important for the expansion of the sector, with many producers taking advantage of funds from the Rural Capitalisation Incentive to develop new estates.

A significant (but contested) concern about the expansion of oil palm is that in the past there was some level of violence and displacement, most notably between 1998 and 2006, with much of it associated with the chronic insurgency problems that beset the country for decades. The December 2016 peace agreement between the Colombian government and FARC has brought the displacement of small landowners back into focus, as the government seeks to encourage investment and open-up land for development.

Law 200 of 1936 was admitted by the State to have been poorly drafted. In 2011, Law 1448 imposed upon it an obligation to restitute land to the victims of violence caused by internal conflict. In mid-2017, oil palm lands covered by this restitution represented a mere 555 hectares of the total of 213,272 hectares restituted in total (a share of 0.003%). This may be interpreted as an indication that this issue is not a major one for oil palm, but equally it may be a sign that small-scale oil palm farmers have been slow to submit claims for restitution.

8.4.5.6. Malaysia: concerns over planting on peat soils

Malaysia has a less complicated regulatory environment than Indonesia. The Malaysian Palm Oil Board (MPOB) "controls research and development and regulation of the industry" [412], and is funded by a fixed payment per tonne of CPO output. Anyone wanting

[412] Potter, Lesley (2015). 'Managing oil palm landscapes: A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa', Occasional Paper 122, Bogor, Indonesia: CIFOR.

to harvest oil palm has to be licensed by the MPOB (though interestingly, the planting of oil palm is not licensed).

129 laws, both Federal and state-specific, govern the behaviour of the palm sector. Since November 2005, the Federal government has stipulated that new palm estates must not replace primary forest or have been planted on any area required to maintain or enhance one or more High Conservation Values.

The clearing of protected land requires the forest to be "degazetted" and the clearing sanctioned by the relevant state's government. Malaysia, like the FAO, treats plantation forests as forests, and allows logging where there is clear felling followed by reforestation. There are instances where some conversion to (acacia, rubber) timber tree plantations, but not oil palm, has been allowed to go ahead. While the Federal Government has strong control over Peninsular Malaysia's 11 state governments, the states located on Borneo (Sabah and Sarawak) are more independent. This is particularly true of policy on forestry, land allocation and agriculture; thus there are regional differences in regulations and enforcement.

The most controversial aspect of land use concerns the application of Native Customary Land Rights (known as NCR) in Sarawak. Local tribes have long been considered to have rights over both their farmland and primary forest on communal land, with a sizeable proportion of this land constituting deep peat soils. A Federal court ruled in 2016 that their rights did not apply to primary forest, putting the State government under pressure to change the Land Code to permit the development of such primary forest[413].

Since oil palm is the most popular crop after the clearance of this primary forest, there are fears that the importance of NCR for local tribes will encourage the Sarawak state government to sustain rapid growth in its oil palm areas (the growth exceeded 100,000 hectares per annum in 2010-2016), much of it in environmentally sensitive areas.

Data transparency can be limited. Sabah has the most detailed data available, publishing a comprehensive annual report on its forests. For Sarawak almost no maps are publicly available. Data in the Peninsular Malaysia region are also limited.

Since, outside Sarawak, Malaysia's oil palm sector may be considered to be very mature, with minimal area growth, the major concerns regarding sustainable production relate to labour and workers' rights. With its very heavy dependence upon foreign workers, notably from Indonesia, the regulation of the conditions of these workers is often fraught with difficulties.

Foreign workers are entitled to the same pay as Malaysian workers, but some states do not permit these workers to bring their families with them, and the government does not allow smallholders (which in Malaysia are defined to be farmers with less than 100 acres, or roughly 40 hectares, of land) to recruit foreign workers directly. This has created a form of under class of foreign workers who work on such smaller estates, but without recourse to legal protection.

Enforcement of regulations

Table 58 highlights the major findings on regulatory frameworks and their enforcement by country. The table was prepared at the end of June 2017 based on literature review

[413] Davidson, Desmond (2017), 'Sarawak native rights defender wants change to Land Code now", The Malaysian Insight, 13 July 2017.

and semi-structured interviews in which standard questionnaires were sent to plantation companies, regulators and NGOs in a selection of countries. Overall approximately 30 people were interviewed in the preparation of this table. It therefore has an inherent bias towards the preoccupations of large organisations. Where possible we have sought the opinion of small and medium-enterprises and the informal sector but this is not always readily available.

The table demonstrates that most countries have sought to introduce regulations. However, in many cases they are not adequately enforced. This can be the fault of systemic corruption, a lack of political will and bureaucratic inertia. Often the bureaucratic inertia is compounded by factors such as decentralisation, which, while democratically desirable, make political and regulatory control cumbersome. The overarching historical problem of land rights allocation also re-emerges frequently.

Table 58: Preliminary country rating by sustainability theme

Questions on sustainability-related rules included (or not), within national laws & regulations for the palm oil sector		Indonesia**	Malaysia*	Brazil**	Colombia**	Gabon**	Liberia**
Deforestation							
Biodiversity loss							
Carbon emissions mitigation	Land use change (LUC)						
	Biofuel						
	Mills and plantations						
Burning							
Peatland conversion							
Water and pollution							
Air pollution	Haze						
	Others						
Indigenous people							
Smallholders							
Forced and child labour							
Labour	Health & safety						
	Wages & others						
Anti-corruption and money laundering							
Fair pricing							
Land ownership/use permit							
Licensing for palm oil (estate and mill)							

	Implementation 'low' (Provision 'Yes' or 'No')
	Implementation 'medium' or 'high' (Provision 'Yes')
	Blank (if uncertain, not known, not applicable)

Note: The questionnaire asked "Are provisions in laws & regulations adequate? Yes/No" and "In your view, is implementation low/medium/high?"
The viewpoints from a regulatory expert or large company** in each country, via a questionnaire that was completed in June 2017.*
 # Although there is no specific law requiring this GHG reduction in this type of GHG, both Brazil and Colombia have policies not to convert forests. Both have extensive pastures or degraded lands that could be converted to oil palm cultivation without significant GHG emissions due to land-use change.

Some countries benefit from structural elements, which make sustainability issues less noticeable. For example, both Colombia and Brazil have the advantage of having large areas of pasture to develop, which has meant less strain on deforestation. However, in these two countries, the pasture was developed decades earlier, and thus deforestation may have occurred long before oil palm was planted. Malaysia has benefited from a more highly urbanised population than Indonesia, making it easier to control deforestation. In the background, there is always a fundamental tension between immediate economic returns and long-term and often not easily quantifiable benefits of the environment and informal markets for other forest goods. In almost all cases large companies are under sufficient scrutiny now to improve their sustainability. In Indonesia, all publicly quoted plantation companies combined (with 16% of the total oil palm area in the country) planted 11,000 hectares of new oil palm areas, which compared with a national total area increase of 286,000 hectares. Thus, these most visible companies accounted for less than 4% of the increase in the total area in 2016. The major concern is whether the government can ensure that smallholders can expand in an economically efficient way, whilst protecting the environment. The challenge of increasing their yields is a difficult one, with few signs in recent years of progress in this respect.

The recent slowdown in new plantings in Indonesia and Malaysia has been marked among publicly quoted companies with the highest visibility. This suggests that the pressures to limit oil palm expansion may be having an impact. However, this almost certainly means that a rising share of those new plantings that do occur is being made in less visible segments of the sector. Whilst there is no direct way of assessing this dynamic situation, the following tables indicate the likely effectiveness of government action to limit such new plantings, by summarising surveys from a number of sources regarding overall governance and corruption in the six case study countries.

Table 59 lists the rankings that emerge from six alternative measures of governance collated by the World Bank. The rankings cover 214 different countries, where a high rank (i.e., above 200) is to be considered to be very good, while a low rank (say, below 50) is poor. We have used colours to indicate rankings by quartile. The bottom quartile (a ranking below 54) is coloured in dark green. The second lowest quartile (with a rank between 54 and 107) is in mid green. None of the six countries manages to reach the third (second highest) or top quartiles.

Table 59: World Bank Governance Rankings for the six case study countries

Country	Control of Corruption	Rule of Law	Regulatory Quality	Government Effectiveness	Political Stability/No Violence	Voice and Accountability
Brazil	38	52	47	48	30	62
Colombia	44	41	67	54	14	50
Gabon	25	31	22	21	44	23
Indonesia	43	39	50	53	33	50
Liberia	26	18	16	8	26	43
Malaysia	62	71	75	76	50	33

Colour Code	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile

Source: World Bank Governance Indicators

Note: Rank out of 214 nations (high being good)

In every respect, other than "voice and accountability", Malaysia has the best ranking. The two African countries have the lowest rankings for the measures listed in the first four columns. Where the palm sector is dominated by a very small number of visible publicly quoted companies (as is the case in Gabon and Liberia), it is likely that the ranking of the sector in terms of these indicators will be higher than the rankings for the country as a whole.

Table 60 focuses upon the perceptions of corruption as published by 12 private rating agencies and the World Bank. The two left hand columns indicate indices of corruption, where 0 is a very poor performance (i.e., highly corrupt) and 100 is an excellent performance (with no corruption). The rankings are listed in the opposite direction, with a high rank, computed out of a total of 176 countries, being considered a poor outcome (note that this is the opposite approach to that applied in

Table 59).

In this case, all six countries are classified as lying within the two middle quartiles, where the second quartile is rated lower (i.e., with higher corruption) than the bottom quartile, and the third quartile is rated as better in terms of limiting corruption than the second quartile. Malaysia and Brazil perform best in these rankings.

Table 60: Transparency International Corruption Ratings for the six case study countries

Country	Index 2015	Index 2016	Rank 2015	Rank 2016
Brazil	38	40	76	79
Colombia	37	37	83	90
Gabon	34	35	98	101
Indonesia	36	37	88	90
Liberia	37	37	83	90
Malaysia	50	49	54	55
Colour Code	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile

Source: Transparency International

Note: These are the averages of corruption indices from 12 private rating agencies and the World Bank

Rank out of 176 nations (a low rank being good); and Index (out of 100, a high value is good)

In summary, whilst direct information on legal enforcement in not available for the six countries assessed, a combination of expert (local) opinion (Table 58) and indirect indicators (

Table 59 and Table 60) point towards a likelihood that laws pertaining to oil palm cultivation may not be consistently enforced. The different indicators used do not paint a wholly consistent picture, although Malaysia generally performs well on all three analyses compared to the other countries. However, it should be noted that in all probability there are companies in all countries that choose to be more compliant with laws and regulations and others less so: thus highlighting the limitation of analysis of national-level indicators.

8.5. Analysis of aspects of RSPO Standards left to national jurisdictions; and summary and analysis of existing initiatives relating to palm oil in the EU, individual EU Member States, India & China

For the major producers we will examine how national interpretations differ from the basic Principles and Criteria of the RSPO. This will be based on evidence provided by RSPO, highlighting peat as a particular flash point. We will also review the use of jurisdictional approaches, such as the IDH sustainable trade and other initiatives, whereby an entire region (Sabah is mentioned as an early possibility) is certified.

We will then review the level of adoption of RSPO in the destination markets. First, for *non-energy use* in the EU based on pledges to adopt the RSPO (or equivalent) by sectors in key markets. Second, for energy-use by examining how the transposition in domestic laws of the Renewable Energy Directive differs between different Member States. Finally, we will also review some of the private sector pledges and public sector initiatives in the other two major consumers India and China.

8.5.1. RSPO National Interpretations

The National Interpretations (NIs) adapt the generic P&C to make them operational locally. The main variations lie in national laws and regulations (and definitions). In general there is less variation on topics that are dealt with at an international level, such as those relating to its HCV, United Nations and International Labour Organization (ILO) rules.

Each National Interpretation Taskforce (NITF) seeks to deliver pragmatic guidance to oil palm producers, processors and procurers on how to implement the RSPO P&Cs within a producer country. The resulting NI must not conflict with the P&Cs but it may, in part, differ from the generic guidance. The NITF identifies a list of applicable laws and regulations, as well as new laws introduced or changes made to local legislation. RSPO plantation members say they prefer using the NI rather than the generic P&C. This means that multinational companies have to take into account differences in policy guidance and definitions across different countries. In Table 61 we highlight where NIs differ for five case study countries (Indonesia, Malaysia, Colombia, Gabon and Liberia). Of our case study countries Brazil does not have a separate NI yet, only a local NI for Agropalma.

There are differences in the extent to which countries take advantage of NIs. Indonesia, Brazil and Liberia have the greatest number of additions in their NIs. Newer producers like Gabon have fewer. In general, changes to the RSPO P&C are most frequent where there are domestic laws to take into account. For example, virtually all countries have their own NIs of criterion 5.3, about waste recycling, where countries have broader national policies on such issues.

A summary of the Principles and Criteria adopted in each of the six countries, together with the details of the number of laws governing the national palm oil industry is provided in

Table 62. An example of the differences in national applications of the RSPO P&Cs is given by their application to soil, as may be gauged from the discussion in **Appendix 12.**

It is also possible for NIs not only to amend the P&Cs of the RSPO but also to add further indicators. In Colombia's case, for example, they have introduced six additional indicators:

- 6.7.2 Guidance for companies in taking appropriate measures if they become aware of child and forced labour in their FFB supply chain.
- 6.7.3 Evidence that children working in smallholders' family farms are in the education system.
- 6.13.2 Progressive implementation of due diligence mechanisms to identify the level of adherence of business practices to international human rights norms.
- 6.13.3 Measures to ensure that hiring private security and surveillance services does not involve people with criminal records, criminal investigations in progress, or that have committed crimes against humanity.
- 7.3.6 Socialising and training to employees about rare, threatened or endangered species present in the region and their management plan within the plantation.
- 7.5.2 Due diligence mechanisms in land acquisitions.

Table 61: National Indicators added to the RSPO P&C 2013

	Indonesia	Malaysia	Colombia	Gabon	Liberia	Brazil
Criterion 1.1	✓					
Criterion 1.2			✓		✓	✓
Criterion 1.3	✓		✓			✓
Criterion 2.1			✓	✓	✓	✓
Criterion 2.2	✓	✓	✓		✓	
Criterion 2.3	✓	✓	✓			✓
Criterion 3.1						
Criterion 4.1			✓		✓	✓
Criterion 4.2	✓		✓		✓	
Criterion 4.3	✓	✓	✓	✓	✓	✓
Criterion 4.4	✓	✓		✓	✓	✓
Criterion 4.5	✓		✓		✓	✓
Criterion 4.6	✓	✓	✓	✓	✓	✓
Criterion 4.7	✓	✓	✓	✓		✓
Criterion 4.8	✓					✓
Criterion 5.1	✓				✓	✓
Criterion 5.2	✓	✓			✓	✓
Criterion 5.3	✓	✓	✓	✓	✓	✓
Criterion 5.4						
Criterion 5.5	✓		✓		✓	✓
Criterion 5.6			✓			✓
Criterion 6.1	✓	✓			✓	✓
Criterion 6.2		✓			✓	
Criterion 6.3						
Criterion 6.4	✓					✓
Criterion 6.5	✓	✓		✓	✓	✓
Criterion 6.6	✓	✓			✓	
Criterion 6.7	✓	✓	✓			✓
Criterion 6.8		✓				✓

	Indonesia	Malaysia	Colombia	Gabon	Liberia	Brazil
Criterion 6.9						✓
Criterion 6.10	✓					
Criterion 6.11	✓					
Criterion 6.12					✓	
Criterion 6.13		✓	✓			
Criterion 7.1	✓	✓			✓	
Criterion 7.2	✓		✓			
Criterion 7.3		✓	✓	✓	✓	✓
Criterion 7.4	✓		✓		✓	✓
Criterion 7.5		✓				✓
Criterion 7.6	✓					✓
Criterion 7.7	✓				✓	✓
Criterion 7.8		✓		✓	✓	
Criterion 8.1	✓				✓	
Sum	28	19	19	9	24	27

Sources: Countries' National Interpretations submitted to the RSPO

Table 62: National adoption of the RSPO's P&Cs and the number of laws governing the behaviour of the oil palm sector

Principle	RSPO P&C No. of Criteria	RSPO P&C In 2013 Indicators	Brazil 2010 Indicators	Colombia 2016 Indicators	Gabon 2016 Indicators	Indonesia 2016 Indicators	Liberia 2016 Indicators	Malaysia 2015 Indicators
1	3	3	2	3	4	4	4	4
2	3	14	12	14	14	14	14	14
3	1	2	3	2f	2	2	2	2
4	8	41	52	41	41	41	41	41
5	6	17	24	17	18	17	17	17
6	13	36	26	40	36	36	36	37
7	8	23	19	25	23	23	23	23
8	1	1	1	1	1	1	1	1
Sum	**43**	**137**	**139**	**143**	**139**	**138**	**138**	**139**

No. of laws	Brazil	Colombia	Gabon	Indonesia	Liberia	Malaysia
Federal	1,066					86
State/Local	125					43
Total	**1,191**	**556**	**59**	**213**	**44**	**129**

Sources: Countries' National Interpretations submitted to the RSPO and local legislation

8.5.2. Implementation questions

In terms of RSPO member compliance, Lord and Durhan (2013)[414], based on a review of 114 audits, found that growers complying with the RSPO P&C experienced the greatest difficulties with criteria relating to four principles: Principles 2 (transparency, legal and compliance), Principle 4 (water, chemicals, OHS & training, best management practices), 5 (HCV, waste, environmental) and 6 (social impact analysis, pay & conditions).

[414] Lord, Simon and Katrina Durham (2013), 'Analysis of RSPO certification and surveillance audit reports across Indonesia, Malaysia and the Rest of the World, Global Sustainability Associates', March 2013, http://www.nbpol.com.pg/wp-content/uploads/downloads/2013/08/RSPO-Audit-Report_all-v7B.pdf.

Ambiguity arises in the implementation of RSPO rules as well as audit quality. There is an RSPO Interpretation Forum, but companies being audited do not have access to this resource. Instead access is restricted to certification bodies (CBs), auditors, and the Accreditation Body to clarify any questions about RSPO standards, systems and procedures. As CBs base their reports on the generic P&C, not the NI, those being audited have to be very knowledgeable in the implementation and interpretation of the NI. Part of the problem is that RSPO has a checklist based solely on the generic P&C. These circumstances often result in differences between plantation company understanding and the CB's understanding of RSPO rules.[415,416]

Some RSPO plantation members faced a mini-crisis over auditing in the first half of 2016 after RSPO sanctioned several accredited auditors in January 2016 (after negative public reports). Immediately two CBs or auditors were suspended for 6 months and 1 CB was withdrawn from the RSPO's approved CB list, forcing its clients to transfer to other CBs. This "clean-up" followed a Wall Street Journal report on CBs' alleged failures in auditing migrant labour problems[417] [418]. The subsequent review of CBs is said to have meant that as many as half the certificates issued since the start of certification were affected and that some reviews were needed as the original audits were queried. To avoid real disruption to the RSPO certificate system, re-audits and re-issuances had to be done within months.

Audit quality is a big issue for many certification systems including the Rainforest Alliance and the ISCC. The ISCC reported that in 2015, deficits and non-conformities were detected especially in GHG calculations, traceability and mass balance. This led to the withdrawal of five certificates for companies and the issue of three "yellow cards" for CBs. Forest Peoples Programme (2014) found that "(Community) outreach (by the RSPO) is increasingly problematic owing to RSPO's challenged reputation for upholding and enforcing its standards."[419] Thus, RSPO and other sustainability schemes have faced rising concerns about the quality of their implementation and have boosted their efforts regarding audits.

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415 In general, sustainability schemes are in a phase of improving their audit and implementation. There is a contrast in their approaches to this. For example, the ISCC has a proactive in-house unit, whilst the RSPO has a more hands-off approach and eschews internal policing (associated with an active public complaints system).

416 Interview with sustainability implementation specialist, 5 July 2017.

417 ASI (2015), ASI-RSPO-PT. Mutuagung Lestari & CU-P&C Compliance/Investigation-Malaysia-2015, 20 Oct 2015, http://www.accreditation-services.com/resources/document-library/download-info/asi-rspo-complianceinvestigation-pt-mutuagung-lestari-cu-at-felda-malaysia-2015.

418 Syed Zain Al-Mahmood, 'Palm-Oil Migrant Workers Tell of Abuses on Malaysian Plantations', Wall Street Journal, 26 Jul 2015, https://www.wsj.com/articles/palm-oil-migrant-workers-tell-of-abuses-on-malaysian-plantations-1437933321.

419 Forest Peoples Programme (2014), 'Intermediary Outreach and Engagement in Producing Countries, Status Assessment and Outreach Plan, Report to the Board of Governors and Secretary General of the Roundtable on Sustainable Palm Oil,' Forest Peoples Programme, October 2014. This is an RSPO commissioned assessment of the status of RSPO's capacity to engage with communities impacted by palm oil development through 'intermediary organisations'. It asked for a plan to suggest how RSPO can enhance such outreach. Some 258 potential entities were interviewed across 21 countries.

8.5.3. Jurisdictional approaches

Landscape or jurisdictional approaches generally combine focus on performance at the scale of a whole landscape or jurisdiction (i.e., local or national government). They are multi-stakeholder, involving government working together with other stakeholders towards one or more shared goals, activities and inputs that support sustainable development (e.g., reducing deforestation, eliminating child labour or supporting smallholders), and accountability to provide credibility and assurance, including long-term governance and monitoring (Proforest, 2016).[420]

At the RSPO's annual meeting in November 2016, there was a focus on efforts to include governments (national and sub-national) in private-public efforts to incorporate the RSPO standard. Although details are not yet available, traders in sustainable products expect that the jurisdictional approach will be modified to deliver an "RSPO light" approach. Hopes that governments can simply make current RSPO rules mandatory may not be practical, in view of the importance of smallholders (with problems of compliance and/or legality in several countries), except if group-certification options were made available.

RSPO was the leader in creating a governance platform for large palm oil corporations on the premise that national governance has been insufficient to address consumers' expectations and concerns related to palm oil production. The state does not have a formal seat at its table, but state agency representatives have had roles in its Working Groups. Since 2015, the RSPO has been trying to realign to the need to include stakeholders in the government sector. RSPO optimistically said: "When a local government agrees to RSPO certification guidelines, everyone, from large multinational plantation owners to the tiniest smallholders, has to enter the programme" for its Sabah and Central Kalimantan Jurisdictional Certification in October 2015[421] [422] implying a hard mandatory goal. RSPO's jurisdictional programmes include:

- Sabah, Malaysia (2015). Making RSPO a legal requirement was mooted by Sabah in November 2016 and again in December 2017. This was one of the RSPO's goals, but the final outcome reveals the difficulties the RSPO faces trying to expand using a voluntary approach. What is now called the "Sabah Jurisdictional Approach"[423] still appears to be at the concept stage, probably evolving to cover many commodities, with RSPO one of several interested parties. The goals include: Sabah forests 100% sustainable certified by 2018; Sabah oil palm to be 100% RSPO-Certified sustainable by 2025; Sabah's terrestrial totally protected areas to cover 30% of total land area by 2025; and a budget of over US$5 million was indicated.

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420 Proforest (2016), 'Introduction to landscape or jurisdictional initiatives in commodity agriculture', August 2016, http://www.proforest.net/en/publications/proforest_landscape_approaches_introductionaug2016_web.pdf, accessed 6 July 2017.

421 RSPO (2015), 'RSPO-Certified palm oil could become the norm in Sabah, Kalimantan', RSPO, 30 October 2015, http://www.rspo.org/news-and-events/news/rspocertified-palm-oil-could-become-the-norm-in-sabah-kalimantan, 6 July 2017.

422 RSPO (2015), 'Central Kalimantan announced jurisdictional certification for sustainable palm oil', RSPO, 26 Jun 2015, https://www.rspo.org/news-and-events/news/central-kalimantan-announces-jurisdictional-certification-for-sustainable-palm-oil, 6 July 2017.

423 Payne, John (2016), 'Introduction to the Sabah Jurisdictional Approach for Sustainable Palm Oil Production', RSPO 14th Roundtable Meeting, Bangkok, Thailand, http://rt14.rspo.org/ckfinder/userfiles/files/PC4_4_2%20Datuk%20Dr%20John%20Payne.pdf, accessed 7 July 2017.

- South Sumatra, Indonesia (2015): Working with IDH[424], the example of Musi Banyasin in South Sumatra Province illustrates the multi-crop interests (palm oil & palm kernel oil, pulp & paper, soybeans, rice, rubber, coconuts, palm sugar and nipah palm) of the area's administrators. The district's area of 1.4 million hectares has 0.44 million of oil palm, 0.70 million of forest areas and 0.28 million of peat areas[425].
- Other regions revealing a strong interest in the jurisdictional approach include Central Kalimantan, Indonesia (2015)[426] and Ecuador (2017)[427].
- Alternative approaches developed in different regions at a broader level include The Marrakech Declaration (2016), which saw several West and Central African palm producers promise mandatory company-level policies with commitments for a WWF-led zero net deforestation concept. Seven (out of 10 hoped for) producer nations signed up to the declaration.[428] It is part of the Tropical Forest Alliance 2020, Africa Palm Oil Initiative, coordinated by Proforest[429]. Proforest explained that RSPO was seen as insufficient coverage and there was a need to "raise the floor" (of sustainability practices). RSPO says it is keen to support this, and would: "Promote appropriate, responsible and transparent investments in the oil palm sector that adhere to this Declaration and adopt international best agricultural and environmental practices and promote palm oil certification, such as The Roundtable on Sustainable Palm Oil (RSPO) Certification Standard."[430]
- IDH[431] Sustainable Trade Initiative focuses on South Sumatra, West Kalimantan and Aceh. It aims to bring stakeholders together, both private sector and local and national governments. South Sumatra's aim is jurisdictional certification under RSPO; West Kalimantan and Aceh both have a "green growth" strategy[432] [433].

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424 IDH (2016), 'Landscapes in Indonesia that IDH supports: Aceh, South Sumatra & West Kalimantan', IDH, 13 Dec 2016, https://www.idhsustainabletrade.com/news/3765/.

425 Hernedi, Beni (2016), 'What does Jurisdictional Certification Mean for Musi Banyuasin', http://rt14.rspo.org/ckfinder/userfiles/files/PC4_3%20Beni%20Hernedi.pdf.

426 RSPO (2015), 'Central Kalimantan announced jurisdictional certification for sustainable palm oil', RSPO, 26 Jun 2015, https://www.rspo.org/news-and-events/news/central-kalimantan-announces-jurisdictional-certification-for-sustainable-palm-oil, 6 July 2017

427 RSPO (2017), 'Ecuador takes a giant step towards Certified Sustainable Palm Oil Production', RSPO, Mar 2017, http://www.rspo.org/news-and-events/news/ecuador-takes-giant-step-towards-certified-sustainable-palm-oil-production.

428 Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Ghana, Liberia, the Republic of Congo and Sierra Leone

429 Proforest (2016), Marrakesh Declaration signed at COP22, Proforest, 18 Nov 2016, http://www.proforest.net/en/news/marrakesh-declaration-signed-at-cop22.

430 Tropical Forest Alliance 2020 (2016), 'Tropical Forest Alliance 2020 Marrakesh Declaration for Sustainable Development of the Oil Palm Sector in Africa Signed at the UN Framework Convention on Climate Change Twenty-Second Session of the Conference of the Parties', Bab Ighli, Marrakesh, Morocco, 16th November 2016, https://www.tfa2020.org/wp-content/uploads/2017/04/TFA2020_Marrakesh_Declaration_post-embargoed.pdf.

431 IDH stands for Initiatief Duurzame Handel, Dutch for Sustainable Trade Initiative.

432 IDH (2016), 'Landscapes in Indonesia that IDH supports: Aceh, South Sumatra & West Kalimantan', IDH, 13 Dec 2016, https://www.idhsustainabletrade.com/news/3765/.

433 Personal communication with EU Delegation in Jakarta (2018): The 2017 Balikpapan Statement is built on the understanding that national governments and many companies have made commitments to reduce both deforestation and greenhouse gas emissions. The Balikpapan Statement is a multi-phase process, and includes three main pillars: (1) sustainable commodities; (2) financing; and (3) indigenous communities. The Statement is supported by 7 Governors out of the 18 provinces that produce palm oil in Indonesia

- Oxfam Fair Partnerships is a further form of landscape approach[434].

8.5.4. Outlook

The new jurisdictional and landscape approaches represent a policy evolution for production areas that existing sustainability schemes and some NGOs are favouring. Some are said to have very few (4 or 5) sustainability indicators and so there are questions about their breadth of policy coverage, and how they will measure indicators or performance. These are still only concepts, and are some distance from being operational[435].

Part of the impetus for these approaches is about the need to work with governments to extend the impact of sustainability schemes since the RSPO only has 20% reach worldwide, and it is difficult to include smallholders. There is hope for jurisdictional RSPO certification, but this is still some way off as the RSPO's lead programme in Sabah still lacks a detailed plan.

That the Sabah administration is mooting legislative change to make RSPO a legal requirement underlines the limits of voluntary support. Indeed, Paoli et al. (2016) says: "*We found limited evidence of support among local political leaders for measures that would significantly change (business as usual) practices in the palm oil sector to reduce deforestation. In general, governors and district heads (apart from a few progressive leaders) have limited knowledge of emerging industry sustainability efforts or new legal provisions designed to improve governance in the sector. Most leaders view such efforts with indifference or see them as threatening to the political and economic status quo…. Our discussions with experts inside and outside government lead us to believe it's unlikely that genuine support from a political leader for a comprehensive JP could be obtained solely by offering extra-governmental financial incentives (such as through REDD+ or improved access to markets). Such incentives would probably not be large enough or sufficiently dependable over time to outweigh political and other benefits generated by current palm oil driven economic development models. Formal legal carrots and sticks, backed by transparent accountability mechanisms and enforcement, would be needed to augment such incentives*."[436]

8.5.5. Sustainability initiatives at destination markets

We review the EU legislative and voluntary approaches. Broadly, recent European data indicate a 23-30% RSPO certification ratio for the EU overall (both non-energy and energy). The RSPO has been unable to gain market share with its RSPO-RED certification, as the energy sector is dominated by the ISCC. We then review sustainability initiatives in China and India.

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434 Source: https://policy-practice.oxfam.org.uk/publications/fair-companycommunity-partnerships-in-palm-oil-development-317155

435 Interview with sustainability specialist.

436 Paoli et al. (2016), 'Jurisdictional Approaches to Reducing Palm Oil Driven Deforestation in Indonesia', Paoli, Gary, Blair Palmer, Jim Schweithelm, Godwin Limberg and Lindsay Green, Daemeter Consulting, Nov 2016, http://daemeter.org/new/uploads/20161105170630.Daemeter_JA_2016_Full_Report_ENG.compressed.pdf, accessed 6 July 2017.

8.5.5.1. EU legislative approach (energy uses) – The EU Renewable Energy Directive (RED)

The European Commission has outlined three main criteria for biofuels and bioliquids to be considered 'sustainable' under the EU RED: a greenhouse gas (GHG) savings target; biofuel feedstocks cannot be grown in areas converted from land with high carbon stock; and biofuels cannot be produced from raw materials obtained from land with high biodiversity value, such as primary forests or highly biodiverse grasslands.

As of July 2017, 15 voluntary certification systems have been recognised by the EC for the purposes of demonstrating compliance with the EU RED sustainability criteria. Schemes are recognised for a period of 5 years. However, some of these schemes are restricted to certain geographical regions, certain types of feedstock or cover only part of the supply chain. Some schemes do not cover calculation of actual GHG savings. The RED allows biofuel suppliers either to apply actual GHG savings values or default GHG savings. Whichever value is higher will be used to maximise the size of the GHG saving. From 2017, the minimum GHG saving vs. fossil fuels specified in the RED is 50% and for new plants starting from 2017, the saving by 2018 must be 60%. For palm biodiesel, the default value is significantly lower (19%) than typical savings (36%). The gap between the two narrows if methane capture is used at the palm oil mill, the default value is 56% and the typical value is 62%. This will enhance the appeal of methane capture at oil palm mills that produce certified CPO.

The consequence of 'default' GHG savings values being applied is that, although RSPO is the most important form of certification for sustainable palm oil used in the food sector, it has found virtually no market in the EU palm biodiesel sector. In addition, RSPO-RED only covers palm oil as a feedstock, which gives biodiesel producers limited flexibility to blend vegetable oil from other feedstocks. This would require an additional form of certification. The dominance of ISCC in the EU biodiesel market has enabled it to match the palm oil tonnage of RSPO, which is concentrated in food-use.

The European Commission has in the recast of the Renewable Energy Directive post 2020 (REDII) proposed the abolition of the renewable energy target in the transport sector, and a gradual phase out of food-based 'conventional' biofuels, while it proposes to focus on the increased use of 2nd and 3rd generation biofuels and other low carbon fuels. Germany has already applied this approach, and it is to be expected that this will soon be adopted more widely within the EU, which will also enhance the appeal of methane capture at oil palm mills that provide certified CPO.

The Commission RED II proposal builds on the ILUC directive, which introduced a cap of 7% on the contribution of conventional biofuels towards the 10% renewable energy sources (RES) target.

8.5.5.2. Voluntary initiatives in the EU (non-energy uses)

Progress reports by some EU countries are starting to shed more light on the adjustment of these supply chains for other markets than biofuels. In this section, we review this in more detail.

National Commitments[437] are worded as "RSPO or equivalent", where RSPO (non-energy coverage), and its equivalents include the ISCC (energy and non-energy) and non-

[437] RSPO (2017), 'National commitments', http://www.rspo.org/certification/national-commitments, accessed 3 July 2017.

certification traceability (non-energy, with NDPE pledge that needs public reporting of product GHG emissions).

Europe is the leading region for sustainable palm oil use and country initiatives emerged in the run up to 2015 pledges made by individual companies and organisations to achieve certified sustainable palm oil use in the EU. There have been problems in keeping to original company and country pledges, and therefore 2015 turned out to have been a soft deadline. 2020 is now regarded as the new hard deadline. Following on from the failure to meet the 2015 targets, the Amsterdam Declaration on Palm Oil (December 2015) was signed by some Member States in support for the Amsterdam pledge by businesses for the full achievement of the use of RSPO certified or equivalent palm oil certification by 2020 (See **Section 8.3.1** and **Appendix 7** for more information on the Amsterdam Declaration). As pledges tend to occur by end-use sub-sectors (which faced varying pressure on sustainability compliance, e.g., low for the catering and animal feed sectors and high for baked goods), the overall coverage has been incomplete.

FEDIOL, the European oilseed sector federation, reports that its members (mostly processors) in 2016 used 3.59 million tonnes (over half) of the EU's palm oil (or 6.2% of world palm oil), representing almost the entire non-energy EU tonnage. Their certified tonnage was 60%, up from 46% in 2014 and 58% in 2015. For palm kernel oil the certified share was 52% in 2016 (up from 32% in 2014 and 42% in 2015). The reporting was confined to the physical chain of custody i.e., MB, SG or IP, thus excluding book & claim).

The MB share for palm oil rose from 9% in 2014 to 16% in both 2015 and 2016, while the SG/IP share increased from 37% to 42% to reach 44% in 2016. For PKO, the MB share went from 3% to 4% to 8% and the SG/IP share from 29% to 38% to 44% over the same three years. 96% of the total palm and palm kernel oil use was traceable in 2016, up from 56% in 2014 and 82% in 2015.

A high degree of market concentration and sensitivity to potential criticisms may have helped to boost the demand for certified palm products within the EU. Certified palm products may be expected to capture a larger market share in those sectors with a higher degree of concentration, such as food retail (which is dominated by three or four large supermarket chains in many countries, although against this, sustainability pledges currently cover only their own brand/own label products). Other palm oil end-use sectors with a high degree of concentration are feed (sustainability has not been a priority in this market) and home and personal care (which seems to favour non-certification traceability due its more complicated value-chain). Sub-sectors with a high degree of sensitivity about sustainability include chocolates and baked goods.

We next present as a case study the uptake in the Netherlands of sustainable palm oil in the food sector (see Figure 35 and

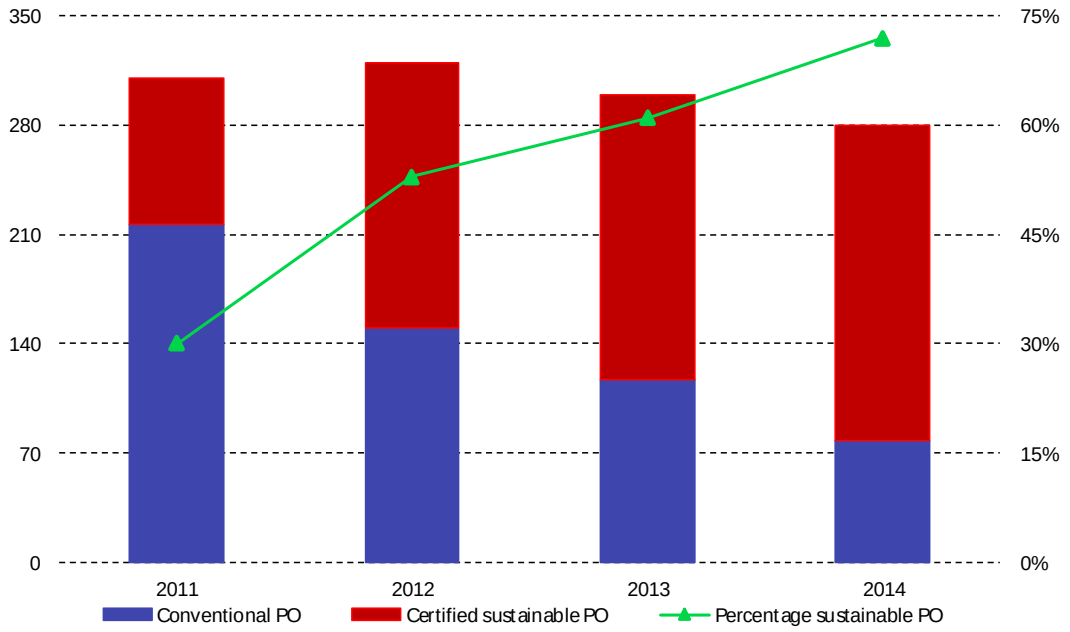
Figure 36).

Case study: the food sector in the Netherlands

Figure 35 and

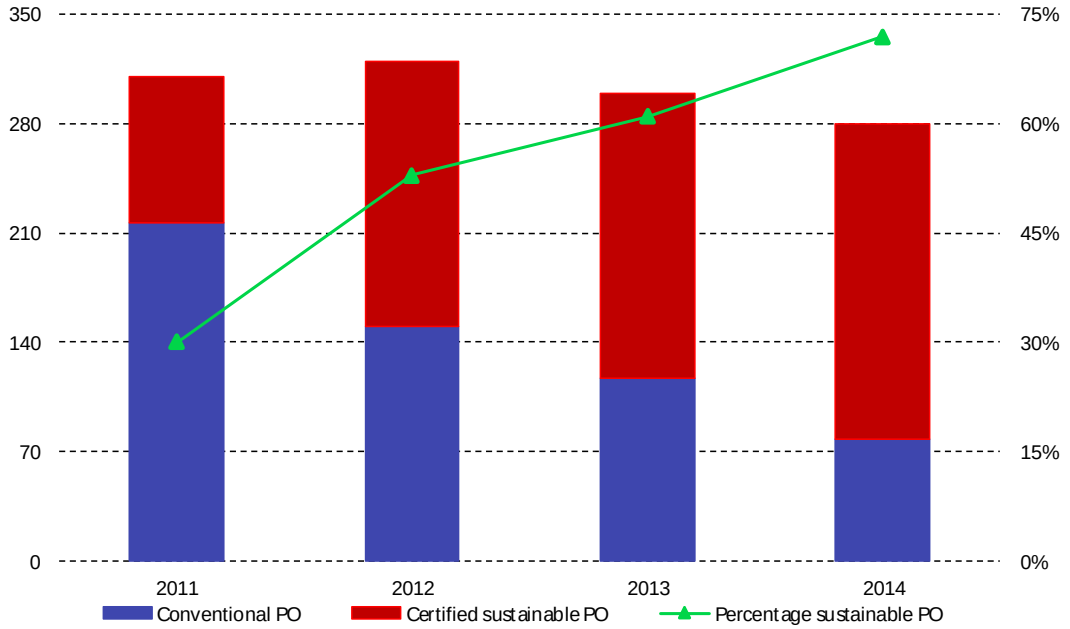
Figure 36 plot the status and progress of the Dutch food sector (domestic and for exports) towards the use of certified sustainable palm oil. The data refer to RSPO certification, which rose to 72% in 2014. Food is about 300.000 tonnes per year of the total 1.2-1.5 million tonnes of palm oil processed per annum for all applications (energy and non-energy).

Figure 35: Dutch food industry certified sustainable palm oil demand



Source: Report by Dutch food industry.

Figure 36: Dutch food industry certified sustainable palm oil progression



Source: Report by Dutch food industry.

8.5.5.3. China and India – voluntary efforts

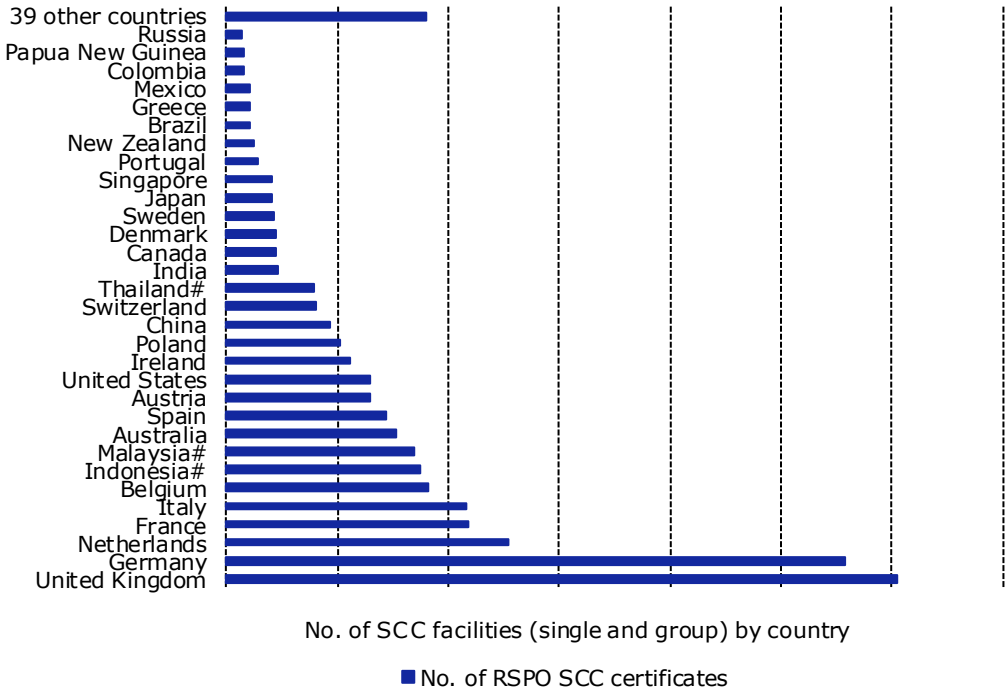
After reviewing the progress in the EU we turn to China and India the other major palm oil importing markets. The WWF (2016) reports that: "*(In 2013) European brands were well ahead of their competitors in the rest of the world in sourcing CSPO. By 2015, Australian and US brands had caught up or even surpassed them. Companies in Japan are also progressing, although slowly. Unfortunately we still see very little progress by brands elsewhere in Asia. Awareness of sustainability issues among the industry using palm oil is low even in countries that produce and consume it in large volumes, like Indonesia and Malaysia.... The European and US markets are progressing well on shifting to CSPO. But the Asian markets – particularly India and China, which each consume as much or more than the whole of Europe and where demand is increasing year on year – are lagging way behind. These markets will shift to CSPO only when global brands start treating their consumers in Asia with the same respect they give consumers in their home countries. That means using CSPO in all products produced for and in Asia, and indeed globally*."[438]

The main markets for certified palm oil are likely to be those with most certified facilities. These are in the EU (

[438] WWF (2016), 'Sustainable palm oil in China and India', Palm Oil Buyers Scorecard, 2016, accessed 6 July 2017. http://awsassets.panda.org/downloads/wwf_palm_oil_scorecard_2016_1.pdf

Figure 37). The number of RSPO SCCs in China and India has lagged well behind EU sustainable supply-chain development.

Figure 37: RSPO Supply Chain Certified (SCC) facilities, 2015



Note: # Indonesia, Malaysia and Thailand SCC facilities are export-oriented.

Developments in China

Interviews with Chinese processors reveal the slow development of the market. One processor used the RSPO Mass Balance supply chain at two factories to supply foreign food and home and personal care (HPC) brands, but saw no need to add more certified facilities. It felt that the RSPO was not well marketed in China; and had not heard of traceability programmes. Unless the government supported sustainability initiatives, it felt local factories see no need to do so[439].

These findings are reiterated by the WWF (2016): "*China is the world's second largest importer of palm oil. The little sustainable palm oil it imports is driven by demand from multinationals for incorporation into the goods they manufacture there. Domestic companies have still to make the same commitments*" [440].

The largest palm oil importer into China is Wilmar. It offers non-certification TFT traceable product as well as RSPO certified material, depending on market demand. Some major RSPO members in China, McDonald's and KFC included, are moving away from palm oil use, undermining their demand for sustainable palm oil in China[441] [442]. WWF noted that "*A range of roundtable discussions on sustainable palm oil in China have*

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439 Based on interviews by LMC International Ltd in late 2015.

440 WWF (2016), 'Sustainable palm oil in China and India', Palm Oil Buyers Scorecard, 2016, http://awsassets.panda.org/downloads/wwf_palm_oil_scorecard_2016_1.pdf.

441 Wang, Fan (2016), 'McDonald's to use blended oil in China for healthier diet', ECNS Wire, 5 July 2017, http://www.ecns.cn/cns-wire/2016/07-15/218470.shtml.

442 Yum Brands (2017), Palm Oil, Yum Brands, http://www.yumcsr.com/food/nutritional-improvement.asp#palmOil, accessed 6 July 2017.

been facilitated by Solidaridad, WWF and other stakeholders…Some key domestic palm oil buyers such as COFCO, Julong and Sinograin have joined the RSPO. Since the last Scorecard was published in 2013, Chinese RSPO membership has grown from 17 to 52 companies as of 30 June 2016… The RSPO has established a presence in China." [443]

COFCO, Fangshun, Julong, Sinograin and Wilmar belong to the China Sustainable Palm Oil Working Group (POWG) that was launched at the end of 2015[444]. A 'Guide for Overseas Investment and Production of Sustainable Palm Oil by Chinese Enterprises" was drafted by the China Chamber of Commerce of Foodstuffs and Native Produce (CFNA) as part of a China-UK Collaboration on International Forest Investment and Trade[445]. This applies to China investments in palm oil overseas, and gives guidance to China enterprises so that their output is consistent with global standards including the RSPO. Chen (2016) estimated that Wilmar imported 50,000 tonnes of RSPO certified oil into China in 2015.

India

In 2015, an Indian refiner reported that very little RSPO certified palm oil or products was being imported into India. A global consumer goods manufacturer asked suppliers to furnish traceability information, and did not insist on RSPO certified methods. At the time there were probably two Indian importers buying RSPO GreenPalm Certificates and some RSPO Mass Balance products. As long as sustainability remained optional, Indian users had little pressure to support it [446]. These findings are reiterated by the WWF (2016): "*Progress on sustainability in India can ultimately be measured by the volume of physical supply of CSPO entering the Indian market. So far, that figure is negligible*" [447].

A leading Indian agribusiness commentator concurred when he wrote in 2017: "*Are palm oil producers ready to face the challenge of cracking the Indian market open for sustainable palm oil? After all, India is a highly price-conscious market with little knowledge about or care for sustainable products*"[448]. As in China, Wilmar and its local partner are major palm oil importers and there is no problem in the supply of non-certification TFT traceable products or RSPO certified material. However, market demand is insufficient[449]. A greater concern is basic food safety. Food safety inspections in India and Pakistan have found some (palm and other) cooking oil and fats that were deemed to be unfit for consumption.

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443 WWF (2016), 'Sustainable palm oil in China and India', Palm Oil Buyers Scorecard, 2016, http://awsassets.panda.org/downloads/wwf_palm_oil_scorecard_2016_1.pdf.

444 Solidaridad (2016), 'Chinese delegation to Indonesia signals growing demand for certified sustainable palm oil', Solidaridad, 2 Dec 2016, https://www.solidaridadnetwork.org/news/chinese-delegation-to-indonesia-signals-growing-demand-for-certified-sustainable-palm-oil, accessed 6 July 2017

445 LTS International (2014 - 2018), 'China-UK Collaboration on International Forest Investment & Trade (InFIT)', LTS International, http://www.ltsi.co.uk/projects/china-uk-collaboration-on-international-forest-investment-trade-infit/, accessed 6 July 2017.

446 Based on interviews by LMC International Ltd in late 2015.

447 WWF (2016), 'Sustainable palm oil in China and India', Palm Oil Buyers Scorecard, 2016, http://awsassets.panda.org/downloads/wwf_palm_oil_scorecard_2016_1.pdf.

448 Chandrashekhar, G (2017), 'Is India ready for sustainable palm oil?' The Hindu Business Line, 20 Feb 2017, http://www.thehindubusinessline.com/opinion/sustainable-palm-oil-in-indian-market/article9552111.ece, accessed 6 July 2017.

449 Adani Wilmar (2017), About Us, Adani Wilmar (website), http://www.adaniwilmar.com/about-us, accessed 7 July 2017.

Sustainability-related efforts include attempts to lobby for a customs duty rebate that RSPO products might enjoy. Meanwhile, some Indian firms have formed the "Sustainable Palm Oil Coalition", a domestic palm oil coalition that has so far focused on lobbying the government to support sustainable palm oil purchases. Led by Godrej, Greenpeace, Hindustan Lever, Ruchi, VVF and WWF-India, the group aims to boost the use of certified sustainable palm oil through a proposal that the government extend a customs duty rebate for all palm products, backed by RSPO certificates. Alternatively, they suggested that the government provides a subsidy to importers of up to 50-75% of the cost of RSPO certificates[450].

The WWF reported in 2016 that "*All CEOs of major Indian buyers of palm are aware of both the sustainability issues linked to palm oil and the RSPO, and have directly engaged with WWF and other NGOs on the subject... Since 2011, membership of Indian companies in the RSPO has increased substantially, going from eight to 46 companies as of May 2016. Another significant development has been the growth in the number of RSPO supply chain certified companies...Although full commitments to sustainable palm oil by Indian companies are not common, the recent round of RSPO ACOP reporting showed that, in addition to the commitments of multinational companies, the likes of Adani Wilmar, VVF Limited and Godrej have all made time-bound commitments to sustainable palm oil...2015 saw the establishment of a permanent RSPO presence in India.*" [451]

The Solvent Extractors' Association of India (SEA) has tied up with Solidaridad to develop a sustainability framework for India, since the local environment and farming practices differ from Indonesia and Malaysia. India produces just 200,000 tonnes of palm oil and imports nearly 9 million tonnes per annum. [452]

8.5.6. Conclusions

There are two main sub-sectors of certified sustainable palm oil, i.e. energy and non-energy: for *non-energy uses*, the RSPO certification system and non-certification traceability by TFT are the leading schemes; for *energy uses*, the ISCC (EU-RED emissions reductions-based) scheme dominates.

Adding to this complexity are the many differences by country in RSPO National Interpretations. These are mostly because the Principles and Criteria of the RSPO have to be adapted to take into account local laws, and this can be compounded by differences in technical assessments in different countries, e.g., this appears to be the case in dealing with soil, as a comparison of Indonesia and Malaysia reveals.

Confusion over National Interpretations has created problems with the RSPO auditing process, as auditors may not be aware of local National Interpretations. In addition, auditees are not given access to the same resources as the auditors, making it difficult for them to understand the requirements. Finally, the RSPO recently suspended a number of auditors, causing alarm among members.

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450 WWF (2011), 'Palm oil in India', WWF Palm Oil Buyers Scorecard, 2011, http://wwf.panda.org/what_we_do/footprint/agriculture/palm_oil/solutions/responsible_purchasing/palm_oil_buyers_scorecards/scorecard2011/markets/india/.

451 WWF (2016), 'Sustainable palm oil in China and India', Palm Oil Buyers Scorecard, 2016, http://awsassets.panda.org/downloads/wwf_palm_oil_scorecard_2016_1.pdf.

452 Reuters (2016), 'India to develop its own palm oil sustainability framework - trade body', Reuters, 4 Oct 2016, http://in.reuters.com/article/india-palm-idINKCN1241AZ.

The RSPO is actively involved in developing jurisdictional approaches, giving rise to concern that this could reduce standards. As a voluntary system, the RSPO cannot simply require that its Principles and Criteria be adopted: consequently attempts to expand have required the RSPO to deal more closely with governments. The state of Sabah has contemplated making RSPO a legal requirement, but it has proposed expanding its scope to include multiple crops and other sustainability indicators. There are fears that this could lead to a decline in RSPO standards, particularly because there is a lack of support from politicians in producer countries about taking actions that would disrupt the status quo.

At the same time alternative approaches have been developed in different regions such as the Marrakech Declaration and the IDH Sustainable Trade Initiative.

Europe remains the leading market for sustainably sourced palm oil but progress on Member States' and companies' pledges has been slower than anticipated, apart from in the energy sector. While certified sustainable palm oil has been widely accepted in high priced food sectors, such as baking, in less visible and more price sensitive sub-sectors (such as catering and animal feeds) progress has been slow. Having missed their targets for 100% certification by 2015, several EU governments have adopted the Amsterdam Declaration, which aims to achieve full RSPO certified or equivalent palm oil usage by 2020.

The penetration of sustainable palm oil in India and China is growing but remains limited, principally due to weak demand for certified products. Only a small number of facilities are certified in India and China and interviews reveal that there is limited demand for sustainable palm oil.

8.6. Review of voluntary initiatives and commitments relating to palm oil in the public and private sectors

8.6.1. Introduction

As can be seen from previous sections, multiple public policies, laws and regulations and enforcement regimes have emerged (some successful, others less so), to enhance sustainability in the development of the palm oil sector from both a production and a consumption perspective. Sitting inside these evolving policy or regulatory landscapes – and often challenging them to do more, better and at a faster pace - are an increasing number of public, NGO and private-sector-driven initiatives and commitments. This has been driven by a growing global acknowledgement of the risks that social injustice and environmental issues, like climate change, biodiversity and soil loss, water scarcity and air pollution, present within the sector.

The 2000s and 2010s have delivered a range of different initiatives and commitments to improve the governance, transparency and sustainability performance of the palm oil sector and those working in it or buying from it. This has included action by 11 European countries, who have established some form of sustainable palm oil commitment at the national level, and three more countries will potentially introduce one (Esselink and van der Wekken, 2015)[453] [454].

In the last five to ten years in particular, a new wave of palm oil-related sustainability initiatives and commitments have emerged in response to growing pressure to eliminate deforestation, peatland conversion and worker exploitation, often driven by a relatively small number of international and local advocacy groups, including large international environmental NGOs like Greenpeace. The underlying message from these groups was simple and aimed to achieve what, in their view, the RSPO and other certification schemes had failed to do: stop the deforestation of biodiverse and carbon-rich primary and secondary forests and peatlands. These campaigns targeted major oil palm traders such as Wilmar, GAR, Musim Mas, Cargill, Asian Agri and Astra Agro. This movement spurred the announcement of more recent commitments that differed from past sustainability policies from major producers and traders in that they were applied not only to their direct operations but also to those of their third-party suppliers for the first time (Pacheco et al 2017).

There are a number of reasons cited by organizations as drivers for establishing voluntary initiatives and commitments, including (adapted from Pacheco et al, 2017, Brack, D. & Gregory, M., 2017[455], Gnych, SM et al, 2015[456] and Consumer Goods Forum

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[453] Esselink E and van der Wekken D. 2015. Sustainable palm oil in Europe: The national initiatives approach. In European Palm Oil Conference. Milan, Italy. 29 October 2015, European Palm Oil Alliance.

[454] The 11 European countries that had made sustainable palm oil commitments at this time were: the UK, the Netherlands, Denmark, Norway, Sweden, Belgium, France, Italy, Switzerland, Austria and Germany. This considering commitments were: Luxembourg, Spain and Poland.

[455] Brack, D. & Gregory, M. - *Company Promises – How businesses are meeting commitments to end deforestation* (FERN, March 2017).

[456] Gnych, SM, Limberg, G and Paoli, G. 2015. *Risky business: Motivating uptake and implementation of sustainability standards in the Indonesian palm oil sector*. Occasional Paper 139. Bogor, Indonesia: CIFOR.

2017)[457]:

- Demonstrating industry leadership;
- The need to respond to issues of growing public and government concern, including deforestation, climate change and sustainability;
- The need to respond to – and engage with – NGOs whose advocacy campaigns were/are undermining consumer and investor relationships;
- Pressure from customers in the supply chain (e.g. sustainable sourcing policies requiring certification and/or collaboration);
- Minimizing and managing future corporate and supply chain risks (e.g. to brand and reputation, security of supply, improving supplier relationships);
- The personal commitment of the CEO of the organization;
- Real or perceived weaknesses in the requirements, operation or outcomes from existing palm oil sustainability certification schemes;
    - E.g. in their principles and criteria or in critical definitions like those for High Conservation Value areas within plantations;
    - E.g. certification can stop at the farm gate, does not consider landscape-level pressure factors that lead to deforestation, and does not include all stakeholders needed (especially government) to tackle this issue;
- Real or perceived lack of market share gained by palm oil certification schemes leading to a reduction in the ability of these schemes to affect positive change (see **Section 8.2);**
- A lack of demand pull for certified sustainable palm oil in some major consumer countries like China and India; and
- Other intangible benefits – e.g. improvements in employee recruitment and retention.

8.6.2. Methods

A structured desk-based literature review was undertaken to identify and, where possible, evaluate the effectiveness and impact of high profile voluntary initiatives and commitments in the public, private and environmental NGO sectors against the environmental, social and economic aspects of palm oil that are of interest to the Commission; and to gain a better understanding of the role these initiatives and commitments may play in supporting the delivery of EU and UN policy objectives relating to palm oil. Where possible case studies were also used to illustrate the range and effectiveness of different voluntary initiatives and commitments.

The literature review included the collection and analysis of voluntary initiatives and commitments at different scales:

- Initiatives and commitments made by or through international organisations, regional governmental bodies and institutions – e.g. the Consumer Goods Forum's 2020 Zero Net Deforestation Commitment, which will be achieved through the responsible sourcing of key commodities, such as palm oil, soy, beef and paper[458]; and the New York Declaration on Forests.

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[457] Consumer Goods Forum – Implementing and scaling-up the CGF Zero Net Deforestation Commitment (accessed on 25 June 2017).

[458] For more information, please see: http://www.theconsumergoodsforum.com/sustainability-strategic-focus/sustainability-resolutions

- Intra-regional initiatives and guidance – e.g. the European Sustainable Palm Oil (ESPO) initiative, EPOA (European Palm Oil Alliance) and ESPOAG (European Sustainable Palm Oil Advocacy Group).
- The policies, strategies and commitments adopted by relevant international and national industry bodies and trade associations, whose members are end users of palm oil – e.g. MVO – The Netherlands Oils and Fats Industry, FONAP (Forum on Sustainable Palm Oil) and FASPO (French Alliance for Sustainable Palm Oil).
- Individual corporate sustainability and CSR initiatives and reports – e.g. commitments from major producer companies and retailers to produce or source palm oil responsibly and sustainably, including reports on the progress they are making and the partnerships they have formed.
- Media reports and coverage relating to the above and other examples in the marketplace.

This review includes consideration of a number of different types of voluntary initiatives and commitments and, in some cases (where they are relatively mature), how they have evolved over time, including:

- Those developed in major palm oil producer and consumer countries;
- Those developed to tackle a single issue of concern (e.g. deforestation or land tenure rights) or that cover multiple environmental and social issues;
- Those involving different actors in the palm oil supply chain (e.g. producer companies, food manufacturers and retailers);
- Those involving single companies or organisations and those seeking to harness the added impact of working as a group or collective; and
- A range of different objectives, goals and foci – e.g. collective action on deforestation and biodiversity loss versus the creation of definitive maps of areas of high conservation value (HCV) or high carbon stocks (HCS).

Where possible, we assess the key characteristics of these initiatives and commitments and provide a description of the:

- Organisations and individuals involved them;
- Logic and drivers behind them;
- The geographies and end use sectors that they cover;
- The different response types in play – e.g. the use of purchasing policies, industry commitments and targets, NGO 'naming and shaming', etc.; and
- Their likely impact and legitimacy, including whether and how the scheme or initiative is measured, monitored and reported (internally or externally) and by who.

The findings from the literature review were then validated and supplemented with reference to a number of existing reports and survey's and through a series of discussions and interviews with those responsible for establishing the initiatives and commitments identified during the review, those actively involved in delivering them and both internal (e.g. in-house policy, sustainability, technical and supply chain teams) and external stakeholders monitoring their progress.

The analysis also takes account of emerging trends amongst these initiatives and commitments and the changing views of end users of palm oil.

Finally, to provide some structure for the analysis, we have segmented these initiatives and commitments into four main types as can be seen in Figure 38 below, covering group

initiatives, individual initiatives, finance and investment support and platforms that can be used to improve transparency, share information and support the progress reporting of initiatives.

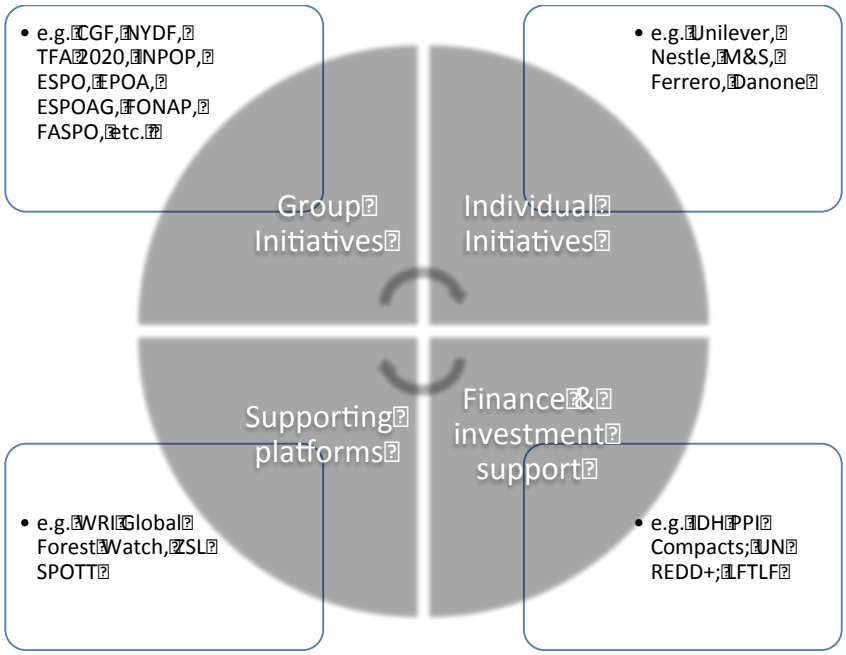

Figure 38: typology of the main forms of voluntary initiative

Key: CGF (Consumer Goods Forum Zero Net Deforestation By 2020 Commitment; NYDF (New York Forest Declaration); TFA 2020 (Tropical Forest Alliance 2020); INPOP (Indonesia Palm Oil Platform); ESPO (European Sustainable Palm Oil); EPOA (European Palm Oil Alliance), ESPOAG (European Sustainable Palm Oil Advocacy Group), FONAP (Forum on Sustainable Palm Oil), FASPO (French Alliance for Sustainable Palm Oil), M&S (Marks and Spencer); WRI (World Resources Institute); ZSL SPOTT (Zoological Society of London, Sustainable Palm Oil Transparency Toolkit); PPI Compacts (Production, Protection & Inclusion Compacts); UN REDD+ (UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries); LFTLF (Landscape Fund for Tropical Landscapes and Forests).

8.6.3. Public and private sector, NGO and collective voluntary initiatives and commitments

This section starts by reviewing some of the more high profile group and individual initiatives including their scope of implementation and outcomes, noting that some are at an early stage and it is still too early to assess their likely impact. It then describes some of the recent financial and investment initiatives and data and reporting platforms that have emerged to support them. The section concludes with a review of the general state of play with reference to a small number of publicly available analyses of the progress being made under voluntary initiatives and commitments.

Examples of high profile group initiatives and collective commitments

Group initiatives and commitments can take many forms (e.g. collective targets, trade and investment financing and incentives, supply chain partnerships, technology platforms) and can come about through a number of fora (e.g. industry associations, trade federations, public-private partnerships, multi-stakeholder groups and group pledges).

Group initiatives, which incorporate collective commitments, can offer their participants

and partners a number of benefits, including:

- Making it easier for them to adopt commitments, in the knowledge that they would be less likely to be undercut by competitors without such targets;
- Templates and model text to support the development of commitments;
- Facilitating the sharing of strategies and best practice;
- Participation in collaborative problem-solving; and
- The development of common metrics and reporting systems[459].

However, those administrating or facilitating these group initiatives also face significant operational and reporting challenges as a result of their top-down nature, including effective oversight of their participants, enforcing their commitments and tailoring their support to meet the needs of different organisations (Donofrio et al, 2017; Brack and Gregory, 2017).

One of these high profile initiatives, announced in November 2010, was the Consumer Goods Forum (CGF) resolution to achieve zero net deforestation by 2020460 in key commodity sectors (soy, palm oil, paper & pulp/timber and beef). **Table 63** and Table 64 below provide the wording of this commitment and an explanation of how the term zero net deforestation is defined in this context. Table 65 then goes on to provide an overview of the CGF commitment.

Table 63: The Consumer Goods Forum Zero Net Deforestation By 2020 Commitment

The Consumer Goods Forum Zero Net Deforestation By 2020 Commitment
"As the Board of The Consumer Goods Forum, we pledge to mobilise resources within our respective businesses to help achieve zero net deforestation by 2020. We will achieve this both by individual company initiatives and by working collectively in partnership with governments and NGOs. Together we will develop specific, time bound and cost effective action plans for the different challenges in sourcing commodities like palm oil, soya, beef, paper and board in a sustainable fashion. We will also work with other stakeholders – NGOs, development banks, governments, etc. – to create funding mechanisms and other practical schemes that will incentivise and assist forested countries to conserve their natural assets and enable them to achieve the goal of zero net deforestation, whilst at the same time meeting their goals for economic development".

459 In January 2017, CERES, a US-based NGO, published its *Reporting Guidance for Responsible Palm-Oil* to help companies at all stage of the palm oil supply chain report their sustainable palm oil activities (accessed 7 July 2017).

460 Consumer Goods Forum – Deforestation Resolution (November 2010): (accessed 25 June 2017).

Table 64: Defining zero net deforestation

Defining zero net deforestation:
The Consumer Goods Forum endorses and uses the WWF definition of zero net deforestation[461], originally produced for discussion at the Ninth Conference of Parties to the Convention on Biological Diversity (CBD COP9) in May 2008. The definition reads: *"Zero Net deforestation" can be distinguished from "zero deforestation", which means no deforestation anywhere.* *"Zero net deforestation" acknowledges that some forest loss could be offset by forest restoration. Zero net deforestation is not synonymous with a total prohibition on forest clearing. Rather, it leaves room for change in the configuration of the land-use mosaic, provided the net quantity, quality and carbon density of forests is maintained. It recognizes that, in some circumstances, conversion of forests in one site may contribute to the sustainable development and conservation of the wider landscape (e.g. reducing livestock grazing in a protected area may require conversion of forest areas in the buffer zone to provide farmland to local communities).* *However, zero net deforestation is not achieved through the conversion of primary or natural forests into fast growing plantations. Such conversion would count as deforestation in assessing progress against the target.*

Table 65: Consumer Goods Forum Zero Net Deforestation Commitment

Topic		Characteristics
Overview	*Organisation:*	Global industry network, bringing together the CEOs and senior managers of around 400 retailers, consumer goods manufacturers and service providers across 70 countries, with combined sales of EUR3.5 trillion and directly employing 10 million people.
	Date initiated:	November 2010 (at the Cancun Climate Summit)
	Motivation:	Multinational companies account for 20% of all palm oil purchases; and therefore have a major role in the transformation of palm oil markets, production and consumption systems.
	Oversight:	CGF Sustainability Pillar Steering Committee and CGF Board of Directors (made up of 50 retailer and manufacturer CEOs).
	Status:	Active. Voluntary and authoritative (non-legally binding).
	Focus on:	Reducing global deforestation by reducing the risks and impacts of forest-risk commodities (palm oil, soy, beef,

[461] Zero Net Deforestation by 2020 - A WWF Briefing Paper (WWF 2008) (accessed on 24 June 2017).

Topic		Characteristics
		paper and board).
	Verification:	Last assessment of progress jointly undertaken by the Global Canopy Project and CDP in 2016[462].
Coverage:	*Geographical scope:*	International
	Signatories:	In theory all CGF members but 2017 Supply Change report highlights 99 member companies with active commitments (a quarter of the membership)
	Financing & incentives:	Linked to new *Landscape Fund for Tropical Landscapes and Forests and the Soft Commodities Compact* (see below)[463].
	Key activities:	CGF Palm Oil Working Group, CGF Sustainable Palm Oil Sourcing Guidelines, collaboration with NGOs to assess progress, mobilising investment in sustainable land use systems
	Impact:	High potential, but still significant gaps to be addressed in order for the CGF to be on course to realize its ambitious goal (see GCP-CDP 2016 review findings above).

The size, influence and geographical reach of the CGF's membership[464] has made this commitment "*a truly remarkable milestone in the fight to tackle deforestation*" (Bregman et al, 2016)[465]. What is perhaps harder to assess, with three and a half years to go until the end of 2020, is the progress of individual CGF members in achieving this collective commitment.

To answer this question, at least in part, the Global Canopy Project, using its Forest 500 database (www.forest500.org)[466] and the CDP's Forests Programme (https://www.cdp.net/en-US/Programmes/Pages/forests.aspx), which requests companies to disclose every year, on behalf of investors, their policies and measures to address deforestation in their supply chains, came together in 2016 to review the

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462 Bregman, TP, et al – *Turning collective commitment into action: Assessing progress by Consumer Goods Forum members towards achieving deforestation-free supply chains* (Global Canopy Programme and CDP, 2016) (assessed 5 July 2017).

463 *World Economic Forum - $400 Million Fund Launched in Davos to Stop Tropical Deforestation and Boost Farming* (published 18 January 2017; accessed 24 June 2017):

464 A list of the CGF's members can be found at: http://www.theconsumergoodsforum.com/about-the-forum/our-members

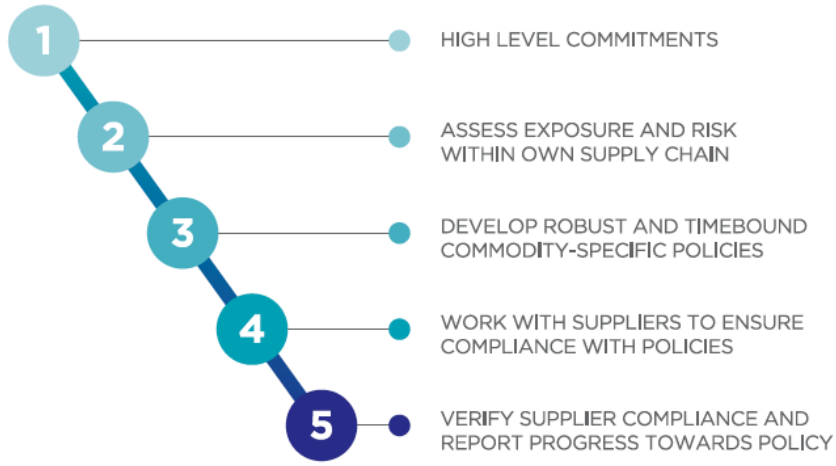
465 Bregman, TP., McCoy, K., Servent, R., and MacFarquhar, C., 2016 – Turning collective commitment into action: Accessing progress by Consumer Goods Forum members towards achieving deforestation-free supply chains (Global Canopy Programme and CDP, UK) (accessed 25 June 2017): http://globalcanopy.org/sites/default/files/documents/resources/GCP%20and%20CDP%202016%20Turning%20collective%20commitment%20into%20action_18_7.pdf

466 The Forest 500 assesses the policies of 250 companies, 150 investors and lenders, 50 jurisdictions, and 50 other power brokers, each selected based on their exposure to forest risk commodity supply chains.

progress being made by CGF members. 55 of the 250 most influential companies included in the Forest 500 database are CGF members: and 44 of the 180 companies that disclosed to the CDP in 2015 were CGF members[467].

As part of this review, the progress made by CGF members and non-members was assessed against a five-step framework that was designed to help companies move from making high-level commitments on deforestation to embedding and implementing these at the company-level, including working with suppliers and verifying supplier performance. Figure 39 below provides an overview of this framework.

Figure 39: Five-step process from high-level individual and collective commitments to actions that lead to deforestation-free supply chains



The key findings from this review were:

- 14 of the 55 CGF members assessed in the Forest 500 have made an individual cross-commodity zero or zero net deforestation commitment that applies to their own commodity procurement. This leaves three quarters of the CGF members assessed without their own overarching policy (Step 1 in the framework).
- 89% of the 44 CGF members that disclosed to the CDP's Forest's Programme identify at least one reputational, operational or regulatory risk that could generate a substantive change in business operations, revenue or expenditure (Step 2).
- 79% of CGF members that are exposed to palm oil have a relevant sustainability policy in place (Step 3).
- 85% of CGF members that disclose to the CDP's Forest's Programme and have a palm oil procurement standard in place state that their standard affects their supplier engagement strategy. However, relatively few CGF members are auditing their suppliers, a necessary prerequisite to moving towards more direct sourcing of deforestation-free commodities (Steps 4 and 5).
- 36% of CGF members disclosing to CDP's Forests Programme use certification to ensure the security of their palm oil supply. However, only 19% of these companies "require" their suppliers to provide certified products, 69% "encourage" this and 13%

[467] In 2015, CDP sent its disclosure request to 87 CGF members, of which 41 responded and 46 did not respond. Three additional CGF members disclosed voluntarily. The review covered all 90 disclosers and non-disclosers.

"prefer" suppliers that provide certified palm oil.

- More encouragingly, 94% of disclosing CGF members reported sourcing certified palm oil; although only 70% reported that they sourced some segregated or mass balance palm oil.
- **Whilst the review showed that CGF members are leading non-members across all five steps in the implementation framework, there are still significant gaps to be addressed in order for the CGF to be on course to realize its ambitious goal of deforestation-free supply chains amongst its members by 2020.**

Another significant international voluntary initiative was launched at the UN Rio+20 Conference in 2012. The Tropical Forest Alliance 2020 (TFA 2020) was established when the CGF partnered with the US government to create a public-private alliance with the mission of mobilizing all actors to collaborate in reducing commodity-driven tropical deforestation (Table 66 below). More recently the TFA 2020 has also pledged to support the achievement of the UN SDGs and the New York Declaration on Forests[468].

Table 66: Overview of the Tropical Forest Alliance 2020

Topic		Characteristics
Overview	*Organisation:*	Tropical Forest Alliance 2020
	Date initiated:	UN Rio +20 Conference, 2012
	Motivation	Mission is to mobilize all actors to collaborate in reducing commodity-driven tropical deforestation.
	Oversight:	Steering Committee of 20 members provides a balanced representation of consumer and forest countries, private sector companies, both producers and consumers, and civil society organizations.
	Status:	Active. Voluntary (non-legally binding). Global public-private alliance.
	Focus on:	Sustainable, low carbon production systems, reducing deforestation and protecting peatlands and biodiversity. Creating new regional markets for sustainable palm oil.
	Verification:	Usually on a project-by-project basis
Coverage:	*Geographical scope:*	International with regional programmes in major commodity production zones.
	Signatories:	Over 90 member organisations: 38 of which are private sector, 14 governments (including the governments of Indonesia, Gabon, Liberia and Colombia), 36 civil society organisations and two multilateral agencies.

[468] Please see: https://www.tfa2020.org/en/about-tfa/objectives/

Topic		Characteristics
	Financing & incentives:	Linked to *Landscape Fund for Tropical Landscapes and Forests* (see below)
	Key activities:	• African Palm Oil Initiative • Latin America Initiative (focus on Brazil and Colombia) • Southeast Asia Initiative • Better Growth with Forests Initiative • Financial Sector Engagement initiative • Emerging markets demand for deforestation-free commodities (in development)
	Impact:	Whilst TFA 2020 is in its early stages there is considerable potential in its evidence-based advocacy approaches to highlight the economic, social and environmental benefits of zero net deforestation commitments.

The stated aim of the TFA 2020 is to work together with its partner countries, companies and civil society organizations to:

- Improve planning and management related to tropical forest conservation, agricultural land use and land tenure;
- Share best practices for tropical forest and ecosystem conservation and commodity production, including working with smallholder farmers and other producers on sustainable agricultural intensification, promoting the use of degraded lands and reforestation;
- Provide expertise and knowledge to assist with the development of commodity and processed-commodity markets that promote the conservation of tropical forests; and
- Improve monitoring of tropical deforestation and forest degradation to measure progress.

Aside from the global and regional programmes managed by TFA 2020, the initiative also visually maps and captures information on the activities of its members via a global map (www.tfa2020.org/initiatives) and its annual reporting process.

TFA 2020 operates three global initiatives and three regional initiatives in Southeast Asia, Latin America and West and Central Africa (more information on these initiatives is included in **Table 40** in **Appendix 13**).

Its three global initiatives are as follows:

- **Better Growth with Forests Initiative**: including:
  - An analysis of the economic and political benefits of zero-deforestation commitments in producing countries, focusing on investment opportunities and rural development in those countries[469]; and

[469] This research found that sustainable production processes represent good investment potential, with circa 90% of the estimated USD160 billion of investment required to support sustainable land use in tropical forest regions attracting investment returns of over 10% (TFA 2020, 2017 – p.15).

- In-depth examinations of sub-national jurisdictional approaches to reduce deforestation and greenhouse gas emissions in five regions: Mato Grosso and Pará, Brazil, in Liberia, in Sabah, Malaysia and in East Kalimantan, Indonesia.

- **Financial Sector Engagement initiative**: key components of this engagement include:
  - A clear and thorough articulation of the challenges and opportunities offered by the transition to deforestation-free supply chains[470]; and
  - Offering a platform for broader engagement around practical solutions to increase financing mechanisms - e.g. Wilmar's *Financing Sustainable Smallholder Replanting* project, which builds the future supply of sustainable palm oil production from smallholders by providing financial support.
- **Emerging Markets demand for deforestation-free commodities initiative**: is currently being developed.

By December 2014, the growing number of "No Deforestation" commitments led to the creation of the New York Declaration on Forests[471], one of the significant outcomes from the UN Climate Change Conference in September 2014. This declaration, which includes national and subnational governments (in Indonesia) as well as civil society and private sector organizations, aims to halve the rate of deforestation by the end of 2020 and eliminate it by 2030. Table 67 below provides an overview of the Declaration.

Table 67: Overview of the New York Declaration on Forests (NYDF)

Topic		Characteristics
Overview	*Organisation:*	United Nations Development Programme (UNDP)
	Date initiated:	23 September 2014.
	Motivation:	To support major international agreements and goals by seeking to halve natural forest loss by 2020 and end it by 2030, restore degraded land and forests, reduce forest-related GHG emissions, and improve forest governance.
	Oversight:	United Nations and NYDF Assessment Coalition
	Status:	Non-legally binding political declaration
	Focus on:	Eliminating deforestation. Restoring forests and croplands of an area larger than India. Cutting carbon emissions by 4.5 to 8.8 billion tonnes a year.
	Verification:	Progress assessed by the NYDF Assessment Coalition against 10 Goals contained in the NYDF.

[470] World Economic Forum and TFA 2020 - *The Role of the Financial Sector in Deforestation-free Supply Chains*, Research Report (2017).

[471] New York Declaration on Forests – Forests – Action Statements and Action Plans (UN Climate Summit 2014) (accessed 1 July 2017).

Topic		Characteristics
Coverage:	*Geographical scope:*	International
	Signatories:	179 entities endorsed the NYDF, including 36 national governments, 20 sub-national governments, 53 companies, 16 indigenous peoples groups and 54 NGOs and CSOs.
	Financing & incentives:	Financial support can be sought from the multilateral forest and climate programmes of the World Bank and the UN.
	Key activities:	• Voluntary Action Agenda providing guidance on how to achieve the NYDF's 10 Goals. • Establishment of UNDP national sustainable commodity platforms, bringing together all stakeholders in a particular supply chain
	Impact:	See NYDF progress assessment below.

In 2015, the first edition of the NYDF Progress Assessment proposed a framework and respective indicators for measuring progress toward all ten goals and offered an initial assessment on the status of progress toward achieving them. The second edition of the NYDF Progress Report (published in 2016) is comprised of two parts: a focus report that provides an in-depth analysis of Goal 2, on eliminating deforestation from agricultural commodity supply chains, and a general report with abbreviated updates on Goals 1-10[472].

Highlights from the 2016 NYDF Progress Report can be found Table 68 below.

Table 68: Highlights from the New York Declaration on Forests 2016 Progress Report

Highlights from the New York Declaration on Forests 2016 Progress Report (Goal 2 / palm oil focus):
Highlights from the report relating to palm-oil include: • *Palm oil attracts the highest number of private sector deforestation free commitments:* accounting for 59% of the 701 commitments from 415 companies. • *Most companies have adopted policies or strategies to operationalize their palm oil-related commitments:* 87% have conducted a risk assessment, 80% have their own procurement standard and 57% have a production standard. • *Less than half (49%) of the companies had time bound actionable plans* on

[472] Progress on the New York Declaration on Forests – Achieving Collective Forest Goals – Updates on Goals 1-10 and Progress on the New York Declaration on Forests – Eliminating deforestation from the production of agricultural – Goal 2 Assessment Report (Climate Focus, 2016) (accessed 25 June 2017): http://climatefocus.com/sites/default/files/2016-Updates-on-Goals-1-10-Report-Executive-Summary.pdf and http://climatefocus.com/sites/default/files/2016-NYDF-Goal-2-Assessment-Report.pdf

palm oil related commitments.

- *Around two thirds of companies have traceability systems:* 70% of producers, processors and traders and 64% of manufacturers and retailers have established traceability systems for palm oil.
- *But very few can trace back to the production level:* just 7% in the case of palm oil.
- *Disclosure of progress against commitments is still quite low:* with 45% of companies disclosing information on compliance with their deforestation policies – but for those that disclose information compliance is fairly high.
- *90% of manufacturers and retailers that have made commitments are headquartered in Europe, North America or Australia:* those headquartered in Latin America, Africa and Asia have been slower to act.
- *Over 90% of assessed companies produce or source in deforestation hotspots:* including Indonesia, Malaysia and Brazil. Companies operating in these countries are more advanced in operationalizing their commitments (approximately 10-20% higher).
- *The majority of companies opt to limit procurement to certified products:* rather than create their own product standards.
- *Only one third of 150 assessed financial institutions have deforestation-related commitments in place:* according to Forest 500 reporting.
- *Weak forest governance presents a major barrier to private sector efforts:* with companies experiencing little improvement in forest governance or public sector support. More successful public-private collaborations were reported.

Other group initiatives and collective commitments

These major international group commitments also resulted in more regional and local level alliances such as the Malaysian-dominated **Sustainable Palm Oil Manifesto (SPOM)** (see overview in Table 69 below).

Table 69: Overview of the Sustainable Palm Oil Manifesto (SPOM)

Overview of the Sustainable Palm Oil Manifesto (SPOM)
The Sustainable Palm Oil Manifesto (SPOM) is an initiative of five palm oil producers, which together produce around nine percent (9%) of the world's palm oil: Sime Darby, Kuala Lumpour Kepong Berhad, IOI Corporation Berhad, Musim Mas and Asian Agri. Other signatories include global palm oil trader Cargill and Apical. The initiative, announced in July 2014, did not have the support or participation of NGOs and was heavily criticized for trying to weaken the existing threshold for no-deforestation. SPOM claims to go beyond the sustainability standards established by the RSPO but rather than stopping forest clearance, it reportedly allowed for continued deforestation during the time in which members of the Manifesto studied tools to determine which forests to develop or protect under the high carbon stock (HCS) approach. Institutional investors representing over half a trillion dollars in assets under management called on the group to adopt an immediate moratorium on deforestation and to support the industry in establishing traceable, deforestation-free palm oil supply chains. Greenpeace also criticized the SPOM commitments because they do not cover all traded oil, or minority shareholdings. Following this pressure, SPOM members announced in September 2014 an

immediate moratorium on the clearance of high carbon stock (HCS) forests, whilst they carried out a year-long study that aims to establish a threshold for defining what constitutes HCS forests.

In December 2015, the group announced the 'HCS+' approach seeking to ensure carbon neutral development. In November 2016, agreement was reached to work with another group, including Greenpeace, TFT and Golden Agri-Resources who had produced a methodology to identify natural forest areas and an approach that combined carbon storage, biodiversity conservation and local community rights and livelihoods. Drawing on elements from both approaches a revised toolkit was published in June 2017.

Sources: http://forest500.org/rankings/other-powerbrokers/sustainable-palm-oil-manifesto; Brack and Gregory, 2017 and http://highcarbonstock.org/

In Indonesia voluntary action took the form of the **Indonesian Palm Oil Pledge (IPOP)**, signed at the same UN Climate Summit in 2014 that brought about the New York Declaration on Forests. IPOP was as an association of five companies (Wilmar International, Cargill, Golden Agri-Resources, Asian Agri, Musim Mas and Astra Agro Lestari) and the Indonesian Chamber of Commerce and Industry (Kadin) working toward the same goal of sustainable palm oil production and zero deforestation commitments. IPOP included a commitment to lobby the Indonesian Government to raise the standards of law, which protect only some types of forest and peatland, in line with those of the pledge (Pacheco et al, 2017).

However, from its inception, the Indonesian Government strongly opposed IPOP, describing it as a cartel in violation of the country's competition laws, a threat to national sovereignty and accusing it of excluding smallholders and SMEs from international markets (Saturi and Nugraha, 2015)[473]. In June 2016, after a tense relationship with the government, IPOP was disbanded (Vit, 2016)[474].

Another initiative, the **Indonesia Palm Oil Platform (INPOP)**[475], led by the Indonesian Ministry of Agriculture with support from 41 organisations[476] including the UN Development Programme, Greenpeace, Sawit Watch, WWF, IDH, IKEA, Mondelez and Musim Mas, continues to provide a forum for all palm oil stakeholders – government, private sector, farmer communities, financial institutions and civil society – to agree and act on a common agenda to maximise palm oil productivity (especially to smallholders), while mitigating negative environmental impacts. A National Action Plan for Sustainable Palm Oil Indonesia, developed under INPOP was released for public consultation in

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473 Saturi S and Nugraha I. 7 September 2015. *Indonesian officials resist movement to end deforestation for palm oil.* Mongabay. Accessed 16 December 2016 https://news.mongabay.com/2015/09/ (Cited in Pacheco P, Gnych S, Dermawan A, Komarudin H and Okarda B. 2017. The palm oil global value chain: Implications for economic growth and social and environmental sustainability. Working Paper 220. Bogor, Indonesia: CIFOR).

474 Vit J. 1 July 2016. *Under gov't pressure, palm oil giants disband green pledge*. Mongabay. Accessed 6 July 2017.

https://news.mongabay.com/2016/07/under-government-pressure-palm-oilgiants-disband-green-pledge/

475 For more information on INPOP please visit: http://www.foksbi.id/id/beranda/

476 For a full list of INPOP members please see: http://www.foksbi.id/id/anggota-dan-peserta-inpop

February 2017.

At the regional level in Europe the **European Sustainable Palm Oil (ESPO) Initiative** is an initiative from the Dutch Oils and Fats sector (MVO) and IDH, the Netherlands sustainable trade initiative. The ESPO has a commitment to stimulate the uptake of more sustainable palm oil in Europe through its objective to achieve 100% certified sustainable palm oil, with a steppingstone to work towards RSPO as a minimum. In its "Commitment to Support" it also commits to supporting the EU-wide monitoring of the uptake of certified sustainable palm oil, as undertaken by a range of European national alliances.[477]

Several national initiatives have resulted in the establishment of **national alliances** with the ambition to drive transformation towards 100% sustainable palm oil by 2020. In addition, the alliances have set additional goals towards zero deforestation, no peat, and no exploitation. The national alliances are member based and in addition receive support from the Dutch MVO and the European Palm Oil Alliance. Table 70 below provides an overview of European national alliances relating to sustainable palm oil.

The **European Palm Oil Alliance (EPOA)** is a business initiative to engage with and educate stakeholders on the full palm oil story. EPOA closely collaborates with national initiatives active in the different European countries, facilitating science-based communication and creating a balanced view on the nutritional and sustainability aspects of palm oil. EPOA strongly supports the uptake of 100% sustainable palm oil. Its main members are the Netherlands Oils and Fats Industry, Malaysian and Indonesian palm oil producing industry associations, and vegetable oil refiners.

The **European Sustainable Palm Oil Advocacy Group (ESPOAG)**, the European Sustainable Palm Oil Advocacy Group, represents major food sectors at European level that source a large range of raw materials. ESPOAG supports the EU objective to stop deforestation by 2030, at the latest, and the promotion of this objective at international level. The sectors ESPOAG represents recognize the important role they play in acting as a responsible steward of forests and the natural environment. Throughout ESPOAG's memberships, companies are taking a proactive role in tackling deforestation through improved traceability and supplier engagement. ESPOAG is composed of the following European food sectors federations:

- AIBI: International Association of Plant Bakers
- CAOBISCO: Chocolate, Biscuits and Confectionery of Europe
- FEDIMA: Federation of European Union Manufacturers and Suppliers of Ingredients to the Bakery, Confectionery and Patisserie Industries
- FEDIOL: EU Vegetable Oil and Protein Meal Industry
- IMACE: European Margarine Association

Finally is worth noting that close relations are maintained amongst the European national alliances, EPOA, and the palm oil producing countries. Their commitment to support 100% sustainable palm oil in European by 2020 has also received support from six EU Member States in the Amsterdam Declaration in Support of a Fully Sustainable Palm Oil Supply Chain by 2020.

[477] For more information on the ESPO initiative please see: https://www.idhsustainabletrade.com/initiative/european-sustainable-palm-oil-espo/

Table 70: European national voluntary initiatives for sustainable palm oil use

Country	Members	100% CSPO target	Criteria	Additional targets	Criteria
Belgium The Belgian Alliance for Sustainable Palm Oil (BASP)	Food sector + Cosmetics and Detergents	2015	Sustainable palm oil, all supply-chain options	2020	Fully traceable, with no HCS and no peat
Denmark - DCC	Retailer own brands	Done	Private-label food products via B&C, in future MB	n/a	n/a
Denmark - CDI	Food producers	2016	Sustainable palm oil, all supply-chain options	2018	100% segregated certified palm oil
French Alliance for Sustainable Palm Oil	12 (mostly) food companies	2015	Sustainable palm oil, all supply-chain options	2020	Include traceability, no peat, no deforestation and no conflict.
Germany, Austria, Switzerland	Mostly food sector, some home & personal care	2014	Sustainable palm and palm kernel oils, all supply-chain options	Various dates, 2015 and beyond	New commitments for specific supply-chain options for specific products toward 100% segregated
Netherlands	Mostly food sector, retailers and feed.	2015	Sustainable palm oils in food and feed	No	No
Norway	Food and retail sectors.	2015	Reduce palm oil or use only sustainable palm oil - applies to inputs and finished products	2018	By 2018 any palm oil products used will be segregated and traceable.
Sweden	Food industry. A separate programme for detergent sector.	2015	Report on volumes	No	No
United Kingdom	Food sector, retailers, feed, home & personal care, energy.	2015	Sustainable palm oil from credible sources.	No	No

Individual initiatives and commitments

Individual commitments are many and varied and are evolving over time. Most start with the development of procurement policies (e.g. in the case of palm oil consumers) or take the form of production standards (e.g. in the case of producers). Most procurement-based approaches start with requirements for certified sustainable palm oil (CSPO), often starting with the use of Book and Claim systems and moving towards mass balance and source segregated CSPO.

A growing number of palm oil consumers are moving beyond the use of CSPO alone to achieve their commitments. Some are making significant strides in improving traceability of palm oil back to the mill (e.g. Mondelez achieved 90% traceability back to the mill at the end of 2015, exiting contracts with 11 suppliers who did not have suitable policies

and practices in place)[478]. Some companies (e.g. Unilever and Danone Wave) are now making significant direct investments to improve smallholder relationships, yields and sustainability performance.

Further examples of individual initiatives and commitments can be found referenced in the section below highlighting the findings from three studies evaluating the progress being made in voluntary initiatives; and in the case studies in **Table 40** of **Appendix 13**.

The emergence of new finance and investment initiatives and data and reporting platforms to drive voluntary initiatives and commitments

The increase in company-level adoption of voluntary initiatives and commitments to address deforestation in their supply chains has also been partly triggered by creation of new finance and investment initiatives and data and reporting platforms. These have supported companies who have recognised that they need to go beyond the use of existing certification-based approaches to achieve their commitments, as certification is rarely able to take account of the cumulative impacts from adjacent oil palm cultivation and palm oil production activities in the same landscape or landscape-scale pressures from other sectors or activities that collectively lead to deforestation, biodiversity loss and negative social impacts.

This has lead some companies and organisations, like the Consumer Goods Forum and IDH, to look to collaborative landscape-scale approaches and partnerships to address the linked issues of land use change and deforestation from the supply-side. They are developing new multi-stakeholder coalitions with supporting finance and incentives, that adopt a landscape or jurisdictional (regional or sub-regional) approach, to address the interconnections between different actors in a landscape and the social, environmental and economic factors that lead to land use change and deforestation.

For example, the Sustainable Trade Initiative (IDH) is establishing so-called Production, Protection and Inclusion (PPI) compacts to improve resilience and support the sustainable use of landscapes (see case study in

Table 71 below)[479].

Table 71: Case study on the use of Production, Protection and Inclusion (PPI) Compacts as landscape scale approaches to forest protection

Case study on the use of Production, Protection and Inclusion (PPI) Compacts as landscape scale approaches to forest protection
PPI compacts are agreements between public, private and civil society parties to enhance productive land and secure livelihoods in exchange for forest protection. These compacts are based on participatory land use planning, whereby land for production, livelihoods and protection is clearly identified, and their related uses are agreed upon by the landscape stakeholders and recognized by local and national governments.

[478] Mondelez International, 2015 Progress Report: The Call for Well-being, http://www.mondelezinternational.com/well-being

[479] Wensing, D. and van de Wekken, D. – Implementing and scaling up the CGF Zero Net Deforestation Commitment (published 12 April 2017 – assessed 30 June 2017)

The compacts also include goals for each of the PPI components: a time bound plan of action, clear definition of roles and responsibilities and a budget for implementation.

IDH, together with its partners, is piloting PPI compacts in several landscapes in Indonesia, Liberia, Côte d'Ivoire, Kenya, Ghana and Brazil.

In Liberia, a new PPI compact will bring together communities, the Forestry Development Authority and Golden Veroleum Liberia, to agree to conserve, actively monitor and manage forests, in exchange for access to investment capital and technical assistance to establish community oil palm farms.

In parallel, the growth in the use of effective satellite-based deforestation monitoring systems in tropical countries, like the World Resources Institute's Global Forests Watch programme and Suitability Mapper[480],[481] and ZSL's Sustainable Palm Oil Transparency Toolkit (SPOTT)[482], have emerged, providing new tools that could help achieve new levels of transparency and participative planning of suitable areas of degraded land for sustainable cultivation across landscapes, both locally and globally (New York Declaration on Forests, 2014).

A number of organizations are also working to develop new business models and create new value chain structures that support and facilitate the inclusion of smallholders in new sustainable value chains. These include development organizations such as the IDH and the Netherlands Development Organization (SNV), multilateral banks such as the International Finance Corporation (IFC), and private sector associations and working groups such as PIS Agro's Palm Oil Working Group[483], and the Sustainable Palm Oil Investors Working Group. Many of these models seek to increase the transparency and traceability of the supply chain at the local level and aggregate smallholders in order to access the financial investments needed to replant and increase yields, as well as meeting internationally recognized sustainability standards (Pacheco et al 2017).

In order to support the work to develop the compacts in

Table 71 above and to encourage other innovative voluntary schemes and initiatives, a new fund, the *Landscape Fund for Tropical Landscapes and Forests*, was announced by Norway at the World Economic Forum in January 2017 (World Economic Forum, 2017).

The Fund, which has a capitalisation goal of USD400 million by 2020; will seek to trigger private sector investment at a minimum leverage ratio of 1:4, kick-starting up to USD1.6 billion of investment into sustainable, deforestation-free agricultural productivity and

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480 Please see: http://www.globalforestwatch.org/ for more information (assessed on 6 July 2017).

481 Please see: http://www.wri.org/resources/maps/suitability-mapper (accessed on 15 August 2017).

482 For more information on SPOTT, including an assessment of 50 of the largest palm oil producing companies through 50 indicators using publicly available information on disclosure of their operations and their commitments to environmental and social best practice, please see: https://www.sustainablepalmoil.org/about/

483 PIS Agro's (the Partnership for Indonesia sustainable Agriculture) Palm Oil working Group is currently engaging with 4,785 smallholder farmers working over 11,000ha of land. It has set a 2020 target to work on 100,000 hectares of land, helping 50,000 farmers to increase production by 150%, whilst reducing environmental impact (assessed 7 July 2017): http://www.pisagro.org/palm-oil

protecting 5 million hectares of forests, peatlands and biodiversity by 2020 (equivalent to the size of Costa Rica), in countries and jurisdictions that are working to reduce deforestation and peat degradation (Tropical Forest Alliance 2020, 2017)[484].

This funding goal will be achieved through a mix of bi-lateral and multilateral donors and private sector funders. The Norwegian Government has already committed up to USD100 million to the Fund and Unilever are the first corporate investor, committing to provide USD25 million of funding over five years[485]. The Fund will also work in partnership with the Global Environment Facility, UN Environment, the Sustainable Trade Initiative (IDH) and major food companies and environmental NGOs in a collective effort to coordinate political, commercial and financial assistance efforts to maximise the impact of forest and peatland protection measures, whilst supporting rural socio-economic development that contributes to the delivery of UN SDGs 1, 2, 8, 13, 15 and 16.

Collaborating civil society organisations, like WWF, WRI and The Nature Conservancy will help to ensure the monitoring of progress and provide technical support to the Landscape Fund where this is required.

A group of 12 international banks, who collectively account for 50% of global trade finance, also came together in March 2016 under the auspices of the *Banking Environment Initiative*[486] to make public commitments via a 'Soft Commodities Compact' with the CGF[487], to increase yields, support sustainable livelihoods and help end deforestation in commodity supply chains by 2020. The group have two principal aims:

- To mobilise the banking industry to direct capital to – and stimulate trade in - sustainably sourced commodities through trade finance instruments; and
- Raising banking standards to ensure that by 2020 all corporate and investment banking customers whose operations include significant production or processing of forest risk commodities, including palm oil, in markets at high risk of tropical deforestation can verify that these operations are consistent with zero net deforestation. Alongside their own due diligence processes, by 2020 Compact banks will confirm that these customers' operations have achieved the same internationally-recognised means of verification that the CGF is prioritising.

In an example of national-level banking collaboration, Indonesia's eight largest commercial banks have also committed to responsible lending practices in the palm oil sector as part of a Sustainable Financial Roadmap developed by the Indonesia Financial Services Authority (OJK) (Pacheco et al, 2017).

Other sources of finance to support these objectives can be found in the multi-lateral forest and climate programmes of the World Bank and the United Nations, including the Forest Carbon Partnership Facility[488], BioCarbon Fund Initiative for Sustainable Forest

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484 Tropical Forest Alliance 2020 – Annual Report 2016-2017 (Published April 2017; accessed 30 June 2017).

485 Carrefour, Marks & Spencer, Mars, Metro, Nestlé and the Consumer Goods forum have also pledged to support the Fund.

486 For more information please see: http://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative

487 Please see: http://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative/pdfs/the-bei-and-cgfs-soft-commodities-compact.pdf

488 For more information please see: https://www.forestcarbonpartnership.org/about-fcpf-0

Landscapes[489] and the UN REDD Programme[490] and the Global Environment Facility[491] (New York Declaration on Forests, 2014).

In addition, to the above high profile examples of voluntary initiatives and schemes, we have sought to capture and summarize examples of other voluntary sustainable palm oil-related activities to illustrate the diversity of approaches being deployed in international, national, sub-national, sectoral and organisational contexts in **Table 40** in **Appendix 13.**

8.6.4. Studies on the progress being made in voluntary initiatives and commitments

The following analysis draws from three publicly available studies that assess the progress being made on voluntary palm oil initiatives and commitments.

The first of these, the *Supply Change* survey[492], tracks corporate commitments to reduce deforestation in supply chains from companies that produce, trade, manufacture or retail products containing to the 'big four' commodities associated with deforestation: palm oil, soy, timber and pulp and beef.

The latest survey, completed in December 2016, identified a total of 718 companies, 447 of which have made 760 commitments (representing an increase in just one year of 22% and 31% respectively; whilst 271 companies did not have a publicly available commitment (a 36% increase from the previous years report). It also investigated whether companies making commitments were reporting their progress or whether commitments might be considered 'dormant'. Table 72 below summarises the overall findings from the 2017 report and highlights those additional findings most relevant to palm oil.

Table 72: Summary of key findings from the 2017 Supply Change report

Summary of key findings from the 2017 Supply Change report:
Key findings are: • *Progress reporting is on the rise:* with 51% of those companies making deforestation commitments transparently reporting their progress. • *Commitments on palm oil and timber and pulp continue to lead the way:* mainly as a result of established certification schemes and increasing scrutiny around palm oil-driven deforestation. • *Business size and structure plays a role:* smaller, private companies continue to lag behind their larger, publicly traded peers in making commitments. Companies with commitments are twice as large as those without them. • *Commitment rates vary across the length of the supply chain:* retailers had the lowest rate of commitments (54%), compared to their peers in the 'upstream' supply chain: producers (71%), processors (72%), traders (70%) and

489 For more information please see: http://www.biocarbonfund-isfl.org/

490 For more information please see: http://www.un-redd.org/how-we-work

491 For more information please see: https://www.thegef.org/about/funding

492 Donofrio, S, et al – Supply Change: Tracking Corporate Commitments to Deforestation-Free Supply Chains, (Forest Trends, 2017).

manufacturers (66%).

- *Commitments that aren't accompanied by progress reporting run the risk of becoming 'dormant':* Supply Change found that one in five commitments has a target date that is past due – or never had a target date – and has never provided progress information. A third (135) of the 447 companies with commitments have at least one commitment that is dormant.
- *Collective action spurs individual action:* members of group initiatives that collectively act on deforestation are far more likely to have their own pledges.
- *Companies are increasingly including policies that address on-the-ground impacts in their commitments:* 37% of tracked commitments now explicitly include policies to protect biodiversity and wildlife, 35% to reduce GHG emissions, 29% to improve water management and 22% support smallholders.
- *Geography is a factor:* most companies with commitments are headquartered in Europe (53%) and North America (23%); and of those without commitments, most are based in Europe (36%) and in Asia (34%).
- *The food and farming sector dominates:* of companies with commitments those producing and selling food products and farming dominate – food products (27%), food retailers and wholesalers (11%), farming (4%) and restaurants and bars (3%). The same applies to companies without commitments: food products (34%), food retailers and wholesalers (21%), farming (10%) and restaurants and bars (3%).
- *The largest growth in progress reporting was found in commitments related to palm oil:* which grew by 75% between 2015 and 2016, suggesting that progress reporting in the palm oil sector is becoming an industry standard.

The 2017 Supply Change survey also tracks 35 group initiatives in order to understand how companies are engaging with other external stakeholders and partners to address commodity-related deforestation.

Table 73 below takes a subset of these group initiatives relevant to palm oil to illustrate how many company participants have established commitments to reduce deforestation, the percentage of total participants that represents, and the percentage of commitments made by participants, for which progress information is available.

Table 74 below highlights changes in participation rates across palm oil-related initiatives between 2016 and 2017.

Table 73: Highest number of companies and commitments by group initiative

Highest no. of participants with commitments		Highest % of participants with commitments		Highest % of commitments with progress information available*	
Consumer Goods Forum	99	High Carbon Stock Steering Group	100%	Palm Oil Innovation Group	73%
New York Declaration on Forests	41	New York Declaration on Forests	98%	High Carbon Stock Steering Group	58%
Tropical Forests Trust	39	Tropical Forest Alliance 2020	95%	Tropical Forest Alliance 2020	57%
We Mean Business (Forest Group)	39	Tropical Forest Trust	95%	Consumer Goods Forum	54%
Tropical Forest	23	We Mean Business	91%	We Mean Business	52%

Highest no. of participants with commitments		Highest % of participants with commitments		Highest % of commitments with progress information available*	
Alliance 2020		(Forest Group)		(Forest Group)	
				New York Declaration on Forests	52%

Key:

- *Across all commitments, progress information is available for 51% of commitments
- NOTE: companies may participate in more than one group initiative that addresses commodity-driven deforestation

Table 74: Number of organisations participating in different palm-oil-related voluntary initiatives, as reported in 2016 Supply Change report

	2016 Report	2017 Report
Related Activities	Number of participants with relevant commitment(s)	Number of participants with relevant commitment(s)
Roundtable on Sustainable Palm Oil	193	217
Global Reporting Initiative	New	157
Consumer Goods Forum	116	99
Publicly report to CDP	78	87
New York Declaration on Forests	38	41
Tropical Forest Trust	36	39
We Mean Business	34	39
The Sustainability Consortium	37	35
Sustainable Agriculture Initiative	25	30
British Retail Consortium	15	25
Tropical Forest Alliance 2020	13	21
High Carbon Stock Steering Group	6	10
Sustainable Palm Oil Manifesto	8	8
Palm Oil Innovation Group	5	7

The second analysis of voluntary initiatives and commitments was published in a report by FERN in March 2017[493], and assesses why businesses have made these commitments, how they are monitoring progress towards meeting their commitments to protect and enhance forest landscapes, the economic cost of doing so, and the barriers they face to achieving them. The analysis is based on publicly reported information and interviews

[493] Brack, D. & Gregory, M. - *Company Promises – How businesses are meeting commitments to end deforestation* (FERN, March 2017).

with companies (a mixture of producers, traders, processors and retailers) making and working to achieve their commitments to provide a company perspective on the process[494]. This report covers palm oil, timber and pulp, cocoa and rubber.

The report highlights the fact that most of the companies interviewed had set out detailed definitions of what they mean in their top-level commitments for either zero deforestation, zero net deforestation, sustainable or responsible forest management or in taking a net positive approach (i.e. a net increase in forest area). Some companies have also developed more restrictive or specific criteria to protect high conservation value (HCV) and high carbon stocks (HCS) areas, and establishing the traceability of products up the supply chain.

Table 75 below summarises the overall findings from the 2017 FERN report and highlights those additional findings most relevant to palm oil.

Table 75: Summary of the key findings from the FERN *Company Promises* report

Summary of the key findings from the FERN *Company Promises* report:
Key findings are: • *Companies are optimistic about achieving their own commitments but pessimistic about achieving broader group commitments:* most companies felt that they could meet their own targets but that the broader targets of the Consumer Goods Forum and the New York Declaration on Forests (NYDF) were probably not achievable. • *Key barriers to developing commitments were usually external:* with some companies experiencing problems with investors more focused on short-term returns. None reported investor pressure to increase their levels of ambition. • *Certification systems play an important role:* for some companies (particularly retailers), achieving 100% certified sustainable palm oil for the products in their supply chain is the primary means through which they meet their commitments. Certification is also seen as adding value by providing platforms for discussion with diverse stakeholder groups. • *Certification schemes have drawbacks too:* not least the cost of certification for smallholders; a failure to gain acceptance in major consuming markets like India and China; and the inadequacy of RSPO rules in addressing deforestation (although RSPO Next and POIG are helping with this). • *Company criteria (in addition to certification schemes) are the most extensive, detailed and complex for palm oil:* as it is the agricultural commodity most exposed to deforestation-related concern. • *Full traceability of palm oil is seen as important but it is difficult and complex:* particularly before it reaches the mill as there are millions of smallholders supplying the mills, although some companies are making progress to ensure that particular suppliers are not associated with deforestation. • *Landscape scale solutions are emerging:* companies are investing in integrated sustainable forest and farming systems and providing livelihoods for local communities that don't involve clearing forests. Some are also investing in peatland

[494] Companies interviewed who were involved in the palm oil sector included: Golden Agri-Resources, Musim Mas, Sime Darby, Cargill, Modelez, Neste, Nestlé, Olam International, Unilever, Delhaize, IKEA, Kingfisher and Marks and Spencer. Key individuals in CDP, the CGF, TFT and Tropical Forest Alliance 2020 were also interviewed to discuss their perspectives on the issues.

restoration initiatives in Indonesia.

- *Companies are investing in and supporting smallholders:* to improve relationships and increase confidence in sustainable production, encouraging smallholders to enter RSPO certification; and installing methane capture systems at palm oil mills.
- *Social challenges are more difficult to resolve than environmental issues and are a major obstacle to achieving commitments, requiring the support of producer country governments:* disputes over land tenure and ownership are crucial problems to be resolved. In particular, lack of clarity over legal concession boundaries and protected areas, lead to local community encroachment on concessions and damage to protected areas in the absence of clear legal rights.
- *Companies with interests in palm oil are also involved in one or more group initiative and collective commitment:* of the 13 companies with interests in palm oil only three are not currently involved in the delivery of any external commitments. Eight are involved in 2-4 group initiatives.
- *Leading companies are pushing the boundaries of sustainable palm oil commitments:* only aiming to source from suppliers that possess the same commitments as they did on deforestation.
- *All of the companies interviewed were prepared to drop suppliers that didn't meet their criteria:* and some had already done this, although they expressed a preference to work directly with suppliers to improve their performance.
- *The cost of implementing commitments can be high:* including internal staff time; paying specialists to help develop policies and map and verify supply chains; and paying premia for certified sustainable palm oil. One retailer estimated costs of £250,000 a year for meeting their commitments on palm oil; whilst producers, who need to make on-the-ground investments, cite investment costs of up to USD200 million over three years.
- *Monitoring, auditing and reporting of progress operates at several levels:* from internal audit teams reviewing reports from technical, product and procurement teams, certified products sourced or produced by companies subject to certification scheme audit systems, and external specialists mapping and verifying supply chains. NGO's were also seen as having a role in reporting supplier's transgressions. External reporting of progress is usually included in annual sustainability reports, or in the sustainability sections of annual reports, with some companies issuing commodity-specific updates and listing their suppliers in detail to increase transparency and traceability of supply.
- *Systematic monitoring and reporting of company's contributions to group initiatives and collective commitments is not common:* with the only notable exceptions being for the CGF's Zero Net Deforestation by 2020 commitment and commitments made under the New York Declaration on Forests (see above for more information on these initiatives).

The third analysis used to assess company performance in relation to preventing or addressing the environmental and social impacts of palm oil is the 2016 WWF Palm Oil Buyers Scorecard[495]. The 2016 scorecard follows previous WWF scorecards in 2009, 2011 and 2013, and assesses the progress of 137 retailers, manufacturers and food service companies from Australia, Canada, Europe, India, Japan and the USA in achieving their commitments on palm oil to the end of 2015. Between them these companies use more that 6 Million tonnes of palm oil a year, representing around 10% of total global palm oil

[495] The Palm Oil Buyers Scorecard – Measuring the Progress of Palm Oil Buyers (WWF, 2016).

consumption. Table 76 below provides a summary of the findings from the 2016 WWF scorecard.

Table 76: Summary of the key findings from the 2016 WWF Palm Oil Buyers Scorecard

Summary of the key findings from the 2016 WWF Palm Oil Buyers Scorecard:
Key findings are: • *Almost one in five companies (28 out of 137) did not respond:* representing a lack of engagement and transparency from companies with significant exposure to palm oil-related risks. • *RSPO has been instrumental in increasing levels of openness and engagement:* 106 of the remaining 109 companies are RSPO members. • *The majority of companies assessed had made public commitments to use CSPO:* 107 out of 137 companies had done this; and over three quarters of them (78%) had committed to use 100% CSPO by the end of 2015. • *Over two thirds of companies did use some CSPO in 2015:* 96 companies reported some use of CSPO, leaving 41 who didn't or didn't report their use publicly. • *100% CSPO targets were achieved by those companies with commitments to do this:* 56 companies out of 78 with 100% CSPO targets by the end of 2015 achieved their goal; but seven of the remaining companies fell short of their target by 50% or more. • *Progress is being made but not by all companies:* Of the 94 companies that were also assessed in the 2013 scorecard, 76 have shown progress, 11 seem to have stalled and seven have gone backwards. • *At the time of this scorecard there was over-supply in the RSPO market:* so those not meeting their targets could have achieved 100% CSPO use in 2015. • *Half of the CSPO bought by all of these companies was Book and Claim:* with 17 out of 96 companies relying on the book and claim system for more than three quarters of the CSPO that they used, despite the fact that the actual palm oil used in their products may come from uncertified sources. • *Segregated palm oil represented a minority for the companies using CSPO during 2015:* with only 15% of the CSPO used coming from segregated sources. Only three brands used 100% segregated CSPO in 2015: Arnott's, Danone and Ferrero. • *Physical supplies of palm kernel oil (PKO) and palm oil derivatives (POD) from RSPO-certified sources are much harder to find than certified crude palm oil (CPO):* making the shift to physical CSPO for companies relying on PKO (e.g. in the personal care sector) and POD (e.g. in specialist technical products) more difficult. • *Manufacturers are much heavier users of palm oil than retailers:* with 48 retailers using 281,845 tonnes of palm oil and 77 manufacturers using 5,640,475 tonnes of palm oil. • *During 2015 the companies assessed used CPO the most, followed by POD and PKO:* at 3,116,549 tonnes, 2,072,524 tonnes and 983,205 tonnes respectively. • *Responses from retailers were polarised:* while 22 out of 48 are buying 100% CSPO another 19 aren't buying any at all; and 14 out of the 33 retailers that are RSPO members did not submit an Annual Communication of Progress (ACOP) to the RSPO. 25 retailers scored the maximum of nine points in the scorecard, whilst 14 retailers did not respond to WWF's request for information. • *Responses from manufacturers were also mixed:* with 33 out of 77 using 100% CSPO (12 using 100% physical CSPO) and 16 appearing to not buy any at all. 10 members did not submit their ACOP to the RSPO or respond to WWF's information request. 26

manufacturers scored the maximum of nine points in the scorecard.

- *Food service companies are behind their retailer and manufacturing peers:* with the majority making little progress and half not buying any CSPO at all. Only four of the food companies assessed scored the maximum of nine points in the scorecard.
- *European, North American and Australian brands are leading the way:* with very little progress evident by Asian brands, although companies in Japan are making slow progress.
- *To realise further significant growth in CSPO Asian markets will have to play their part:* particularly the large and expanding markets in China, India, Indonesia and Malaysia.
- *Company size doesn't seem to matter:* when it comes to sourcing 100% CSPO, with the performance of companies sourcing 1,000 to 1 million tonnes a year broadly similar.
- *Unilever stands out:* as the largest user of palm oil by far and as the single company that has done the most to source CSPO with 100% CSPO use to meet its needs for over 1.5 million tonnes of palm oil in 2015.
- *The 80:20 rule applies:* of the 137 companies assessed, the 14 largest users account for more than two thirds of the total palm oil used, with Unilever alone making up nearly 30%.
- *Leading brands are moving away from book and claim systems:* Nestlé have stopped buying book and claim certificates, preferring to rely on their own sourcing guidelines; while other brands are seeking to directly invest in smallholder schemes rather than book and claim certificates.
- *Supporting smallholders is critical:* as 40% of palm oil produced globally is grown by smallholders 23 of the companies assessed are now buying independent smallholder book and claim certificates.
- *Companies are setting additional sourcing requirements:* 8 companies specified RSPO Next, 6 the POIG Charter, 17 companies banned harmful chemicals; 33 sought zero net emissions, 19 required GHG emissions reductions; and 13 required GHG reporting.

8.6.5. Palm-free initiatives

A growing number of companies and brands have launched palm oil-free initiatives and some have introduced palm oil-free labels on their products. However, palm oil-free labels have raised some legal concerns (e.g. legal uncertainty and potential conflicts with the requirements of the EU's Food Information to Consumers (FIC) Regulation No. 1169/2011[496]; inappropriate and contested marketing claims suggesting that palm oil free products provide additional health and sustainability benefits[497]).

The main focus of palm oil-free initiatives to date appears to have been in the food and

[496] Scott-Thomas, C. - Palm oil-free products could face legal challenges, say lawyers (Food Navigator, 3 December 2014) (accessed 7 July 2017): http://www.foodnavigator.com/Policy/Palm-oil-free-products-could-face-legal-challenge-say-lawyers

[497] Michail, N. – Ferrero wins appeal as Belgium court tells Delhaize [Belgium] to stop saying no palm oil is healthier and more sustainable (Food Navigator, 7 June 2017) (accessed 7 July 2017): http://www.foodnavigator.com/Policy/Ferrero-wins-appeal-as-Belgian-court-tells-Delhaize-to-stop-saying-no-palm-oil-is-healthier-more-sustainable

home and personal care sectors, with a growing number of product listings appearing on consumer-focused and specialist product websites[498], which show listings covering a growing number of product categories from biscuits and chocolates to nut butters, chocolate spreads, soaps and shampoos.

Retailers and brands that have introduced palm oil-free products include M&S, Sainsbury's, Waitrose, Coop Italia, Body Shop, LUSH, Dorset Cereals, Mondelez, Walkers, McVities, Balshen, Whole Earth, Devine, Montezuma, Guylian, and Lindt.

Although there are no publicly available studies that attempt to quantify the scale of palm oil-free initiatives, two presentations to a recent Malaysian palm oil industry conference referenced a move into palm oil-free animal feeds by New Zealand-based animal feed company, Landcorp, who recently removed palm kernel expeller (PKE) from its animal feeds[499] and a survey of 'No Palm Oil' labels that identified 1,750 of these labels in use in Italy, France and Belgium alone[500].

The level of interest in palm oil free products has prompted the recent launch of a new certification scheme: the International Palm Oil Free Certification Accreditation Programme (POFCAP)[501]. This new, not for profit, consumer-facing certification scheme is already approved to certify products in Australia and the United Kingdom, with applications pending in 14 other countries; but it is still too early to determine what the update will be from the consumer goods industry.

The following sections look at the challenges and barriers to the successful achievement of voluntary initiatives and commitments, some potential ways forward to overcome these challenges and a summary of the range of voluntary initiatives and commitments, including trends and our views on their potential to support the achievement of EU and UN policy objectives.

8.6.6. Challenges and barriers

Drawing on a number of studies (Pacheco et al, 2017; Brack and Gregory, 2017; WWF, 2016; Donofrio et al, 2017; and Bregman et al 2016), we have identified a number of challenges to the development and implementation of voluntary initiatives and commitments and have attempted to draw them out below:

- Top-level leadership within organisations is critical to ensure the proper resourcing of both initial work (e.g. drafting and agreeing the scope and nature of the initiative and the commitments and targets within it) and the implementation and reporting process

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498 For example: Ethical Consumer, One Green Planet and Selvabeat (http://www.ethicalconsumer.org/shoppingethically/palmoilfreelist.aspx, http://www.onegreenplanet.org/lifestyle/guide-vegan-products-and-palm-oil/ and https://www.selvabeat.com/home/palm-oil-free-shampoo-guide)

499 Source: Puah Chiew Wei, Ph.D. – Regional Highlights: Australasia and Oceania – presentation to the Malaysian Palm Oil Industry (Malaysian Palm Oil Board, 14 April 2017).

500 Source: Kalanithi Nesaretnam & Rafizah Mazlan – Palm Oil in Europe - presentation to the Malaysian Palm Oil Industry (Malaysian Palm Oil Board, 12 April 2017).

501 Please see: http://www.palmoilfreecertification.org/ and https://innovation-forum.co.uk/analysis.php?s=do-consumers-want-to-go-palm-oil-free for more information (accessed on 29 August 2017).

(e.g. mapping and verifying supply chains, internal and external review of procurement and product reports);

- The lack of available data in the early stages of commitment development and implementation and the critical nature of establishing new data systems/platforms to normalise new monitoring and reporting requirements;
- The cost of making and tracking a commitment, particularly as a producer company where significant on-the-ground investments are required and your supply base can stretch to tens of thousands of smallholders;
- The difficulty of improving standards and achieving certification amongst smallholders and SME suppliers in situations where premia are too low to provide an incentive to invest – this is in the context of a heavy reliance on certification by those seeking to make or achieve their commitments;
- The current lack of traceability and transparency in the global palm oil supply chain, particularly when going upstream beyond the palm oil mill;
- The difficulty of responding to, addressing and improving social issues like disputes over land tenure with 5,000 or so land disputes going through the Indonesian courts alone (Brack and Gregory, 2017), ownership and natural resource rights, in the absence of producer country government's providing the right framework conditions to support private sector and NGO-driven commitments;
- The complexity and expense of identifying, monitoring, verifying and reporting against labour issues and rights, including the treatment of bonded or migrant workers and child labour;
- The lack of demand and pressure for deforestation-free palm oil in major consuming markets, notably India and China – but also in Eastern Europe;
- The absence of global agreement on definitions and standards for terms like 'zero deforestation' and 'net zero deforestation' that are central to most voluntary initiatives, commitments and targets, creating confusion, lack of comparability between different initiatives and, in the worst case, inertia in the palm oil market;
- Failures of government regulation and enforcement leading to further uncertainty in palm oil supply chains;
- Pressure from vested interests and political elites worried about initiatives challenging the status quo and national sovereignty;
- Working together in pre-competitive collaborations for the good of society and the environment, whilst avoiding cartel-like behaviour and the potential to breach national and international competition laws;
- The current lack of legal and geographical clarity around concession and plantation boundaries and land use claims, leading to deliberate or unintentional encroachment by local communities on producer company concessions, creating further challenges to those initiatives and companies trying to establish landscape-scale solutions to deforestation and biodiversity, and programmes to provide local community sustainable livelihoods; and
- The difficulties in finding capable, experienced and appropriately trained people to conduct complex and culturally sensitive procedures to ensure the proper use of free, prior and informed consent (FPIC) of communities to new projects (this is also a challenge in the context of the auditing resource available for sustainable palm oil certification schemes).

The following section looks at some of the solutions that can be brought into play to overcome or reduce some of the challenges and barriers to the development of and successful achievement of voluntary initiatives and commitments.

8.6.7. Ways forward

In order to deliver the critical mass of successful voluntary initiatives and commitments required to transform the palm oil sector into a more sustainable, resilient and equitable market, the mix of initiatives needs to tackle both supply and demand side policies and practices. Given the evidence above and in **Table 40** in **Appendix 13** (further examples of voluntary initiatives and commitments) these outcomes are most likely to be delivered through existing and new group initiatives and collective commitments, where some of the 'barriers to entry' referenced in the previous section are more easily overcome. Closer cooperation and coordination between existing private sector, government, finance and NGO initiatives would also be helpful to avoid duplicated effort and drive the pace and scale of change.

One thing is clear: that for voluntary initiatives and commitments to have the impact they were designed for greater efforts will be required to bring together those with a keen interest in affecting positive change with those that can set the right framework conditions (national and sub-national government policies, laws and regulatory frameworks and incentives) with those able to provide the financing and investment mechanisms and funds to incentivise change and leverage private sector investments (e.g. international donors, banks, World Bank and EU and UN financial mechanisms).

So rather than focusing solely on voluntary initiatives and commitments, or dismissing them as too difficult to achieve, they should be used as a springboard to multi-stakeholder discussions to reinvigorate a process to assess the changes required in the palm oil sector and those needed at producer and consumer country level.

Drawing on a number of studies (Pacheco et al, 2017; Brack and Gregory, 2017; WWF, 2016; Donofrio et al, 2017; and Bregman et al 2016), we now look at the roles that different actors in the palm oil sector can play and the actions they can take to improve the chances of existing and future voluntary initiatives and commitments succeeding:

Actions by companies:

- Greater investment in smallholder and SME production, building genuine, long-term partnerships and collaborations and creating the confidence to invest in sustainable production and certification;
- Working more closely with local communities and indigenous peoples to:
  - Establish and promote more participatory planning processes;
  - Help with education and training applied to local conditions, providing producers with better planting material, environmental friendly practices for production, etc.
  - Identify opportunities to work together on landscape-scale solutions to deforestation and biodiversity loss, whilst providing sustainable livelihoods that don't require forest clearance or degradation;
  - Identify conservation areas including areas of high conservation value (HCV) and high carbon stocks (HCS);
  - Ensure that the principle of free, prior and informed consent is applied to local communities affected by new projects or developments – and initiate multi-stakeholder dialogues involving NGOs and government at the early stages of planning;
- Making greater use of the technology and data sharing platforms available to them, including satellite remote sensing, geo-spatial data platforms and drone technology to monitor the progress being made under their commitments;
- Applying pressure to their peers in other major consuming markets to ensure uptake

of existing voluntary initiatives or to create new ones in geographies where they don't exist; and create more demand pull for sustainable palm oil – organisations like the CGF, TFA2020, CDP and NGOs have a role here; and

- Taking more advantage of new sources of funding and investment (e.g. carbon funds, REDD+ finance for standing forests rather than as an 'extractive resource').

Actions by producer-country governments:

- The development, agreement and adoption of clear and consistent policies, laws and regulatory regimes relating to:
  - Land tenure and land and natural resource access rights and their effective administration (no farmer will invest in better systems or certification without clear tenure rights);
  - Landscape-level land use planning, protected area designation and concession allocation;
  - Registration of farmers to avoid sourcing palm oil from illegal sources;
  - The settling of historical land use disputes;
- Improving the clarity and consistency of relevant laws and their enforcement at the national and sub-national level;
- Reform of laws seen as hindering commitments – e.g. in Indonesia the possibility that undeveloped land within a concession must be handed back to the government, making it difficult to set aside land for conservation purposes (Brack and Gregory, 2017);
- Improvements in the designation and regulatory protection of HCV and HCS areas, which would make it easier for producer companies to agree protection policies with local communities;
- Regular dialogue with producer companies, and with local communities and indigenous peoples affected by the palm oil sector;
- Continuing research and development programmes with the palm oil industry to improve yields and sustainable agriculture techniques;
- Working with producer companies to offer support and extension services to smallholders and SME suppliers; and
- The development of a definitive map of protected areas, concession and plantation boundaries, land use rights and ownership (similar to that proposed under Indonesia's One Map initiative[502]). And the use of satellite and drone technologies for the monitoring of compliance with these boundaries and supporting legal and regulatory frameworks where they exist.

Actions by consumer-country governments:

- The provision of financial and technical support to producer countries and to smallholder producers in particular;
- The use of public procurement policies to grow the market for sustainable palm oil;
- Supporting the development of common definitions, standards and reporting frameworks and platforms for sustainable palm oil;

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[502] For more information on Indonesia's One Map initiative please visit: https://www.opengovpartnership.org/sites/default/files/case-study_Indonesia_One-Map-Policy.pdf

- Providing greater clarity and raising awareness of key national and regional policy objectives in relation to the environmental, social and economic impacts and benefits of palm oil and the role of certification schemes and voluntary initiatives and commitments in helping to deliver them;
- Establishing programmes in close collaboration with producer countries to help develop alternative livelihoods for farmers, who would otherwise be inclined to deforest;
- Exploring the potential for lower taxes on products that meet sustainability criteria (along the lines of lower VAT rates for energy conservation products); and
- Exploring the potential of FLEGT-like voluntary partnership agreements (VPAs), including independent monitoring, to be developed and applied in the palm oil sector. This process is transforming the forestry sector in countries such as Indonesia, Liberia and Ghana. Other potential models to explore include comparable initiatives on illegal fishing and conflict minerals (Brack and Gregory, 2017).

Actions by NGOs and other civil society groups:

- On-going monitoring and reporting of the progress being made under voluntary initiatives and commitments, including for those group initiatives and collective commitments that haven't yet received the level of scrutiny that others have;
- Facilitating the development of common definitions and standards, monitoring and reporting frameworks, by working closely with those involved in voluntary initiatives and commitments and the certification systems that often underpin them;
- Ensuring that measures are taken to ensure that any competitive or financial benefits are passed on to producers, who are ultimately the ones incurring the costs associated with making necessary changes in production practices and in certification, rather than financial benefits being retained by retailers and manufacturers (Pacheco et al 2017); and
- Increasing their level of engagement with the banking, finance and investment communities.

Actions by the banking, finance and investment communities:

- Raising awareness of existing funding and investment opportunities amongst producer companies, smallholder farmers and SME suppliers;
- Providing the technical support to smallholders and SME suppliers that facilitates access to funding and investment to enable the adoption of more sustainable agriculture practices and yield improvements;
- Establishing or extending tailored financial support for those involved in voluntary initiatives and commitments to allow them to achieve or exceed their targets; and
- Exploring the potential of green bonds as an innovative way of financing investment and action in palm oil supply chains.

The following section summarizes the analysis of voluntary initiatives and commitments and makes some general conclusions about their actual and potential role in contributing to environmental and social policy objectives of relevance to palm oil in the EU and UN policy instruments reviewed in this study.

8.6.8. Summary and conclusions

It is clear that there has been a significant growth in voluntary initiatives and commitments relating to different aspects of palm oil sustainability, as well as an increase in the diversity of the topics covered by them and the range of different

organisations and sectors involved in them. This is often as a result of sustained campaigning from advocacy groups, a growing level of awareness from investors of the risks and opportunities associated with these commodities and pressure from consumers who are keen to see companies take action.

From the forerunners like the original 2010 Consumer Goods Forum Zero Net Deforestation by 2020 commitment, with a singular focus on eliminating deforestation, to more recent initiatives which include other environmental and social impacts, like better water and waste management, reductions in GHG emissions and direct engagement with - and support for - smallholder farmers, these commitments are becoming both more integrated and more complex as a result.

Group initiatives and collective commitments bring with them a number of benefits, reducing first mover disadvantage and reducing the instance of free riders, providing those organisations involved with less risk and more confidence. The evidence also suggests that companies operating within these collective environments are spurred on to achieve more than if they operated alone.

Challenges for those leading or convening these group initiatives relate to tracking the progress of individual participants, tailoring their support to different entities and above all finding effective and robust ways of monitoring progress overall, often having to call upon multiple sources of data and information, as is the case with both the CGF commitment and the New York Declaration on Forests.

However, there remain significant obstacles to the success of this growing body of voluntary initiatives and commitments, in particular:

- On-going challenges around land use planning and land tenure and regulatory enforcement that threaten to undermine or slow progress; and require greater emphasis on private/public partnerships and the support of local government to ensure future economic development and the enforcement of areas of production and areas of protection (Pacheco et al 2017).
- The difficulty and complexity of addressing social and labour issues.
- The on-going traceability challenges associated with a very large pool of smallholder farmers and SME suppliers.
- The need to improve the standards and certification systems that so many commitments are reliant on, whilst including smallholders to ensure that their needs are met and that they are able to access the markets for their products.
- The need for other major consuming countries to engage more meaningfully, following the lead of European and North American counterparts.

That said, there are positive signals that progress is being made: reporting of progress against commitments is generally on the rise with palm oil in the lead; landscape-scale solutions to deforestation and biodiversity loss are emerging; more companies are engaging with and investing directly with suppliers (including smallholders) and improving traceability in the process; inter-linkages and cooperation between different group initiatives is strengthening – adding to their collective impact and momentum; and companies operating in deforestation hotspots are accelerating their implementation efforts.

However, there is no room for complacency as assessments of both high profile group initiatives and the progress against commitments of individual companies show that there is still a considerable body of work required for 2020 and 2030 commitments to be delivered and considerable scepticism by leading companies that the targets embodied in group initiatives will be achieved within this timeframe.

Another important consideration within this topic is the heavy reliance by many

organisations on the use of sustainable palm oil certification schemes, like RSPO, to meet their voluntary commitments.

Whilst RSPO and the other schemes do play an important role in helping to reduce deforestation and deliver other environmental and social benefits within individual company supply chains – and their requirements can be improved over time – they account for a relatively small volume of the global palm oil market and are not being adopted in major consuming markets like India and China. The result is that there are significant gaps in the market coverage of these standards as the market demand for CSPO in these countries is largely absent. This situation, where producers can produce palm oil unsustainably and supply into these markets, can lead to further deforestation and peatland conversion. This creates a serious mismatch between a major implementation vehicle for voluntary commitments and the delivery of reductions in deforestation and other environmental and social goals on the ground, which will need to be addressed in the future.

That said, voluntary initiatives and commitments have a role to play in supporting the achievement of EU and UN environmental and social policy objectives contained in the instruments taken into consideration in this study, providing useful existing on-the-ground activity and ready-made collaborations that are open to working more closely with the public sector.

9. Summary, conclusions, key findings and insights

9.1. Summary, conclusions, key findings and insights

The following sections summarise the key findings from this study and provide conclusions on the environmental, social and economic impacts and benefits of palm oil for consideration by the European Commission, drawing on key findings and insights identified during the study.

9.2. The economics and agronomics of oil palm cultivation and palm oil production

The oil palm is a very productive crop, with yields of oil per hectare per annum that are very much greater than for other oil crops. **This high yield means palm oil requires 5-8 times less land area than competing oil crops for the same quantity of oil and makes it very attractive to producers.**

Palm oil today is by far the most important source of vegetable oil for the world, having overtaken soybean-oil in 2006. Rapeseed oil and sunflower oil are in third and fourth place, respectively. **The world is reliant on palm oil to satisfy growing global demand for vegetable oil.**

Indonesia and Malaysia dominate production with close to 90% of world output. Planted area, although much more modest, has also expanded in West Africa and Central America. Indonesia and Malaysia will remain the major producers for the foreseeable future, with expansion focused on Kalimantan. **As a result, discussion of the oil palm must focus predominantly on Indonesia and Malaysia.**

As there has been limited success at mechanisation to date, harvesting is very labour intensive, which is palm oils major financial disadvantage. **To deal with the high labour requirement of the oil palm plantations often rely on large amounts of migrant labour.**

Oil palm fruits are processed to produce two types of oil:

- **Crude Palm Oil** (CPO) from the fibrous mesocarp around the outside of the fruits and;
- **Crude Palm Kernel Oil** (CPKO) from the kernels at the centre of the fruits.

Although both oils originate from the same fruit, palm kernel oil is chemically and nutritionally distinct from palm oil and can have different end use applications. **The high level of versatility of palm oil and palm kernel oil means that they are found in over half of all consumer products covering a wide variety of product categories from shampoos and liquid detergents to baked goods, margarines and confectionary.**

Importantly palm oil does not require artificial hardening, via hydrogenation, for use as a food in hard fat applications. Since hydrogenation creates trans-fats, which are considered unhealthy and have stringent incorporation limits in many markets, palm oil is widely used as a naturally hard fat in food products. **Therefore palm oil is currently important for the production of many food products in countries where products are required to be trans-fat fee.**

The production of oil palm is split between company owned plantations and smallholders (defined as having less than 50 hectares). In many countries, it is a requirement that

company-owned plantations include land for smallholders. The contribution to palm oil production from smallholders differs depending on the country. In South East Asia roughly 60% of the palm oil comes from the larger plantation companies (privately owned or government-linked) and 40% from smallholders. **The high yield of the oil palm makes it a very attractive source of income for smallholder farmers and a key component of rural development.**

The relationship between plantations and smallholders is built on the fact that the FFB produced from these smallholders' plantations is processed in company mills alongside the FFB produced from the company's plantation. Each mill typically has a catchment area of up to 5,000 hectares of palms. **The FFB deteriorate quickly after harvesting (typically within 24 hours), which limits the distance they can be transported**. In addition, the company may provide technical support and subsidised inputs, such as fertiliser, **as high and consistent fertiliser applications are required to maintain yields once harvesting commences.**

In order to maximise the oil extraction rate and ensure optimum oil quality, stringent plantation management, strict harvesting standards and efficient processing of the fresh fruit bunches (FFB) are critical. **The complexity of the supply chain necessitates close co-operation between smallholders and plantations.**

India is the largest consumer of palm oil almost all of which is imported, followed by Indonesia. Among high-income consumer markets, only the EU (ranked third) and the US (ranked tenth) appear in the top ten palm oil consumers. **All high-income countries together consume exactly one sixth of world palm oil output. The remaining five sixths of global production are consumed by middle and low-income countries. Asia alone consumes exactly two thirds of the world's palm oil supply.**

The bulk of palm oil consumption and consumption growth will occur in the developing world.

9.3. The environmental impacts of oil palm cultivation and palm oil production

9.3.1. Deforestation

The environmental impact of the palm oil industry often focuses on deforestation in tropical forests resulting from oil palm cultivation.

Overall area under oil palm in Indonesia and Malaysia has increased from 2.6 million hectares in 1990 to over 15 million hectares in 2014, and there is evidence that higher crude palm oil (CPO) prices encourage the planting of oil palm.

A reliable study suggests that around 45% of oil palm plantations in Southeast Asia came from areas that were forests in 1989. For Indonesia and Malaysia, the estimates were 54% and 40% respectively. In other regions the planting on forested areas appears to have been lower – at 31% in South America, 7% in Africa and 2% in Central America.[503]

[503] Vijay V., Pimm S.L., Jenkins C.N., Smith S.J. 'The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss'. *PLoS ONE* 11/7 (2017), 1-19.

The oil palm is not the only cause of deforestation. **Estimates for the proportion of deforestation caused by the expansion of the oil palm in Indonesia range from 11% (between 2000 and 2010) to a maximum of 16% (between 1990 and 2005).**[504]

Two-thirds of the forest area converted to palm oil plantations is estimated to be embodied in global trade in palm oil.[505] **The EU alone was estimated to be responsible for 0.9 million hectares of embodied deforestation through its imports of palm oil between 1980 and 2000.**[506]

In summary, we conclude that whilst there are other drivers of historical deforestation in producer regions, there is a high degree of confidence that the expansion of oil palm cultivation has resulted in significant deforestation in Indonesia and Malaysia in particular.

Future expansion of palm oil cultivation may result in different deforestation patterns to those seen in the past. A large proportion of the suitable oil palm planting area in Malaysia is now utilised, meaning that further deforestation is likely to be focused on Sarawak[507], where the provincial government is promoting plantation expansion.[508] The proposed further doubling of palm oil in Indonesia[509] could theoretically be done without further loss of forestland and without compromising rice production,[510] but it remains to be seen whether such a course will be followed.

Globally, an estimated 234 million hectares of suitable and available land are available for palm oil cultivation, a significant proportion of which is in the Amazon.[511] In Brazil, initiatives from the federal government to restrict oil palm expansion to already deforested areas (the Sustainable Palm Oil Production Program and the Agro-Ecological Zoning of Oil Palm in Deforested Areas of the Amazon) have

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504 Abood, S. A., Lee, J. S. H., Burivalova, Z., Garcia-Ulloa, J., and Koh, L.P. 'Relative contributions of the logging, fiber, oil palm, and mining industries to forest loss in Indonesia'. Conservation Letters 8 (2015), 58-67.

505 Henders, S., Persson, U.M. & Kastner, T. (2015). 'Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities'. Environmental Research Letters 10/12 (2015), 125012.

506 Cuypers, D., Geerken, T., Gorissen, L., Lust, A., Peters, G., Karstensen, J., Prieler, S., Fisher, G., Hizsnyik, E. and van Velthuizen, H. 'The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation'. European Union Technical Report - 2013 - 063 (2013).

507 There is a collaboration between Malaysia, Brunei and Kalimantan, Indonesia under the "Heart of Borneo" Initiatives for approximately 200,000 km2 of forest conservation. Sarawak targets increasing the size of Totally Protected Areas and Forest Habitats to 1 million ha by 2020.

508 Cramb, R. 'The Political Economy of Large Scale Palm Oil development in Sarawak', in Cramb, R, and McCarthy, J.F., eds., *The Oil Palm Complex* (Singapore, 2016) 189-246.

509 Jakarta Post (December 2, 2009) 18 million hectares of land for palm oil. Jakarta Post. http://www.thejakartapost.com/news/2009/12/02/indonesia-allocates-18- million-hectares-land-palm-oil.html

510 Koh, L.P. & Ghazoul, J. 'Spatially explicit scenario analysis for reconciling agricultural expansion, forest protection, and carbon conservation in Indonesia'. *Proceedings of the National Academy of Science*, 107/24 (2010), 11140–11144.

511 Pirker, J., Mosnier, A., Kraxner, F., Havlík, P and Obersteiner, M. 'What are the limits to oil palm expansion?' *Global Environmental Change*, 40 (2016) 73–81.

apparently had some initial success in reducing the environmental impacts of palm oil expansion.[512]

The areas potentially under threat from future deforestation include Borneo, Indonesian Papua, Papua New Guinea, parts of Central America and large swathes of West Africa and South America.

9.3.2. Biodiversity loss

A central concern over deforestation is the extent to which it leads to biodiversity loss. Conversion of forest to other land uses and degradation of forest reduces the extent and quality of habitat, thus causing a loss of biodiversity. Concern is particularly acute, in the lowland tropics, where oil palm is predominantly cultivated,[513] as they contain the most species rich forests on Earth.[514]

Those of Southeast Asia are amongst the most biodiverse of all, contain high levels of endemism[515] and include charismatic and endangered fauna, such as orang-utan, Asian elephant, Sumatran tiger, birds of paradise, and three species of rhinoceros. **Indonesia, for example, covers just 1.3% of the globe's land surface, yet its forests are home to around 10% of all species of flowering plants, 17% of all species of birds, 12% of all species of mammals, 16% of all species of reptiles, and 16% of all species of amphibians**.[516]

It is well established and uncontested that the conversion of tropical forest to agriculture, plantations and other land uses causes a significant loss of species.[517] **Loss of species occurs whether or not the forest converted to plantations has been previously logged**, because selectively logged forest typically retains a significant proportion of the biodiversity of unlogged, primary tropical forest.[518,519,520]

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512 Brandão, F. and Schoneveld, G. 'The state of oil palm development in the Brazilian Amazon: Trends, value chain dynamics and business models.' Centre for International Forestry Research Working Paper 198. CIFOR (2015), Bogor, Indonesia.

513 Corley, R.H.V. and Tinker P.B. (eds.) *The Oil Palm* (Oxford, 2003).

514 Whitmore, T.C., *Introduction to Tropical Rain Forests* (Oxford, 1998).

515 Whitmore, T.C., *Tropical Rain Forests of the Far East* (Oxford, 1988).

516 Collins, N., Sayer, J.A. and Whitmore, T.C. *The Conservation Atlas of Tropical Forests: Asia and the Pacific.* International Union for the Conservation of Nature (IUCN) (London, 1991).

517 Brook, B.W., Sodhi N.S., Ng P.K.L. 'Catastrophic extinctions follow deforestation in Singapore'. *Nature* 424 (2003), 420–423.

518 Barlow, J., Gardner T.A., Araujo I.S., Ávila-Pires, T.C., Bonaldo, A.B., Costa, J.E., Esposito, M.C., Ferreira, L.V., Hawes, J., Hernandez, M.I.M., Hoogmoed, M.S., Leite, R.N., Lo-Man-Hung, N.F., Malcolm, J.R., Martins, M.B., Mestre, L.A.M., Miranda-Santos, R., Nunes-Gutjahr, A.L., Overal, W.L., Parry, L., Peters, S.L., Ribeiro-Junior, M.A., da Silva, M.N.F., da Silva Motta, C., and Peres, C. A. 'Quantifying the biodiversity value of tropical primary, secondary and plantation forests'. *Proceedings of the National Academy of Science* 104 (2007), 18555–18560.

519 Gardner, T.A., Ribeiro-Junior, M.A., Barlow, J., Avila-Pires, T.C.S., Hoogmoed M.S., and Peres C.A. 'The value of primary, secondary, and plantation forests for a neotropical herpetofauna'. *Conservation Biology* 21 (2007), 775–787.

520 Putz, F.E., Zuidema, P.A., Synnott, T., Pena-Claros, M., Pinard, M.A., Sheil, D., Vanclay, J.K., Sist, P., Gourlet-Fleury, S., Griscom, B., Palmer, J. and Zagt, R. 'Sustaining conservation values in selectively logged tropical forests: the attained and the attainable'. *Conservation Letters* 5 (2012), 296–303.

In summary, there is high confidence that the conversion of forest – primary or selectively logged – to oil palm cultivation causes a significant loss of biodiversity, with forest specialist species particularly affected.

9.3.3. Peatland conversion

Malaysia, Indonesia and Papua New Guinea support some of the most extensive tropical peatlands in the world, covering around 27.1 million hectares.[521] **Only 36% of the historical peat swamp forest area in the region remains, with only 9% currently in designated protected areas,[522] and the majority of the remaining areas are now degraded.[523]**

The development of peat land can have a disproportionate impact on biodiversity and greenhouse gas emissions, because the Indo-Malay peat swamp forests provide habitat for a large number of globally threatened species, which are threatened by the conversion of peat land and because peat land contains a high proportion of carbon. Once drained, decomposing organic matter by oxidation results in carbon dioxide emissions, and drained peat is highly flammable: once alight, peat fires can burn for months or even years.

The largest oil palm growing regions (Peninsular Malaysia, Borneo and Sumatra, i.e., virtually all the combined Indonesian and Malaysian oil palm areas) are estimated to have had 14.75 million hectares of peatland, 27% of which estimated to have been converted to industrial plantations by 2015, of which 73% (3.1 million hectares) was oil palm.[524]

The impact this has had in terms of greenhouse gas emissions is difficult to assess exactly. This is partly due to the fact there are large differences in peat thickness, which range from less than 1 metre to over 12 metres.[525] As there does not appear to a body of research describing oil palm planted by peat depth this cannot be consistently factored into calculations.

9.3.4. Greenhouse gas emissions

Greenhouse gas emissions from oil palm cultivation and palm oil production derive from two main sources: (a) **land use change** and (b) **plantation and mill activities**.

Tropical forests store around 46% of the world's living terrestrial carbon,[526] and 25% of total net global carbon emissions may stem from deforestation.[527]

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521 Hooijer, A., Silvius, M., Wösten, H. and Page, S. 'PEAT-CO2, Assessment of CO2 emissions from drained peatlands in SE Asia'. *Delft Hydraulics report Q3943* (2006), Delft, Netherlands.

522 Posa, *et al.,* (2011). *Op. cit.*

523 Yule, C.M. 'Loss of biodiversity and ecosystem functioning in Indo-Malayan peat swamp forests'. *Biodiversity and Conservation* (2010) 19:393–409.

524 Miettinen, J., Shi, C., and Liew, S.C. Land cover distribution in the peatlands of Peninsular Malaysia, Sumatra and Borneo in 2015 with changes since 1990' Global Ecology and Conservation, Volume 6, (2016), Pp 67–78.

525 Hooijer et al. (2006). Op. cit.

526 Soepadmo, E. 'Tropical rain forests as carbon sinks'. *Chemosphere* 27 (1993), 1025–1039.

Land use change can result in large net greenhouse gas emissions. For example: unlogged Asian tropical forests store approximately 400 tonnes of carbon per hectare above ground[528,] whilst a fully mature oil palm plantation only stores around 91 tonnes per hectare.

Therefore oil palm plantations only store a third as much carbon as unlogged forests, meaning that an estimated net amount of 163 tonnes per ha of stored carbon is emitted to the atmosphere when rainforest is converted to oil palm.[529] **In addition, clearing forest with fire is estimated to result in additional emissions of between 207 to 650 tonnes of carbon per hectare.[530]**

If the original habitat were peat swamp forest, then a soil carbon stock of 1,550 tonnes per hectare would be added to emissions from the oxidisation of drained peat soil,[531] or a total of at least 1,300 tonnes carbon dioxide equivalents during the first 25-year cycle of oil palm growth.

In contrast, oil palm plantations established on degraded grassland will replace the released carbon within approximately 10 years, as grassland has an above ground carbon stock that has been estimated at less than that of a mature oil palm plantation: 39 tonnes per hectare.[532] **This suggests that oil palm plantations established on grassland would result in the net removal of about 135 tonnes carbon dioxide per hectare from the atmosphere over a 25-year period**.

In addition to land use change, greenhouse gas emissions occur from mill and plantation activities, including methane emissions from the treatment of POME, nitrous oxide release from the use of nitrogen fertilisers, and carbon dioxide emissions from using fossil fuels. The methane emissions are increasingly being converted, with government support, into feedstocks for power generation, either for use within a mill or for electric power for wider geographical use. The emissions from these sources are smaller than the emissions from forest conversion.

In summary, there is consistent and rigorous evidence that converting forests to palm oil plantations results in net greenhouse gas emissions. Emissions are extremely high if the forest being converted is peat swamp forest, high from unlogged forest on mineral soils and variable from selectively logged forest. **Conversion of grasslands, however, can see a net uptake of carbon dioxide**.

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527 Skutsch, M., Bird, N., Trines, E., Dutschke, M., Frumhoff, P., de Jong, B., van Laake, P., Masera, O., and Murdiyarso, D. 'Clearing the way for reducing emissions from tropical deforestation'. *Journal of Environmental Science and Policy* 10 (2007), 322–334.

528 Murdiyarso, D., M. van Noordwijk, M., Wasrin, U.R., Tomich, T.P. and A. N. Gillison. 'Environmental benefits and sustainable land use options in the Jambi transect, Sumatra'. *Journal of Vegetation Science* 13 (2002), 429–438.

529 Danielsen *et al.* (2008), *op. cit.*

530 Germer J. and Sauerborn, J. 'Estimation of the impact of oil palm plantation establishment on greenhouse gas balance'. *Environment Development and Sustainability* 10 (2007), 619-716.

531 Hooijer *et al.* (2006), *op. cit.*

532 Murdiyarso *et al.* (2002), *op. cit.*

9.3.5. The use of fire and its impacts

The annual use of fire to clear forests for agriculture, in particular in Kalimantan and Sumatra, are a major source of greenhouse gas emissions, air pollution and biodiversity loss, as well as reducing carbon storage.

Forest fires can be particularly severe during the droughts associated with El Niño. For example, **the 2015 fires in Indonesia were associated with an El Niño event and caused emissions of between 1.62[533] and 1.75[534] billion tonnes of CO_2 equivalent, effectively tripling Indonesia's greenhouse gas emissions for that year**.

Oil palm cultivation could be responsible for perhaps 16-19%[535] [536] **(and 52% in Sumatra in 2013) of these fires,** albeit based on a small number of rigorous studies.

9.3.6. Air pollution and haze

Haze pollution consists of airborne particles, including fine ($PM_{2.5}$) and ultrafine (PM_{10}) particles generated from fires. The principal source of haze in Southeast Asia is fires started in order to clear land for agriculture, especially on peat lands, with Sumatra and Kalimantan the main source locations.[537,538] **This has been an occasional but sometimes severe problem in Southeast Asia over the past 20 years.**

The health effects of haze include potential *in utero* deaths, respiratory ailments and exacerbation of existing heart and lung conditions. **Severe haze in 2015, lasting three months, resulted in an estimated 100,300 excess deaths across Indonesia, Malaysia and Singapore.[539]**

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533 Chamorro, A., Minnemeyer, S., and Sargent, S. *Exploring Indonesia's Long and Complicated History of Forest Fires*. World Resources Institute, February 16, 2017 http://www.wri.org/blog/2017/02/exploring-indonesias-long-and-complicated-history-forest-fires

534 World Bank 'The Cost of Fire An Economic Analysis of Indonesia's 2015 Fire Crisis'. *Indonesia Sustainable Landscapes Knowledge Note: 1*. The World Bank Group (2016), Jakarta

535 Recalculated from figure on page 1 of World Bank (2016), *op. cit.*

536 Cattau, M.E., Marlier, M.E., and DeFries, R. 'Effectiveness of Roundtable on Sustainable Palm Oil (RSPO) for reducing fires on oil palm concessions in Indonesia from 2012 to 2015'. *Environmental Research Letters* 11 (2016), 105007

537 Sastry, N. 'Forest fires, air pollution, and mortality in Southeast Asia'. *Demography* 39 (2002), 1–23.

538 Reddington, C., Yoshioka, M., Balasubramanian, R., Ridley, D., Toh, Y., Arnold, S. and Spracklen, D. 'Contribution of vegetation and peat fires to particulate air pollution in Southeast Asia'. *Environmental Research Letters*, 9 (2014), 094006.

539 Koplitz, S.N., Mickley, L.J., Marlier, M.E., Buonocore, J.J., Kim, P.S., Liu, T., Sulprizio, M.P., DeFries, R.S., Jacob, D.J., Schwartz, J., Pongsiri, M. and Myers, S.S. 'Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure'. *Environmental Research Letters*, 11 (2016), 094023.

Other economic impacts include disruption to transport and tourism.[540][541] The economic impacts of haze are felt most strongly in Indonesia, Singapore and Malaysia but can also extend to Vietnam, Thailand and the Philippines.[542][543][544]

In summary, there is a body of evidence that transboundary haze pollution, causes economic and health damage in Southeast Asia. **Forest fires, especially those on peat lands, which are started to clear land for agriculture, are the main cause of haze. Oil palm cultivation is one of the contributor factors to these fires**.

9.3.7. Water pollution

The dominance of palm cultivation and milling in some landscapes means that watershed-scale impacts on surface and ground water can occur. The major risks of water pollution from oil palm cultivation are run-off and sedimentation during the clearing and establishment phase of plantations when the soil is largely uncovered;[545] discharge of untreated palm oil mill effluent (POME); and the release of agrichemicals through run-off, soil erosion and leaching.[546] The limited evidence that exists suggests that water pollution from palm oil plantations is usually within national and international norms.

9.4. The economic and social impacts of oil palm cultivation and palm oil production

The economic and social impacts of palm oil are complex and contradictory. Oil palm cultivation has provided livelihoods for many rural people, including smallholders, and has supported rural development[547]. However, it has also often been associated with social concerns, the most important of which are land use rights, forced and child labour, and issues relating to the terms and conditions of labour, (such as wages, health and safety and gender discrimination).

9.4.1. The effect of oil palm on smallholders' livelihoods, income and wellbeing

Smallholder income estimates suggest that the oil palm farmers receive higher incomes than those with similar rice and rubber holdings.[548] However, yields – and

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[540] Lee, J.S.H., Jaafar, Z., Tan, A.K.J., Carrasco, L.R., Ewing, J.J., Bickford, D.P., Webb, E.L. and Koh, L.P. 'Toward clearer skies: challenges in regulating transboundary haze in Southeast Asia'. Environmental Science and Policy 55 (2016), 87–95.

[541] Lin *et al.,* (2017), *op. cit.*

[542] Chisholm, R.A., Wijedasa, L.S. and Swinfield, T. 'The need for long-term remedies for Indonesia's forest fires'. Conservation Biology 30 (2016), 5–6.

[543] Lee *et al.,* (2016), *op. cit.*

[544] Lin *et al.,* (2017), *op. cit.*

[545] Goh, K. J., Härdter, R., and Fairhurst, T. 'Fertilizing for maximum return'. In *Oil Palm: Management for Large and Sustainable Yields* (T. Fairhurst and R. Hardter, Eds.), pp. 279–306. Potash & Phosphate Institute/Potash & Phosphate Institute of Canada and International Potash Institute (PPI/PPIC and IPI), 2003, Singapore.

[546] Goh *et al.* (2003) *ibid.*

[547] Section 7.3.12 discusses the wider economic and social benefits of the oil palm sector using Input-Output and multiplier techniques.

[548] Khor, Yuleng (2016), Socio-economic parameters for peat restoration policy makers [presentation], LM International Ltd, 15th International Peat Congress (Kuching: 17 Aug. 2016).

therefore revenue - obtained by smallholders often depend on the assistance they receive in terms of higher-yielding planting materials, credit, fertiliser and technical advice. However, poorer households and those unable manage debt or to access technical support may not be able to benefit.

There is significant variation in the way that smallholder oil palm cultivation is organised. One of the most successful schemes for organising smallholders is Malaysia's Federal Land Development Authority (FELDA). The FELDA project began in 1956 as a resettlement scheme for landless peasants. FELDA was able to settle 122,000 families between 1959 and 1990, developing about 470,000 hectares (ha).[549] **Over five decades, the Felda scheme succeeded in raising smallholder household incomes considerably above the national poverty line**, prompting some observers to characterise it as 'one of the most successful land settlement organisations in the world'.[550] Other notable examples include the corporate-led development of smallholder schemes in Indonesia.

9.4.2. Land use rights

Oil palm expansion has been accompanied by disputes over land rights in which the creation of large-scale plantations has, in some instances, resulted in local and indigenous peoples losing their customary land, and along with it part of their traditional livelihoods and cultural reference. This has been documented in Indonesia,[551] [552] [553] [554] and to a lesser extent in Malaysia,[555] [556] Papua New Guinea,[557] Cambodia,[558] the

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549 Khor, Yuleng (2016), Socio-economic parameters for peat restoration policy makers [presentation], 15th International Peat Congress (Kuching: 17 Aug. 2016).

550 Sutton, K. (1989), Malaysia's FELDA (Federal Land Development Authority) land settlement model in time and space, *Geoforum*, Volume 20, Issue 3, 1989, Pages 339-354.

551 Siscawati, M. 'The Case of Indonesia: Under Soeharto's Shadow'. *In The bitter fruit of oil palm: dispossession and deforestation.* World Rainforest Movement (2001), UK.

552 Colchester, M. and Jiwan, N. *Ghosts on our own land: Indonesian oil palm smallholders and the Roundtable on Sustainable Palm Oil*. Forest People's Programme & Sawit Watch (2006), Moreton-in-Marsh, UK and Bogor, Indonesia.

553 Colchester, M., Jiwan, N., Andiko, Sirait, M., Firdaus, A.Y., Surambo, A., and Pane, H. *Promised Land: Palm Oil and Land Acquisition in Indonesia: Implications for local communities and indigenous peoples*. Forest People's Programme, Sawit Watch, HuMa and World Agroforestry Centre (2007), Moreton-in-Marsh, UK and Bogor, Indonesia.

554 Marti, S. *Loosing ground: the human rights implications of palm oil plantation expansion in Indonesia*. Friends of the Earh & Sawit Watch (2008), London and Bogor.

555 Dayang Norwana, A.A.B., Kunjappan, R., Chin, M., Schoneveld, G., Potter, L. and Andriani, R. 'The local impacts of oil palm expansion in Malaysia: An assessment based on a case study in Sabah State'. *Working Paper 78*. CIFOR (2011), Bogor, Indonesia.

556 Chao, S. 'Malaysia: the Murut struggle against palm oil, for land and life'. *The Ecologist* (12th December 2016). Available at: http://www.theecologist.org/campaigning/2988442/malaysia_the_murut_struggle_against_palm_oil_for_land_and_life.html

557 Numapo, J. *Commission Of Inquiry Into The Special Agriculture And Business Lease (SABL).* Chief Commissioner Port Moresby 24th June, 2013, Papua New Guinea.

558 Sokhannaro, H.E.P, 'Oil palm development in Cambodia.' In Colchester, M. and Chao, S. Oil Palm Expansion in South East Asia: Trends and Implications for Local Communities and Indigenous Peoples. (Forest People's Programme and SawitWatch (2011), Moreton-in-Marsh, UK and Bogor, Indonesia.

Philippines,[559] Nigeria,[560] Liberia,[561] and Colombia.[562] These land use disputes are often in fact disagreements about how rural development is carried out rather than about oil palm *per se*.[563]

Accurate figures for the total number of land rights issues associated with oil palm plantations globally are not available, but Indonesia's National Land Bureau of Indonesia estimated that around half of the country's 8000 land conflicts are within the oil palm sector in 2012.[564] In summary, **there is strong evidence that oil palm has expanded on to land traditionally used by indigenous peoples and local communities**. This can result in grievances that sometimes escalate into conflict, and occasionally violence between plantation companies and local people. **This appears to be a particularly focused in Indonesia, where many of the examples cited in this study are recorded.**

9.4.3. Forced or child labour

Forced labour is any work or service that is exacted from a person under the threat of penalty, and for which that person has not offered himself or herself voluntarily. 'Child labour', is defined by ILO Convention No.182 as 'work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development.'

Whilst **there is limited official data on the incidence of forced and child labour within the palm sector in major producing countries**, there are concerns that the high reliance on migrant labourers on plantations, who are more vulnerable to exploitation, may result in incidences of forced labour.[565]

Indeed, the US Department of Labor's List of Goods Produced by Child Labor or Forced Labor **includes palm oil produced in Malaysia (both forced and child labour), Indonesia (child labour) and Sierra Leone (child labour)**.[566] NGO and Press reports of child and forced labour also surface sporadically.[567] [568] [569] Notably in December 2016,

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559 Harbinson, R. *Broken Promises: Communities in Philippine island take on palm oil companies*. Mongabay (23 October 2015).

560 Friends of the Earth. *Exploitation and empty promises: Wilmar's Nigerian land grab.* Friends of the Earth (2016), USA and Nigeria.

561 RAN. *Conflict Palm Oil in Practice: Exposing KLK's role in Rainforest Destruction, Land Grabbing and Child Labor*. Rainforest Action Networm (2014), San Francisco.

562 Miroff, N. 'In Colombia, a palm oil boom with roots in conflict.' The Washington Post (December 30, 2014).

563 Levang, P., Riva, W.F., Orth, M.G. 'Oil palm plantations and conflict in Indonesia: evidence from West Kalimantan' in Cramb, R, and McCarthy, J.F., eds, *The Oil Palm Complex* (Singapore, 2016), 283-300.

564 Badan Pertanahan Nasional (National Land Bureau, Indonesian Government): presentation to RSPO 2012

565 UNICEF 'Palm Oil and Children in Indonesia'. United Nations Children's Fund (2016)

566 Bureau of International Labor Affairs. *List of Goods Produced by Child Labor or Forced Labor*. US Department of Department of Labor (2014), USA.

567 World Vision 'Forced, child and trafficked labour in the palm oil industry'. World Vision Australia (2012).

568 Skinner, E.B. 'Indonesia's Palm Oil Industry Rife With Human-Rights Abuses: The hidden human toll of the palm oil boom'. Bloomberg Business Week, 2013).

Amnesty International published the results of an investigation into Wilmar, the world's largest processor of palm oil, finding serious human rights abuses in the plantations of Wilmar and its suppliers.[570]

Reports range from press reports to meticulous interviews, but do not collectively provide sufficient information to conclude with a high degree confidence how widespread forced and child labour is.

9.4.4. Terms and conditions of labour

The terms and conditions of labour ('working conditions') cover a broad range of issues, including hours worked, wages, leave, health and safety and the right to assembly. The very high reliance on migrant workers once again is a cause for concern, as they typically have less legal protection on labour rights issues than the domestic workforce.

For example, an estimated two-thirds of palm oil workers in Malaysia and Indonesia, over 2.5 million people, are internal or international migrants[571]. Indonesian oil palm workers in Malaysia receive only two thirds of the wage of a Malaysian, and just one third if they are unregistered.[572]

A recent Amnesty International report into five plantations in Indonesia found that workers were paid below the legal minimum wage, potential breaches of regulations on overtime pay, insufficient training on use of hazardous chemicals and inconsistent use of safety equipment and the potential exclusion of women from permanent employment.

In Malaysia, following complaints, ASI, the organisation that accredits RSPO certifiers, found pay below the minimum and insufficient leave at an RSPO certified FELDA estate. Some labourers are kept as causal labourers for extended periods (years), without the terms and conditions to which permanent employees are entitled.

Evidence from analysis of RSPO audits[573] and NGO investigations[574] [575] [576] suggest that issues regarding terms and conditions of oil palm plantation

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https://www.bloomberg.com/news/articles/2013-07-18/indonesias-palm-oil-industry-rife-with-human-rights-abuses

569 Al-Mahmood, S.Z. (2015), 'Palm-Oil Migrant Workers Tell of Abuses on Malaysian Plantations', The Wall Street Journal (26 Jul. 2015), https://www.wsj.com/articles/palm-oil-migrant-workers-tell-of-abuses-on-malaysian-plantations-1437933321, accessed 1 Feb. 2017.

570 Amnesty International (2016), *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names* (London: Amnesty International, 7 Dec. 2016), https://www.amnesty.org/en/documents/asa21/5184/2016/en/, accessed 1 Feb. 2017.

571 Cramb, R, and McCarthy, J.F. 'Characterising Oil Palm Production in Indonesia and Malaysia', in Cramb, R, and McCarthy, J.F., eds., *The Oil Palm Complex* (Singapore, 2016) 27-77.

572 Cramb, R, and McCarthy, J.F. (2016) *ibid.*

573 Lord, S., and Durham, K. *Analysis of RSPO certification and surveillance audit reports across Indonesia, Malaysia and the Rest of the World*. Global Sustainability Associates (2014), Singapore.

574 Amnesty International. *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names*, Amnesty International (2016), London.

575 International Labour Rights Forum & Sawit Watch (2013) *op. cit.*

576 EIA. *Who Watches the Watchmen? Auditors and the Breakdown of Oversight in the RSPO*. Environmental Investigation Agency (2015), London.

workers, such as below minimum wages, gender discrimination and exposure to unsafe working practices, may be widespread.

9.5. The role and potential of existing palm oil sustainability certification schemes

The four main sustainable palm oil certification schemes reviewed in this study are:

- The **Roundtable on Sustainable Palm Oil (RSPO):** established in 2004 was the first scheme specific to oil palm. It remains the most prominent global scheme in the sector with a membership of 3,413 organisations. RSPO is the predominant certification system in the food, oleochemical and hygiene and care sectors.
- The **International Sustainability and Carbon Certification (ISCC):** was created in 2010 and whilst it is applicable to all end uses, the ISCC EU standard is the predominant standard for biofuels and bioliquids, and is used to ensure compliance with the sustainability criteria requirements set in the EU Renewable Energy Directive (Directive 2009/28/EC).
- The **Indonesian Palm Oil Standard (ISPO):** was launched by the Indonesian Government in 2011. The standard is based on existing Indonesian regulations that pertain to palm oil cultivation and processing and is mandatory for Indonesian companies producing and/or processing palm oil.
- The **Malaysian Sustainable Palm Oil (MSPO):** was started as a voluntary standard in 2015 and is expected to become mandatory.

There are significant differences in the processes underpinning certification as well as in the requirements of the standards. We will look at each in turn.

9.5.1. Certification process of the four schemes

Table 77 summarises the certification process in the four schemes demonstrating that:

- All four schemes rely on **third party, independent audits** to verify compliance with the standards, and surveillance audits are repeated annually. The RSPO, ISCC and MSPO have independent **accreditation** of the certification bodies who decide whether a certificate is granted or not, and the same schemes provide a degree of transparency through making documents on audits and complaints publicly available. The ISPO system has less robust and transparent procedures on these elements, but like the ISCC and RSPO, has supply chain verification mechanisms. MSPO is currently in the process of developing similar supply chain verification procedures.

- Alongside differences in the certification and accreditation processes there are differences in how the schemes cover environmental and social themes, as Table 78 below demonstrates. For example, the four standards differ markedly regarding **deforestation**. The **ISCC** excludes production from primary forest, and forests of high biodiversity value (Criterion 1.1), and degraded forest (Criterion 1.3). Degraded forest is defined conservatively, with a high proportion of logged forest included in the restriction. The **RSPO** standard has the less exacting requirement that forest clearance is legal, but primary forest and High Conservation forest are not to be cleared for oil palm cultivation.[577] The **ISPO**

[577] High Conservation Value' was first articulated in the Forest Stewardship Council's Principles and Criteria to define and maintain the world's most important forests for biodiversity,

standard permits forest clearance provided it is within land zoned for agriculture; is allowed under the environmental impact assessment; and the government has granted the necessary permits. The **MSPO** standard is broadly similar to ISPO, but with additional requirements on Environmentally Sensitive Areas and areas with high biodiversity value.

- **Overall, the ISCC provides the most restrictive environmental safeguards, while the RSPO is stronger on the social issues relating to oil palm. MSPO provides strict standards for plantation management (dealing with burning, air and water pollution). The ISPO is based on existing Indonesian regulations that pertain to oil palm cultivation and processing and has a more limited coverage, addressing to a lesser extent the possible negative environmental and social impacts of palm oil production.**

Table 77: Summary of certification processes within four palm oil certification schemes

Certification scheme element		Standard			
		RSPO	ISCC	ISPO	MSPO
Certification	Who: independent 3rd Party				
	How: audit				
	How often: annual surveillance				
	Who decides: certification body				
Accreditation	Fully independent accreditation				
Complaints	Documented procedures available				
Transparency	Audit reports publicly available				
Claims	Supply chain verification				

Note: Dark shading indicates that the process reaches best practice, with the greatest restrictions on activities; pale shading indicates absence of the process; mid-shade implies an intermediate state.

ecosystem services, culture and society. The notion has been extended to include other, non-forest ecosystems, and within other sectors, such as oil palm.

Table 78: Summary of provisions within standards against environmental and social themes.

Theme	Standard			
	RSPO	ISCC	ISPO	MSPO
Deforestation				
Biodiversity				
Peat land conversion				
GHG emissions				
Burning				
Air pollution				
Water pollution				
Rights & Wellbeing				
Land use rights				
Treatment of smallholders				
Forced and Child labour				
Terms and conditions of labour				

Note:
Dark shading indicates that the process reaches best practice, with the greatest restrictions on activities; pale shading indicates absence of the process; mid-shade implies an intermediate state.

9.5.2. Analysis of palm oil certification systems and the environmental objectives in selected EU and UN policy instruments

The report provides a first-order analysis of how certification standards relate to the objectives of selected EU, UN and regional policy instruments.

No single certification scheme fully addresses all of the EU and UN policy instruments identified and used in this study. It should be noted that this does not mean that any of the schemes assessed here are 'poor': none of them were designed to address the suite of EU and UN instruments assessed (although the ISCC scheme was developed around the EU RED sustainability criteria), and divergence between the content of the schemes and the objectives of these instruments is therefore not surprising.

In general terms:

- **The ISCC addresses a larger share of the environmental objectives of EU and UN instruments than the other schemes**. This is largely a result of the restrictions on converting land with high carbon stock, and the clear and conservative definition of high carbon stocks within the standard, that in effect prohibits conversion of all but the most degraded secondary forest. This resulted in a strong match with policy objectives on deforestation and greenhouse gas emissions from land use change in particular.
- **The RSPO overall addresses a larger share of the social objectives of EU and UN instruments than the other schemes**. The RSPO standard has broader and more tightly defined requirements on rights and wellbeing, land rights, terms and conditions of labour and responsibilities towards smallholders than the other schemes.
- The **ISPO** scheme generally addresses fewer objectives of EU and UN instruments than either RSPO or ISCC schemes, with the **MSPO** scheme intermediate.

Although hard evidence on the impact of and certification on the ground is limited, a number of NGO reports have surfaced which indicate that serious breaches of standards can occur within certified plantations. However, there is simply insufficient evidence to judge whether or not such breaches are widespread.

9.5.3. Extent of up-take of certified sustainable palm oil.

Together The RSPO and ISCC account for the vast majority of CSPO. **Table 79** shows the volumes of CSPO sold through RSPO and ISCC.

- **The annual supply of RSPO Certified Sustainable Palm Oil (CSPO) is around 12.8 million tonnes**. Sales of RSPO CSPO however, were only around 6 million tonnes.
- **ISCC certification covers almost 9 million tonnes**. Only around half of total ISCC CSPO was bought as such (4.2 million tonnes).

Around half of CSPO therefore was sold as such under each scheme, with the remainder bought as conventional or other certified palm oil. While many producers may be opting for certification under both schemes (thereby inflating the total supply), it is still clear that the supply of CSPO exceeds the demand for certified materials, on a combined basis.

Table 79: RSPO and ISCC market uptake of certified palm oil, 2015

	Number of mills	Estimated capacity, '000 tonnes	Estimated sales, '000 tonnes	% take-up
RSPO	327	12,890	6,183	48%
ISCC	226	8,814	4,250	48%

RSPO does not provide trade data for destination markets. However, an estimated 48% of their overall tonnage is sold in developing or emerging markets. Europe is the leading region for sustainable palm oil use, but CSPO still represents less than half on non-energy uses of palm oil in Europe and the market is declining.

In terms of attainment of general RSPO certification, the food sectors that were most advanced were bakery, dairy/non-dairy and the slowest was fried foods. The home and personal care (HPC) and cosmetics sectors appear to lag behind the food sector in their use of CSPO.

If ISCC CSPO volumes are added to RSPO ISCC, then even for the leading German and UK markets, tonnages indicate certified ratios in the region of 61-63%. Even in the most advanced markets therefore a third of palm oil is still entirely uncertified.

Uptake of CSPO in developing markets is growing but remains very low. Pledges in China and India are limited to global brand names, such as Unilever and McDonald's. There are very few RSPO certified facilities in these markets, particularly in India.

Supply outstrips demand for CSPO. Demand is concentrated in a handful of large international buyers serving developed markets. While the EU is the most advanced region pledges to reach 100% CSPO have not yet been met. Even in the most advanced

member states a third of palm oil is still not certified. Use of CSPO in developing markets remains very low, outside of global brands, as shown by the lack of RSPO certified facilities.

9.5.4. Margins for CSPO and costs of certification

As we have seen demand for CSPO only accounts for around half of total supply, with the remainder sold as regular crude palm oil. **As a result of this oversupply basic RSPO premia are only in the region of $2 per tonne**.

Basic RSPO compliance costs for CSPO are usually higher than the premia. For plantations they are around $5 per tonne (ex-mill) and small producers' between $8-12 per tonne (ex-mill).

Higher premia are available for suppliers of segregated palm oil and downstream specialist products (such as palm kernel oil, oleochemicals and surfactants). However, these are usually the preserve of larger integrated companies.

The significant shortfall between RSPO compliance costs, an inability to secure higher premia for specialist products and the lower premia available to them as a result is creating a disincentive to smallholders to become certified.

9.6. Analysis of existing legislation and enforcement regimes in major producing countries

9.6.1. Extent of existing legislation

Table 80 summarises the main laws by topic in the six case study producer countries included in this study.

Table 80: Overview of legislation in the six case study countries

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Deforestation		■	■	■	■	■	■
Biodiversity loss		■	■	■	■	■	■
Reducing carbon emissions	Land use change (LUC)	■				■	
	Biofuel	■	■	■	■		
	Mills and plantations	■	■				■
Burning		■	■		■		
Peatland conversion		■			■	■	■
Water and pollution		■	■	■	■	■	■
Air pollution	Haze	■	■		■		
	Others	■	■		■	■	■
Indigenous people		■	■	■	■	■	■

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Smallholders		■	■	■	■	■	■
Forced and child labour		■	■	■	■	■	■
Terms and conditions of labour	Health & safety	■	■	■	■	■	■
	Wages & others	■	■	■	■	■	■
Anti-corruption and money laundering		■	■		■		■
Fair pricing		■	■		■	■	■
Land ownership/use permit		■	■	■	■	■	■
Licensing for palm oil estate and mill		■	■	■	■	■	

Source: LMC International analysis based on RSPO data. Note: A shaded box indicates that there is domestic legislation dealing with that topic.

As Table 80 shows, a large number of laws and regulations exist, dealing with most of the environmental and social themes that relate to palm oil sustainability. The table also reveals that there are some areas that are not yet covered by legislation. In some cases this may be because countries benefit from structural elements, which make certain sustainability issues less noticeable. For example, for deforestation both Colombia and Brazil have the advantage of having large areas of pasture to develop, while Malaysia has benefited from a more highly urbanised population than Indonesia, making it easier to control deforestation.

Nonetheless it is clear that there are some issues that are poorly covered in individual countries:

- It is noteworthy **that only two countries make specific reference to Land Use Change** (Indonesia and Gabon).
- Only in Indonesia, Malaysia and Liberia does legislation aim to reducing **carbon emissions** from mills and plantations.
- In a similar vein, ***burning*** does not appear to be a priority for legislation in Brazil, Gabon and Liberia and neither is ***air pollution*** more broadly.

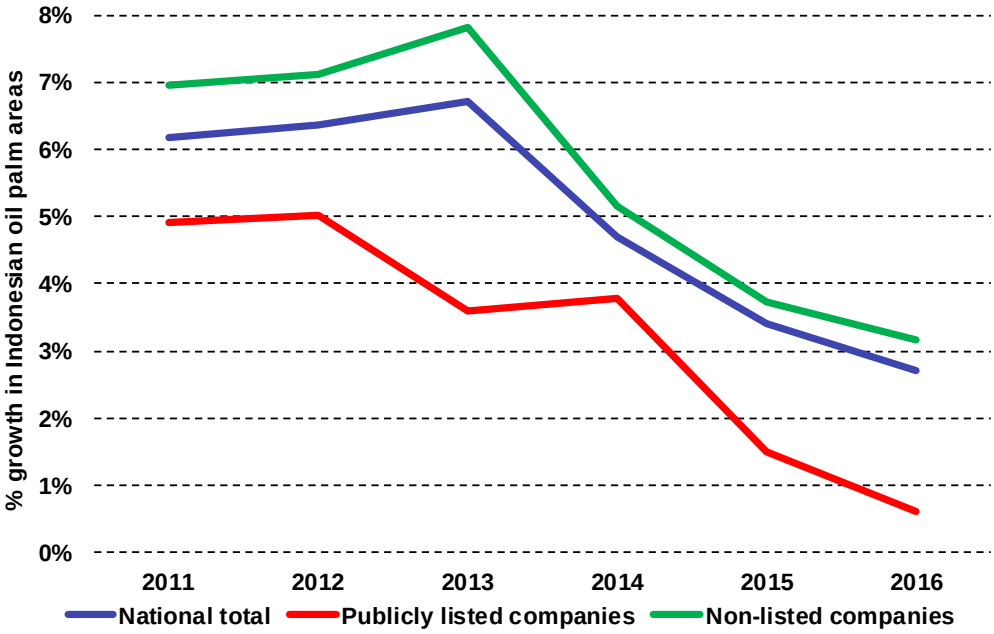
The table demonstrates that most countries have sought to introduce regulations. However, in many cases they are not adequately enforced. In the next section we highlight some of the major enforcement issues.

9.6.2. Enforcement of existing legislation

Difficulties in enforcing legislation can arise as a result of a number of factors: e.g., a lack of clarity on roles and responsibilities between national and sub-national governments and agencies, ambiguity in the underlying laws, a lack of political will, limited capacity, insufficient resources, the potential for corruption and vested interests and bureaucratic inertia. Often the bureaucratic inertia is compounded by factors such as decentralisation, which makes it difficult to enforce national laws. The complexity of the legal system can work in the favour of established plantations, which may have more resources to tackle these issues. The overarching historical problem of land rights allocation also re-emerges frequently.

The recent slowdown in new plantings in Indonesia has been marked among publicly quoted companies with the highest visibility. Figure 40 compares the growth in the planted areas in Indonesia of publicly listed companies with that of Indonesia as a whole and of all producers who are not publicly listed. The slowdown in growth is marked, particularly among the most visible, listed companies, the ones most likely to have signed up to schemes such as RSPO.

Figure 40: The growth in planted areas in Indonesia, by sector



This suggests that the pressures to limit oil palm expansion in particular areas that are likely to breach certification standards are having an impact. However, this almost certainly means that a rising share of those new plantings that do occur is being made in less visible segments of the sector.

Whilst there is little hard evidence by which to ascertain the degree of legal enforcement for palm oil companies within producer companies, an indication can be given by assessing national indicators of governance and of corruption. Six producer countries assessed (Indonesia, Malaysia, Brazil, Colombia, Liberia and Gabon) were all within the bottom or second lowest quartile of countries of the World Bank's Governance ranking. The same six countries fell within the middle two quartiles of Transparency International's Corruption index.

When reported incidences of illegality are also taken into account, it is likely then that enforcement of laws in many producer countries is not consistent. However, it should also be noted that national–level indicators do not account for the specifics of the palm oil sector, nor for companies that choose to be law abiding even in circumstances where laws may not always be enforced.

Finally, there are a number of enforcement issues worth highlighting owing to their severity or potential impact:

- **In Indonesia there is concern that the moratorium over developing forest and peat land may be weakening** – despite high level government support for the policy. To enforce the moratorium, record fines have been meted out on agro forestry companies for illegal forest clearing and fires (including on peatlands)[578] [579], but payment of these high fines is said to still be pending. New ministries have been created to improve enforcement but decentralisation and overlapping governance structures make it difficult for them to act.[580]
- In **Brazil** while measures to ensure environmental sustainability, strong worker rights and transparency are enforced, **the political crisis has led to** a reduction in budget allocated to enforcement activities and an increase in deforestation in the recent past.
- In **Colombia** there is (contested) concern that some expansion of oil palm in the past was accompanied by levels of violence and displacement.

9.7. The review of voluntary initiatives and commitments relating to palm oil

Alongside the four main certification schemes, there are an increasing number of public and private initiatives and commitments relating to different aspects of palm oil sustainability. These have been motivated by, amongst other things:

- Real or perceived weaknesses in the requirements, operation or outcomes from existing palm oil sustainability schemes.
- Real or perceived lack of market share gained by palm oil certification schemes leading to a reduction in the ability of these schemes to affect positive change.
- A growing "No Deforestation, No Peat, No Exploitation" movement, whose argument has been that the RSPO and other certification schemes have been unable to stop the deforestation of biodiverse and carbon-rich primary and secondary forests and peatlands.
- The need to respond to NGO and customer pressure.
- The personal commitment of the CEO of the organisation and the desire to demonstrate industry leadership.

Figure 41 provides a useful categorisation of voluntary initiatives, splitting them into four categories: group initiatives, individual initiatives, initiatives to provide finance and investment support and supporting data and reporting platforms designed to share data, assess compliance and report progress.

We will look at each in turn highlighting the major examples.

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578 Jong, Hans Nicholas (2015), 'Record fine against plantation company upheld', The Jakarta Post, 13 Sep 2015, http://www.thejakartapost.com/news/2015/09/13/record-fine-against-plantation-company-upheld.html, accessed 21 June 2017.

579 Jong, Hans Nicholas (2016), 'Landmark court ruling expected to serve as deterrent'. The Jakarta Post, 18 Nov 2016, http://www.thejakartapost.com/news/2016/11/18/landmark-court-ruling-expected-to-serve-as-deterrent.html, accessed 21 June 2017.

580 ZSL (2017), 'Governments', Sustainable Palm Oil Transparency Toolkit, https://www.sustainablepalmoil.org/governments/, accessed, 20 June 2017.

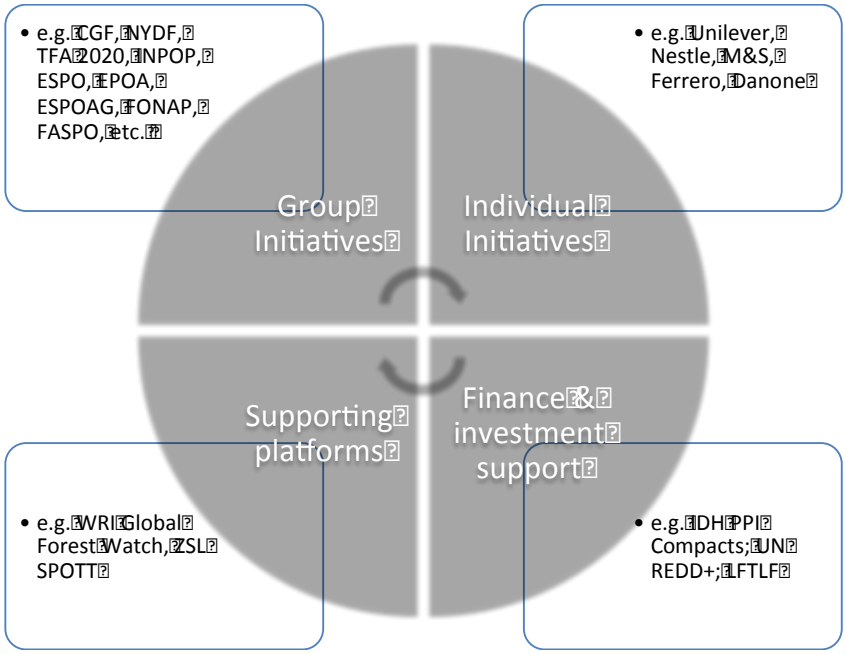

Figure 41: typology of the main forms of voluntary initiative

Key: CGF (Consumer Goods Forum Zero Net Deforestation By 2020 Commitment; NYDF (New York Forest Declaration); TFA 2020 (Tropical Forest Alliance 2020); INPOP (Indonesia Palm Oil Platform); ESPO (European Sustainable Palm Oil); EPOA (European Palm Oil Alliance), ESPOAG (European Sustainable Palm Oil Advocacy Group), FONAP (Forum on Sustainable Palm Oil), FASPO (French Alliance for Sustainable Palm Oil), M&S (Marks and Spencer); WRI (World Resources Institute); ZSL SPOTT (Zoological Society of London, Sustainable Palm Oil Transparency Toolkit); PPI Compacts (Production, Protection & Inclusion Compacts); UN REDD+ (UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries); LFTLF (Landscape Fund for Tropical Landscapes and Forests).

- **Group initiatives and collective commitments** include the Consumer Goods Forum (CGF) resolution to achieve zero net deforestation by 2020 in key commodity sectors (soy, palm oil, paper & pulp/timber and beef)' the Tropical Forest Alliance 2020 (TFA 2020); and the New York Declaration on Forests which aims to halve the rate of deforestation by the end of 2020 and eliminate it by 2030. At the regional level in Europe there are a number of organisations supporting the use of certified sustainable palm oil, stopping deforestation and protecting the natural environment, including the European Sustainable Palm Oil (ESPO) Initiative; the European Palm Oil Alliance (EPOA) and the European Sustainable Palm Oil Advocacy Group (ESPOAG), which represents major food sectors. At the national level, several national alliances have been established with the ambition to drive transformation towards 100% sustainable palm oil by 2020, and have set additional goals towards zero deforestation, no peat, and no exploitation, and the Indonesia Palm Oil Platform (INPOP)[581], provides a forum for all palm oil stakeholders to agree and act on a common agenda to maximise palm oil productivity.

- **Individual initiatives and commitments:** Individual commitments have evolved over time, having started with procurement requirements for certified sustainable palm oil and now making significant strides in improving traceability of palm oil back

[581] For more information on INPOP please visit: http://www.foksbi.id/id/beranda/

to the mill or making significant direct investments to improve smallholder relationships, yields and sustainability performance.

- **Finance and investment initiatives:** these are emerging partly been as a result of new collaborations and financial instruments to support private and public sector efforts; and partly due to a growing body of pressure on banks to adhere to environmental, social and governance commitments. Examples include. Some examples include the Landscape Fund for Tropical Landscapes and Forests, announced by Norway at the World Economic Forum in January 2017; a group of 12 international banks, who collectively account for 50% of global trade finance, coming together in March 2016 under the auspices of the Banking Environment Initiative[582] to make public commitments via a 'Soft Commodities Compact' with the CGF; and a national-level banking collaboration, that brought together Indonesia's eight largest commercial banks to commit to responsible lending practices in the palm oil sector as part of a Sustainable Financial Roadmap developed by the Indonesia Financial Services Authority (OJK)**.** A number of organizations are also working to develop new business models and create new value chain structures that support and facilitate the inclusion of smallholders in new sustainable value chains. These include development organizations such as the IDH and the Netherlands Development Organization (SNV), multilateral banks such as the International Finance Corporation (IFC), and private sector associations and working groups such as PIS Agro's Palm Oil Working Group[583] and the Sustainable Palm Oil Investors Working Group.

- **Data and reporting platforms:** In parallel, the growth in the use of effective satellite-based deforestation monitoring systems in tropical countries, like the World Resources Institute's Global Forests Watch programme[584] and Suitability Mapper[585], and ZSL's Sustainable Palm Oil Transparency Toolkit (SPOTT)[586], have emerged, providing new tools that could help achieve new levels of transparency and participative planning of suitable areas of degraded land for sustainable cultivation across landscapes, both locally and globally.

This growing number of initiatives does appear to be making some progress: [587] [588] [589] –

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582 For more information please see: http://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative

583 PIS Agro's (the Partnership for Indonesia sustainable Agriculture) Palm Oil working Group is currently engaging with 4,785 smallholder farmers working over 11,000ha of land. It has set a 2020 target to work on 100,000 hectares of land, helping 50,000 farmers to increase production by 150%, whilst reducing environmental impact (assessed 7 July 2017): http://www.pisagro.org/palm-oil

584 Please see: http://www.wri.org/resources/maps/suitability-mapper (accessed on 15 August 2017).

585 Please see: http://www.globalforestwatch.org/ for more information (assessed on 6 July 2017).

586 For more information on SPOTT, including an assessment of 50 of the largest palm oil producing companies through 50 indicators using publicly available information on disclosure of their operations and their commitments to environmental and social best practice, please see: https://www.sustainablepalmoil.org/about/

587 Donofrio, S, et al – Supply Change: Tracking Corporate Commitments to Deforestation-Free Supply Chains, (Forest Trends, 2017).

588 Brack, D. & Gregory, M. - *Company Promises – How businesses are meeting commitments to end deforestation* (FERN, March 2017).

- Reporting of progress on voluntary commitments relating to forest risk commodities is on the rise, with palm oil leading the way;
- Commitments made on sustainable palm oil are embracing landscape-scale thinking, more restrictive or specific criteria on protecting HCV and HCS land and improvements in supply chain traceability and transparency;
- The food and farming sector dominants the commitments 'landscape';
- The nature of commitments is evolving, initially focusing on deforestation and then including reducing biodiversity loss, GHG emissions, improving water stewardship and support for smallholders;
- The number of commitments made across the supply chain varies, with producers, processors and traders making the most, followed by manufacturers and retailers;
- Collective action spurs individual action and the number of organisations involved in group initiatives is generally growing over time;
- Certification systems play an important role in CSPO take-up but can be flawed in some areas and remain expensive for smallholders to adopt;
- Companies are investing in their palm oil supply chains, especially smallholders, but are also prepared to drop suppliers that don't comply with their commitments;
- The cost of voluntary commitments can be high, with retailers citing annual costs of implementation of £250,000 and producers (investing heavily in on-the-ground improvements) spending up to USD200 million over three years;
- Progress is being made but not by all companies, even in a market characterised by over supply of CSPO;
- Companies have used Book and Claim systems to meet their commitments in the past but are moving towards either than own sourcing guidelines or greater use of mass balance and source segregated systems;
- European and North American companies are far more advanced than their Asian counterparts.

There remain significant challenges to the achievement and collective impact of voluntary commitments, most notably: lack of engagement in some major consumer countries, such as India and China, cost of implementation, supply chain complexity, traceability and transparency of supply, weaknesses and lack of inclusion in land use planning (resulting in land disputes), lack of legal and geographical clarity around concession boundaries and protected areas and a lack of experienced people to conduct complex FPIC processes and certification audits (particularly those audits involving national interpretations of standards).

That said, a growing number of voluntary initiatives are attempting to overcome some of these historical barriers to progress: the growth of financial, data reporting and geo-spatial platforms; more investment in, and building better relationships with, suppliers (including smallholders); a growing number of public/private partnerships to improve the designation, protection and communication of protected areas and concession boundaries; the use of private and public procurement policies to drive further demand for CSPO; and the emergence of landscape-scale thinking to address the multiple drivers of deforestation and biodiversity loss.

9.8. General conclusions and considerations

The oil palm is a highly productive crop generating yields of palm oil and palm kernel oil significantly greater than those for other vegetable oils. As a result, it has reduced the need for agricultural land and is a very attractive crop for producers. Given the labour

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589 The Palm Oil Buyers Scorecard – Measuring the Progress of Palm Oil Buyers (WWF, 2016).

intensity involved in the maintenance and harvesting of oil palm it also provides the backbone for rural development in major production zones.

Palm oil is likely to remain the dominant vegetable oil for the foreseeable future, having overtaken production volumes for soy-based oils over a decade ago.

However, the rapid expansion of oil palm cultivation and palm oil production and consumption, particularly in Indonesia and Malaysia, has come at a high environmental cost, leading to the deforestation of biodiverse tropical forest ecosystems and peatlands. In addition, land clearance leads to soil erosion, loss of carbon storage, water and air pollution and significant regional greenhouse gas emissions and haze events. All of which also come at an economic cost that runs to billions of dollars and some of which have a significant impact on human health and mortality. Land use change is the dominant driver of environmental impact in the palm oil sector; and is the single biggest potential environmental threat and is very likely to remain so in the future, unless significant improvements in legislation and enforcement regimes occur, as well as the extension of existing moratoriums on oil palm development in protected areas and peatland.

The rural development and economic benefits of palm oil are significant. The oil palm has helped to alleviate poverty and raise family incomes (allowing for improvements in quality of life and education). To achieve this improvement in living standards there have, however, been social and environmental costs. Land use planning and land use rights remain significant challenges, exacerbated by decentralised government structures, policies and regulations.

The vested interests of established plantations and political elites in some major producing countries can also complicate the enforcement of regulations, as discussed in **Section 8.4.3**. Similarly, a lack of legal and geographical clarity around protected areas and concession boundaries leads to further conflicts between producers, local communities and government agencies. In environmental terms this has led to the development in some instances of land with high environmental value. In social terms there have been issues regarding the distribution of wealth with some areas losing the right to their customary lands. In addition, the high reliance on migrant labour combined with the lack of transparency in terms and conditions of labour have led to instances of forced and child labour in palm oil supply chains.

Whilst our analysis of the legal and regulatory enforcement regimes in six major palm oil producing countries, suggests that in some countries decentralised law-making and enforcement create substantial difficulties in data gathering, enforcement and oversight, with national, sub-national and local laws and approvals leading to regulatory duplication, gaps and confusion. With legal and regulatory complexity favouring established plantations and larger companies with the resources to map, manage and, indeed, influence the legal landscape.

Some stakeholders also point to the problem of lobbying power (if not corruption) in the drafting and enforcement of regulations. [590,591] Our analysis also shows that whilst most of these countries have sought to introduce regulations, in many cases they are not adequately enforced.

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[590] Interview with NGO specialist on Liberia, 16 Jun 2017.

[591] Interview with legal specialist, 23 Jun 2017.

The introduction of sustainable palm oil certification schemes, like RSPO, ISCC, MPSO and ISPO, has attempted to drive positive change. However, the requirements, performance, market uptake and transparency of these certification schemes differ considerably. There is also evidence of inconsistency in the way that scheme requirements are applied and enforced.

As such, none of these schemes are perfect and certification as a tool has limitations in transforming sectors. These include: the impossibility of defining performance for all circumstances, the limitations of auditing as a means of verifying performance and the ability of certification schemes to address complex governance issues.

It is also worth noting that none of the certification schemes currently cover all of environmental and social issues included in EU and UN policy objectives.

Additional or complementary approaches to securing good economic, environmental and social outcomes, such as jurisdictional or landscape approaches, are in their infancy and as yet unproven.

Nonetheless, credible and rigorous certification is currently the only option available at scale that provides some degree of confidence that palm oil supply chains are free from the worst forms of environmental and social impacts.

Finally, from our analysis, the growing number of voluntary initiatives and commitments, offer a promising ready-made platform for further work to address the sustainability impacts and benefits of palm oil; and to drive further market uptake of CSPO. Whilst, as noted above, there remain obstacles to the achievement of these commitments, public policy will play an important role in overcoming existing barriers to achievement and in unlocking the potential of existing and emerging public/private partnerships and collaborations.

Study on the environmental impact of palm oil consumption and on existing sustainability standards

For European Commission, DG Environment

(Study contract No.: 07.0201/2016/743217/ETU/ENV.F3)

Appendices to the Main Report

[Written by Mark Barthel, Steve Jennings, Will Schreiber, Richard Sheane and Sam Royston (3Keel LLP) and James Fry, Yu Leng Khor and Julian McGill, (LMC International Ltd.]
[*February 2018*]

EUR [number] EN

Prepared by:

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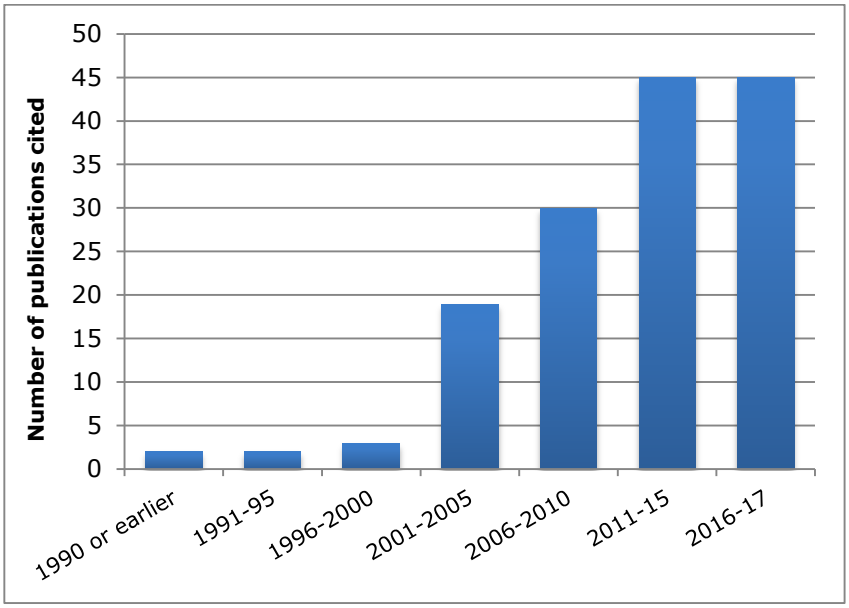
Appendix 1 – Research Quality Assurance Framework

(Please see **Section 6.3** of the main report)

Information on the social, environmental and economic aspects of the palm oil sector comes from various sources, ranging from world-class academic journals, to the 'grey literature' of consultant's reports to articles in the written media. Palm oil is not a 'neutral' subject devoid of opinion or polemic, however, and so it is important to understand the quality of information that is being used to report sustainability of the sector, so that the degree of confidence in findings can be reported consistently and transparently.

The approach we have taken throughout this report is firstly to focus on recent publications – post 2000 – where possible. This helps with information quality in the sense that it allows authors to build on the past, and eliminates historical events or findings that are not relevant today. Ninety-five per cent of the sources cited in this study have publication dates of 2001 or later (please see Figure 1 below).

Figure 1: Publication date of cited papers



Secondly, we focus on the most rigorous academic publications first. Unfortunately, not all aspects of the palm oil sector are well covered by rigorous academic study, which means that other sources of information are often required.

Thirdly, we use an information quality assessment tool. This tool is used on all sections of the document that rely significantly upon existing literature. Each cited publication is scored according to the following parameters (following Hagen-Zanker and Mallett, 2013[1]):

- **Number of studies**: this is the number of studies that are cited to answer a specific research question
- **Appropriateness**: this measures whether a particular research method is appropriate to answering the research question. It is scored as 'high' if the research methods used are designed to answer the same question that we are asking, 'medium' if the research methods are partially relevant to the question and 'low' if the research method can at best just indicate what the answer is.

[1] Hagen-Zanker, J. and Mallett, R. 'How to do a rigorous, evidence focused literature review in international development. A Guidance Note.' *ODI Working Paper* (2013). Overseas Development Institute, UK.

- **Rigour**: this measures the technical thoroughness of the research methodology used in the cited publication. Each cited source of information is scored 'high' for peer reviewed academic journals where the methods used include a large sample size, high quality statistical analysis, etc. A score of 'medium' is given for well-researched NGO/consultant type grey literature and peer reviewed academic literature that has some obvious faults (e.g., limited sample size). A 'low' score is given for journalism, opinion or grey literature with weak methodology
- **Consistency**: each cited source is scored as either 'positive' if the research shows a strong positive association between palm oil and the research question, 'neutral' if the research failed to show any association (or showed both positive and negative associations in different contexts) or 'negative' if palm oil has the opposite impact. For example, for the research question 'does oil palm cultivation increase smallholder incomes' a study showing that it does would score positive, one that showed no difference scores 'neutral' and one where smallholder incomes declined would score negative.

These information quality parameters are reported in a simple table at the end of each section to which it is relevant. The table reports the number of studies cited to answer the research question. It also reports the scores for appropriateness, rigour and consistency, converted into an index ranging from 0-1, with one being the highest score (i.e., if all cited sources scored high for rigour, the rigour score would be 1). Finally, the table reports an overall score, which is a measure of the degree of confidence in the research finding. This score is the average of the appropriateness, rigour and consistency scores. Scores are colour coded to aid quick visual understanding of the data quality (please see Table 1 below for example information quality assessment table). All of the citations that are used to assess the quality of information are stated in an accompanying footnote.

Table 1: Example of an information quality assessment table

Topic	Number of studies	Appropriateness	Rigour	Consistency	Overall score
Research topic	13	0.7	0.6	1.0	0.8

As Hagen-Zanker and Mallett, 2013[2] note, all assessments of information quality have a degree of subjectivity. However, transparency about the quality of information is important to allow readers to assess the meaning of the report for themselves.

[2] Hagen-Zanker & Mallett (2013) *ibid*

Appendix 2: Summary of data quality

(Please see **Section 5.3** of the main report)

This annex provides a summary of data quality for those sections of this study report (highlighted in sub-headings) that rely more heavily on socio-economic and market data and information as the basis for the analysis of topics (described in the left-hand column of Table 2 below), rather than published studies. The main data sources underpinning this work are listed in the middle column of the table; and comments related to these data sources are included in the right-hand column of the table.

Table 2: Table showing summary of data quality assessment for this study

Topic	Source	Comments
7.1.3.9 and 7.1.3.10 Structure of Employment on Plantations		
People (incl. foreigners) employed on plantations in Malaysia	Malaysian Departments of Labour and Immigration	The data refer only to the estate sector. They do not include foreign workers without work permits. They do not include comprehensive data for the smallholder sector, which occupied 16% of the total Malaysian oil palm area in 2015. (A smallholder cannot get a permit for a foreign worker if the palm area is less than 10 hectares.) In addition, there many State agency and settler schemes, which occupy a further 23% of the palm area, and do not provide full coverage of true employment. The wives of foreign workers, who often work on estates, are not provided work permits except in Sabah, and thus are under-recorded elsewhere. The official data therefore are likely to represent a significant under-estimate of true employment in oil palm production.
Employment on plantations, government estates and smallholder plots in Indonesia	Directorate General of Estates. Some publicly listed companies provide data.	The DGE data provide estimates of the distribution of palm areas by type of owner. Smallholders occupy 40% of the total area, and estates the remaining 60%. The employment figures are therefore approximations, using Malaysian estimates as a broad guide to the relative labour intensity of different sectors.
7.1.3.11 Incomes in the traditional sector vs. those generated by palm oil		
Incomes in the palm sector	High Carbon Stock+ Study data from plantation groups.	Estate companies provided confidential data on incomes as part of the HCS+ Study.
7.1.3.13 Historical Costs, CPO Prices vs. Production Costs		
Prices	Bursa Malaysia & Malaysian Palm Oil Board prices	These are both considered to be reliable and transparent

Topic	Source	Comments
Production costs	LMC production costs	These are built up as engineering cost models, and are crosschecked against the costs reported by individual plantation companies.
7.3 The evolution of the areas planted to grain and oil crops worldwide		
Area data for global crops	UN Food & Agriculture Organisation, U.S. Department of Agriculture area data	These are the main sources for area data. NB: the FAO classifies rubber as a forest crop, and so conversion from rubber to oil palm, which has been a major source of palm land in S.E. Asia, is classified as deforestation.
7.3 The feedback from prices to plantings		
Germinated seed sales as a proxy for area	Malaysian Palm Oil Board and individual germinated oil palm seed companies	Germinated seed sales are accurate in both countries. If a company has legal rights to land, palm areas should be accurate. If land rights are unclear, area figures will be less precise. This is relevant to Indonesia. Also some smallholders use false seeds, from their trees, which are not included in official data.
7.4.1 Supply and demand of major palm oil producers		
Malaysian palm oil output + consumption	Malaysian Palm Oil Board	Output is considered to be very accurate. Consumption is only measured indirectly from production, import, export and stock data.
Estimates of palm oil consumption by country and by end-use	U.S. Department of Agriculture	The USDA provides the most comprehensive estimates of consumption worldwide, relying on its Agricultural Attaches at embassies.
Indonesian palm oil output	Badan Pusat Statistik and the Directorate General of Estates	These are the best local official sources of data, but are less accurate than the Malaysian statistics
Indonesian palm oil output	Gabungan Pengusaha Kelapa Sawit Indonesia	GAPKI is the association of private estates. Its figures are a guide to growth trends.
Colombia palm oil output	Fedepalma	These are very accurate as there is a revenue sharing scheme for the sector.
Thailand palm oil output	Bank of Thailand	It monitors very closely palm output in South Thailand
7.4.1 Palm oil consumers		
India supply-demand	Solvent Extractors' Association and the Central Organisation for Oil Industry & Trade	SEA works with the Customs authorities to compile data on imports. The COOIT prepares highly regarded crop forecasts.
China supply-demand	China National Grain and Oils Information Centre	As a semi-governmental body, the CNGOIC compiles data on production, imports, exports, oilseed crushing volumes and stocks. It is also highly

Topic	Source	Comments
		regarded.
EU supply-demand	European Commission, COPA-COGECA, Fediol and European Biodiesel Board	These all tabulate different aspects of the vegetable oil sector and are viewed as providing reliable data.

Appendix 3: Environmental assessment and consequential life cycle analysis – Review of existing studies and additional information

(Please see Section **7.4.1** of the main report).

1.1.1. Consequential approaches in life cycle assessment

One of the primary purposes of public and corporate environmental policy setting is to reduce the impact of the production and consumption of goods and services. The ultimate success of these policies should be judged on the net environmental benefit to society as a whole. Over the past decade, environmental modelling techniques, such as life cycle assessment (LCA), have been adapted to estimate not only the intended environmental and social impacts of policies, but also their unintended consequences in the wider economy[3]. The principle of using these 'consequential' models is sensible given the interconnected and complex nature of modern economic *systems*: increased demand for a product in one part of the world results in changes to production far away.

The most frequently used application of consequential approaches in the agri-food sector is the estimation of the greenhouse gas emissions from land use change due to increased demand for biofuels. Conceptually, land use change is either 'direct' or 'indirect'. Direct land use change is where the crop of interest, for example oil palm, is planted directly on deforested land. *Indirect* land use change (*ILUC)* occurs when the demand for a crop in one part of the world, such as EU rapeseed, causes land use change *elsewhere*.

The phenomenon of indirect land use change has been integrated into revisions of EU biofuel and energy policies[4]. **Section 7** of this report provides further details of the 'top down' impacts associated of land use change relative to existing carbon stocks.

A number of methodologies have been developed to estimate the impacts of land use change emissions within product systems, ranging from complex economic models to simple 'rule-based' approaches, such as those used in the EU Product Environmental Footprint guide[5]. Despite agreement over the potential risk posed by indirect impacts of environmental policies, it remains an area of controversy due to the inherent quantification challenges and allocation of impacts to particular products. For example, if land is cleared for timber but then planted to oil palm, the degree to which each sector takes responsibility for deforestation is within their own accounting. These issues have been explored by many authors[6, 7, 8] and centre around the uncertainties associated with predicting cause-effect chains in complex global socio-economic systems. One of the greatest challenges is quantifying how much land is actually converted to agriculture as a result of higher demand for a crop. This is because the nature of the response is

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3 Marcelle C., McManus A., Caroline M., Taylor (2015) The changing nature of life cycle assessment. Biomass and Bioenergy 82 (2015) 13-26

4 European Commission (2012) Proposal for a Directive of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

5 Schmidt, J., Weidema, B., Branda, M. (2015) A framework for modelling indirect land use changes in Life Cycle Assessment. Journal of Cleaner Production 99 (2015) 230e238

6 Delzeit, R., Klepper, G. and Söder, M. (2016) An evaluation of approaches for quantifying emissions from indirect land use change. Kiel Working Paper No. 2035

7 Valin, H., Peters, D., van den Berg, M., Frank, S. Havlik, P., Forsell, N., Hamelinck, C. (2015) The land use change impact of biofuels consumed in the EU Quantification of area and greenhouse gas impacts

8 Aoun, W., Gabrielle, B. and Gagnepain, B. (2013) The importance of land use change in the environmental balance of biofuels. OCL 2013, 20(5) D505

influenced by a number of local factors, such as agro-ecological conditions, regulations, land ownership structures, subsidy regimes, land prices, land use options, etc. [9, 10, 11]

The European Commission acknowledged these uncertainties and limitations in its proposal for amending biofuels regulations to take into account ILUC. Despite these uncertainties the Commission also acknowledged that ILUC is an important issue and recommended that it was to be mitigated using a precautionary approach[12] (for example, by increasing the minimum GHG savings allowable for crop biofuels).

1.1. Existing Life Cycle Assessment studies/Literature review

The research presented in **Section 7.2** of this report demonstrates the impacts associated with palm oil production from land preparation to use, applying a 'top-down' approach to impacts. This takes the view of having the entire impacts within the country divided by the total amount of production. LCA approaches, by contrast, typically use a 'bottom-up' approach by isolating each activity and then adding them together to determine the total impact across a range of categories.

This study included a review of existing LCAs to determine the relative impacts of different uses of land in Malaysia and Indonesia considering the consequential impacts of alternative systems. Only LCAs are considered in this section as the full lifecycle view within a study boundary ensures that all impacts and benefits are accounted for within the system. Using singular deforestation studies, or palm oil impact studies that only assess the direct production and processing of palm oil, can potentially exclude significant impacts.

Although LCAs provide a consistent general method for accounting for impacts within a product system, the specific rules applied within any one study are largely within the control of study author, thus restricting the potential comparability of outputs. This review therefore identified the criteria in **Table 3**, below, to determine the core requirements studies should adhere to in order to present the most credible results.

Table 3: Minimum criteria for LCAs

No.	Criteria	Requirement	Why it's included
1	Conforms to ISO 14040 and ISO 14044	Essential	Most credible international standard and guidelines for completing a life cycle assessment
2	Includes Malaysian and/or Indonesia palm oil	Essential	Target countries for analysis
3	ILUC estimated within study	Essential	Study requires consideration of full production impacts, including indirect land use change

9 Delzeit, R., Klepper, G. and Söder, M. (2016) An evaluation of approaches for quantifying emissions from indirect land use change. Kiel Working Paper No. 2035

10 European Commission (2010) Report from the Commission on indirect land-use change related to biofuels and bioliquids

11 Hiederer, R., F. Ramos, C. Capitani, R. Koeble, V. Blujdea, O. Gomez, D. Mulligan and L. Marelli. (2010) Biofuels: a New Methodology to Estimate GHG Emissions from Global Land Use Change. EUR 24483 EN. Luxembourg: Office for Official Publications of the European Communities. 150pp.

12 European Commission (2012) Proposal for a Directive of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

No.	Criteria	Requirement	Why it's included
4	Study conducted using data post-2000	Essential	Growth in palm oil production over the past twenty years has placed new land pressures
5	Considers alternative crops and/or land use	Desirable	Research scope includes a comparison of alternative land utilisation
6	Published in peer review journal	Desirable	Promotes credibility of approaches and assumptions used by the author
7	Conducted by independent party	Desirable	Avoidance of bias

Many existing studies that assess the impacts of palm oil and deforestation typically include only a single environmental indicator - such as global warming potential[13] - or do not consider the full life cycle of impacts including land use change up to the point of having a finished product[14]. Those that do include impacts associated with ILUC often note the high level of uncertainty surrounding the impacts of deforestation within other land systems and treat its causes differently depending on the authorship and intention of the study.

It is essential that LCA results be considered in the context of their goal and scope in to ensure that they are interpreted correctly. Often studies are funded by particular stakeholders that have a specific interest in carrying out the research and the scope and boundaries of studies are often based on the needs of these stakeholders. In the case of palm oil, past studies have generally focused on answering two questions in response to governmental and corporate policy initiatives:

1. **Biofuel**: How do palm oil impacts compare to alternative biofuels?
   Comparison based on global production and opportunities for other bio-based substitutes (e.g. corn)

2. **Food oil**: How do palm oil impacts compare to other food oils?
   Comparison based on global supply chains to deliver substitute (e.g. sunflower oil, rape, soy)

Over time the number of available LCA studies attempting to answer these questions have increased as knowledge of land use change – direct and indirect - and associated accounting methodologies have improved. The focus of these studies has typically been on the question of palm biodiesel as opposed to palm oil in food[15], however the general impacts and causes are often the same[16].

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13 Henders, S. et. al. (2015) Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities; Choo, Y.M. et. al. (2011) Determination of GHG contributions by subsystems in the oil palm supply chain using the LCA approach. Int J Life Cycle Assess 16, 669-681; Reijnders, L (2006) Palm oil and the emission of carbon-based greenhouse gases. J Clean Prod. Oct 27 (16), 477-482

14 Norfaradila, J. et. al. (2014) Life cycle assessment (LCA) for the production of palm oil diesel: a case study in Malaysia and Thailand. Malays. Appl. Biol. 43(1), 53-63; Muhamad, H. et. al. (2014) Life cycle assessment for the production of oil palm seeds. Tropical Life Sciences Research 25(2), 41-51; Siregar, K. (2015) A comparison of life cycle assessment on oil palm (*Elaeis guineensis* Jacq.) and Physic nut (*Jatropha curcas* Linn.) as feedstock for biodiesel production in Indonesia. Energy Procedia (65), 170-179; Ashnani, M.H.M. (2013) Life cycle assessment of palm oil biodiesel production in Malaysia. Applied Mechanics and Materials Vols. 465-466,1080-1086.

15 Yusoff S (2007) Feasibility study of performing an life cycle assessment on crude palm oil production in Malaysia. Int J Life Cycle Assess. 12 (1), 50–58; Norfaradila, J. et. al. (2014) Life

In 2000 one of the first LCA studies was conducted to include an assessment of land use change in the production of oil crops[17]. The study assessed a period of land use change in Malaysia covering the second half of the twentieth century right before the significant growth in palm oil plantations that we have experienced over the past twenty years. Despite the absence of current drivers, the authors postulated that direct land use is "one of the most significant impact categories" in assessing production, in particular on the loss of biodiversity.

There remains significant variability between the calculated impacts of land use change for palm oil production as shown in Sub-task 1-3 and, as noted in a recent study, there "is currently no consensus in the LCA community for how to model ILUC".[18] The most recent meta analysis of palm oil LCAs[19] calculated a mean impact across a range of LCAs indicating an impact of 40 gCO_2e per MJ, four times greater than palm oil produced without ILUC (9 gCO_2e/MJ) and ten times less than if the plantation is located on converted peatland forest (400 gCO_2e/MJ). In particular, the authors note the different methods for accounting for ILUC in LCAs means that the two principal variables affecting the range relate to how studies account for existing embodied carbon within the biomass being cleared and the assumption of how long plantations will operate.

How this compares between the total impacts of palm oil production after land clearing varies by study as shown in

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cycle assessment (LCA) for the production of palm oil diesel: a case study in Malaysia and Thailand. Malays. Appl. Biol. 43(1), 53-63; Ashnani, M.H.M. (2013) Life cycle assessment of palm oil biodiesel production in Malaysia. Applied Mechanics and Materials Vols. 465-466, 1080-1086.

16 Bessou, C. and Pardon, L. (2017) Environmental impacts of palm oil products: what can we learn from LCA? IJoLCAS I, 1-7.

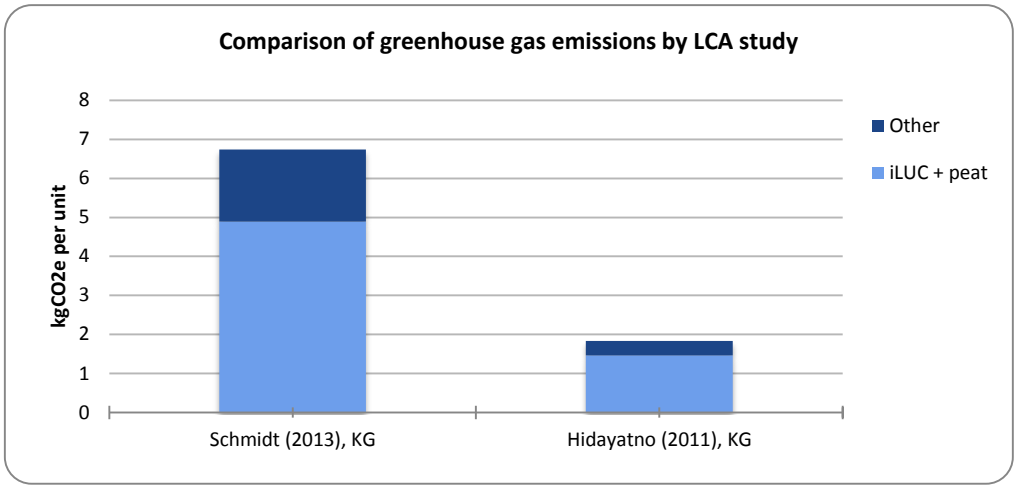
17 Mattson, B. et. al. (2000) Agricultural land use in life cycle assessment: case studies of three vegetable oil crops. Journal of Cleaner Production 8, 283-292.

18 Schmidt, J.H. (2015) Life cycle assessment of five vegetable oils. Journal of Cleaner Production 87, 130-138.

19 Manik, Y. and Halog, A. (2012) A meta-analytic review of life cycle assessment and flow analyses studies of palm oil biodiesel. Integr Environ Assess Manag. 9(1), 134–141. Bessou (2017)

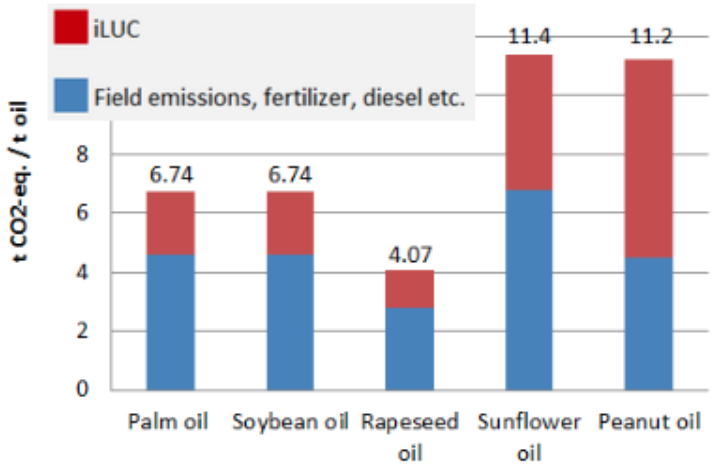
Figure 2 below.

Figure 2: Comparison of LCA study impacts



Insufficient information is currently available to assess the full lifecycle impacts of alternative land use scenarios in Malaysia or Indonesia. Although alternative crop analyses are available (see Figure 3**),** these are not fair representations of actual crop production opportunities for Indonesia and Malaysia should palm oil no longer be produced.[20] Nevertheless, as the worst land use change contributor is widely agreed to be production on forest peatland whereby this will always be the dominant contributor to a product's greenhouse gas emissions regardless of the crop, it can be concluded that changing from palm oil production to another crop within the same plot of land will have a negligible impact.

Figure 3: Comparison of different agricultural crop impacts in Schmidt (2013)[21]



No LCAs have been found that assess the optimal use of land considering the drivers and impacts of land use change or considering the social impacts of production systems between products. The lack of existing studies specifically addressing this question means that it is inappropriate to attempt to draw conclusions from the existing literature when determining the least impactful use of land within these geographies beyond the following top level considerations:

- **Land use change from deforestation and peat soils are the dominant contributor to the lifecycle impacts of palm oil production.**

[20] Schmidt (2015) analysed impacts for palm oil (Indonesia/Malaysia), soybean oil (Brazil), rapeseed oil (Europe EU27), sunflowers (Ukraine), and peanut oil (India).

[21] Schmidt, J. H. (2013) Five edible oils – a comparison. 11th Annual Roundtable Meeting on Sustainable Palm Oil, 12 November 2013. Peat emissions have been considered "field emissions" in this chart and are treated separately from other ILUC.

All available studies that have included ILUC have indicated that the majority of impacts are attributable to the land selection for plantations. In Indonesia and Malaysia one LCA funded by the Roundtable on Sustainable Palm Oil (RSPO) showed the impacts of deforestation (2.5 tCO2e / tonne) and peat (2.4 tCO2e / tonne) are roughly equivalent in their contribution to climate change impacts and make up 71% of the total impact (6.74 tCO2e / tonne).[22] The second biggest impacts are typically associated with the mill and whether or not biogas (methane) is captured from effluent treatment processes.[23]

- **If land use is not considered the impacts of producing palm oil compared to other oils is not significantly different on a per tonne basis.**
  All studies that have included ILUC have indicated that the majority of impacts are attributable to the land selection for plantations. It can therefore be deduced that planting any crop on this land will likely have a similar magnitude of emissions, as the scope of reductions will be comparatively small. The amount of land, needed however may increase between different crops, as the associated yields will not be the same, as shown in **Table 4**.

Table 4: Comparison of land requirements per tonne of oil

Crop	Tonnes / ha[24]	Tonnes of palm oil (2014)	Land required for current production (ha)
Palm oil	4.8	60,000,000	12,500,000
Rape seed oil	1.2		50,000,000
Soybean oil	0.4		150,000,000

Palm oil is the most efficient edible oil crop on a per hectare basis. As the impacts of land use change are relatively fixed regardless of the crop grown, consideration of where changes in land use are occurring is an important consideration.

1.2. Applying existing LCA knowledge to inform policy making

Changes to policy have ILUC effects, though assessing the scale of these impacts is still subject to major uncertainties. Despite these uncertainties, consequential approaches are valuable when deciding upon public and private sector sustainability policies.

First, simply targeting a single country or land use sector is unlikely to deliver countrywide or global reductions in deforestation. To deliver reductions in indirect land use change, sustainability criteria need to be applied to other agricultural crops, or the conversion of carbon rich areas needs to be more comprehensively restricted[25].

Second, when examining potential future policies in this area, the wider impacts of changes to consumption should be taken into account, even if not quantified. Overall, a precautionary approach should be taken, as has been done in the case of EU biofuels policies. For example, by designing policies with the expectation that ILUC will occur.

Finally, avoiding planting oil palm on peat is consistently beneficial as it results in such significant GHG emissions. In a study of indirect land use change associated with biofuel production, Valin et al (2015) noted: *"Whereas a global approach could be effective to tackle unsustainable land use change, this study shows that one of the major contributors to LUC emissions, peat land drainage, is a relatively local problem. If peatland drainage in Indonesia and Malaysia were stopped, the negative greenhouse gas impact of land use change would reduce dramatically. This requires an effort either from*

22 *Ibid.*

23 Bessou (2017).

24 Mattson, B. et. al. (2000) *op. cit.*

25 European Commission (2010) Report from the Commission on indirect land-use change related to biofuels and bioliquids

the Indonesian and Malaysian governments, all palm oil using sectors (food, personal care products, biofuel) or, best of all, a combination of both. Whether by global action to stop unsustainable land conversion, or by local action to stop peatland drainage, our study shows that LUC values can be reduced by effective policies."[26]

Future LCAs to assess a specific country's impacts or measures to improve management practices should ensure that the studies take due consideration of existing land area characteristics, including biodiversity; the ILUC method used to assess existing carbon stocks; plantation life expectations; yields; competing demands for land use; and the avoidance of generic, or global, characterisation factors to convert inputs to impacts.

Appendix 4: Demand and supply balances for the major countries producing or consuming palm oil and palm kernel oil

(See **Section 7.4.1** in the main report.)

1.1. Major producing countries

1.1.1. Malaysia

Table 6 shows the supply and demand balance of palm oil in Malaysia. From 2006 to 2015 annual production grew by around 4 million tonnes. The effect of the El Nino in 2016 reduced output back down the level in 2008.

Around 90% of production is exported, with the trend remaining around that level. However, of the exports an increasing share is being exported as crude oil as Malaysia faces difficulty competing with the increased exports of processed products from Indonesia. In volume terms both exports of biodiesel and oleochemicals have increased as their share of total exports has fallen.

Of the major end-uses food is the smallest accounting for a fifth of total domestic consumption. It is also growing at the slowest rate. The fastest growth has been in biodiesel, as the Malaysian mandate has grown, with biofuel use eclipsing food use in 2014. Oleochemical use remains the largest single domestic use of palm oil.

Table 7 shows the supply and demand balance for palm kernel oil. Production has grown in line with that of palm oil, which is unsurprising given that palm kernel oil is a co-product from the oil palm. Around a third of palm kernel oil production is exported, down from two-fifths in 2006. While the share of exports has declined, the share that is exported as crude palm kernel oil is growing. Domestic consumption is dominated by the oleochemical sector, which produces fatty alcohol and other downstream derivatives.

1.1.2. Indonesia

Table 8 shows the supply demand balance for palm oil in Indonesia. In 2006 Indonesian and Malaysian output were both around 15.9 million tonnes. Since then Indonesian output has grown much faster than Malaysian with the result that today Indonesia produces 60% more than Malaysia.

Indonesian exports account for around 70% of total production – a lower share than in Malaysia due to the much larger domestic market. The share of exports of crude palm oil has declined since 2006 from around two-fifths to one-fifths of total exports, as Indonesia has claimed market share in processed palm products from Malaysia.

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[26] Valin, H., Peters, D., van den Berg, M., Frank, S. Havlik, P., Forsell, N., Hamelinck, C. (2015) The land use change impact of biofuels consumed in the EU Quantification of area and greenhouse gas impacts.

Food remains the most important domestic use of palm oil in Indonesia, due to its large population. The fastest growth has been in biodiesel demand. This was initially driven by free market use of palm methyl ester and more recently by government policy. Biodiesel exports also increased greatly, particularly when it was cost-competitive, but have recently fallen back.

Table 9 shows that the production of palm kernel oil has also increased alongside the palm oil out. A declining share of that output has been exported as crude oil as Indonesia has taken markets share from Malaysia.

1.1.3. Secondary producers (Thailand and Colombia)

Malaysia and Indonesia account for the vast majority of global palm oil production. However, there are smaller players in regions with a suitable rainfall pattern and temperature**. Table 10** and **Table 11** show the supply and demand data for Colombia and Thailand, respectively.

Since 2006 Colombian palm oil production, shown in **Table 10** has grown from around 700,000 tonnes to just over 1.1 million tonnes. While exports increased so did imports and most growth was consumed domestically. The main end-use with room to expand was biodiesel, which grew rapidly as Colombia adopted higher biodiesel mandates.

The situation in Thailand, shown in **Table 11**, is similar with production growing, with fluctuations, since 2006. Most of this growth has been used domestically, with biofuel consumption of palm oil increasing from none in 2006 to almost double that of food use in 2016.

1.1.4. Conclusion

Malaysia and Indonesia remain the largest producers in the world. Both export the vast majority of their production. Indonesian output has grown much faster than that of Malaysia, as has their share of world exports. Domestic support to processing has meant that the Indonesian share of processed exports has grown particularly quickly – to the detriment of Malaysia, which has seen an increased share of its palm oil and palm kernel oil exports being shipped as crude oils.

Other producers, such as Colombia and Thailand, remain very small compared with Indonesia and Malaysia. Growth in these countries has been driven by increased use of palm oil in biodiesel.

Data quality: Overall the data quality is high with some variation by country. Table 5 below summarises the main data sources and their accuracy.

Table 5: Data quality table for section on supply and demand of major palm oil producers

Country	Source	Comments
Malaysia	Malaysian Palm Oil Board	Output is considered to be very accurate. Consumption is only measured indirectly from production, import, export and stock data.
Indonesian palm oil output	Badan Pusat Statistik and the Directorate General of Estates	These are the best local official sources of data, but are less accurate than the Malaysian statistics
	Gabungan Pengusaha Kelapa Sawit Indonesia	GAPKI is the association of private estates. Its figures are a guide to growth trends.
Colombia palm oil output	Fedepalma	These are very accurate as there is a revenue sharing scheme for the sector.
Thailand palm oil output	Bank of Thailand	It monitors very closely palm output in South Thailand

Supply-demand and end-use

National supply-demand balances

Table 6: Malaysian palm oil data (`000 tonnes)

	Production	Exports Crude	Exports Processed	Total Exports	Local Demand	Use in Food	Use in Oleochemicals	Use in Biodiesel	Exports of Downstream Products Oleochemicals	Exports of Downstream Products Biodiesel
2006	15,881	2,377	12,047	14,423	2,145	500	863	49	2,111	48
2007	15,824	1,936	11,811	13,747	2,264	520	794	98	2,140	95
2008	17,734	2,337	13,076	15,413	2,707	550	720	187	2,076	182
2009	17,565	2,537	13,343	15,881	2,688	570	922	228	2,175	227
2010	16,994	2,740	13,924	16,664	2,301	580	811	156	2,204	90
2011	18,912	3,478	14,516	17,993	2,204	600	919	211	2,181	50
2012	18,781	4,634	12,929	17,563	2,150	620	979	221	2,601	37
2013	19,216	3,986	14,148	18,134	2,451	630	1,438	601	2,727	211
2014	19,667	4,678	12,599	17,277	2,869	649	1,659	749	2,828	339
2015	19,962	5,263	12,178	17,441	2,941	660	1,672	875	2,847	350
2016	17,319	3,796	12,222	16,018	2,990	650	1,728	781	2,756	256

Sources: **Malaysia Palm Oil Board, USDA, EC and US import statistics for biodiesel exports and LMC estimates.**

Table 7: Malaysian palm kernel oil data ('000 tonnes)

	Production	Exports Crude	Exports Processed	Total Exports	Local Demand	Use in Oleochemicals	Use in exported Oleochemicals
2006	1,956	97	834	931	1,025	1,135	998
2007	1,908	186	875	1,061	847	1,192	1,077
2008	2,131	148	899	1,047	1,084	1,245	1,085
2009	2,097	184	933	1,117	980	1,338	1,002
2010	2,015	181	983	1,164	851	1,349	1,114
2011	2,145	205	971	1,176	969	1,270	1,010
2012	2,164	220	863	1,083	1,080	1,323	1,298
2013	2,270	245	926	1,171	1,099	1,274	1,031
2014	2,276	322	788	1,111	1,165	1,216	935
2015	2,276	292	775	1,067	1,210	1,344	940
2016	1,959	246	675	921	1,039	1,204	823

Sources: **Malaysia Palm Oil Board, USDA, EC and US import statistics for biodiesel exports and LMC estimates.**

Table 8: Indonesian palm oil data ('000 tonnes)

	Production	Exports Crude	Exports Processed	Total Exports	Local Demand	Production			Exports of Downstream Products	
						Food	Oleochemicals	Biodiesel	Oleochemicals	Biodiesel
2006	15,996	5,068	6,936	12,005	3,680	3,387	230	63	508	52
2007	17,577	5,701	6,440	12,141	4,190	3,744	187	259	445	215
2008	19,685	7,904	6,661	14,565	4,650	4,115	173	361	451	315
2009	22,582	9,567	7,598	17,164	4,835	4,490	205	140	478	20
2010	23,075	9,444	7,161	16,605	5,196	4,118	250	828	635	605
2011	26,106	8,424	8,389	16,813	6,269	4,039	413	1,817	937	1,371
2012	29,432	7,253	11,831	19,084	7,115	4,180	721	2,213	1,616	1,321
2013	29,549	6,585	14,490	21,075	8,035	3,913	1,096	3,026	1,969	1,688
2014	31,853	5,727	17,267	22,994	8,750	4,181	1,513	3,056	2,497	1,376
2015	32,119	7,778	18,959	26,737	7,520	4,949	1,497	1,074	2,571	289
2016	28,304	5,284	18,183	23,467	9,528	5,149	1,424	2,955	2,302	446

Sources: **Badan Pusak Statistik (BPS), GAPKI, USDA and LMC estimates.**

Table 9: Indonesian palm kernel oil data ('000 tonnes)

	Production	Exports Crude	Exports Processed	Total Exports	Local Demand	Use in Oleochemicals	Use in exported Oleochemicals
2006	1,773	1,032	242	1,274	499	303	222
2007	1,946	1,107	228	1,335	611	280	206
2008	2,175	1,140	217	1,357	818	300	222
2009	2,496	1,471	246	1,717	780	297	219
2010	2,550	1,346	231	1,577	973	416	308
2011	2,834	1,104	351	1,455	1,379	571	419
2012	3,284	1,978	861	2,838	446	975	716
2013	3,244	452	1,251	1,703	1,541	971	698
2014	3,738	401	1,144	1,545	2,193	1,109	787
2015	4,143	606	1,281	1,887	2,256	1,203	859
2016	3,999	270	1,405	1,675	2,324	993	702

Sources: **Badan Pusak Statistik (BPS), GAPKI, USDA and LMC estimates.**

Table 10: Colombian palm oil data (‘000 tonnes)

	Production	Exports	Imports	Net Exports	Local Demand	Palm oil demand in Food	Biodiesel
2006	714	238	12	226	488	488	0
2007	733	341	15	326	407	407	0
2008	778	318	26	292	486	486	0
2009	805	234	59	175	630	467	163
2010	753	114	114	0	753	415	338
2011	941	168	111	57	884	441	443
2012	967	188	122	66	901	411	490
2013	1,039	202	118	84	955	453	502
2014	1,110	274	122	152	958	440	518
2015	1,274	418	123	295	979	465	513
2016	1,142	401	203	198	944	494	450

Sources: **Fedepalma.**

Table 11: Thai palm oil data ('000 tonnes)

	Production	Exports	Imports	Net Exports	Local Demand	Palm oil demand in Food	Palm oil demand in Biodiesel
2006	1,128	205	1	204	661	388	0
2007	1,019	283	1	282	701	400	28
2008	1,475	360	30	330	1,090	410	407
2009	1,262	114	1	113	1,220	410	536
2010	1,221	121	1	120	1,415	410	732
2011	1,718	382	66	316	1,266	412	580
2012	1,846	293	44	249	1,439	430	736
2013	2,135	549	0	549	1,664	490	901
2014	1,811	222	24	198	1,691	510	908
2015	1,833	51	75	-24	1,737	520	943
2016	1,562	39	28	11	1,781	530	978

Sources: **Bank of Thailand and USDA.**

1.2. Major palm oil consuming countries

Having discussed the major palm oil producers we will now look at the three largest consumers: India, China and the EU, none of which produce palm oil in any significant volumes and are therefore pure importers.

1.2.1. India

India is the largest importer of crude palm oil; this is due to a tariff structure which favours domestic refining.

As

Table 13 shows, crude palm oil (CPO) imports grew threefold over the last decade, but collapsed in 2016 as poor production pushed up the price of CPO relative to other oils. Imports of refined palm oil increased greatly from 2007 to 2008, but have since remained grown only slowly.

The other major vegetable oil in India is soybean oil, the share of which varies according to relative prices. Currently high relative palm oil prices have increased the share of soybean oil imports compared with palm oil. The majority of palm oil is for food use with around a fifth going to oleochemical or other uses.

1.2.2. China

By contrast imports into China are almost entirely of refined palm oil with palm accounting for close to 70% of imports as shown in **Table 14**. Soybean oil is the other major imported oil, but its share has been declining. However, **Table 14** only includes direct imports of vegetable oils. However, for oilseeds they are often imported in seed form and the crushed into meal and oil in the country. As a result, substantial volumes of oil are imported indirectly, in the form of seeds, which are then crushed in the country. Therefore we have prepared **Table 15**, which also includes these indirect volumes. This shows that indirect imports actually account for a greater share of total imports – around 65-70% of imports over the past three years. The share of oil from imported seeds has also been growing, as demand for meat has driven increased demand for soybean meal as animal feed with soybean oil produced as a co-product from domestic crushing. Viewed from this perspective, palm therefore only accounts for around a fifth of total (direct and indirect) vegetable oil imports.

1.2.3. European Union

Table 16 shows that in the EU the direct import of oil is more important than the indirect import through the crushing of seeds, which yields oil in the EU. One reason for this is because of the relatively large crushing of domestic seeds, which reduces the need for imported meal. In addition, as we will see, the growth in biodiesel demand has created more demand for oil than for meal – therefore favouring direct oil imports over the import of oilseeds.

Overall direct oil imports have grown by around one third from 6.6 million tonnes in 2006 to just 8.6 million tonnes in 2016. Palm oil accounts for four-fifths of direct oil imports and one third of total (direct and indirect) oil imports. In both cases the share of palm oil has increased over time.

Table 17 shows the main end uses of palm oil in the EU. The table demonstrates that food and other uses have grown over time, but that most of the growth has been in biodiesel. However, biodiesel use of palm oil has not just been in the form of imported palm oil or stearin, which is converted into palm methyl ester but also through the direct importation of palm methyl ester. In the last three years (2013-2016) this accounted for another 330,000 tonnes of palm oil as biodiesel on average.

1.2.4. Conclusion

Of the three main consumers, India, China and the EU, the dynamics of the palm oil imports are quite different:

1. India imports predominantly crude palm oil for food use.
2. China imports processed palm oil predominantly for food use, but this has to compete with large volumes of oilseeds imported for meal and producing oil as a co-product.
3. The European Union imports palm oil, but the growth has mostly been driven for biodiesel. As the demand for biodiesel has not created a concomitant demand for meal, it has favoured palm oil over oilseeds.

Data quality: the data on which we based our analysis is considered accurate and well regarded. **Table 12** below summarises the different data sources by country.

Table 12: Data quality table for section on palm oil consumers

Country	Source	Comments
India	Solvent Extractors' Association and the Central Organisation for Oil Industry & Trade (COOIT)	SEA works with the Customs authorities to compile data on imports. The COOIT prepares highly regarded crop forecasts.
China	China National Grain and Oils Information Centre	As a semi-governmental body, the CNGOIC compiles data on production, imports, exports, oilseed crushing volumes and stocks. It is also highly regarded.
EU	European Commission, COPA-COGECA, Fediol and European Biodiesel Board	These all tabulate different aspects of the vegetable oil sector and are viewed as providing reliable data.
Additional estimates of palm oil consumption by country and by end-use	U.S. Department of Agriculture	The USDA provides the most comprehensive estimates of consumption worldwide, relying on its Agricultural Attaches at embassies.

Table 13: Indian vegetable oil import data ('000 tonnes)

	CPO	PPO	Soybean Oil	Other Oils	Total	Palm Oil % of Imports	Palm oil demand in Food	Palm oil demand in Other
2006	2,586	107	1,608	792	5,093	50.78%	2,300	393
2007	3,125	134	1,270	806	5,335	58.57%	2,960	299
2008	4,330	955	813	726	6,824	63.46%	4,200	335
2009	5,268	1,224	1,107	1,696	9,295	56.68%	5,600	592
2010	5,244	1,141	1,569	1,167	9,122	57.50%	5,600	586
2011	5,422	1,121	941	1,285	8,769	61.83%	5,750	592
2012	6,116	1,574	1,100	1,486	10,276	59.52%	6,985	506
2013	5,961	2,381	1,124	1,622	11,089	53.76%	8,020	573
2014	6,502	1,305	2,101	2,228	12,136	53.57%	8,052	455
2015	7,411	2,019	3,520	2,093	15,044	49.26%	8,750	680
2016	5,601	2,646	3,882	2,235	14,364	39.00%	8,600	547

Sources: **Solvent Extractors' Association of India, USDA and LMC estimates.**

Table 14: Chinese imports of vegetable oils ('000 tonnes)

	As oils						
	CPO	PPO	Total Palm	Soybean	Rapeseed	Sunflower	SUM
2006	183	4,958	5,141	1,543	44	0	6,728
2007	181	4,916	5,097	2,822	375	0	8,294
2008	186	5,062	5,248	2,586	270	0	8,103
2009	229	6,213	6,442	2,391	468	0	9,300
2010	202	5,494	5,696	1,341	985	0	8,023
2011	65	5,847	5,913	1,143	551	0	7,607
2012	0	6,342	6,342	1,693	1,096	0	9,131
2013	0	5,980	5,980	1,158	1,527	361	9,026
2014	0	5,430	5,430	1,119	897	455	7,901
2015	0	5,910	5,910	818	815	624	8,167
2016	1	4,478	4,479	561	700	956	6,695

Sources: **China National Oils and Grains Information Company, USDA and LMC estimates.**

Table 15: Share of palm oil in Chinese imports of vegetable oils (‘000 tonnes)

	Palm oil imports	Total direct oil imports	Indirect oil imports in seed	All oil imports	Palm oil demand in		Palm oil % of	
					Food	Other	Direct oil imports	All oil imports
2006	5,141	6,728	5,528	12,255	3,074	2,067	76.41%	41.95%
2007	5,097	8,294	6,035	14,329	3,188	1,909	61.46%	35.57%
2008	5,248	8,103	7,446	15,550	3,222	2,026	64.76%	33.75%
2009	6,442	9,300	8,940	18,240	3,568	2,874	69.26%	35.32%
2010	5,696	8,023	10,776	18,799	3,880	1,816	71.00%	30.30%
2011	5,913	7,607	10,371	17,978	3,717	2,196	77.73%	32.89%
2012	6,342	9,131	12,118	21,249	3,691	2,651	69.45%	29.85%
2013	5,980	9,026	13,284	22,310	4,189	1,791	66.25%	26.80%
2014	5,430	7,901	14,817	22,718	3,600	1,830	68.73%	23.90%
2015	5,910	8,167	16,910	25,077	3,750	2,160	72.36%	23.57%
2016	4,479	6,695	16,824	23,519	2,800	1,679	66.89%	19.04%

Sources: **China National Oils and Grains Information Company, USDA and LMC estimates.**

Table 16: EU imports of vegetable oils ('000 tonnes)

	Total direct oil imports	Indirect oil imports in seed	Overall oil imports	Output of oils from local seeds	Direct exports of oils	Total oils supply	Palm as % of oil imports	Palm as % of imports including oil in seed	Palm as % of total supply
2006	6,574	2,995	9,569	7,816	590	16,795	65.04%	26.96%	24.91%
2007	7,264	3,209	10,473	8,334	605	18,202	59.73%	24.95%	22.95%
2008	7,510	3,195	10,705	8,997	722	18,980	66.14%	27.84%	25.46%
2009	7,823	4,040	11,863	9,325	797	20,391	70.42%	28.35%	26.37%
2010	7,400	3,287	10,687	11,059	793	20,953	73.54%	30.61%	25.29%
2011	7,158	3,509	10,667	10,251	1,041	19,877	69.07%	28.28%	23.87%
2012	7,692	3,846	11,538	10,353	1,348	20,543	74.19%	30.16%	26.96%
2013	8,286	3,756	12,042	10,709	1,848	20,903	82.21%	33.95%	31.94%
2014	8,640	3,996	12,636	11,757	1,611	22,782	80.66%	33.40%	29.88%
2015	8,279	3,607	11,886	12,888	1,901	22,873	83.78%	35.21%	29.82%
2016	8,565	4,423	12,988	11,633	1,785	22,836	77.64%	31.34%	28.46%

Sources: **European Commission, Fediol, European Biodiesel Board, USDA and LMC estimates.**

Table 17: EU demand for palm oil ('000 tonnes)

	Direct palm oil demand in			Net palm oil	Palm oil in	Total palm	Total palm oil	Palm with indirect biodiesel as %
	Food	Biodiesel	Other	demand (- exports)	imported PME	biodiesel use	including imported biodiesel	of total supply
2006	2,646	279	1,259	4,184	11	290	4,195	24.96%
2007	2,656	403	1,118	4,177	100	503	4,277	23.37%
2008	2,720	540	1,573	4,833	179	720	5,012	26.16%
2009	2,750	587	2,041	5,378	280	867	5,658	27.37%
2010	2,750	748	1,800	5,298	579	1,327	5,877	27.29%
2011	2,800	685	1,259	4,744	1,104	1,789	5,848	27.87%
2012	2,950	1,484	1,104	5,538	1,170	2,654	6,708	30.90%
2013	3,380	2,214	1,083	6,677	606	2,820	7,283	33.86%
2014	3,280	1,674	1,853	6,807	341	2,014	7,148	30.91%
2015	3,200	1,524	2,096	6,820	362	1,886	7,182	30.91%
2016	3,000	2,039	1,461	6,500	307	2,346	6,807	29.41%

Sources: **European Commission, Fediol, European Biodiesel Board, USDA and LMC estimates.**

Appendix 5: Areas under soybeans and other annual crops, and projections of oil crop output to 2026

(See **Section 7.4.2** in the main report.)

1.1. Areas under soybeans and other major annual crops in selected countries

Figures 4-9 illustrate the growth in soybean areas in the leading producing and exporting countries, all in the Americas. These soybean areas are contrasted with the areas planted to all other major annual arable crops that compete for land with soybeans[27]. We did not include tree crops and sugar cane with the other crops, as these are not planted annually and thus only compete with soybeans for land over a long period.

In the case of Brazil, a distinctive feature is the growth in the double cropping of soybeans with maize (whose second crop is known as the *safrinha*, which now accounts for half the total area planted to maize and half the country's output of that crop). As the *safrinha* means that the total maize area harvested each year includes some land that is harvested twice, we include a second series for the area under "non-soybean crops" in Figure 5 for Brazil. This one excludes the *safrinha* area, as this is already included within the soybean total.

For the US, we include a series depicting the area under the Conservation Reserve, which is the land taken out of arable farming for environmental reasons in return for special payments.

1.2. Conclusion

In all four South American countries the soybean area has grown rapidly. It now exceeds the areas under all the other major annual arable crops, combined. In the US, the soybean area has recently grown very slowly.

Figure 4: The growth in soybean areas in leading producing countries

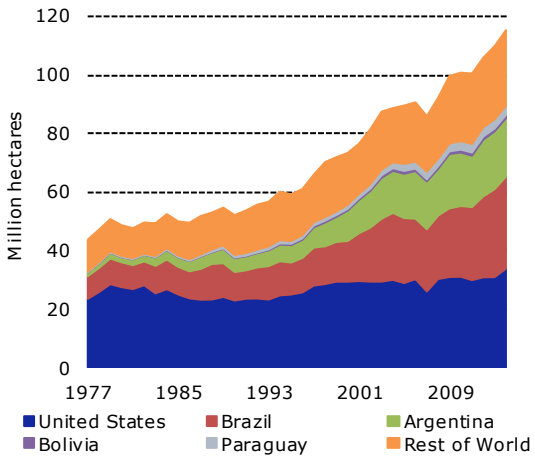
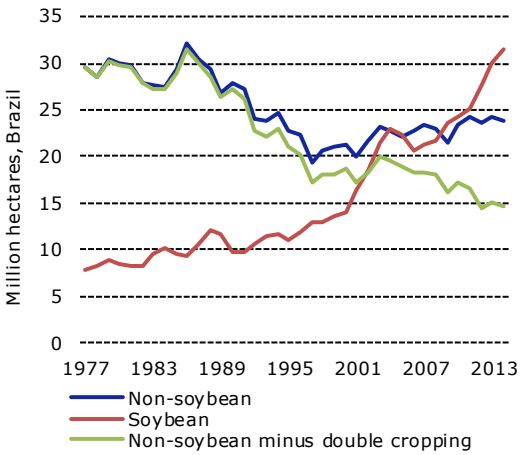


Figure 5: Area harvested for soybeans and other major annual crops - Brazil



Note: The double-cropped safrinha area represents maize planted immediately after soybean harvesting.

[27] The other major are wheat, maize, rice, sorghum, barley, millet, oats, rye, cotton, rapeseed, sunflower seed and peanuts annual crops. The data are derived from UN FAO, USDA and CONAB.

Figure 6: Area harvested for soybeans and other major annual crops - Argentina

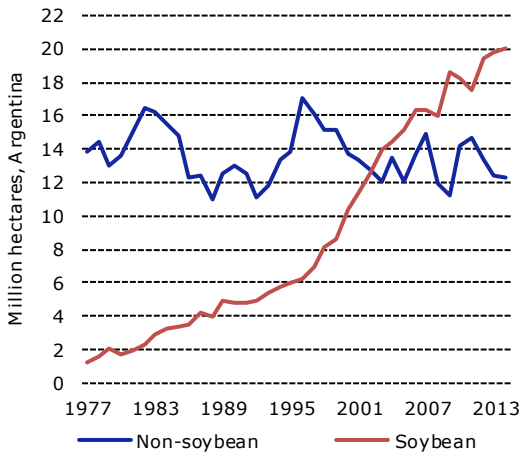


Figure 7: Area harvested for soybeans and other major annual crops – United States

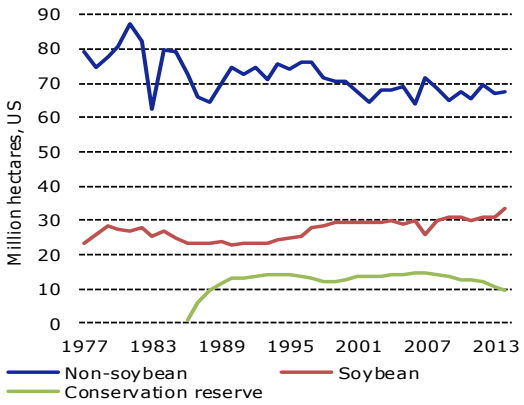


Figure 8: Area harvested for soybeans and other major annual crops – Paraguay

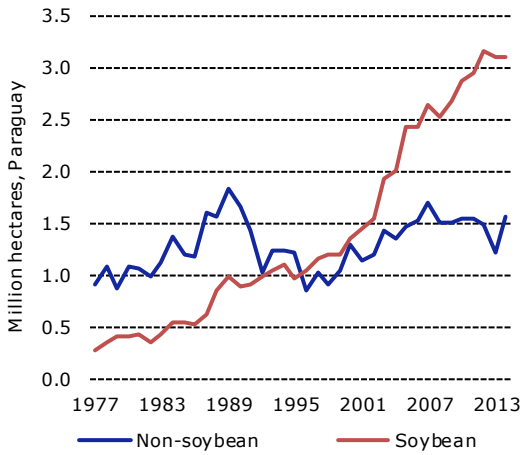
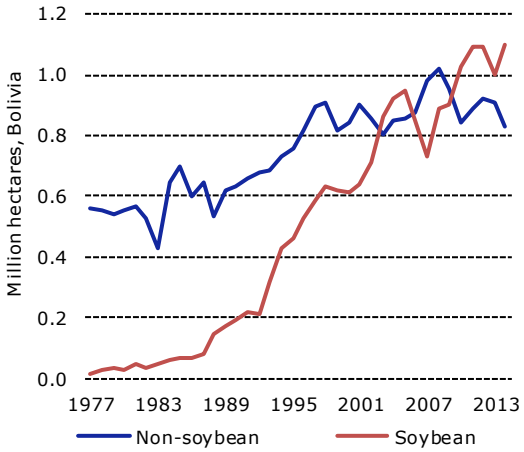


Figure 9: Area harvested for soybeans and other major annual crops – Bolivia



1.3. The evolution of the areas planted to oil crops

This section analyses the pressures upon agricultural land for the main crops. It reveals that the area under oil crops has grown for decades. The largest area under these crops and the greatest absolute increases in areas occurred in soybeans. Rapeseed and sunflower recorded the second and third largest areas and increases in areas. Oil palm was in last place among the four main oil crops.

Figure 10 plots the growth in oil crop areas. Figure 11 compares the annual growth in areas since 1981. Soybeans dominate the growth; rapeseed is second, well behind, followed by sunflower and oil palm. Figure 12 reveals that the growth in world demand for oils outstripped that for oilseed meals, both growing slightly faster than world GDP. Growth rates diverged after 2002, when biofuel demand for oils emerged on a large scale.

The small rise in palm areas is due to its high yields of oil per hectare.

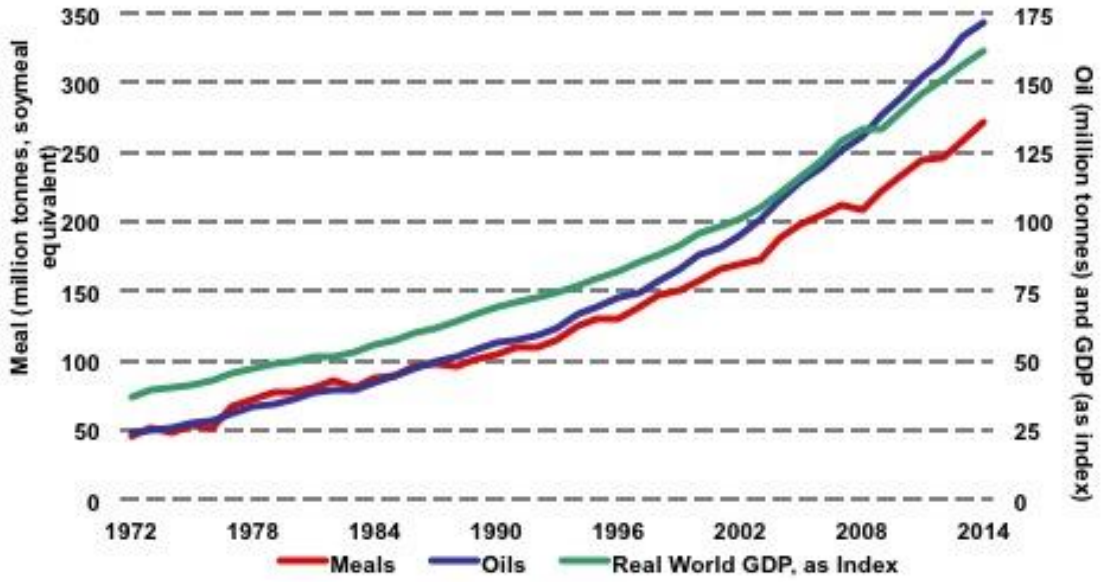


Figure 13 compares worldwide yields of such crops. **Oil palm, on average, yields almost 3.5 tonnes of oil per hectare worldwide, soybeans yield under 0.5 tonnes of oil per hectare.** Figure 14 **compares** the area of each crop needed, on average, to yield one tonne of oil.

We now consider the land use implied by projections of oil crop output to 2026.

Figure 15 depicts the impact of extrapolating past trends in oil crop areas, assuming continuation of past demand and yield growth rates. 73 million hectares of oil crops would be added. 42 million of these hectares would be soybeans, 21 million rapeseed, 13 million hectares would be oil palm and 4 million sunflower.

Figure 16 illustrates the implications for the area that would need to be brought into cultivation at actual 2013 yields to meet rising oil demand if **no increase occurred in palm areas**, keeping it at 19 million hectares, rather than 31 million hectares on trend. This diagram reveals that, **if all the forgone palm oil were replaced with soybean oil, an additional 98 million hectares of soybeans would be needed, on top of the 42 million simply following trend.** This implies a world soybean area of 257 million hectares in 2025, up from 117 million in 2014.

Figure 10: World areas of oil crops, 1981-2014

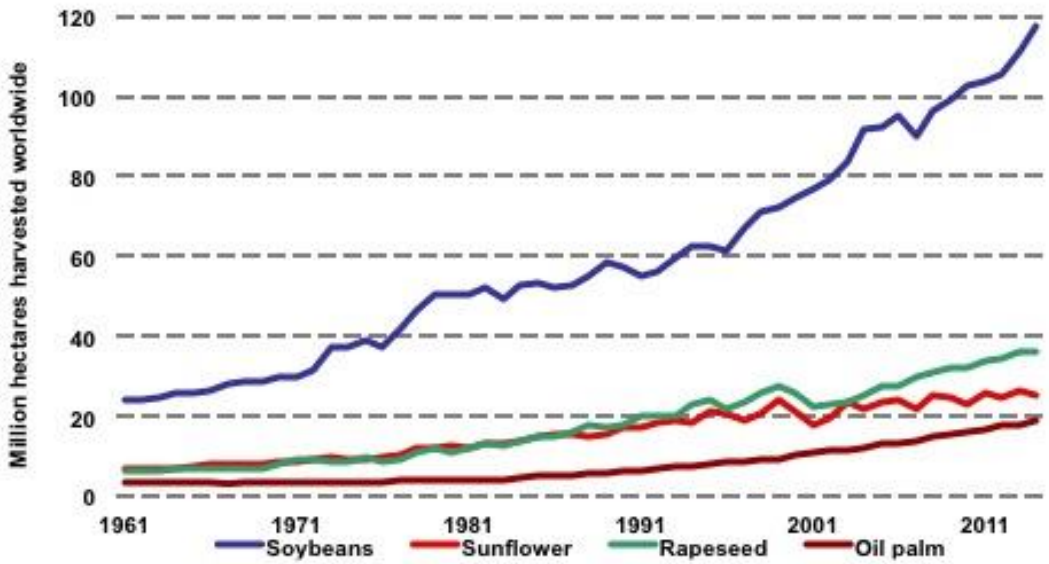


Figure 11: Growth in areas under oil crops, 1981-2014, mn ha. per annum

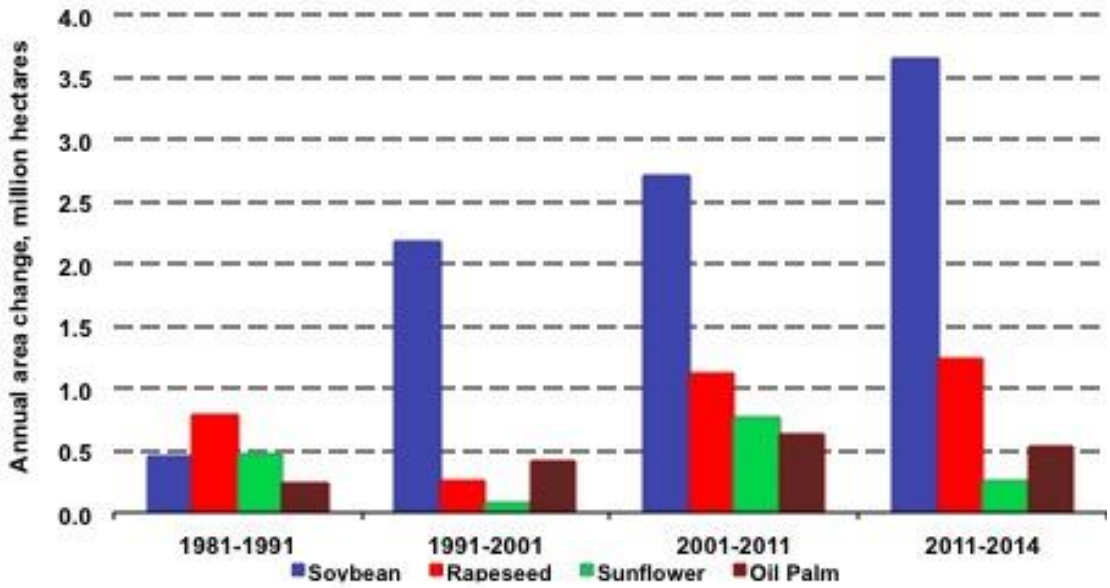


Figure 12: World GDP, vegetable oil and oilseed meal output, 1972-2014

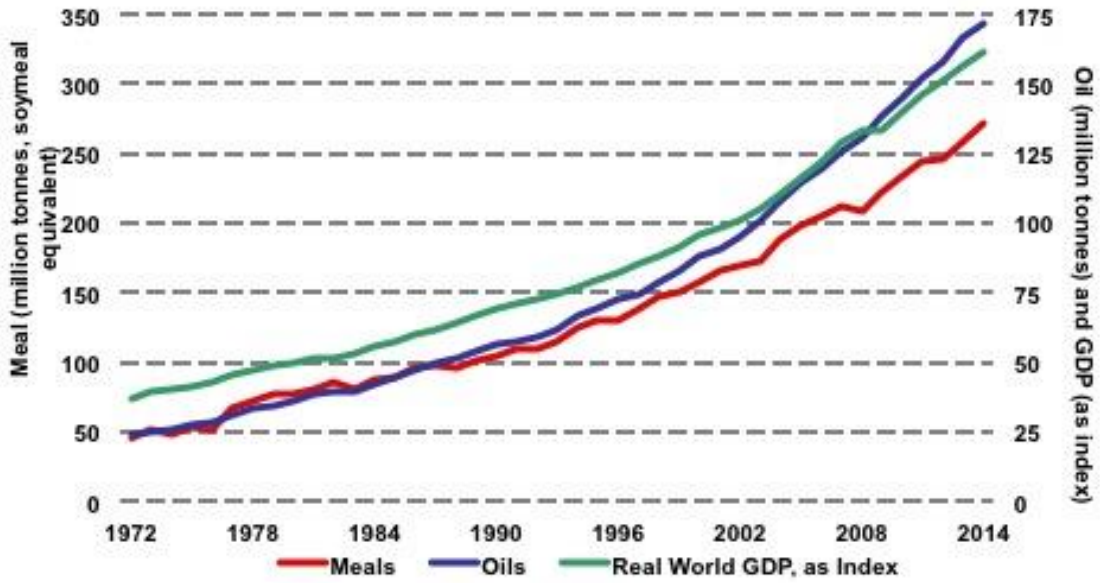


Figure 13: World average oil and meal yields per hectare of oil crops

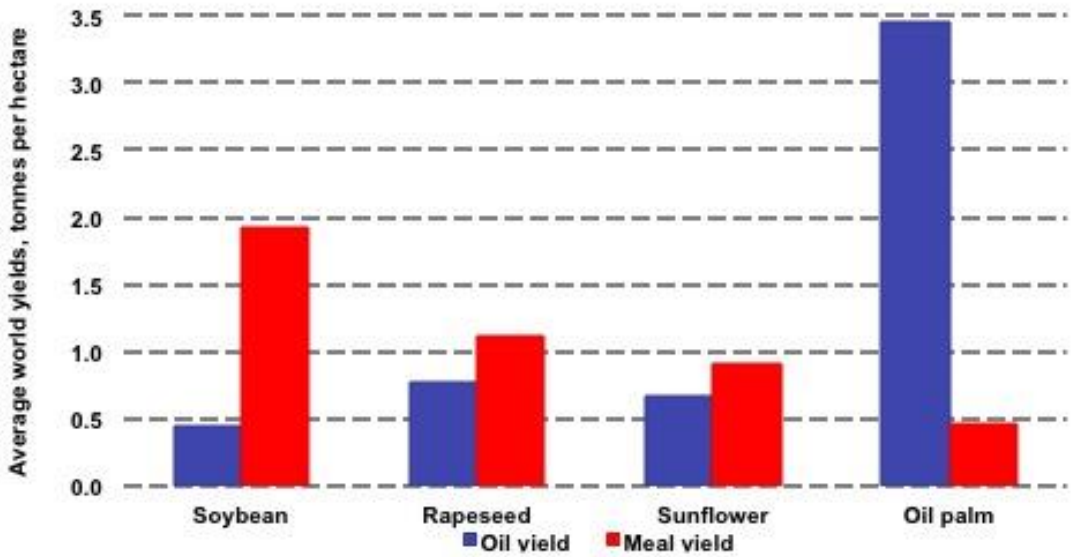


Figure 14: World average hectares per tonne of oil and meal of oil crops

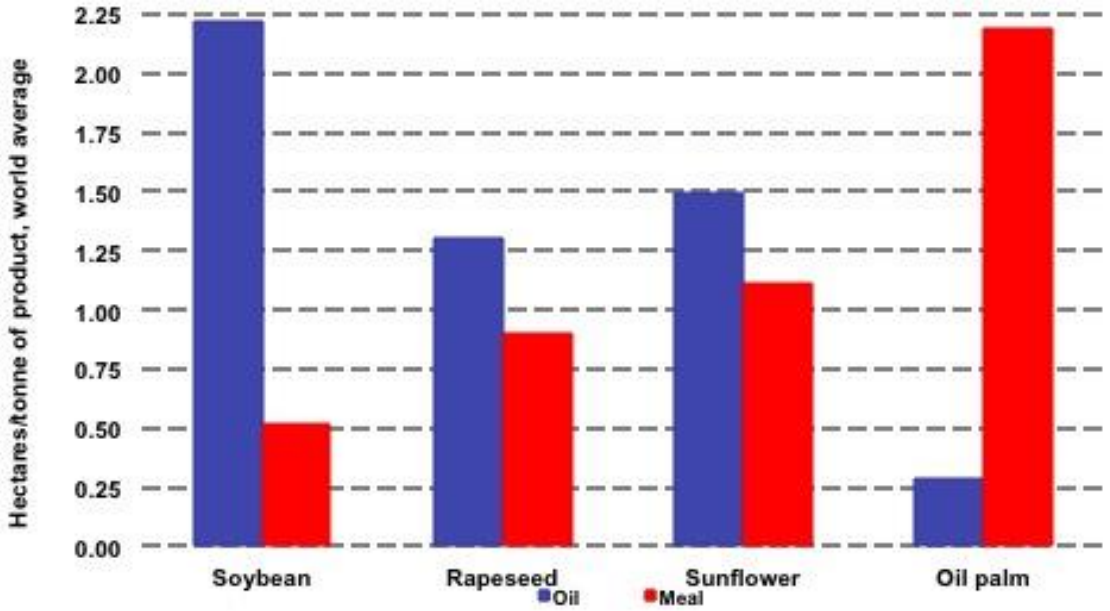


Figure 15: Extrapolating past trends in growth in global areas under oil crops to 2026

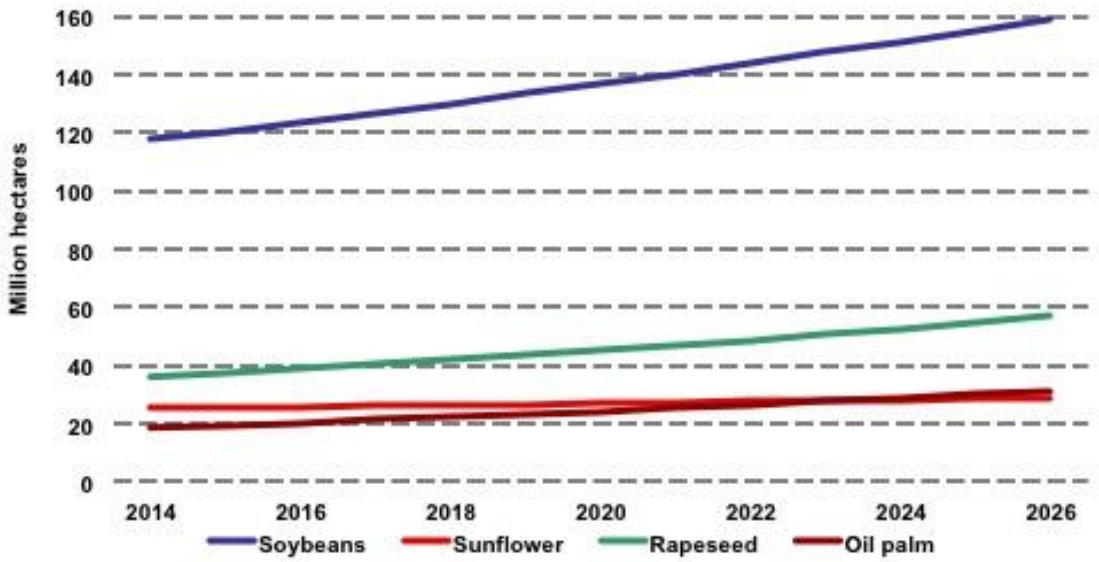
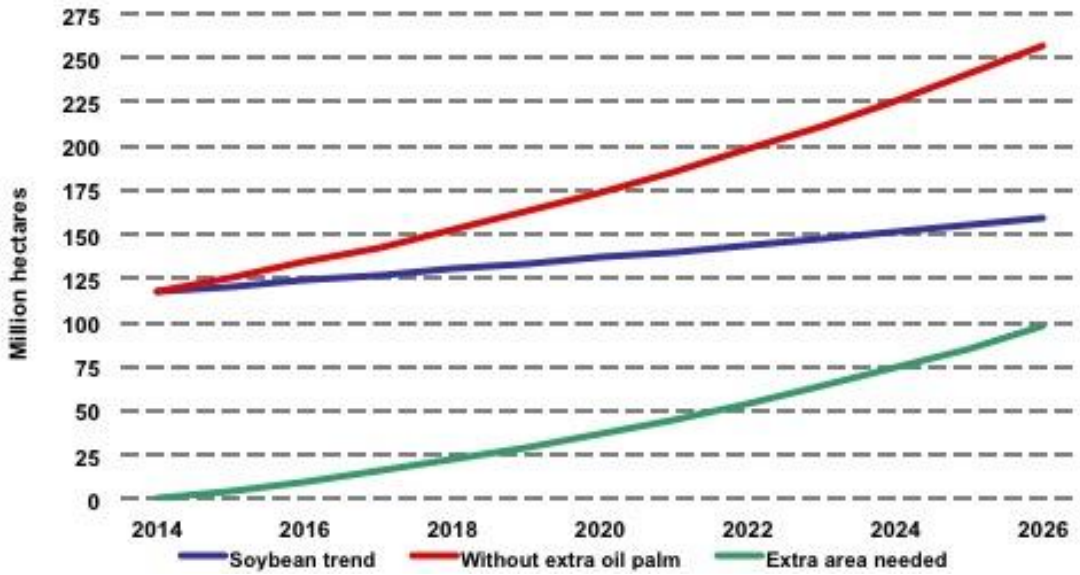


Figure 16: Soybean area if palm oil output remained at 2013 levels and soybeans supplied the extra oil that would be from palm



Appendix 6: Principles of main sustainable palm oil certification standards

(Please see **Section 8.1.1** of the main report).

The following **tables 32-35** summarise the principles contained within each of the major sustainable palm oil certification standards.

Table 18: Summary of RSPO Principles[28]

Principle	Brief description
Principle 1: Commitment to Transparency	Contains three criteria that specify: provision of information to stakeholders; public availability of specified documents; and a commitment to ethical conduct.
Principle 2: Compliance With Applicable Laws and Regulations	Contains three criteria that specify: compliance with all applicable local, national and ratified international laws and regulations; that the company has the (uncontested) right to use the land; and the legal, customary or user rights of others are not diminished without their free, prior and informed consent (FPIC).
Principle 3: Commitment to Long-term Economic & Financial Viability	Contains one criterion, that requires an implemented management plan that aims to achieve long-term economic and financial viability
Principle 4: Use of Appropriate Best Practices by Growers and Millers	Includes eight criteria that specify: documentation of management practices; maintenance of soil fertility; control of soil erosion; maintenance of ground and surface water; use of integrated pest management techniques; safe use of pesticides; an Occupational Health and Safety plan; and appropriate staff training.
Principle 5: Environmental Responsibility and Conservation of Natural Resources and Biodiversity	Contains six criteria, that specify: environmental impact assessment; identification and management of High Conservation Values (including rare species); waste management; efficient energy use; avoiding the use of fire in land preparation; and plans to reduce pollution (including GHG emissions).
Principle 6: Responsible Consideration of Employees and of Individuals and Communities Affected by Growers and Millers	Contains thirteen criteria, that specify: social impact assessment; transparent communication with local communities; a complaints and grievances procedure; representation of community groups during compensation negotiations; adequate workers' pay and conditions; the right of employees to free assembly; absence of child labour; absence of forced labour; absence of discrimination; absence of harassment; fair treatment of smallholders; contribution to local development; and respect for human rights.
Principle 7: Responsible Development of New Plantings	Contains eight criteria, that specify: a social and environmental impact assessment; soil surveys; that plantings since November 2005 have not replaced primary forest or any area of High Conservation Value; avoidance of planting on steep slopes and peat; avoidance of planting on land where local people have demonstrated legal, customary or use rights without FPIC; provision of compensation for people who have lost use rights; avoidance of use of fire in plantation establishment; and minimisation of GHG emissions.
Principle 8: Commitment To Continual Improvement In Key Areas of Activity	Contains one criterion, specifying demonstrate continual improvement in key operations.

[28] RSPO (2013). Principles and Criteria for the Production of Sustainable Palm Oil.

Table 19: ISCC Principles (ISCC EU - Sustainability Requirements[29])

Principle	Brief description
Principle 1: Protection of Land with High Biodiversity Value or High Carbon Stock	Contains three mandatory criteria that specify: biomass is not produced on land with high biodiversity value; high carbon stock; or from peatland
Principle 2: Environmentally Responsible Production to Protect Soil, Water and Air	Contains ten criteria that specify: conservation of biodiversity; maintenance of soil fertility; appropriate fertilizer application; restricted fertilizers, pesticides and seeds; use of integrated pest management; best practices in agro-chemical application; best practice in storing resources; best practice in maintaining water resources; and waste and energy management.
Principle 3: Safe Working Conditions	Contains two criteria that specify: training and competence of employees and Occupational Health and Safety
Principle 4: Compliance with Human, Labour and Land Rights	Contains two criteria that specify: contribution to rural development; and appropriate terms and conditions of employment.
Principle 5: Compliance with Laws and International Treaties	Contains two criteria that specify: legitimacy of land use and compliance with laws and treaties.
Principle 6: Good Management Practices and Continuous Improvement	Contains two criteria that specify: the documents and process for economic stability and good management practices.

[29] ISCC (2016). *ISCC 202 Sustainability Requirements*, Version 3.0

Table 20: ISPO Principles (for integrated plantation and mill companies[30])

Principle	Brief description
Principle 1: Legal requirements on land allocated for plantation	Contains nine criteria, that require a company to have a location permit; a business license; land title; that the plantation is on specified previous land use types; is consistent with land use plans; and that the company is a legal entity; contributes to community development; follows the procedure for unused lands; and has a procedure for dispute resolution.
Principle 2: Plantation management	Contains five criteria that require plantation planning; implementation of technical guidelines; settlement for areas that overlap with mining activities; documentation for plantation and processing units; and provision of information to stakeholders.
Principle 3: Protections to the utilization of primary natural forest and peatlands	Principle only, requiring land release and location permits documents.
Principle 4: Environmental Management and Monitoring	Contains ten criteria that specify compliance with legal obligations related to: integrated plantations and mills; environmental permits; management of hazardous waste; and management of noise and odour emissions; fire procedures; preservation of biodiversity; maintenance of water resources; management of protected areas; erosion control and reduction of GHG emissions.
Principle 5: Responsibilities towards employees	Contains five criteria that specify requirements for occupational health and safety; workers' welfare and capacity building; prohibition of child labour and discrimination; facilitation of the formation trade unions; workers and smallholder cooperatives.
Principle 6: Social responsibility and community economic empowerment	Contains three criteria that require contribution to the welfare of communities around the plantation; empowerment of indigenous people; and contribution to the local economy.
Principle 7: Sustainable business improvement	Principle only, requiring continual improvement.

[30] ISPO (2015). Regulation Of The Minister of Agriculture of the Republic Of Indonesia Number 11/Permentan/Ot.140/3/2015. Annex II Principles And Criteria of Indonesian Sustainable Palm Oil (ISPO) For Plantation Companies Operating/Managing Oil Palm Plantation Integrated With Processing Facilities/Mill, and Produce CPO For Renewable Energy.

Table 21: MSPO Principles (General Principles[31])

Principle	Brief description
Principle 1: Management commitment and responsibility	Contains four criteria, specifying documented commitment to the MSPO; internal audits; periodic management review; and continual improvement
Principle 2: Transparency	Contains three criteria, specifying availability of documents to stakeholders; procedures for consultation and communication; and supply chain traceability
Principle 3: Compliance to legal requirements	Contains three criteria, specifying compliance with appropriate laws and regulations; legality of land rights and maintenance of customary land rights
Principle 4: Social responsibility, health, safety and employment conditions	Contains six criteria, that require a social impact assessment, a complaints and grievance procedure; contribution to local development; employee safety and health; terms and conditions of employment; and training of employees.
Principle 5: Environment, natural resources, biodiversity and ecosystem services	Contains seven criteria, requiring environmental management; efficient and renewable energy use; responsible waste management; reduction of air pollution; management of natural water resources; maintenance of rare, threatened and endangered species and high biodiversity value areas; and avoidance of burning.
Principle 6: Best practices	Contains four criteria, that specify good practice for site management; a business plan; transparent and fair pricing for products and services; and an obligation that subcontractors are aware of MSPO requirements
Principle 7: Development of new planting	Contains six criteria, requiring that oil palm is not planted on primary forest or land designated for protection; mitigation plans for planting on peat; a social and environmental impact assessment is conducted; a soil and topographic survey conducted; planting on steep slopes is avoided; and that no new plantings are established on recognized customary land without the owners' free, prior and informed consent

[31] Department of Standards, Malaysia (2013). Malaysian Sustainable Palm Oil (MSPO) Part 1: General principles. MS 2530-1:2013.

Appendix 7: Full summaries of EU, UN and regional policy instruments relating to palm oil

(Please see **Section 8.3.1.2** of the main report)

Topic		Characteristics
Policy instrument: Directive 2009/28/EC: On the promotion of the use of energy from renewable sources amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC		
Description: The Directive establishes a common framework for the promotion of energy from renewable sources. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020, by the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020. The directive also establishes sustainability criteria for biofuels and bioliquids.		
Overview	*Issued by:*	European Parliament and Council
	Date established:	23/04/09
	Environmental policy objectives:	Sustainability criteria (Article 17) for raw materials used to produce biomaterials and biofuels include: • Greenhouse gas emission savings of at least 35%, 50% from 2017 and 60% from 2018; • Not grown on land with high biodiversity value; • Not grown on land with high carbon stock; and • Not grown on peat land. The Commission must also report on national measures taken by third countries that are a significant source of biofuels, to respect the sustainability criteria and for soil, water and air protection.
	Social policy objectives:	• The Commission must report on the impact of increased demand for biofuels on social sustainability in third countries, particularly on the availability of foodstuffs at affordable prices and wider development issues. • Report should also address land-use rights. • The Commission must also report whether countries providing a significant source of raw materials for biofuels have ratified and implemented ILO core conventions.
Policy instrument: Directive 2015/1513: Amendment of Directive 98/70/EC relating to the quality of petrol and diesel fuels and amendment of Directive 2009/28/EC on the promotion of the use of energy from renewable sources to work towards the inclusion of indirect land use change emissions into the sustainability criteria for biofuels and bioliquids.		
Description: The 2015 amendment to the EU RED recognises the potential negative environmental and social impacts of increased biofuel production in third countries. To address these impacts, the amendment sets a limit of 7% for the contribution of biofuels and bioliquids produced from food crops to the final consumption of energy in transport in the Member States in 2020.		
Overview	*Issued by:*	European Parliament and Council

	Date established:	09/11/15
	Environmental policy objectives:	• The 2015 amendment increases the minimum greenhouse gas emissions savings from 35% to 60% for biofuels and bioliquids produced in installations starting operation after 05/10/15. • The Commission must submit a report by the end of 2017 reviewing the effectiveness of measures introduced by this Directive in limiting indirect land-use change greenhouse gas emissions and the impact of EU legislation (RED).
	Social policy objectives:	• Stronger regulation of the certification schemes used to demonstrate biofuels meet the sustainability criteria - stakeholder involvement (particularly of indigenous and local communities) should be considered when reviewing voluntary certification schemes. • Recognises importance of good governance and a rights-based approach, particularly governance of land tenure and land-use rights - member states should support the implementation of the FAO Voluntary Guidelines.
Policy instrument: Regulation (EU) No 233/2014: Establishing a financing instrument for development cooperation for the period 2014-2020.		
Description: The regulation sets up a financing instrument (the 'Development Cooperation Instrument') for the period 2014-20, specifying geographic and thematic programmes the EU can fund to meet objectives of eradicating poverty, fostering sustainable development and consolidating and supporting democracy. The regulation gives a good indication of development priorities in the EU's external actions.		
Overview	*Issued by:*	European Parliament and Council
	Date established:	01/01/14
	Environmental policy objectives:	Focus areas for cooperation include: • The protection and sustainable use of biodiversity • Equitable access to water and water resources management
	Social policy objectives:	Focus areas for cooperation include: • Support of human rights, including the rights of indigenous peoples • Protection of land rights • Smallholder agriculture for sustainable agricultural practices • The promotion of decent work, including combatting child labour.
Policy instrument: COM(2008) 645: Addressing the challenges of deforestation and forest degradation to tackle climate change and biodiversity loss.		
Description: The communication details the EU's response to the challenge of climate change, with the core objective to 'halt global forest cover loss by 2030 at the latest and to reduce gross tropical deforestation by at least 50% by 2020 compared to current levels'.		

The communication proposes an internationally supported incentive scheme to reduce emissions from deforestation and forest degradation in developing countries.		
Overview	*Issued by:*	European Commission
	Date established:	17/10/08
	Environmental policy objectives:	• Goal is to halt global forest cover loss by 2030 and reduce gross tropical deforestation by at least 50% by 2020. • UN CBD should feed biodiversity considerations into international climate negotiations. • Focus on carbon emissions – proposal of the Global Forest Carbon Mechanism to reduce emissions from deforestation and forest degradation. • Mention of biofuel production, indicating the need to ensure future production is sustainable.
	Social policy objectives:	• Communication supports effective forest governance and respect for the rights of forest-dependent people.
Policy instrument: Technical Report (2013-063): The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation		
Description: The report links EU consumption patters to deforestation by quantifying the impact of overall EU consumption. The study developed the concept of embodied deforestation, which refers to deforestation associated with commodity production.		
Overview	*Issued by:*	Funded by the European Commission, DG ENV
	Date established:	2013
	Environmental policy objectives:	The report found that palm oil contributes to 8% of global deforestation and that oil crops (soybean and oil palm) and their derived products represent the largest share (63%) of deforestation embodied traded crop commodities.
	Social policy objectives:	N/A
Policy instrument: COM (2015) 497: Trade for all – Towards a more responsible trade and investment policy.		
Description: The 'Trade for all' Communication updates the EU's trade and investment policy to include a focus on values. The main aim of this policy is the integration of development goals into trade policy, to achieve social and environmental outcomes.		
Overview	*Issued by:*	European Commission
	Date established:	14/10/15

	Environmental policy objectives:	• The strategy promotes sustainable development through the conservation of and sustainable use of natural resources (including biodiversity, water and forests). • The strategy also refers to on-going negotiations for an environmental goods agreement (EGA) to facilitate trade in green technologies, including renewable energy generation. This could be relevant to palm oil if it is applied to the production of biofuels in major palm oil producing countries.
	Social policy objectives:	The strategy promotes: • Human rights • Inclusion of smallholders in trade opportunities • Implementation of core labour standards including tackling child and forced labour, and decent working conditions.
Policy instrument: COM (2016) 501: A European Strategy for Low-Emission Mobility		
Description: The strategy frames future initiatives on reducing emissions from the transport sector.		
Overview	*Issued by:*	European Commission
	Date established:	20/07/16
	Environmental policy objectives:	• The strategy note that the Commission have already indicated that food-based biofuels are likely to have a limited role in decarbonising the transport sector and should not receive public support after 2020. • The strategy references the policy framework for climate and energy (2020 to 2030), which draws on the proposal for the 2015 amendment on RED, which first suggests the limit on the contribution of biofuels made from food crops to the RED targets on renewable energy consumption.
	Social policy objectives:	N/A
Policy instrument: COM (2011) 244: Our life insurance, our natural capital: an EU biodiversity strategy to 2020.		
Description: The EU Biodiversity Strategy outlines the EU's biodiversity policy to 2020, in line with meeting its international goals and objectives under the UN CBD. The strategy is mainly focused on biodiversity policy within the EU, with the exception of target 6, which details the EU's role in tackling global biodiversity loss.		
Overview	*Issued by:*	European Commission
	Date established:	03/05/11

	Environmental policy objectives:	Target 6: By 2020, the EU has stepped up its contribution to averting global biodiversity loss. • Action 17: Reduce indirect drivers of biodiversity loss: measures to reduce the biodiversity impacts of EU consumption patterns, enhance contribution of trade policy to conserving biodiversity, provide correct market signals for biodiversity conservation. • Action 18: Mobilise additional resources for global biodiversity conservation: contribution of fair share to international efforts, improve effectiveness of EU funding for global biodiversity. • Action 19: 'Biodiversity proof' EU development cooperation: systematically screen development cooperation action to minimize any negative impact on biodiversity. • Action 20: Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use. The mid-term review finds that more efforts are needed to implement provisions on biodiversity in recent trade agreements, and to integrate biodiversity objectives into EU trade policies.
	Social policy objectives:	N/A
Policy instrument: P8_TA (2016) 0034: European Parliament resolution on the mid-term review of the EU's Biodiversity Strategy		
Description: Non-legally binding resolution, providing detailed recommendations for each of the targets in the biodiversity strategy.		
Overview	*Issued by:*	European Parliament
	Date established:	02/02/16
	Environmental policy objectives:	The resolution: • Calls for the Commission to submit an ambitious action plan to tackle deforestation and forest degradation. • Calls for social and environmental sustainability criteria for biomass production to form a coherent part of the framework laid down by EU RED. • Draws attention to the threat to biodiverse environments, including peatland, posed by growing demand for biofuels. • Highlights the impact of forest burning for land clearance.
	Social policy objectives:	Calls on the Commission to promote sustainable management of forests by respecting the rights of indigenous people to sustain forest resources.
Policy instrument: EU 7th Environment Action Plan		
Description: The EU 7th Environmental Action Plan guides European environment policy until 2020 providing a long-term 2050 direction.		
Overview	*Issued by:*	European Parliament
	Date	20/11/13

	established:	
	Environmental policy objectives:	Priority objective 9: • Sets a global focus for environmental action to address international environmental and climate challenges. • Calls on the EU to assess the environmental impact of its consumption of food and non-food commodities, and develop policy proposals to address the findings and give due consideration to an action plan on deforestation and forest degradation'.
	Social policy objectives:	N/A
Policy instrument: 2017/C 210/01: The new European Consensus on Development 'Our world, our dignity, our future'		
Description: Shared vision and framework for action for development cooperation for the European Union (EU) and its Member States. This Consensus addresses the main focus points of the 2030 Agenda: people, planet, prosperity, peace, and partnership.		
Overview	*Issued by:*	European Parliament, Council and European Commission
	Date established:	20/06/17
	Environmental policy objectives:	The EU and its Member States will: • Tackle illegal logging and its associated trade, land and forest degradation, and biodiversity loss. • Support agro-ecological practices to protect soils, conserve water resources, halt, prevent and reverse deforestation. • Implement the 2030 Agenda and the Paris Agreement.
	Social policy objectives:	The EU and its Member States will: • Implement a rights-based approach to development cooperation and promote labour standards (including decent working conditions and combatting child labour). • Promote the involvement of local stakeholders and respect for the rights of all, including indigenous and local peoples. • Support improvements in forest governance and equitable access to land tenure, including customary land use and water access.
Policy instrument: COM (2003) 251: Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan		
Description: The EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) outlines measures to prevent the import of illegal timber into the EU, improve the supply of legal timber, and increase demand for timber from responsibly managed forests.		
Overview	*Issued by:*	European Commission
	Date established:	21/05/03
	Environmental	• Establishment of timber verification and licencing systems to control entry of timber into the EU

	policy objectives:	from countries in bilateral FLEGT Voluntary Partnership Agreements (VPAs). • The EU Timber Regulation (EUTR) (2010) prohibits the import and use of illegally harvested timber and timber products in the EU, and requires EU traders in timber products to keep records of their suppliers and customers. FLEGT is not directly relevant to palm oil, as it is focused on illegally harvested timber rather than other agricultural commodities, but plays a role in sustainable forest management. Similar approaches could also be adopted for other agricultural commodities as reviewed in a feasibility study on an EU deforestation action plan.
	Social policy objectives:	FLEGT plays a role in promoting forest governance.
Policy instrument: The 2030 Agenda - UN Sustainable Development Goals (SDGS)		
Description: International agenda for sustainable development made up of 17 goals and 169 targets.		
Overview	*Issued by:*	United Nations
	Date established:	01/01/16
	Environmental policy objectives:	Goal 6 – Ensure availability and sustainable management of water and sanitation for all • 6.3: By 2030, improve water quality by reducing pollution • 6.6: By 2020, protect and restore water-related ecosystems, including forests and wetlands. Goal 12 – Ensure sustainable consumption and production patterns • 12.2: By 2030, achieve the sustainable management and efficient use of natural resources • 12.6: Encourage companies to adopt sustainable practices and integrate sustainability information into reporting cycles • 12.7: Promote sustainable public procurement practices. Goal 15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss • 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally • 15.5 - Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species • 15.B - Mobilize significant resources from all sources and at all levels to finance sustainable forest management.
	Social policy objectives:	Goal 2 – End hunger, achieve food security and improved nutrition and promote sustainable agriculture

		• 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, through secure and equal access to land, and increased markets opportunities. Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all • 8.7: - Take immediate and effective measures to eradicate forced labour, and by 2025 end child labour in all its forms • 8.8: Protect labour rights and promote safe and secure working environments for all workers.
Policy instrument: The United Nations Convention to Combat Climate Change (UNFCCC) – Paris Agreement		
Description: The UNFCCC is a framework for intergovernmental efforts to tackle the challenge posed by climate change. The Paris Agreement aims to enhance the implementation of the original Convention by setting a target to limit global average temperature increase to 'well below 2°C', and preferably below 1.5°C.		
Overview	*Issued by:*	United Nations
	Date established:	Paris Agreement entered into force 04/11/16
	Environmental policy objectives:	Parties are encouraged to implement: • Policy approaches and incentives for activities that reduce emissions from deforestation and forest degradation. • Recognise the role of conservation and sustainable management of forests in enhancing forest carbon stocks.
	Social policy objectives:	N/A
Policy instrument: The Convention on Biological Diversity (CBD)		
Description: The UN CBD entered into force on 29/12/1993 following the Rio Earth Summit. The treaty has three main objectives: 1. Conservation of biological diversity; 2. Sustainable use of the components of biological diversity; 3. Fair and equitable sharing of the benefits arising out of the utilization of genetic resources.		
Overview	*Issued by:*	United Nations
	Date established:	Entered into force 29/12/93
	Environmental policy objectives:	Article 8 commits parties to: • Establishing protected areas for biodiversity; • Promoting environmentally sound sustainable development; • Rehabilitating and restoring degraded ecosystems.
	Social policy	The Convention commits parties to respecting the practices of indigenous and local communities.

	objectives:	
Policy instrument: Strategic plan for Biodiversity 2011-2020		
Description: The Strategic Plan, including the Aichi Biodiversity Targets, provides a framework for the protection of biodiversity, which Parties must translate into national biodiversity strategies and action plans.		
Overview	*Issued by:*	UNEP
	Date established:	29/10/10
	Environmental policy objectives:	• Target 3 specifies the elimination or reform of incentives, including subsidies, which are harmful to biodiversity and the need for positive incentives for the conservation and sustainable use of biodiversity – relevant to biofuels. • Target 5: halve the rate of loss of all natural habitats, including forests, and significantly reduce degradation; • Target 7: sustainably manage areas under forestry to ensure the conservation of biodiversity; • Target 14: restore and safeguard ecosystem services • Target 15: enhance the contribution of biodiversity to carbon stocks
	Social policy objectives:	• Target 18: respect the customary use of biological resources by indigenous and local communities.
Policy instrument: ILO Conventions		
Description: International labour conventions, which provide legally binding protections for workers, children and indigenous peoples.		
Overview	*Issued by:*	International Labour Organisation (ILO)
	Date established:	1930-2001
	Environmental policy objectives:	N/A
	Social policy objectives:	• Forced Labour Convention (No. 29) • Abolition of Forced Labour Convention (No. 105) • Minimum Age Convention (No. 138) • Worst forms of child labour Convention (No. 182) • Protection of Wages Convention (No. 95) • Occupational Safety and Health Conventions (multiple) • ILO Convention concerning Indigenous and Tribal Peoples in Independent Countries (No 169) expanded in UN Declaration on the Rights of Indigenous Peoples (UNDRIP).
Policy instrument: UN Forest Instrument		
Description: The UN Forest Instrument is the most recent version of the 'Non-legally binding instrument on all types of forests' (NLBI). The Instrument extends the timeline of the global objectives of forests originally set out in the NLBI from 2015 to 2030, but otherwise		

the text of the NLBI remains unchanged.		
Overview	*Issued by:*	United Nations
	Date established:	22/12/15 (NLBI established 17/12/07)
	Environmental policy objectives:	**Global objective 1:** Reverse the loss of forest cover worldwide through sustainable forest management, and increase efforts to prevent forest degradation.
	Social policy objectives:	**Global objective 2:** Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest-dependent people. Includes measures to: • Provide investment opportunities for local and indigenous communities • Support education, training and extension programmes involving local and indigenous communities • Enhance access by households, small-scale forest owners, and forest dependent local and indigenous communities to forest resources and relevant markets.
Policy instrument: UN Strategic Plan for Forests		
Description: The UN Strategic Plan for Forests 2017-2030 provides a global framework for action to sustainably manage all types of forests and trees outside forests, and halt deforestation and forest degradation.		
Overview	*Issued by:*	UN Forum on Forests
	Date established:	20/01/17
	Environmental policy objectives:	• **Global Forest Goal 1:** Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change. • **Global Forest Goal 3:** Increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests
	Social policy objectives:	• **Global Forest Goal 2:** Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest dependent people. • **Global Forest Goal 5:** Promote governance frameworks to implement sustainable forest management, including through the UN Forest Instrument, and enhance the contribution of forests to the 2030 Agenda.
Policy instrument: Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security		
Description: Non-legally binding reference document to provide guidance on how to improve the governance of land tenure.		
Overview	*Issued by:*	FAO and CFS (Committee on World Food Security)
	Date established:	Endorsed by CFS on 11/05/12

	Environmental policy objectives:	Guidelines recommend establishing environmental safeguards to minimise degradation and biodiversity loss, for states using readjustment approaches.
	Social policy objectives:	Guidelines recommend: • Assessment for potential impacts on human rights • Respect for and appropriate action to identify all existing tenure right holders including customary tenure rights • Particular concern for rights of indigenous peoples • Protection of tenure rights of smallholders and support • Appropriate community interactions.
Policy instrument: Voluntary guidelines on the responsible management of planted forests		
Description: Guidelines aim to ensure that planted forests have a positive impact on livelihood needs and do not negatively impact the environment.		
Overview	*Issued by:*	FAO
	Date established:	2006
	Environmental policy objectives:	Coverage of: • Biodiversity loss • Carbon emissions
	Social policy objectives:	Coverage of: • Rights and wellbeing of local and indigenous communities • Land rights • Rights of smallholders • Labour rights
Policy instrument: Principles for responsible investment in agriculture and food systems		
Description: Endorsed by Committee on World Food Security (CFS) on 15/10/14		
Overview	*Issued by:*	CFS
	Date established:	Endorsed by Committee on World Food Security (CFS) on 15/10/14
	Environmental policy objectives:	Principle 6: Conserve and sustainably manage natural resources
	Social policy objectives:	Principles 5: Respect tenure of land, fisheries and forests
Policy instrument: OECD FAO Guidance for Responsible Agricultural Supply Chains		
Description: The guidance combines existing standards to produce a model enterprise policy for responsible business conduct in		

agricultural supply chains.		
Overview	*Issued by:*	FAO and OECD
	Date established:	2016
	Environmental policy objectives:	Guidance covers: • Sustainable use of natural resources • Conservation of biodiversity and ecosystem services • Reduction of carbon emissions and pollution.
	Social policy objectives:	Guidance covers: • Respect for human rights • Sharing of monetary and non-monetary benefits with indigenous peoples, and respect for their knowledge • Respect for legitimate tenure rights holders including indigenous and customary rights • Respect for ILO Core Conventions including elimination of forced and child labour; and commitment to decent working conditions
Policy instrument: ASEAN Agreement on Trans-boundary Haze Pollution		
Description: The objective of the Agreement is to prevent and monitor transboundary haze pollution as a result of land and/or forest fires, which should be mitigated, through concerted national efforts and intensified regional and international cooperation.		
Overview	*Issued by:*	Governments of the ten ASEAN Member Countries. 9 member countries have ratified the agreement.
	Date established:	Entered into force 25/11/03
	Environmental policy objectives:	• Commitment for measures to prevent/control haze pollution • Includes measures to control activities relating to fires • Requires parties to manage and use natural resources in an ecologically sound and sustainable manner.
	Social policy objectives:	N/A
Policy instrument: ASEAN Programme on Sustainable Management of Peatland Ecosystems 2014-2020		
Description: The ASEAN Programme on Sustainable Management of Peatland Ecosystems (APSMPE) supports collaboration among stakeholders in the ASEAN Region to achieve the goal of the ASEAN Peatland Management Strategy 2006-2020 (APMS), namely: To promote sustainable management of peatlands in the ASEAN region through collective actions and enhanced cooperation, support and sustain local livelihoods, reduce risk of fire and associated haze and contribute to global environmental management.		
Overview	*Issued by:*	ASEAN environment ministers
	Date established:	September 2013
	Environmental policy objectives:	Targets include: • The promotion of the zero burning agricultural practice • Identification and conservation of peatlands.
	Social policy	N/A

	objectives:	
Policy instrument: Amsterdam Declaration Towards Eliminating Deforestation from Agricultural Commodity Chains with European Countries		
Description: Non-legally binding declaration of political intent, signed by Denmark, France, Germany, the Netherlands, Norway and the UK. The Declaration recognises the need to eliminate deforestation relating to agricultural commodity trade, and supports private and public initiatives to halt deforestation.		
Overview	*Issued by:*	Ministry of Foreign Affairs (The Netherlands)
	Date established:	07/12/15
	Environmental policy objectives:	• Objective is the elimination of deforestation • Emphasises the importance of reducing emissions from deforestation and forest degradation to limit global temperature rise.
	Social policy objectives:	• The declaration draws attention to the importance of forest governance and land rights, particularly of indigenous communities.
Policy instrument: The Amsterdam Declaration in Support of a Fully Sustainable Palm Oil Supply Chain by 2020		
Description: Non-legally binding declaration of political intent, signed by Denmark, France, Germany, the Netherlands, Norway and the UK. Signatories support the goal of a 'fully sustainable palm oil supply chain'.		
Overview	*Issued by:*	Ministry of Foreign Affairs (The Netherlands)
	Date established:	07/12/15
	Environmental policy objectives:	Signatories support the goal of a fully sustainable palm oil supply chain, but there is little explanation of what 'sustainable palm oil' entails or how this outcome will be achieved.
	Social policy objectives:	N/A

Appendix 8: Analysis of the four major certification schemes against requirements of EU, UN and regional policy instruments

(Please see **Section 8.3.2.2** of the main report).

The following tables provide details of the relationship between the content of the Principles and Criteria of RSPO, ISCC (EU), ISPO and MSPO standards and the objectives of a range of EU, UN and regional policy instruments. The analysis is summarised visually in **Tables 48-55** in the main report.

Analysis between RSPO certification system and environmental aspects required to meet selected EU/UN and regional objectives

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU Renewable Energy Directive	RSPO Principle 7 prohibits conversion of primary forest but not HCS forest (Article 17).	RSPO Principle 7 prohibits the conversion of high conservation value forest (Article 17).	RSPO Principle 7 prohibits conversion of primary forest and HCV but not HCS forest - partly consistent with reduced GHG emissions from LUC (Article 17).	RSPO Principle 7 prohibits conversion of primary forest and HCV but not HCS forest - partly consistent with reduced GHG emissions from LUC (Article 17).	RSPO Principle 5 includes requirements on waste and emissions management (Annex V)		RSPO Principle 7 limits but does not fully exclude conversion of peatland (Article 17).	RSPO Principle 5 contributes to the reduction of water and air pollution (Article 17), soil erosion, and management of conservation areas (Article 18).		RSPO Principle 5 contributes to the reduction of water and air pollution (Article 17).
EU Financing Instrument		RSPO Principle 5 requires protection of biodiversity and ecosystem services (Regulation Annex 1 and IV).						RSPO Principle 5 requires management of water, but not equitable access, integrated water resource or river basin management (Annex I).		
EU Communication on Deforestation	RSPO Principle 7 prohibits conversion of HCV and primary forests - partly consistent with reducing 'gross tropical deforestation' (Objective).	RSPO Principles 5 and 7 require forest and biodiversity protection but the extent to which imports do not 'jeopardise efforts to protect forests or broader biodiversity priorities' is unknown (section 4.1.2).	RSPO Principle 7 prohibits conversion of primary forest and HCV but not HCS forest - partly consistent with reduced GHG emissions from LUC (section 5.1).	The RSPO Principles and Criteria contribute towards sustainability, as required for biofuels (section 4.1.2).		RSPO Principles 5 and 7 limits burning but does not prohibit it (mentioned without specific requirement in section 2.3).		RSPO Principle 5 covers water management and erosion control (mentioned in the Summary without specific policy requirements).		RSPO Principle 5 requires monitoring and reduction of emissions (section 2.3 without specific policy requirements).
EU Communication on Trade for all	RSPO Principle 5 covers conservation of biodiversity, soil, water, wildlife, etc. (section 2.2).	RSPO Principle 5 covers conservation of biodiversity, soil, water, wildlife, etc. (section 4.2.2).		RSPO Principle 5 includes requirements on climate change and protecting the environment (section 4.2.2).				RSPO Principle 5 covers conservation of biodiversity, soil, water, wildlife, etc. (section 4.2.2).		RSPO Principle 5 requires monitoring and reduction of mill emissions (section 4.2.2 without specific requirements).

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU Low-emission mobility strategy				The strategy re-affirms a limited role for food-based biofuels thus certification of palm oil does not support the policy.						
EU Biodiversity Strategy to 2020 and Parliament Resolution	RSPO Principle 7 prohibits conversion of HCV and primary forests - potentially contributes to P8_TA (2016) 0034, Target 6, 62, to take 'ambitious' measures to tackle deforestation.	RSPO Principles 7 and 5 cover forest conversion and biodiversity conservation - likely to be consistent with Target 6.		P8_TA (2016) 0034, Target 3, 48 urges environmental sustainability criteria for biomass production coherent with RED, with which the RSPO is partly coherent.		RSPO Principle 7 limits but does not prohibit planting on peat, an issue noted in P8_TA (2016) 0034 but without specific policy requirement.	RSPO Principle 7 limits but does not prohibit use of fire for clearing, an issue noted in P8_TA (2016) 0034 but without specific policy requirement.			
The New European Consensus	RSPO Principle 7 prohibits conversion of primary forest and HCV but does not prohibit deforestation entirely - partly consistent with halting deforestation (section 2.3).	RSPO Principle 5 includes conservation of 'rare, threatened and endangered species' - likely to be consistent with maintaining biodiversity (section 2.3).						RSPO Principle 5 covers management of soils and water sources (section 2.3).		
UN 2030 Agenda	RSPO Principle 7 prohibits conversion of primary forest and HCV but does not halt deforestation entirely - partly consistent Goal 15, Target 15.2.	RSPO Principles 5 and 7 include maintaining HCVs - partly consistent with Goal 15, Target 5.	RSPO Principle 7 (limiting types of forest that can be converted) and Principle 5 (conserving biodiversity) are partly consistent with conserving GHG sinks (Goal 13).					RSPO Principle 5 includes water resource management (Goal 6) and reduced and environmental sound management of chemicals (Goal 12).		RSPO Principle 5 requires responsible chemical use and waste management (Goal 12, 12.4).
UNFCCC (Paris Agreement)	RSPO Principle 7 prohibits conversion of HCV and primary forests - partly consistent with 'reducing emissions from deforestation' (Article 5.2).	RSPO Principle 5 is likely to be consistent with protecting biodiversity (Introduction with no specific policy requirement).	RSPO Principle 7 (limiting types of forest that can be converted) and Principle 5 (conserving biodiversity) are partly consistent with conserving GHG sinks (Article 5, 1).							
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	RSPO Principle 7 prohibits conversion of primary forest and HCV but does not prohibit deforestation entirely - partly consistent with at least halving loss of natural habitats (Article 8e).	RSPO Principles 5 and 7 include maintaining HCVs and conserving rare species, but does not have provision for sharing of benefits of biodiversity (Article 1, Objectives).	RSPO Principle 4 includes ecosystem restoration as an option, but does not include requirements to restore at least 15% of degraded ecosystems (Goal D, Target 15).					RSPO Principle 4 includes ecosystem restoration as an option, but does not include requirements to restore at least 15% of degraded ecosystems (Goal D, Target 15).		
ILO Conventions										

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
UN Forest Instrument	RSPO Principle 7 prohibits conversion of HCV and primary forests -partly consistent with reversing the loss of forest cover (iV.5 Global Objective 1).									
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests		RSPO Principles 5 and 7 include maintaining HCVs - consistent with minimising loss of biodiversity (Section 13.6).								
OECD FAO Guidance for Responsible Agricultural Supply Chains	RSPO Principle 7 prohibits conversion of HCV and primary forests - helps to prevent and minimise negative impacts on forests and biodiversity (Model Enterprise Policy, 8).	RSPO Principles 5 and 7 include maintaining HCVs - consistent with 'respecting ... high conservation value areas and endangered species' (Model Enterprise Policy, 8).						RSPO Principles 5 and 7 include maintaining HCVs - consistent with preventing and minimising negative impacts on air, land, soil, water' (Model Enterprise Policy 8).		RSPO Principle 5 includes requirements for monitoring and reducing mill emissions (Model Enterprise Policy, 8).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy	RSPO Principle 7 prohibits conversion of HCV and primary forests - likely to be considered consistent with the sustainable use of natural resources (Article 3).					RSPO Principles 5 and 7 stipulate implementation of guidelines for the ASEAN Zero Burning Policy.	RSPO Principles 5 and 7 stipulate implementation of guidelines of the Zero Burning Policy, but allows some peatland conversion - potentially in conflict with APSME Target 5.		RSPO Principles 5 and 7 stipulate implementation of guidelines for the ASEAN Zero Burning Policy - consistent with minimizing haze (Haze Agreement, Article 3.2 and 3.3).	
Amsterdam Declaration on Deforestation	RSPO Principle 7 prohibits conversion of HCV and primary forests - consistent with their stated 'global importance' but not with achieving 'zero net deforestation'.		RSPO Principle 7 (limiting types of forest that can be converted) and Principle 5 (conserving biodiversity) are partly consistent with reducing emissions by deforestation (Eliminating Deforestation).							

Analysis between RSPO certification system and social aspects required to meet selected EU/UN and regional objectives

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and Conditions of Labour
EU RED	RSPO Principle 6 includes 'wider development issues' required by Article 17 (7), including an indicator to ensure affordable food for workers.	RSPO Principles 2 and 7 include requirements for respecting land use rights, including FPIC (Article 17, 7).	RSPO has a smallholder working group but the requirements of certification are generally considered burdensome for smallholders (Article 18, 3).	RSPO Principle 6 prohibits both child and forced labour (Article 17,7).	
EU Financing Instrument	RSPO Principles 2 and 6 require respect for human rights and the law (Article 2 (1b)).	RSPO Principles 2 and 7 include requirements for 'protection of land rights of the population in its various form and access to land for local populations' (Annex 2).	RSPO Principle 3 includes technical support to 'scheme' smallholders, and Principle 4 includes training of 'associated' smallholders, partly aligned to Annex I (II).	RSPO Principle 6 prohibits child labour, forced labour and trafficking (Annex 2, III. (d i) and (f i)).	RSPO Principle 4 includes requirements on terms and conditions of labour, training, and social dialogue (Annex 2).
EU Comm on Deforestation	RSPO Principles 2 and 6 include respect for forest dependent people's rights, including land use and human rights (section 5.1).				
Trade for all	RSPO Principle 6 includes respect for human rights, responsible treatment of employees and people affected by operations (section 4.2.2).	RSPO Principles 2 and 7 include requirements for FPIC and hence are consistent with preventing 'land grabbing' (section 4.2.5).	RSPO Principle 6 requires fair dealings with smallholders (section 4.2.4).	RSPO Principle 6 prohibits child labour, forced labour and trafficking (sections 4.2.2 and 4.2.5).	RSPO Principle 4 includes requirements for non-discrimination, freedom of association, health and safety (section 4.2.2).
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution		RSPO Principles 2 & 7 prohibits land rights violations (mentioned without specific requirement in P8_TA (2016) 0034, Target 3, 44).			
The New European Consensus	RSPO Principle 6 includes communication and consultation with communities (section 1.3 (44)).	RSPO Principles 2 and 7 include requirements for 'respecting the rights of local populations and of indigenous peoples, including customary land use and access to water' (section 2.3 (54)).	RSPO Principles 3, 4 and 6 require support to smallholders (section 2.3, 55).	RSPO Principle 6 prohibits child labour, forced labour and trafficking (section 2.3).	RSPO Principle 4 requires decent employment conditions and wages in line with ILO (section 2.3 (54)).
UN 2030 Agenda	RSPO Principle 1 requires provision of adequate information to stakeholders (Goal 16, 16.10) and Principle 6 partly aligns with Goal 3 (health and well-being).	RSPO Principles 2 and 7 include requirements for ensuring secure access to land for indigenous ad local groups (Goal 2, Target 2.3)	RSPO Principles 2, 3, 4, 6 and 7 support Goal 2 (2.3) on security of land use, transfer of knowledge and fair trade, but do not include a productivity target.	RSPO Principle 6 prohibits child labour, forced labour and trafficking (Goal 8 (8.7)).	RSPO Principle 4 includes requirements on labour rights and safe working conditions (Goal 8 (8.8)).
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	RSPO Principles 2 and 7 require respect for indigenous land use (Target 18) but the standard does not have provision for supporting traditional lifestyles (Article 8 (j)).	RSPO Principles 2 and 7 include requirements for respect of customary resources (Strategic Plan, Goal E, Target 18).			
ILO Conventions		RSPO Principles 2 and 7 stipulate FPIC and compensation if land use rights change (Indigenous and Tribal Peoples Convention, Articles 2, 3 and 4; UN Declaration, Article 10).		RSPO Principle 6 prohibits child labour, forced labour and trafficking using the definitions of and referring to the ILO Conventions.	RSPO Principle 4 explicitly refers to ILO core conventions and conventions 184, 87, 98, and 138 in its guidance - likely to be consistent with ILO conventions in general.
UN Forest Instrument	RSPO Principle 6 includes local sustainable development (Global Objectives on forests).	RSPO Principles 2 and 7 include requirements on recognising and respecting land rights and consultation including of indigenous people	RSPO Principle 6 requires fair dealings with smallholders - partly consistent with section		

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and Conditions of Labour
		(Section V.6 (h) & (y)).	V,6(y).		
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests	RSPO Principles 2 & 7 include respect for tenure, and Principles 6 identification of impacts (section 3.2).	RSPO Principles 2 and 7 include requirements compatible with Guiding Principles on recognising and respecting land rights (including customary rights), and consultation as per V.6. (y) & (h).	RSPO Principles 2,7 & 6 are partly consistent with the requirement to identify existing land rights and support smallholders (sections 7.3, 11.8 and 12.2).		
OECD FAO Guidance for Responsible Agricultural Supply Chains	RSPO Principles 2 & 6 require respect for human rights and the law (Model Enterprise Policy, 2).	RSPO Principles 2 and 6 are compatible with Model Enterprise Policy, 6, which includes respect for land tenure rights, including indigenous and customary rights.		RSPO Principle 6 prohibits child labour, forced labour and trafficking (section 2 (3).	RSPO Principle 4 includes requirements on occupational health and safety, wages and working conditions sufficient to satisfy the basic needs of workers (section 2 (3)).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation	RSPO Principles 2, 7, and 6 require respect for law, and the rights of communities and indigenous people, including assessing women's rights.	RSPO Principles 2 and 6 are compatible with the aim of strengthening the rule of law, 'especially those pertaining to their lands'.			

Analysis between ISCC (EU) certification system and environmental aspects required to meet selected EU/UN and regional objectives

		Carbon emissions							Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU RED	ISCC Principle 1 prohibits biofuels from land that was primary forest, HCS forest or of high biodiversity value in January 2008 (Article 17.3).	ISCC Principle 1 prohibits biofuels from land that was primary forest, HCS forest or of high biodiversity value in January 2008 (Article 17.3).	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest in January 2008 (Article 17.3).	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest in January 2008 (Article 17.3).	ISCC Principle 2 includes provision for reducing fuel consumption and associated greenhouse gas emissions (Annex V).		ISCC Principle 1 prohibits biomass production from land that was peatland in January 2008 or thereafter (Article 17(5)).	ISCC Principle 2 includes the protection of soil, water and air (Article 17.3, 4 & 7).		ISCC Principle 2 includes the protection of soil, water and air (Article 17.3, 4 & 7).
EU Financing Instrument		ISCC Principle 1 requires protection of biodiversity and ecosystem services (Regulation Annex 1 and IV).						ISCC Principle 2 requires management of water and maintenance of access for other (Annex 1).		
EU Comm on Deforestation	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - likely to be consistent with the Regulation's Objective to halve deforestation by 2020.	ISCC Principle 1 requires forest protection and biodiversity but the extent to which imports do not 'jeopardise efforts to protect forests or broader biodiversity priorities' is unknown (section 4.1.2).	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest in January 2008 consistent with reducing emissions from deforestation (Section 5.1).	ISCC Principles 1 & 2 contributes towards sustainability, as required for biofuels under section 4.1.2 of the Regulation.		ISCC Principle 2 prohibits burning for land clearance (mentioned in 2.3 without specific policy requirements).		ISCC Principle 2 covers water management and erosion control (mentioned in the Summary of the Regulation without specific policy requirements).		ISCC Principle 1 prohibits burning for clearance and is consistent with reducing air pollutants from deforestation (mentioned in 2.3 without specific requirements).
Trade for all	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - consistent with section 4.2.2.	ISCC Principle 1 is likely to be consistent with the conservation of forests to combat climate change (section 4.2.2).		ISCC principles are consistent with reducing emissions from deforestation and with EU RED (sections 4.2.2 & 4.2.3).				ISCC Principle 2 covers conservation of biodiversity, soil, water, wildlife, etc. (section 4.2.2).		ISCC Principle 2 includes the protection of soil, water and air, waste management and energy management (section 4.2.2 without specific requirement).
EU Low-emission mobility strategy				The strategy re-affirms a limited role of food-based biofuels thus certification of palm oil does not support the policy.						
EU Biodiversity Strategy to 2020 and Parliament Resolution	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest consistent with P8_TA (2016) 0034, Target 6, 62 (no specific requirement).	ISCC Principles 1 cover forest conversion and conservation of rare, threatened and endangered species - likely to be consistent with Target 6.		P8_TA (2016) 0034, Target 3, 48 urges environmental sustainability criteria for biomass production coherent with EU RED, with which the ISCC is consistent.		ISCC Principle 2 prohibits burning for land clearing, an issue noted in P8_TA (2016) 0034 but without specific policy requirement.	ISCC Principle 2 prohibits burning for land clearing, an issue noted in P8_TA (2016) 0034 but without specific policy requirement.			

		Carbon emissions							Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
The New European Consensus	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - whether this fulfils the objective to 'prevent and reverse' deforestation is unknown (sections 2.2 (44) & 2.3 (56)).	ISCC Principle 1 includes conservation of 'rare, threatened and endangered species' - likely to be consistent with maintaining biodiversity (section 2.3).						ISCC Principle 2 requires conservation of water and control of soil erosion (section 2.3).		
UN 2030 Agenda	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest but whether this fulfils the objective to prevent deforestation and cause reforestation is unknown (Goal 15.2).	ISCC Principles 1 includes maintaining primary forest, HCVs and HCS and conserving rare species - unknown whether this is fully consistent with 'prevent the extinction of rare species' (Goal 15.5).	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - consistent with Goal 13 (no specific requirement)					ISCC Principle 2 includes water resource management (Goal 6) and reduced and environmentally sound management of chemicals (Goal 12).		ISCC Principle 2 includes chemical use and waste management including reduction of use (Goal 12.4).
UNFCCC (Paris Agreement)	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - consistent with reducing emissions from deforestation and degradation (Article 5, 2).	ISCC Principle 1 includes conserving rare species and protecting forest, consistent with the Introduction (no specific requirement).	ISCC Principle 1 prohibits clearance of primary, HCS, and high biodiversity value forest consistent with conserving GHG sinks (Article 5, 1).							
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - likely to be consistent with 'at least halving the rate of forest loss by 2010' (CBD Article 8 (e)).	ISCC Principle 1 includes maintaining HCVs and conserving rare species, but does not have provision for sharing of benefits of biodiversity (CBD Article 1 (Objectives).	ISCC Principle 1 prohibits clearance of primary, HCS, or high biodiversity value forest - consistent with conserving GHG sinks but without requiring restoration (Strategic Plan, Goal D, Target 15).					ISCC Principle 2 includes ecosystem restoration as an option, but does not include a restoration target (Goal D, Target 1).		
ILO Conventions										
UN Forest Instrument	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest but whether this fulfils the objective to 'reverse deforestation is unknown (IV.5. Global objective 1).									

		Carbon emissions							Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests		ISCC Principle 1 includes maintaining HCVs and conserving rare species - consistent with minimising loss of biodiversity (section 13.6).								
OECD FAO Guidance for Responsible Agricultural Supply Chains	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - consistent with section 2.8.	ISCC Principle 1 includes maintaining HCVs, which is consistent with 'respecting ... high conservation value areas and endangered species' (Model Enterprise Policy, 8).						ISCC Principle 1 prohibits burning and Principle 2 (conservation or water, soils and management of waste and pollution) - consistent with Model Enterprise Policy, 8.		ISCC Principle 2 includes requirements for monitoring and reducing mill emissions (Model Enterprise Policy, 8).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest - consistent with ecologically sustainable use of resources (Haze Agreement, Article 3.4).					ISCC Principle 2 prohibits burning of clearance or preparation, which exceeds the requirements of the ASEAN Zero Burning Policy.	ISCC prohibits conversion of peatland and burning (APSMPE Targets 2 & 4).		ISCC Principle 1 prohibits burning, exceeding the ASEAN Zero Burning Policy, and consistent with minimizing haze (Haze Agreement - Article 3.2 and 3.3).	
Amsterdam Declaration on Deforestation	ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest but whether this fulfils the objective of 'zero net deforestation' is unclear (Eliminating Deforestation).		ISCC Principle 1 prohibits clearance of primary, HCS and high biodiversity value forest, consistent with reducing emissions by deforestation (Eliminating Deforestation).							

Analysis between ISCC (EU) certification system and social aspects required to meet selected EU/UN and regional objectives

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
EU RED	ISCC Principles 4 & 5 require compliance with the law, but there is limited treatment of community rights and women's rights (Article 17.7 and 18.3).	ISCC Principle 4 prohibits land rights violations and its production must not impair food security (Article 17.7).	There is no specific provision within the ISCC system to reduce the administrative burden on smallholders (Article 18, without specific requirement).	ISCC Principle 4 prohibits both child and forced labour (Article 17.7).	
EU Financing Instrument	ISCC Principle 4 prohibits violation of human rights and compliance with the law but makes little reference to indigenous people (Articles 1, 2, & 3).	ISCC Principle 4 prohibits land rights violations and Principle 5 requires proof of legitimate land use and securing traditional land use (Annex 2).	ISCC Principle 2 describes that smallholders may be trained on OHS, partly consistent with supporting smallholder sustainable agriculture (Annex I (II)).	ISCC Principle 4 prohibits child labour, forced labour and trafficking (Annex 2, III. (d i) and (f i)).	ISCC Principle 4 requires fair contracts, payment of a living wage and Principles 2 & 3 require training (Annex 2).
EU Comm on Deforestation	ISCC Principle 4 prohibits violation of human rights and compliance with the law but makes little reference to indigenous people (section 5.1).				
Trade for all	ISCC Principle 4 prohibits violation of human rights and compliance with the law (section 4.2).	ISCC Principle 4 prohibits land rights violations (mentioned in section 4.2.5 without specific requirement).	The ISCC standard has no explicit requirement for fair trade with smallholders (section 4.2.4).	ISCC Principle 4 prohibits child labour, forced labour and trafficking (sections 4.2.2 and 4.2.5).	ISCC Principle 4 requires freedom of association, non-discrimination, and occupational health and safety (section 4.2.2).
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution		ISCC Principle 4 prohibits land rights violations (mentioned without specific requirement in P8_TA (2016) 0034, Target 3, 44).			
The New European Consensus	ISCC Principle 4 prohibits violation of human rights and compliance with the law but makes little reference to indigenous people or community consultation (section 1.3 and 2.2).	ISCC Principle 4 prohibits land rights violations and Principle 5 specifies respect for indigenous people's rights (sections 2.3.54 & 55).	The ISCC standard does not explicitly require support to smallholders (section 2.3).	ISCC Principle 4 prohibits child labour, forced labour and trafficking (section 2.3).	ISCC Principle 4 requires living wage, fair contracts and freedom of association (section 2.4(54)).
UN 2030 Agenda	ISCC Principle 4 relies on a participatory SIA process, publicly available and with communications documented, to ensure access to information, but does not explicitly demand participation in decision-making (Goal 16).	ISCC Principle 4 prohibits land rights violations and Principle 5 specifies respect for indigenous people's rights (Goal 2.3).	The ISCC standard does not require plantation companies to support a doubling of the productivity or incomes of smallholders (Goal 2.3).	ISCC Principle 4 prohibits child labour, forced labour and trafficking (Goal 8.7).	ISCC Principle 4 requires living wage, fair contracts, non-discrimination, freedom of association, etc. (Goal 8.8).
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	The ISCC standard lacks specific provision for indigenous people's rights and traditional lifestyles (CBD Article 18) but has provision of community wellbeing (Target 14).	ISCC Principle 4 prohibits land rights violations and Principle 5 specifies respect for indigenous people's rights but does not specify respect for indigenous knowledge and practices (Strategic Plan, Goal E, Target 18).			
ILO Conventions		ISCC Principle 5 specifies respect for indigenous people's rights but does not specify FPIC (Indigenous and Tribal Peoples Convention and United Nations Declaration, Article 10).		ISCC Principle 4 prohibits child labour, forced labour and trafficking using the definitions of and referring to the ILO Conventions.	ISCC Principle 4 is explicitly based on ILO core standards.
UN Forest Instrument	ISCC Principle 4 includes benefits for the communities (iV.5.2) but these are not specified.	ISCC Principle 4 requires provision of community benefits but does not require producers to increase the access of local and indigenous people to forest resources or markets (V.6 (h) & (y)).	The ISCC standard does not require producers to increase the access of smallholders to forest resources or markets (V.6 (y)).		
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests	ISCC Principle 4 prohibits violation of land rights and identification of social impacts (section 3.2).	ISCC Principle 4 prohibits land rights violations including those of indigenous people (sections 7.3 & 9.3-5).	ISCC Principle 4 requires a complaints procedure but not full consultation with smallholders on land rights (section 7.3) and does not require investment in smalllholders (section 12.2).		
OECD FAO Guidance for Responsible Agricultural Supply Chains	ISCC Principle 4 prohibits violation of human rights and compliance with the law (section 2.2).	ISCC Principle 4 prohibits land rights violations and requires respect for existing water use rights (section 2.6).		ISCC Principle 4 prohibits child labour, forced labour and trafficking (section 2.3).	SCC Principle 4 requires living wage, fair contracts, non-discrimination, freedom of association, etc. (section 2.3).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation	ISCC Principle 4 prohibits violation of human rights and compliance with the law and Principle 5 specifies respect for indigenous people's rights (Eliminating deforestation).	ISCC Principle 4 prohibits violation of human rights and compliance with the law and Principle 5 specifies respect for indigenous people's rights (Eliminating deforestation).			

Analysis between ISPO certification system and environmental aspects required to meet selected EU/UN and regional objectives

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU RED	ISPO has no specific provisions for primary forests, HCV or HCS (Article 17).	ISPO Principle 3 requires plantation managers to preserve biodiversity as per the plantation permit but has no specific provision for high biodiversity value areas (Article 17).	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest (Article 17).	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest as (Article 17).	ISPO Principle 4 requires an inventory of GHG emissions and emissions reduction measures to be in place but does not specify methane capture (Annex V).		ISPO Principle 2 requires that planting on peat should take into account ecosystem functioning, but does not prohibit planting on peat after January 2008 or drainage (Article 17.5).	ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management (Article 17 (7) and Article 18).		ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management (Article 17 (7) and Article 18).
EU Financing Instrument		ISPO Principle 3 requires plantation managers to preserve biodiversity as per the plantation permit but does not per se promote protection of biodiversity (Annex 1 (e)).						ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management but not for equitable access (Annex I A, I (e)).		
EU Comm on Deforestation	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not to halt forest cover loss (Objective).	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit, but does not ensure that imports do not 'jeopardise efforts to protect forests or broader biodiversity priorities' (section 4.1.2).	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify emissions from LUC (section 5.1).	The ISPO Principles and Criteria contribute towards sustainability, as required for biofuels (section 4.1.2).		ISPO Principle 2 (guidance) requires an SOP for land clearance without burning (section 2.3).		ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management (mentioned in the Summary without specific requirement).		ISPO Principle 2 requires monitoring and reduction of mill emissions (section 2.3 without specific requirements).
Trade for all	ISPO Principle 1 includes coherence with spatial plans and Principle 3 requires avoidance of erosion prone areas - partly consistent with conservation of biodiversity, soil, water, wildlife, etc. (section 2.2).	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit, but depending on the permit may not result in significant conservation of biodiversity (section 2.2).		ISPO Principle 3 includes identification of sources of GHG emissions (section 4.2.2).				ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management consistent with sustainable management of water (section 4.2.2).		ISPO Principle 2 requires waste management and monitoring and reduction of mill emissions (section 4.2.2 without specific requirements).
EU Low-emission mobility strategy				The strategy re-affirms a limited role of food-based biofuels thus certification of palm oil does not support the policy.						
EU Biodiversity Strategy to 2020 and Parliament Resolution	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not requirements to combat deforestation (P8_TA (2016) 0034, Target 6, 62).	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit - partly coherent with 'halting biodiversity loss (Headline Target).		P8_TA (2016) 0034, Target 3, 48 urges environmental sustainability criteria for biomass production coherent with RED, with which ISPO is partly coherent.		ISPO Principle 2 (guidance) requires an SOP for land clearance without burning (P8_TA (2016) 0034, Target 3, 49).	ISPO Principle 2 requires that planting on peat should take into account ecosystem functioning, but does not prohibit it (P8_TA (2016) 0034 Target 3 (49) without specific requirement).			
The New European Consensus	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit, -						ISPO Principles 2 & 3 include requirements for water quality conservation, controlling		

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
	avoidance of erosion prone areas but not to 'prevent and reverse' deforestation (section 2.3 (56)).	consistent with conservation of biodiversity and ecosystems (sections 2.2(44) and 2.3 (56)).						erosion, and waste management consistent with 'actions to conserve water resources' (section 2.3 (56)).		
UN 2030 Agenda	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not requirements to combat deforestation (Goal 15.2).	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit, - depending on the permit may be consistent with Goal 15.5.	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest (Goal 13 without specific requirements).					ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management (Goals 12.4 and 14.1).		ISPO Principle 2 requires responsible waste management (Goal 12.4).
UNFCCC (Paris Agreement)	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not requirements to reduce emissions from deforestation (Article 5, 2).	ISPO Principle 3 is likely to be consistent with protecting biodiversity as noted in the Introduction with no specific policy requirement.	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify LUC - partly consistent with conserving sinks of greenhouse gases (Article 5, 1).							
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not to at least halve deforestation (CBD Strategic Plan, Goal B, Target 5).	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit, - partly consistent with conservation of biological diversity (Article 1 (Objectives)).	ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify LUC - partly consistent with conserving carbon stocks (Strategic Plan, Goal D, Target 15).					ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management, but not restoration (Strategic Plan, Goal D, Target 14).		
ILO Conventions										
UN Forest Instrument	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not requirements to reverse the loss of forest cover (IV.5 Global objective 1).									
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests		ISPO Principle 3 is likely to be consistent with protecting biodiversity as noted in the section 13 with no specific policy requirement.								
OECD FAO Guidance for Responsible Agricultural Supply Chains	ISPO Principle 1 requires consistency with the spatial plan, which would include Protected Areas -partly consistent with Section 2.8.	ISPO Principle 3 requires preservation of biodiversity as per the plantation permit; - depending on the permit may be consistent with conserving biodiversity						ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management (section 2.8).		ISPO Principles 2 & 3 include requirements for water quality conservation, controlling erosion, and waste management and monitoring and reducing mill emissions (section

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
		(section 2.8).								2.8).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy	ISPO Principles 1 requires consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas, partly consistent with managing forests in a 'sustainable manner' (Article 3).					ISPO Principle 2 (guidance) requires an SOP for land clearance without burning (Article 9).	ISPO Principle 2 includes requirements for zero burning, maintaining ecosystem functioning and reducing GHG emission from peat (APSMPE Targets 2, 4 & 5).		ISPO Principle 2 (guidance) requires an SOP for land clearance without burning (Haze Agreement; Article 3 (2 & 3).	
Amsterdam Declaration on Deforestation	ISPO Principles 1 requires land title, permits and consistency with the spatial plan, and Principle 3 requires avoidance of erosion prone areas but not requirements to achieve 'zero net deforestation'.		ISPO Principle 3 requires sources of GHG emissions to be identified, but does not specify emissions from LUC (Eliminating Deforestation).							

Analysis between ISPO certification system and social aspects required to meet selected EU/UN and regional objectives

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
EU RED	ISPO Principles 1, 2 & 6 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (Article 17.7 and Amendment 2009/28/EC, 6 (d)).	ISPO Principle 1 requires land title, permits, dispute resolution and compensation, and provision of information but with limited detail on consultation (Article 17.7).	ISPO certification is not mandatory for smallholders (Article 18).	The ISPO standard does not prohibit forced labour; Principle 4 requires 'a policy regarding worker age requirements that follows applicable legislation' (Article 17.7).	
EU Financing Instrument	ISPO Principles 1, 2, & 6 include consultation with, welfare and respect for knowledge of indigenous people, but does not specify respect for human rights (Article 2.1 (b), Article 3.1 and Annex 1 & 2).	ISPO Principle 1 requires land title, permits, disputes resolution and compensation, and provision of information but with limited detail on consultation and protection of land rights (Annex 2, IV).	The ISPO standard does not stipulate support for smallholder's agricultural practice (Annex I (II)).	The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable legislation (Annex 2, III, d (i) & f (i)).	ISPO Principle 4 requires payment of minimum wage, free association and workers' facilities, but the standard has no provision for contracts of employment (Annex 2 III.(f) (i).
EU Comm on Deforestation	ISPO Principles 1, 2 & 6 include consultation with, welfare and respect for knowledge of indigenous people, but does not specify respect for human rights (section 5.1).				
Trade for all	ISPO Principle 5 includes responsible treatment of employees and people affected by operations, but these do not cover all ILO fundamental conventions (section 4.2.2)	With no requirement for FPIC, ISPO certification is potentially open to accusations of land grabs (section 4.2.5).	No explicit ISPO requirements to deal fairly with smallholders (section 4.2.4).	The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable legislation (sections 4.2.2 & 4.2.5).	ISPO Principle 4 requires free association and non-discrimination but has minimal requirements for OHS (section 4.2.2).
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution		ISPO Principles 4 & 5 require consultation on land rights and respect for the knowledge of indigenous people (P8_TA (2016) 0034, Target 3, 44).			
The New European Consensus	ISPO Principles 1, 2 & 6 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (section 1.3 (16 & 44)).	ISPO Principle 1 requires land title, permits, disputes resolution and compensation, and provision of information but with limited detail on consultation and no requirements on equitable access (P8_TA (2016) 0034 2.3, 54 & 55).	No explicit ISPO requirements to deal faily with, train or ensure food security of smallholders (section 2.3, 55).	The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable legislation (section 2.3, 54).	ISPO Principle 4 requires payment of minimum wage, free association and workers' facilities, but the standard has no requirements for contracts of employment (section 2.3 54).
UN 2030 Agenda	ISPO Principles 1, 2 & 6 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (Goal 3).	ISPO Principle 1 includes land title, provision of at least 20% of land for smallholder plantations; but does not define 'equal access' (Goal 2.3).	The ISPO standard does not stipulate support for smallholder's agricultural practice and market access (Goal 2.3).	The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable legislation (Goal 8.7).	ISPO Principle 4 requires payment of minimum wage, free association and workers' facilities, but the standard has no provision for contracts of employment and minimal requirements on OHS (Goal 8.8).
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	ISPO Principles 1, 2 & 6 include consultation with, welfare and respect for knowledge of indigenous people, but does not specify how this contributes to their sustainable management of natural resources or safeguard ecosystems (CBD Article 8 (j); Strategic Plan, Goal E, Target 14 & 16).	ISPO Principles 4 & 5 require consultation on land rights and respect for the knowledge of indigenous people in line with national legislation (Strategic Plan, Goal E, Target 18).			
ILO Conventions		ISPO Principle 1, 4 & 5 requires land title, permits, disputes resolution and compensation, and respect for indigenous knowledge but does not specify FPIC (United Nations Declaration,		The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable	ISPO Principle 4 requires payment of minimum wage, free association and workers' facilities, but the standard has no provision for contracts of employment and minimal requirements on

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
		Article 10).		legislation (Conventions 29, 105, 138 & 182).	OHS (Conventions 155, 161, 184 & 95).
UN Forest Instrument	ISPO Principles 1, 2 & 6 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (section IV.5. Global Objective 2).	ISPO has no requirements for training or market access of indigenous people or to increase access to forest resource (section V.6 (y) & (h)).	ISPO Principle 1 includes provision of at least 20% of land for smallholder plantations (section V.6 (v)).		
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests	ISPO Principle 3 requires and social impact assessment but this does not cover 'all human rights (section 3.3).	ISPO Principles 1, 4 & 5 requires land title, permits, disputes resolution and compensation, and respect for indigenous knowledge but does not specify fully 'secure' customary tenure (sections 7.3 and 9.3-5).	ISPO Principle 1 includes provision of land tenure, but there is no explicit requirement to increase food security, market access, poverty reduction, etc. (sections 7.3, 11.8 & 12.2).		
OECD FAO Guidance for Responsible Agricultural Supply Chains	ISPO Principles do not explicitly require respect for human rights (Model Enterprise Policy, 2).	ISPO Principles 1, 4 & 5 requires land title, permits, disputes resolution and compensation, and respect for indigenous knowledge but does not specify fully 'secure' customary tenure (section 7.3) or water rights (section 2.6).		The ISPO standard does not prohibit forced labour; Principle 4 requires a policy regarding worker age requirements that follows applicable legislation and free association (section 2.3).	ISPO Principle 4 has minimal OHS requirements and although requires payment of a minimum wage does not specify a living wage (section 2.3).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation	ISPO is formulated to respect the rule of law and Principles 1, 2 & 6 contain provisions on indigenous people, but there are no specific requirements for women's rights (Eliminating Deforestation).	ISPO is formulated to respect the rule of law and Principles 1, 2 & 6 contain provisions on indigenous people, but there are no specific requirements for women's rights (Eliminating Deforestation)			

Analysis between MSPO certification system and environmental aspects required to meet selected EU/UN and regional objectives

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU RED	MSPO Principle 7 prohibits clearance of primary forest, protected areas and areas needed to conserve rare, threatened and endangered species but not HCS forest (Article 17).	MSPO Principle 7 prohibits clearance of primary forest, protected areas and areas with rare, threatened and endangered species (Article 17.3).	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest (Article 17).	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest (Article 17).	MSPO Principle 4 requires an assessment of air pollution and implementation of a plan to reduce it but does not specify methane capture (Annex V).		MSPO Principle 5 permits cultivation and drainage of peat if consistent with MPOB guidelines, but does not prohibit planting on peat after January 2008 (Article 17.5).	MSPO Principle 5 includes requirements for water resource management and Principle 6 includes requirements for erosion control and avoiding contamination (Article 17.7 and Article 18).		MSPO Principles 5 & 6 contribute to the reduction of water and air pollution (Article 17), soil erosion, and management of conservation areas (Article 18).
EU Financing Instrument		MSPO Principle 7 requires protection of 'high biodiversity value' areas and Principle 5 requires conservation of biodiversity (Regulation Annex 1 and IV).						MSPO Principle 5 includes requirements for water resource management and Principle 6 includes requirements for erosion control and avoiding contamination but without specifying equitable access (Annex I (e)).		
EU Comm on Deforestation	MSPO Principle 7 prohibits conversion of primary forests, protected areas and areas with rare, threatened and endangered species - partly consistent with reducing 'gross tropical deforestation' (Objective).	MSPO Principles 5 and 7 require forest protection and biodiversity but the extent to which imports do not 'jeopardise efforts to protect forests or broader biodiversity priorities' is unknown (section 4.1.2).	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify emissions from LUC (section 5.1).	The MSPO Principles and Criteria can be argued to contribute towards sustainability, as required for biofuels (section 4.1.2).		MSPO Principle 5 limits burning but does not prohibit it (mentioned without specific requirement in section 2.3).		MSPO Principles 5 & 6 include requirements for water quality conservation, controlling erosion, and waste management (mentioned in the Summary without specific requirements).		MSPO Principle 5 requires monitoring and reduction of emissions (section 2.3 without specific requirements).
Trade for all	MSPO Principle 7 prohibits clearance of primary forests, protected areas and areas with rare, threatened and endangered species (section 4.2.2).	MSPO Principle 5 covers conservation of biodiversity, soil, water, wildlife, etc. (section 4.2.2).		MSPO Principle 3 includes identification of sources of GHG emissions (section 4.2.2).				MSPO Principles 5 & 6 include requirements for water quality conservation, controlling erosion, and waste management consistent with sustainable management of water (section 4.2.2).		MSPO Principle 5 requires waste management and monitoring and reduction of mill emissions (section 4.2.2 without specific requirements).
EU Low-emission mobility strategy				The strategy re-affirms a limited role for food-based biofuels thus certification of palm oil does not contribute to the policy.						

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
EU Biodiversity Strategy to 2020 and Parliament Resolution	MSPO Principle 7 prohibits conversion of primary forests, protected areas and areas with rare, threatened and endangered species - potentially contributes to P8_TA (2016) 0034, Target 6, 62, to take 'ambitious' measures to tackle deforestation.	MSPO Principles 5 and 7 cover forest conversion and biodiversity conservation (Target 6).		P8_TA (2016) 0034, Target 3, 48 urges environmental sustainability criteria for biomass production coherent with RED, with which MSPO is partly consistent.		MSPO Principle 5 limits but does not prohibit planting on peat, an issue noted in P8_TA (2016) 0034 but without specific policy requirement.	MSPO Principle 5 permits cultivation and drainage of peat if consistent with MPOB guidelines, but does not prohibit it (P8_TA (2016) 0034, Target 3, 49).			
The New European Consensus	MSPO Principle 7 prohibits conversion of forest with 'high biodiversity value' but does not prohibit deforestation entirely - partly consistent with halting deforestation (section 2.3).	MSPO Principle 5 includes conservation of 'rare, threatened and endangered species' - likely to be consistent with maintaining biodiversity (section 2.2 (44) & (56)).						MSPO Principles 5 & 6 include requirements for water quality conservation, controlling erosion, and waste management consistent with 'actions to conserve water resources' (section 2.3 (56)).		
UN 2030 Agenda	MSPO Principle 7 prohibits conversion of 'high biodiversity value' forest but does not prohibit deforestation entirely - partly consistent with halting deforestation (Goal 15.2).	MSPO Principles 5 and 7 include maintaining HCVs - partly consistent with Goal 15.5.	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify emissions from LUC or prohibit conversion of HCS forest (Goal 13 without specific requirements).					MSPO Principles 5 & 6 include requirements for water quality conservation, controlling erosion, and waste management (Goals 12.4 and 14.1).		MSPO Principles 5 & 6 require responsible chemical use and waste management (Goal 12.4).
UNFCCC (Paris Agreement)	MSPO Principle 7 prohibits conversion of 'high biodiversity value forests' - partly consistent with 'reducing emissions from deforestation' (Article 5.2).	MSPO Principle 5 requires legally compliant conservation of rare species - partly consistent with protecting biodiversity (Introduction).	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify LUC - partly consistent with conserving sinks of greenhouse gases (Article 5, 1).							
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	MSPO Principle 7 prohibits conversion of 'high biodiversity value' forest but does not fully prohibit deforestation - partly consistent with at least halving loss of natural habitats (Article 8e).	MSPO Principles 5 and 7 require maintaining high biodiversity value areas and conserving rare species, but without provision for sharing the benefits of biodiversity (Article 1).	MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify LUC - partly consistent with conserving carbon stocks (Strategic Plan, Goal D, Target 15).					MSPO Principle 5 includes ecosystem restoration as an option, but does not include requirements to restore at least 15% of degraded ecosystems (Goal D, Target 1).		
ILO Conventions										

			Carbon emissions						Air pollution	
Policy Instrument	Deforestation	Biodiversity loss	LUC	Biofuel	Mills and Plantations	Burning	Peatland conversion	Water use and pollution	Haze	Others
UN Forest Instrument	MSPO Principle 7 prohibits conversion of high biodiversity value forest - partly consistent with reversing the loss of forest cover (IV.5. Global objective 1).									
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests		MSPO Principles 5 and 7 include protecting high biodiversity values - partly consistent with preventing and minimizing biodiversity loss (section 13.6).								
OECD FAO Guidance for Responsible Agricultural Supply Chains	MSPO Principle 7 prohibits conversion of 'high biodiversity value forests and so helps to prevent and minimise negative impacts on forests and biodiversity (Model Enterprise Policy, 8).	MSPO Principles 5 and 7 include maintaining high biodiversity value area - partly consistent with 'respecting ... high conservation value areas and endangered species' (Model Enterprise Policy, 8).						MSPO Principles 5 & 6 include requirements for water quality conservation, controlling erosion, and waste management (Model Enterprise Policy, 8).		MSPO Principles 5 & 6 include requirements for monitoring and reducing mill emissions (Model Enterprise Policy, 8).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy	MSPO Principle 7 prohibits conversion 'high biodiversity value' forests and is likely to be considered consistent with the sustainable use of natural resources (Article 3).					MSPO Principle 5 limits use of fire to specific situations, as identified by ASEAN Zero Burning Policy.	MSPO Principle 5 is consistent with APSMPE burning and economic management of peatlands, but not fully consistent with conservation of peatlands (Target 5).		MSPO Principle 5 requires use of regional best practice (Haze Agreement - Article 3.2 & 3.3).	
Amsterdam Declaration on Deforestation	MSPO Principle 7 prohibits clearance of primary forest, protected areas and areas with rare, threatened and endangered species but not HCV areas (Eliminating Deforestation).		MSPO Principle 5 requires sources of GHG emissions to be identified, but does not specify emissions from LUC (Eliminating Deforestation).							

Analysis between MSPO certification system and environmental aspects required to meet selected EU/UN and regional objectives

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
EU RED	MSPO Principle 4 includes contributions to community development (Article 17.7)	MSPO Principles 4 & 7 requires demonstration of the right to use land that should not diminish the rights of others without FPIC and compensation negotiations, (Article 17.7).	MSPO has standards for organised and for independent smallholders (Article 18).	The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (Article 17, 7).	
EU Financing Instrument	MSPO Principle 4 requires a policy on human rights and Principle 3 requires compliance with the law (Annex 2.1(b)).	MSPO Principles 4 & 7 requires demonstration of the right to use land that should not diminish the rights of others without FPIC and compensation negotiations (Annex 2.iV (a)).	Support for organised smallholder's agricultural practice by plantations is implicit (Annex I (II)).	The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (Annex 2, III, d (i) & f (i)).	MSPO Principle 4 includes requirements on terms and conditions of labour, training, and social dialogue (Annex 2).
EU Comm on Deforestation	MSPO has no explicit mention of forest dependent people but Principle 4 includes respect for human rights and Principle 7 includes FPIC for indigenous land rights (section 5.1).				
Trade for all	MSPO Principle 4 includes respect for human rights, responsible treatment of employees and people affected by operations, but these do not cover all ILO fundamental conventions (section 4.2).	MSPO Principle 4 includes respect for human rights and Principle 7 includes FPIC for indigenous land rights (section 4.2.5 without specific requirements).	MSPO Principle 6 requires fair dealings with smallholders (section 4.2.4).	The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (sections 4.2.2 & 4.2.5).	MSPO Principle 4 includes requirements for non-discrimination, freedom of association, health and safety (section 4.2.2).
EU Low-emission mobility strategy					
EU Biodiversity Strategy to 2020 and Parliament Resolution		MSPO Principles 4 & includes respect for human rights and land rights (P8_TA (2016) 0034, Target 3, 44 without specific requirement).			
The New European Consensus	MSPO Principles 4 & 7 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (section 1.3, 16 & 44).	MSPO Principles 4 & 7 include requirements for respecting local peoples' and indigenous people's land rights, including customary rights but without specific provision for access to water (section 2.3, 54).	MSPO Principle 6 requires fair dealings with smallholders but there is no explicit requirement to train or ensure food security of smallholders (section 2.3, 55).	The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (section 2.3, 54).	MSPO Principle 4 requires decent employment conditions and wages broadly in line with ILO (section 2.3, 54).
UN 2030 Agenda	MSPO Principles 4 & 7 require consultation with indigenous and local people on land rights, and facilitating development in the wider community (Goal 3).	MSPO Principles 4 and 7 include requirements for ensuring secure access to land for indigenous and local groups (Goal 2.3).	Support for organised smallholder's agricultural practice or market access is implicit in the MSPO standard (Goal 2.3).	The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (Goal 8.7).	MSPO Principle 4 includes requirements on labour rights and safe working conditions (Goal 8.8).
UNFCCC (Paris Agreement)					
CBD with the Strategic Plan for Biodiversity (2011-2020) and Aichi Biodiversity Targets	ISPO Principles 4 & 7 include consultation with indigenous people, but does not specify respect for their knowledge or wellbeing nor how this contributes to their sustainable management of natural resources (CBD Article 8 (j); Strategic Plan, Goal E, Target 14 & 16).	MSPO Principles 4 and 7 include requirements for respect of customary land use but without specific mention of other resources (Strategic Plan, Goal E, Target 18).			
ILO Conventions		MSPO Principles 4 and 7 stipulate FPIC and compensation if land use rights change (Indigenous and Tribal Peoples Convention, Articles 2, 3 and 4; UN Declaration, Article 10).		The MSPO standard does not explicitly prohibit forced labour; but Principle 4 does prohibit child labour and exploitation of children (Conventions 29, 105, 138 & 182).	MSPO Principle 4 does not explicitly refer to ILO core conventions 184, 87, 98 and 138 but is likely to be consistent with ILO conventions in general.

Policy Instrument	Rights and wellbeing	Land use rights	Smallholders	Forced and child labour	Terms and conditions of labour
UN Forest Instrument	ISPO Principles 4 & 7 require FPIC with indigenous and local people on land rights, and facilitating development in the wider community (section IV.5. Global Objective 2).	MSPO Principles 2 and 7 include requirements on recognising and respecting land rights and consultation including of indigenous people (section V.6 (h) & (y)).	The MSPO standard does not require producers to increase the access of smallholders to forest resources or markets (section V.6 (y)).		
FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests	MSPO Principle 4 requires social impact assessment but this does not cover 'all human rights (section 3.3).	MSPO Principles 4 and 7 include requirements compatible with Guiding Principles on recognising and respecting land rights (including customary rights), and consultation (sections 3.1 and 7.3).	MSPO Principle 4 includes provision of land tenure, but there is no explicit requirement to increase food security, market access, poverty reduction, etc. (sections 7.3, 11.8 & 12.2).		
OECD FAO Guidance for Responsible Agricultural Supply Chains	MSPO Principles 3 & 4 require respect for human rights and the law (Model Enterprise Policy, 2).	RSPO Principles 2 and 6 are compatible with Model Enterprise Policy, 6, which includes respect for land tenure rights, including indigenous and customary rights.		The MISPO standard does not explicitly prohibit forced labour; Principle 4 does prohibit child labour and exploitation of children and requires free association (Model Enterprise Policy, 3).	MSPO Principle 4 includes requirements on occupational health and safety, wages and working conditions sufficient to satisfy the basic needs of workers (Model Enterprise Policy, 3).
ASEAN Trans-boundary Haze agreement, APSMPE, and Zero Burning Policy					
Amsterdam Declaration on Deforestation	RSPO Principles 3, 4, and 7 require respect for law, and the rights of communities and indigenous people, but without explicit mention of women's rights (Eliminating Deforestation).	RSPO Principles 3, 4 & 7 are compatible with the aim of strengthening the rule of law, 'especially those pertaining to their lands'			

Appendix 9: Key findings from literature review and stakeholder interviews on sustainability enforcement issues in six palm oil producer case study countries

(Please see **Section 8.4.1** in the main report).

Table 22: Sustainability enforcement issues for six palm oil producing countries

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
Deforestation	Still focused on increasing the area under the crop rather than improving yields; conclusion that future development should be on degraded or deforested land has scarcely been heeded. A big theme in the literature for both Indonesia and Sarawak remains the destruction of forest and wildlife habitat, especially incursions of oil palm onto peat soils with concomitant burning (Po.15). Area converted illegally from conservation area could remain oil palm for a certain number of years to compensate for investment by private sectors or local communities but after that to restore the area to forest (Pu.15). More recently the Malaysian and Indonesian governments have been looking to establish policies that more	Between 1990 and 2005, oil palm expanded far more than any decline in land under other crops; such expansion was most likely taking place at the expense of forests, in many cases previously logged forests(Po.15). More recently the Malaysian and Indonesian governments have been looking to establish policies that more effectively address environmental and social issues (Zs.17). A big theme in the literature for both Indonesia and Sarawak remains the destruction of forest and wildlife habitat, especially incursions of oil palm onto peat soils with concomitant burning. A public policy debate is raging about the RSPO, MSPO and sustainability issues, with the declaration of Wilmar causing great concern, especially in Sarawak. Some officials continue to	*Br1: Brazil has progressive legislative safeguards for palm oil production, mandated smallholder participation and all sorts of other environmental regulations; although not always evenly enforced. Subsidized loans or low interest loans for plantations who abide by certain criteria - register property and compliant (Bu.12). The expansion of oil palm is restricted to areas already affected by human activity before July 2008. Areas of intact native vegetation, conservation areas and reserves set aside for quilombolas (Afro-Brazilians) and indigenous groups have been excluded. The forest reserve of (50 or 80%) of the land farmed must, be maintained. Agricultural lobby in the National Congress tried to change the Forest Code to allowed oil palm	Deforestation issues were not as critical in Colombia as in Indonesia, given the large areas of poorly performing cattle ranches that could be converted to oil palm, especially on the eastern savannas, the most promising area for future development (Po.15). Oil palm cultivation has been developed in Colombia without deforestation. Academic studies report: even though Colombia increased 69.5% its planted area with oil palm between 1989 and 2013, the deforestation was 0%; and expansion between 2001 and 2014 was in lands that were previously intervened by pastures for extensive farming or by other crops such as cotton, rice or bananas. Colombia will be soon signing the international Agreement between Germany, Norway and United Kingdom on zero deforestation. With	Refer to "Case study: Development disputed in high forested areas, the Gabon example" -- Olam points to the "right to develop" of nations like Gabon, where a third of people live below the poverty line and a fifth are unemployed. "We agree with Gabon's sovereign right to convert a tiny percentage of its least valuable forested land for agriculture, so long as it is responsibly and transparently done," Olam said.	There is a Forestry Law in Liberia (with a community element), but there is a great deal of degradation from charcoal production by local peoples. Norway has (pledged $160 million for conservation targets, to be spent on capacity building and World Bank is focusing on degradation. Liberia has mixed capacity at the policy level and its Environmental Protection Agency has low capacity. Local communities have a big role in degradation; due to Liberia's backwardness there is limited electrification (only near towns). The new Tropical Forest Alliance Marrakesh Declaration signed end 2016 - sets a mandatory HCS Approach signed by President (but this is still stuck at a very high level) EPA..

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	effectively address environmental and social issues (Zs.17). Indonesia suffers from illegal use of conservation areas, while Malaysia hardly faces this (St.17).	deny that deforestation has occurred in Sarawak. This attitude of denial, when such claims can be easily refuted, does the Malaysian palm oil industry no service (Po.15). New policy includes Sarawak no more concessions on peat (does not preclude smallholder on peat). Negeri Sembilan no more wetland conversion (St.17).	plantations to count towards the reserve. Revised Forest Code 2012 retains the 80% legal reserve in the Amazon, but exempts family farmers but there is a rule to restore 5 m of degraded woods beyond their boundaries Landowners can cultivate riverbanks and hillsides (previously restricted) but must restore up to 30 m of previously deforested areas and join the Rural Environmental Registry (CAR; used to monitor illegal deforestation via satellites. ...Most warn that weak governance can easily undermine the system. Development is in limited areas of Pará, and with some needed improvement in yields at traditional Bahi palm groves; size is not yet uncontrollable, even with the growth plans of bigger companies. However, other states of the Legal Amazon are waiting to participate (Po.15).	commitment to prevent deforestation and the defence of human and labor rights, the industry expects that by 2020, 50% of the Colombian palm oil production can be certified by the RSPO (St.17).		
Biodiversity loss	Also refer to Deforestation, [3], [4]	Also refer to Deforestation, [3], [4] HCV requirements are there, but it is a general UN HCV (St.17).;	Also refer to [4]. Deforestation is on the rise again. Forest Law 2012 amnesty for those who deforested illegally before 2008. Farmers need to register	Also refer to Deforestation, [4]. For 2012-2108, there is joint project financed by the United Nations, GEF: "A Biodiverse oil palm landscape" has been		Liberia has the most valuable rainforest outside Congo - with pygmy hippos and other rich indigenous flora & fauna; there is illegal hunting. There was a riot

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
			properties and rule to restore or provide compensation for illegally-deforested areas delayed twice. Brazil's sub-national initiatives to reduce deforestation lack demonstrated coordination, added pressure will come from beef (opening of US and China markets). The number of conservation units in the Amazon has been reduced, leading to an increase in illegal occupation Ge.17)	jointly undertaken by the WWF, the Alexander Von Humboldt Institute, Cenipalma and Fedepalma. It has so far found 1200 insect species and 560 animal species such as birds, mammals, amphibians and reptiles, among others, are preserved as a result of the oil palm crops, which are cultivated in areas that were previously intervened by pastures for extensive farming or by annual crops (St.17).		on a conservation system that did not take local community needs into account. Conservation set-asides policy needs co-management to be effective, prevent degradation and that it is not taken by another company or community (St.17).
Forest degradation	The conclusion that future development should be on degraded or deforested land has scarcely been heeded (Po.15)	Also refer to Deforestation. There is no regulation to cover degradation of non-gazetted forest. But this would be an issue for logging people, I've not heard of palm oil involved. The HCS concept is not in regulations (St.17). Degradation is not well regulated. This is due to bad logging practices (and not palm oil); maybe Malaysia is better than other countries; Sabah has had bad logging (more degraded) while Peninsular logged over forest still looks quite good (St.17).	Also refer to Deforestation. Some aspects of deforestation were more subtle in the Brazilian Amazon, more recently the idea was floated that oil palm as a "low impact crop", could be used to reforest protected areas (Po.15).	Also refer to Deforestation.		Also refer to Deforestation.
Reducing carbon emissions	Also refer to Deforestation and Peatland. The Indonesian government has tried to	In terms of impacts on land-use change, in parts of Peninsular Malaysia, oil palm was planted on	The recent expansion of oil palm plantations in the Amazon is presented by the Brazilian			On emissions - carbon commitments will come with the work ongoing on mapping and carbon

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	address greenhouse gas issues by signing a moratorium with the Norwegian government, halting the release of new concessions on forested land (Zs.17).	former rubber land, so the original deforestation took place much earlier, much of it for 1960s FELDA schemes (e.g. in the Jengka Triangle of Pahang) (Po.15).	Government as a carefully controlled development using predominantly degraded lands in restricted areas. It obviously provides an economic improvement to the previously run-down pastures the plantations have replaced and foreshadows a possible environmental gain in reduced GHG emissions (Po.15).			accounting. (St.17).
	Ambitious targets for biodiesel expansion will increase domestic demand for palm oil, and risks driving expansion of plantations for domestic use. Could potentially offset progress made by cleaning up palm oil supply chains linked to more discriminating international markets. Producers selling to local biodiesel exempt from ISPO certification. Two-tiered market with differential sustainability norms (Da.15). There is a real worry that a tougher new EU approach will be difficult for smallholders (while large business can fall back on lobbying for more domestic burning of palm oil in the biodiesel mandate) (St.17).	Domestic biofuels does not require GHG emissions reductions ratings (St.17).		Colombia has a biodiesel mix of 10%. According to EMPA, a Swiss company, after analyzing the life cycle of this biofuel, Colombian palm biodiesel reduces in 83% to 108% the greenhouse gases (GHG); comparing positive to the biofuel parameters of 20% and 35% in USA and in the European Union (St.17).		
	Public policy debate has focused most attention	Mill emissions and an energy assessment plan	Any palm producer in Brazil that only complies			

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	on efforts to change the mind-set of large plantation firms (Po.15) The Indonesian Parliament is upset at EU politicians' recent demand for tougher standards; but points out that there has apparently not been enough effort from the industry (there are only about 20-25 exporters) to disclose sufficient data (including on GHG emissions) to satisfy these markets (St.17).	is required (it is a listing of items on GHG; there is no calculation required, and there is no mitigation requirement yet). There is a biogas capture rule and 94 mills have implemented, but it is not mandatory yet; This is for the Kyoto obligation but the CDM market didn't work well on price collapse (St.17).	with the legal requirements will be easily approved in any of the certification schemes RSPO, Rainforest Alliance and meet 85% of the requirements required by POIG (Palm Oil Innovation Group) that constitute the most difficult multi-stakeholders initiative (St.17).			
Burning	Also refer to "Case study: Indonesia sustainability policy upgrading"	Policy for zero burning, to manage water tables in peat areas to reduce subsidence. (St.17).	Partial bans?			Charcoal making is common activity. Local farmers use fire, and slash and burn. They were not happy with "no burning" policy in the concession areas. Fallow cycles are shortening with increased pressure on the land.
Peatland conversion	Issues of deforestation and peat (moratorium policy), fires in Riau (on peat), and GHG emissions from plantations. In Riau, Sumatra, a GIS analysis of land cover change found large plantations were mainly the ones involved in deforestation, especially in the peat swamps, which smallholders found too difficult to work. A big theme in the literature	Also refer to Deforestation (comments on Sarawak, which has substantial peat zones). A big theme in the literature for both Indonesia and Sarawak remains the destruction of forest and wildlife habitat, especially incursions of oil palm onto peat soils with concomitant burning (Po.15). Policy for zero burning, to manage water tables in peat	The total area of peat land in Brazil is estimated to be nearly 24 000 km2, the second largest in South America after Peru. There are large peat deposits in the Middle Amazon and in a large marshy plain (Pantanal) near the Bolivian border. Smaller areas of peatland are located in coastal areas. World Energy (2017), 'Peat in Brazil', https://www.worldenergy.org/data/resources/coun	339,000 ha of peat.	Possible areas.	There aren't significant peat lands (St.17). 40,000 ha of peat.

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	for both Indonesia and Sarawak remains the destruction of forest and wildlife habitat, especially incursions of oil palm onto peat soils with concomitant burning (Po.15)	areas to reduce subsidence. Peat rule; planting and replanting allowed with water management program, water level maintenance and natural water resources. Records of this. EIA reports to each state authority for peat SOPs - water levels and fertilizer management especially particular for peat; Guidelines of the Devt of a Std Op Procedure for Oil Palm Cultivation on Peat, MPOB. A Unified Peat Classification System will be added (it will indicate which type of peat is not feasible i.e. woody, and focus shallow peat with appropriate SOP (St.17).	try/brazil/peat/, accessed 30 Jun 2017; 1.5 million ha.			
Water and pollution		In Sabah and Sarawak, more in-depth environmental analyses are needed, not on forests, which seem to be covered, but on local aspects such as effluents from mills (Po.15). Mill waste products are covered by regulation. DOE enforces and I hear many mills get summons on this; regulation is 100ppm Peninsula (looser) and 20ppm for Sabah (areas like Kinabatangan are sensitive); there is constant news about	Brazilian and Canadian researchers seeking to find the source of mercury contamination in the Amazon came to a startling conclusion: agricultural practices rather than gold mining were most to blame....mercury was occurring naturally in the soil and was being released into the river system -- and eventually the food chain -- by slash-and-burn farming. Johnson, M. (unknown) 'CASE STUDY: Brazil — Mercury contamination in			A real problem in concession areas; these have been subject to RSPO complaints. Mistakes were made in the first two years of development. The big plantations didn't leave margins around villages, rivers and creeks. Palms were planted to the edges. Water was polluted and they overplanted into swampy areas (that locals use for rice and fish). Some compensation was done for this, but problems with water still there, as

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
		state DOE enforcement (St.17).	the Amazon, https://www.idrc.ca/en/article/case-study-brazil-mercury-contamination-amazon, accessed 30 Jun 2017.			well as loss of a key protein source (St.17).
Air pollution	A network of powerful actors (local elites, absentee investors and migrant groups) and a "culture of patronage" involved in the political economy of fire and haze. "Farmer group organizers gained as much as USD486 per hectare. They influence decision-making through their patronage network for their own interests. The networks provide power, support, protection and access to various resources. To effectively reduce fire, governments need to disempower these farmer group organizers through law and policy (Pu.17).					Refer to Burning.
		State DOE enforced and mills regularly get summons, E.g. Kinabatangan, Sabah.				Refer to Burning.
Indigenous people	Negative reports on the performance and direction of the rural economy, with the well-supported plantation sector expanding and profiting from workers and villagers, with the exception of a group of	In East Malaysia native customary land is taken over in a series of schemes hardly profitable to the landholder. In Sabah and Sarawak these are large areas, which the governments characterize as	Dozens of indigenous people are killed each year in Brazil in fights with farmers and ranchers over land, often in the relatively lawless Amazon region, where hired gunmen have been used to push the	From the 1960s, the unresolved agrarian issues led to the formation of guerrilla groups and violent armed conflict, partly fuelled by the trade in illicit crops, notably coca....the Uribe government decided that	Knight, Judy (2006), 'Indigenous Forest Peoples of Gabon Face Uncertain Future', http://www.iwgia.org/publications/search-pubs?publication_id=444, accessed 30 Jun 2017.	Despite their contributions, significant concerns that agricultural concessionaires have dispossessed communities of control over and benefits from their own lands. Negotiations are in

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	small and middle-level producers (Po.15). The rights of indigenous peoples / smallholders would be helped by recognizing traditional use. This was not so in Indonesia, and companies might convert community forest into a plantation (Bu.12). More recently the Malaysian and Indonesian governments have been looking to establish policies that more effectively address environmental and social issues (Zs.17). Also refer to [2], "Case study: Indonesia sustainability policy upgrading"	unproductive. Partnerships to develop oil palm here, but poor treatment of indigenous people by some estate companies, with confiscation of their lands. Sabah has a high percentage of land occupied by oil palm, risk of food security issue there (Po.15). More recently the Malaysian and Indonesian governments have been looking to establish policies that more effectively address environmental and social issues (Zs.17). We support of Sarawak and Sabah native rights and have projects to include them in oil palm development; the Ministry has been led by East Malaysian politicians for several years. Some "conflict" can be opportunistic claims when a development project arrives There is strong voting for the ruling government, in spite of complaints (St.17). Orang Asli are now pressured in Kelantan and seems to be due to logging. Sarawak and Sabah are better; but in the Peninsula natives have been marginalized (much like the Aborigines	indigenous off resource-rich reserves. http://www.nbcnews.com/news/latino/brazil-indigenous-protest-over-land-rights-turns-violent-n751336	oil palm would be a suitable candidate among a number of other possible choices.. Many of the land dealings which took place in the countryside during this period have been described as "accumulation by dispossession" These were: oil palm cultivation in connection with displacement operated by illegal armed groups; take-over of land left by internally; displaced people; actual or attempted occupation of lands under contested ownership rights; occupation of public lands; land-use change; land concentration…. Oil palm's expansion has not always been associated with high levels of violence and displacement, though this was common between 1998 and 2006 (Po.16).		Monrovia, far from affected communities and without consultation from community members. Concessions are in isolated rural communities that operate outside formal legal structures. Under the Aborigines Law and the Public Lands Law in 1956, the Liberian government has treated all land not under private ownership as public property owned by the state....Communities have voiced anger and frustrations, and resulting conflicts are well documented. A concessionaire allegedly occupied the entirety of one community's land with no space for subsistence farming, so they were "scavengers" on their own land. At the time of interviews, the community was organizing a peaceful protest to respond to government and concessionaire's inaction (Le.17). Forestry Law (with a community policy element); but there has been poor / no implementation of FPIC on oil palm concessions (St.17).

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
		of Australia in the past) (St.17).				
Smallholders	Reduced smallholder benefit, especially through the latest 80/20 schemes, increasing socioeconomic gaps among smallholders, many suffer 'adverse incorporation', and some say oil palm participation is only for the rich. Current government policies of disengagement are not working; Worries about certification of smallholders to ISPO, high cost of bringing independent smallholder productivity up to a certification standard. Indonesia and Malaysia have made much progress towards certifying smallholders (Po.15). Must crackdown on schemes between companies and smallholders that are abusive and use debt bondage. Smallholders may have to sell fruit bunches for whatever the company will pay for them (Bu.12). There is a real worry that a tougher new EU approach will be difficult for smallholders (while big business can fall back on lobbying for more domestic burning of palm oil in the biodiesel	Indonesia and Malaysia have made much progress towards certifying smallholders. A model, developed by Malaysia, of smallholder "clusters" grouped around estates who receive training in agronomic and environmental practices, is run by the MPOB, with NGO assistance, using government funding to replant aged trees. As in Indonesia, the neoliberal model of market dominance has been adopted in Malaysia, though the government is closer to the private plantation sector than its Indonesian counterpart and exercises more control over much of the smallholder sector. Malaysia is (more fortunate than Indonesia) as government organizations have a continuing role in managing much of the smallholder sector of the industry (Po.15).	. The "social fuel seal" is available to estates that incorporated "family farmers" (Po.15). Also refer to Br1. There are so many legal requirements that a company can rarely get any operating license in less than a year of term, and in some cases environmental licensing processes extend for five, ten or more years. I dare say that more than 90% of the family farmers in Brazil are illegal under the laws. We can say with certainty that Brazilian legal regulation is highly sustainable when correctly applied, but rarely this will occur between small companies and family farming (St.17).	Access to funds from the lucrative Rural Capitalization Incentive was available to plantations, especially when they initiated smallholder alliances. , Fedepalma has been working with alliance groups using a model, developed by Malaysia, of smallholder "clusters" grouped around estates who receive training in agronomic and environmental practices... Among unsolved issues there is still much scope for improvement of conditions of workers on the plantations and for more attention to be given to problems of food insecurity in the plantation areas.... The background of violence and land consolidation... remains a factor and is one of the reasons why the (current oil palm) model has failed (Po.15). Studies of conflict regions with and without palm oil show that those with oil palm crops have a higher per capita income of about 30% (palm's "social dividend")... Small producers dominate production and 83% of		Companies often promise to undertake community development projects (health clinics and schools), but may not deliver for years or may not provide access to residents who are not directly employed A Columbia University report , "Unless directly hired communities]experience little improvement to living standards" ... Cash payments for destroyed crops often fail to compensate for the loss of livelihood of local farmers; food insecurity can increase... A 2016 study found economic losses would far outweigh any economic gains (concentrated in the minority directly employed , while the losses would affect the entire community).... In 2013 a new Land Rights Policy., but it is not binding as yet to enact the Land Rights Act.... In interviews, government officials expressed concern regarding the limited recognition of customary land ownership despite the Land Rights Policy (Le.17). There are

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	mandate) (St.17). Indonesia has 5 million smallholders. Most have 2 hectares. There could be 1 million who deforested without permit. There is a major problem with smallholder legality. Policy in Indonesia is topsy turvy (St.17). Also refer to [2]..			producers have less than 50 hectares. They are organized around over 130 productive alliances with larger entrepreneurs. (St.17).		village stands of oil palm; all concessions will have smallholders but with major delays, none have proceeded (partly due to land issue delay). GROW has an out grower schemes but has funding delays; smallholder areas have been work in progress since 2009-2011 ; the concessions focus on their own (delayed) estates, and mills have only just start operating.(St.17).
Forced and child labour		Labour rules fall short of ILO conventions, most core ILO conventions are not signed; and then you need to translate this content to national law and there are still some gaps. There may not be political will to change the situation driving a big illegal pool of workers; why not make it free market (permit is personal to the worker and not with the company) and whoever is here can be hired legally? (St.17). Some premises now have passport access; this will likely be widespread in a voluntary basis, but not likely to be written into labour rules. Passage cost as paying upfront seems normal and accepted. Housing for a	Brazil's ministry of labour has fined 340 Brazilian companies for using slave labour, including forced labour and people working in degrading conditions for little or no pay in rural and urban areas, a leading anti-slavery group has said. A "dirty list" published by the rights group Reporter Brazil this month revealed that 340 Brazilian companies from May 2013 to May 2015 employed people working in slave-like conditions, including in sweatshops producing clothes, in farms, cattle ranches, timber companies, construction and charcoal production.http://www.reuters.com/article/brazil-slavery-idUSL8N15U3CD	With commitment to prevent deforestation and the defence of human and labor rights, the industry expects that by 2020, 50% of the Colombian palm oil production can be certified by the RSPO (St.17). Colombian labor trafficking victims are found in mining, agriculture, and domestic service. Colombian children working in the informal sector, including as street vendors, are vulnerable to labor trafficking. Colombian children and adults are exploited in forced begging in urban areas. Illegal armed groups forcibly recruit children to serve as combatants and informants, to cultivate illegal narcotics, or to be	Gabon is primarily a destination and transit country for children and women from Benin, Nigeria, Togo, Mali, Guinea, and other West African countries who are subjected to forced labor and sex trafficking….Gabon's population is approximately 1.8 million, with foreigners (mostly Africans from West and central Africa) making up as much as one quarter to one third of that total. Foreign firms report a shortage of highly-skilled Gabonese labor...Recruited to take up hard or dangerous work in mines, forests and plantations, or otherwise drawn by the petro-dollar boom, foreigners from	Child labor, including in the production of rubber and mining diamonds, and in the worst forms of child labor, including in forced labor in domestic work (US, DOL)

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
		family is a 2 bedroom unit, and hostels for those without family and this comply with the relevant act. However, there are issues with illegal status workers (but legalization drives happen often) (St.17).		exploited in prostitution (US, DOS)	elsewhere in Africa are Gabon's vulnerable underclass. Gabon - Non-Gabonese Africans, Minority Rights (2017), http://minorityrights.org/minorities/non-gabonese-africans/, accessed 30 Jun 2017.	
Terms and conditions of labour	Indonesia transmigrant workers may be mistreated, sent to marginal land they could be displaced and they have no fall back but to take on jobs on plantations. With poor pay and conditions (amenities, water supply etc.) (St.17).	There is good enforcement of the OSH Act (St.17).	Mendeloff, John (2015), 'Occupational Safety and Health in Brazil', RAND Corporation Working Paper, Jul 2015, https://www.rand.org/content/dam/rand/pubs/working_papers/WR1100/WR1105/RAND_WR1105.pdf, accessed 30 Jun 2017.	Colombia—dubbed by the AFL-CIO's Solidarity Center the most dangerous place in the world for trade unionists. Franklin, S. (2013), 'Colombian Workers Struggle for a Voice and Safe Jobs', http://pulitzercenter.org/reporting/colombian-workers-struggle-voice-and-safe-jobs, accessed 30 Jun 2017.	Health and safety standards are in place but not always observed.	Constant accidents, neglect, abuse and other health related cases... the Liberian government needs to establish a comprehensive safety and regulatory policy that will lead to the enactment of the National Occupational Safety and Health Act of Liberia, http://www.frontpageafricaonline.com/index.php/letter-comment/3069-establishing-comprehensive-safety-management-policy-in-liberia
	On labor, wage levels in the plantation industry a problem; particularly the conditions under which workers are hired on the estates. The use of indirect or casual labor is common in Colombia and Indonesia (Po.15). Also refer to Indigenous People	Discriminatory practices occur such as withholding migrant workers' passports (Po.15). Direct employment of migrant workers seems fine; they can earn Rm2000/month in harvester and supervisor roles, but others earn minimum wage. Contractor employed workers may be more problematic (St.17).	A company is required to provide shelters, with tables and toilets for employees to receive food in the field. E.g. for 40,000 ha zone there will be a need for at least 40 of these. Also obligatory the presence of toilets distributed by the plantation, or in movable vehicles that accompany the workers throughout the day, one for men and one for women. There is an extensive network of	On labor, particularly the conditions under which workers are hired on the estates. The use of indirect or casual labor is common in Colombia and Indonesia… Among unsolved issues there is still much scope for improvement of conditions of workers on the plantations (Po.15).	Gabon's French-inspired labor code recognizes the right of workers to form and join independent unions and bargain collectively, and prohibits antiunion discrimination, but the right to strike was limited or restricted. ...Labor unions and confederations are active. There is a law pending enactment that would limit foreign workers to 10 percent of a company's workforce (Us,	The minimum wage is not a living wage; min wage recently in place $5.50/day not $6.50/day as hoped. Full month earnings is $100-150/month (with a system of deductions too); so Liberians cannot afford secondary school education for their children who need to go to towns for this. Contract workers earn less e.g. half day,

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
			social insurance, unique rules and benefits that are among the best for global palm producer (St.17)		DOS).	$80/month (St.17).
Anti-corruption and money laundering	Economic demand for lands that are degraded, burned and then planted with oil palm provides huge benefits to certain actors (Pu.15). Various sectors worry about "multiple approvals from local and national government departments that are often in conflict in a heavily decentralised nation" and insufficient transparency (Bl.17). Both Indonesia and Brazil have a lot of problems with corruption. This affects transparency and public data about concessions. Progress is noted for sectors such as logging in Brazil but Indonesia is still behind. A database of geo-referenced plantations and their land use plans combined with use of remote sensing technology can increase transparency; data points must be entered into an accessible system, then NGOs and others could monitor it (Bu.12). Also refer to [1]. "Case study: Indonesia sustainability policy upgrading"	Also refer to [1]. By moving to online licensing renewals and such there are few avenues for corruption. Perhaps some issues in the past on issuance of new mills licenses (St.17).	Also refer to [1]. Both Indonesia and Brazil have a lot of problems with corruption. This affects transparency and public data about concessions. Progress is noted for sectors such as logging in Brazil but Indonesia is still behind. A database of geo-referenced plantations and their land use plans combined with use of remote sensing technology can increase transparency; data points must be entered into an accessible system, then NGOs and others could monitor it (Bu.12).	Also refer to [1]. Colombia remains a seriously conflicted country, although there are some signs of improvement... The government is beginning to distance itself somewhat from the cozy relationship with the palm oil industry that characterized the Uribe years and this means fewer opportunities for corruption. Following his reelection, Santos has promised a Colombia with more justice and equality and the end of violence... his planned restitution of "stolen lands" is still far from a reality. A low level of violence is certainly continuing most of it not directed specifically at the palm oil industry, although small outbreaks still occur. However, they are marginal compared to the situation in the past (Po.15).	Also refer to [1]. Ghosh, P (2013), 'Gabon's Bongo Family: Living In Luxury, Paid For By Corruption And Embezzlement', 15 Feb 2013, http://www.ibtimes.com/gabons-bongo-family-living-luxury-paid-corruption-embezzlement-1088930, accessed 30 Jun 2017.	Also refer to [1]. This is a corrupt political-economy, plantations and mining companies donate to community development funds and these have not materialized; apparently taken by local politicians. There is an Anti-corruption Commission, but it has no budget for lawyers. It handles some very minor cases, but there are big scandals in the news (St.17).

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
Fair pricing	(Under de facto debt bondage) Smallholders may have to sell fruit bunches for whatever the company will pay for them (Bu.12).	Malaysia is (more fortunate than Indonesia) as government organizations have a continuing role in managing much of the smallholder sector of the industry (Po.15). Pricing of FFB is okay, but some more remote zones e.g. Limbang, Lawas vs Miri; suffer on transport distance, OER grading is fair at 20% and smallholders seem happy (St.17).				Liberian palm oil is traded locally and even to Nigeria (it is a smoked palm oil). Prices vary. It is processes in hot cauldrons for two days (need charcoal for this). Informal vs outgrower segments will have different price/economic regulation (no price monitoring for the informal sector) (St.17).
Land ownership/use permit	President Joko Widodo's administration has already established a task force to resolve conflicts in Indonesia's forests. The task force will be a joint collaboration between Ministry of Environment and Forestry (MOEF), the Home Affairs Ministry, the Agrarian Ministry, and the Corruption Eradication Commission (KPK) (Pu.15). Indonesia's One Map Policy remit to identify and resolve overlapping land claims, and also feed into Indonesia's centralized Land Registry (Ci.16) Also refer to [4], "Case study: Indonesia sustainability policy upgrading"	Also refer to [4]. Untitled lands, especially swidden fallows and secondary forests, although in customary use, are considered 'idle' and at risk of state intervention in the name of 'development' or poverty alleviation. Indigenous Sabahans have "enthusiastically embraced" smallholder oil palm whether their lands have titles or not, and will also plant oil palm to demonstrate that their lands are not idle, in order to prevent "land grabbing" by the big companies {Po.15). Land titles are handled by the District Office; legality of land is in MSPO rules; but those in NCR areas have low awareness of compliance	*Also refer to Br1.. Also refer to [4].	Also refer to [4]. Those with "legal protection of their lands... meant that established oil palm producers could not acquire such lands. However local landholders could be persuaded to enter into "productive alliances" with the plantations and thus expand the oil palm frontier....Such a process also applied where displaced small farmers were allocated land by the government, provided they planted it with oil palm. Some small farmers entered an alliance under these terms because it seemed to be the only means of keeping their land. Others perceived the alliance as potentially	While some customary use of land is upheld, no family or community can secure ownership of its traditional forests, arguably its most precious livelihood and capital asset. Colonial and post-colonial administrations have continued to hand over rights and resources to big business rather than invest in local initiatives. Rights-based reforms in land tenure and governance in Africa since the 1990s have simply passed Gabon by. Fern (2102), Land Rights in Gabon, Facing Up to the Past - and Present, FERN, 26 Jun 2012, http://www.fern.org/publications/reports/land-rights-gabon-facing-past-and-present, accessed 30	Concession negotiations have deviated from the formal legal procedures required of them. A 2013 audit by London-based accounting firm Moore Stephens found that only six out of the 68 concession contracts examined were awarded in accordance with Liberian law.. Without a formal land tenure system in place, concessionaires effectively become the final authority to determine which communities are entitled to compensation. Leaving concessionaires to sort out conflicting land claims is problematic since some concessions are located on areas subject to "long-standing and well-known boundary conflicts."...

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
		with legal areas (St.17).		profitable, so did not feel disadvantaged (Po.15).	Jun 2017.	While some companies are working to address these concerns, for example by walking with community members on their land to find and confirm boundary stones together, such policies are not universally practiced (Le.17). The progressive new land law (is stuck in legislature); confusion over concessions overlap with customary and private land - this was not unencumbered state land the companies hoped for. Positively, after expiry of concession, it goes back to customary ownership (unlike Indonesia) (St.17).
Licensing for palm oil (estate and mill)	The compulsory ISPO (rival to the RSPO) has been rather slow to be implemented, (not surprising. It is a huge job), but potentially could have a major positive impact throughout the industry...Continuing poor behaviour of some plantations (deforestation, land conflicts and poor treatment of casual estate workers (Po.15). Some major refiners often RSPO members) have been identified as buying illegal (tainted)	Also refer to [3]. Policy is for MSPO to become compulsory, target dates 2018-2019. ISPO and MSPO may need add-on efforts to meet market demand, on top of better implementing domestic rules (St.17). We have licenses from selling fruit.to every stage of the value chain (St.17).	The Ecologic and Economic Zoning (ZEE) for palm oil defines zones for cultivation, totally monitored by satellites and with control and history of deforestation since 2008. The rule is zero deforestation, with no exceptions. Legal reserves: Plantations within the ZEE need to maintain 50% of total area protected under forest reserve. For plantations outside the ZEE legal reserve of 80% (St.17). 1,400 legal requirements		Within Gabon, they are very strict. All aspects are with permits and government approval (St.17)	In sum, despite benefits that concessions have provided to some communities, there is reason to be cautious about the continued advisability of a concession-driven development strategy, both in Liberia and worldwide. Other countries that have depended on agricultural concessions have experienced similar problems to those described above. Common criticisms are that large-scale

Sustainability enforcement issues (examples of positive and negative)	Indonesia	Malaysia	Brazil#	Colombia	Gabon	Liberia
	produce from conservation and forest zones, and recently accused of non-tax compliance and corruption (NGOs. vs. four RSPO members and others). Indonesia has been driving legalization via Ministerial Decrees and other land status releases akin to amnesty (St.17). The decentralization agenda and overlapping laws have made it difficult for policy to effectively address sustainability issues.... The Indonesian Sustainable Palm Oil (ISPO) standard sets mandatory sustainability requirements for all oil palm growers (Zs.17). ISPO and MSPO may need add-on efforts to meet market demand, on top of better implementing domestic rules (St.17). Also refer to [3]		necessary for the establishment and continuity of a palm oil company in Brazil, but these results in segregation: a) large corporations are constantly monitored by law enforcement agencies, and face heavy fines. b) These same authorities know that the small and medium-sized ones do not have the financial, administrative and logistical conditions to comply and they are rarely checked. Results in centers of excellence in the midst of illegality with likely more than 90% of family farmers in Brazil illegal under the laws. Brazil does not need more laws; but we need enforcement so that everyone implements these laws at all stages of the production chain, regardless of the size of the producer (St.17).			concessions reduce the ability of states to self-govern, threaten food security, harm the environment, fuel land conflicts, and benefit neither national nor local economies to the degree anticipated. Unlike the forestry sector, which is governed in large part by a single piece of regulatory legislation, no general management law regulates Liberia's agricultural sector. Instead, a number of laws impact the awarding and operation of agricultural concessions. All of these laws should be interpreted in light of the fundamental rights protected in the Liberian Constitution. (Le.17).

Notes: 1. The Transparency International Corruption Perception rankings for 2016 were: Malaysia 55, Brazil 79, Colombia 90, Indonesia 90, Liberia 90, and Gabon 101 (Tr.16).; but this may represent "smaller-scale everyday corruption rather than 'grand corruption' (in political business circles)" (St.17).

2. "It is not enough just to earn the right to call the land or forest their own, people also need to be able to use it – in some cases management regulations are very restrictive, and in other cases people need technical support, tools and financing, to be able to make the best use of resources to improve their livelihoods." (La.17)

3. Bu.12 holds more negative view on Malaysia and Indonesia as both established palm oil certifications based on legality (rather than sustainability criteria), and this suggests a lot of non-compliance to existing rules. There is a surfeit of land use laws, not enforced very well. There are gaps in legislation for protecting High Conservation Value (HCV) areas.

4. The main issues in Southeast Asia and South America are zoning, land use planning and best practice issues. HCV areas are critical to land use planning - for dividing up the forest and determine where to expand agriculture (Bu.12).

.. Not covered in literature review sources and stakeholder interviews.

Sources: Bl.17 Bland, Ben (2017), 'Chinese investors hesitate over Indonesia investment', The Financial Times, 15 Jun 2017, https://www.ft.com/content/bb1a9658-4517-11e7-8519-9f94ee97d996, accessed 24 Jun 2017.

Bu.12 Butler, Rhett (2012), 'Legislation and palm oil: South America and Southeast Asia', ZSL interview, 4 Oct 2012, http://www.sustainablepalmoil.org/case-studies/mongabay/, accessed 15 Jun 2017.

Ci.26 CIFOR (2016), 'The Political Economy of Fire and Haze in Indonesia', http://www.cifor.org/fire-and-haze/wp-content/uploads/sites/26/2016/09/088-Fire-and-Haze-project-flyer_v18.pdf, CIFOR, accessed 28 Jun 2017.

Da.15 Daemeter Consulting (2015), 'Indonesia's Evolving Governance Framework for Palm Oil: Implications for a No Deforestation, No Peat Palm Oil Sector', August 2015,http://daemeter.org/new/uploads/20150902122555.RFN_E_Book_p09.pdf, accessed 15 Jun 2017.

Ge.17 Gebrara, Marai F. (2017), Can REDD+ help Brazil roll back rising deforestation rates? CIFOR Forest News, 23 Jun 2017, http://blog.cifor.org/50288/can-redd-help-brazil-roll-back-rising-deforestation-rates?fnl=en, accessed 26 Jun 2017.

La.17 Larson, Anne (2017), 'Tenure reform: Lessons from the Global South', CIFOR Forest News, 20 Mar 2017, http://blog.cifor.org/48869/tenure-reform-lessons-from-the-global-south?fnl=en, accessed 28 Jun 2017.

Le.17 Leiserson, Elizabeth et al. (2017), 'Governance of Agricultural Concessions in Liberia: Analysis and Discussion of Possible Reforms', Allard K. Lowenstein International Human Rights Clinic at Yale Law School, 13 Mar 2017, https://law.yale.edu/system/files/area/center/schell/document/liberia_final_2017.pdf, accessed 23 Jun 2017.

Po.15 Potter, Lesley (2015). 'Managing oil palm landscapes: A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa', Occasional Paper 122, Bogor, Indonesia: CIFOR.

Pu.17 Purnomo, Herry (2017), 'Fire economy and actor network of forest and land fires in Indonesia', Forest Policy and Economics 78: 21-31, DOI: 10.1016/j.forpol.2017.01.001.

St.17 Stakeholder views, June 2017 (total of 6; 2 from each region including regulators, NGOs, corporates).

Tr.16 Transparency International (2016), Corruption Perceptions Index 2016, https://www.transparency.org/news/feature/corruption_perceptions_index_2016#table, accessed 24 Jun 2017.

Zs.17 ZSL (2017), 'Governments', Sustainable Palm Oil Transparency Toolkit, https://www.sustainablepalmoil.org/governments/, accessed, 20 Jun 2017.

Appendix 10: Summary of laws and regulations relating to palm oil by country & sustainability theme

(Please see **Section 8.4.5** in the main report).

Table 23: Summary of laws and regulations by country and sustainability theme

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Deforestation		Company's Social and Environmental Responsibility, Environmental Impact Assessment, Forest Destruction. Forest Area, Conservation Area, Postponement for New Permit and Improvement of Primary Forest and Peatland Management	Kyoto Protocol UNFCCC (2002), Environmentally Sensitive Areas (ESAs) Ranking in National Physical Plan (NPP), National Forestry, National Park	New Forest Code (Permanent Protection Areas along the water courses and Legal Reserve, that in Amazonia varies from 50% up to 80%), National System of Conservation Unities of Nature (National Parks, Biological Reserves, Environmental Protection Areas, etc.)	Forest utilization, Requirements of the Environmental Management System, National System of Protected Areas (SINAP), Environmental determinants	Agriculture (agricultural code; sustainable agricultural development), Environment (EIA/impact studies), National Parks	Environmental Protection and Management Law
Biodiversity loss		High Conservation Value Forest, Conservation, Protected Area, Convention on Biological Diversity	Wildlife Conservation, National / State Parks (Federal and State)	Environmental Crimes Law (fines and jail times for deforestation, hunting, pollution, and other environmental crimes). [Also refer to Deforestation]	National System of Protected Areas (SINAP), Environmental determinants, Wildlife and threatened species	Forest (protection of wildlife, repression of offenses, hunting, integrally & partially protected species), United Nations Framework Convention on Biological Diversity (CBD), Algiers (nature and natural resources), Bonn (migratory species) ad Washington (endangered flors & fauna, CITES) conventions	Environmental Protection and Management Law
Forest degradation							
Reducing carbon emissions	**Land use change (LUC)**	REDD, Carbon Emission, Carbon Stock Measurement, Land Cover Classification				UNFCCC - Kyoto Protocol	
	Biofuel	Biofuel, National Policy on Energy *Domestic biofuel exempted from ISPO.	Biodiesel blending mandate	Biodiesel blending mandate	*Colombia has a biodiesel mix of 10%. According to EMPA, a Swiss company, analyzing the life cycle of biofuel, Colombian palm biodiesel reduces		

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
					83% to 108% GHG emissions; comparing well to the biofuel parameters of 20% and 35% in USA and in the European Union. (Also refer to Deforestation)		
	Mills and plantations	*No policy	*MPOB licensing required introduction of methane capture facilities				Environmental Protection and Management Law
Burning		Forest Fire	ASEAN policy on zero-burning, Environment Quality (Open Burning) - both 2003		Controlled burning in the agricultural sector (disposal of waste.)		
Peatland conversion		Protection and Management of Peat, Peat Land Utilization, Postponement for New Permit and Improvement of Primary Forest and Peatland Management			Proper use of soil, Land-related standards in communities and ethnic groups	Ramsar Convention on Wetlands	Environmental Protection and Management Law, National Forestry Reform Law
Water and pollution		Waste Management, Water Resources, Swamp, River, Watershed Management, Controlling Water Pollution, Domestic Waste, Wastewater Standard	Natural Resources and Environment, Irrigation Areas, Environmental Quality (width of river reserves), Pesticides Act, Environment Quality (Scheduled Wastes, 2005), Poison.	National Policy on Hydric Resources, Pesticides Laws, National Policy of Solid Residues Management	Planning and watershed management, Water harvesting, Water use, Vertimientos, Water reuse, Use of authorized pesticides, Education and training, Medical care, Measures for the protection of the environment and people, Pesticide application, Management of remnants, residues and pesticide containers, Integrated management of ordinary solid waste, Integrated management of hazardous waste - RESPEL, Transport and final disposal of RESPEL	Environment (pollution. waste disposal, discharge in waters, anti-pollution, Certain Hazardous Chemicals and Pesticides in International Trade); Stockholm Convention on Persistent Organic Pollutants (POPs)	Environmental Protection and Management Law, National Forestry Reform Law
Air pollution	**Haze**	(Refer to Burning and Peatland conversion)	(Refer to Burning and Peatland conversion)		Controlled burning in the agricultural sector (disposal of waste.), Atmospheric Emissions		

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
	Others	Pesticides Monitoring, Pesticides Residues, Air Pollution, Emission Standard	Environmental Quality, Municipal Waste, Environmental Quality (Clean Air Regulation, Control of Emissions from Engines)		Use of authorized pesticides, Education and training, Medical care, Measures for the protection of the environment and people, Pesticide application, Management of remnants, residues and pesticide containers; Integrated management of ordinary solid waste, Integrated management of hazardous waste - RESPEL, Transport and final disposal of RESPEL, Offensive Odour, Noise	Environment (pollution. waste disposal, discharge in waters, anti-pollution, Certain Hazardous Chemicals and Pesticides in International Trade); Stockholm Convention on Persistent Organic Pollutants (POPs)	Environmental Protection and Management Law, National Forestry Reform Law
Indigenous people		Customary Community, Communal Reserved Land, Customary Forest, Social Conflict, International Covenant on Economic, Social and Cultural Rights (ICESCR), Social Aspect Assessment in EIA Process, Company's Social and Environmental Responsibility.	Constitution (Orang Asli rights), Aboriginal People Act, Land Ordinance/Code, Environmental Impact Assessment, UN Declaration on the Rights of Indigenous Peoples, United Nations Guiding Principles on Business and Human Rights	"Lands Statute", agro-ecological zoning, Ecological Economic Zoning of North and East of Para State (where oil palm plantations are located), "Indigenous Peoples Statute", quilombola (Afro-Brazilian) communities, Penal Code, Civil Code, Children and Teenagers Statutes, National Policy of Traditional Peoples and Communities Sustainable Developments (other kinds of traditional peoples, rather than indigenous or quilombola)	Determination of indigenous reservations, Prior consultation, Property belonging to ethnic groups, Laws on protection of property, Laws relating to ethnic minorities, Types of processes related to real estate; Forms in which land is used, Conflict resolution; Soil use, Forestry, Building materials ; Private Property, Victims' Law, National and international regulation related to the protection and respect for human rights, Official language of Colombia, Official language of minorities, Right of petition, Standards related to land ownership and ethnic minorities	Land Property (customary rights of use), Agriculture (compensation)	Community Rights Law, Community Forest Law, Land Right Policy, Liberian Constitution, Environmental Protection and Management Law

		Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Smallholders		**Changes in plantation/ smallholder arrangements gradually reduced smallholder benefit (Potter, 2015)	*MPOB Regulations	*Brazil has progressive legislative safeguards for palm oil production, mandated smallholder participation and all sorts of other environmental regulations.	Commercial contracts, Fair prices		Model Agriculture Concession Agreement (MACA)
Forced and child labour		ILO Conventions on Child Labour, Forced Labour	Children and Young Person (Employment), Labour Ordinance, ILO Convention Minimum Age, ILO Convention Worst Form of Child Labour, Human Rights Commission, Children and Young Person (Employment),	"Consolidation of Labor Laws" (labor relations, minimum wage, annual 30 day of paid leave, 120 days of paid maternity leave and other maternity rights, prohibition of child labor, freedom of association)	Rights of children and adolescents, Prohibition of forms of forced labor, ILO Conventions	ILO Conventions	Labor Law, Liberian Constitution
Terms and conditions of labour	**Health & safety**	Occupational Health and Safety, Use of Pesticides, Hazardous Chemical	OSH, Factories & Machinery, Sexual Harassment In The Workplace	Health and Safety, companies' Internal Commission of Labor Accidents Prevention, Personnel Protection Equipment, Plan for Medical Control of Occupational Health (PCMSO), Program of Labor Environmental Risks Prevention (PPRA), work involving electricity, rules for transportation, storage and handling of materials and goods, for machinery and equipment operations, for boilers operation, rural labor, work at height	Medical insurance, Occupational hazard insurance, Work accident, Hygiene and safety measures, Occupational disease, Medical care, industrial hygiene and safety; Exclusive dedication of civic activities by workers, Workplace harassment, Sexual harassment	Labour (labour code, safety and health)	Environmental Protection and Management Law, Model Agriculture Concession Agreement (MACA)

	Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Wages & others	Employment, Minimum Wage, Compensation and Social Insurance, Representation in Industrial Relation, Industrial Dispute Settlement, Discrimination	Minimum Wage Order, Employment Acts & Regulations, Social Security, Estate Workers Minimum Standards Housing Act, Trade Unions, Employment Act / Labour Ordinance,	"Consolidation of Labor Laws" (labor relations, minimum wage, annual 30 day of paid leave, 120 days of paid maternity leave and other maternity rights, prohibition of child labor, freedom of association), non-discrimination, Brazilian official retirement pension fund	Contract of employment, Social benefits, Contractors; Trade union agreement, Collective bargaining, Conflict resolution, Non-union associations	ILO Conventions	Labor Law, Liberian Constitution
Anti-corruption and money laundering	Eradication of Money Laundering, Corruption Prevention and Eradication, UN Convention Against Corruption	Malaysia Anti-Corruption Commission (MACC) Act, Whistleblower Protection Act, United Nations Conventions Against Corruption		Anti-corruption statute		Penal Law, Model Agriculture Concession Agreement (MACA)
Fair pricing	Determining Fresh Fruit Bunches Prices	*MPOB Regulations		Commercial contracts, Fair prices	Agriculture (collection and marketing)	Model Agriculture Concession Agreement (MACA)
Land ownership/use permit	Basic Agrarian Law. Spatial Planning, National Landscape, Location Permit (Ijin Lokasi), Land Suitability for Oil Palm	National Land Code, Land Rules/Ordinance (of each state)	(Refer items in Deforestation)	Determination of indigenous reservations, Prior consultation, Property belonging to ethnic groups, Laws on protection of property, Laws relating to ethnic minorities, Types of processes related to real estate	Land (urban and rural land forming part of the private domain of the State), Land Property (long leases granted by the state), Land Ownership (land register, system of ownership, cancellation of deeds), Land Expropriation	Community Rights Law, Community Forest Law, Land Right Policy

	Indonesia	Malaysia	Brazil	Colombia	Gabon	Liberia
Licensing for palm oil (estate and mill)	Plantation Cultivation, Plantation Business Permit	*MPOB Regulations	Environmental licensing for agriculture activities	**Every plantation must have a certificate that indicates that it has been established in an area suitable for agriculture in the municipal land use plan; the rural planning agency recently created suitability maps for different crops including oil palm.	Agriculture (technical approval farm operator; legal status of agricultural and farm operator)	

Note: Short name of laws and regulations (prepared from RSPO National Interpretation Annex lists)

As no RSPO NI Annex listing is available for Brazil, this is derived from "Sustainability Regulations Applicable to Palm Oil Production in Brasil" by Agropalma Group

* Updated from stakeholders interviews, Jun 2017 or literature review.

.. Uncertain

1.1. Additional source documents and information on laws and regulations in case study countries

We refer readers to the source documents for the full listings of the laws and regulations as follows:

- Indonesia - The Indonesia NI (INANI 2016) of the RSPO Principles and Criteria was endorsed by the RSPO Board of Governors on 30th September 2016[32]. As Indonesia's laws and regulations have been evolving, we include a listing to highlight newer items (2005 and after) in the text above.

- Malaysa - The Malaysia National Interpretation (MYNI) 2014 of the RSPO Principles and Criteria was endorsed on 6th March 2015[33].

- Brazil – As there was no RSPO NI document for Brazil, a summary listing from Agropalma Group is included above.

- Colombia - The Colombia NI (CO NI 2016) of the RSPO Principles and Criteria was endorsed by the RSPO Board of Governors on 26th September 2016[34].

- Gabon - The Gabon NI (GA NI 2017) of the RSPO Principles and Criteria was endorsed by the RSPO Board of Governors on 6th March 2017[35].

- Liberia - Liberia: Adoption of the International RSPO Criteria in its Entirety as a National Interpretation [Draft for Endorsement by the RSPO Secretariat March 2014][36].

1.2. Supplementary information on Indonesian laws and regulations

A regulatory expert notes that key regulations are those 2005 and later (which include some international sustainability considerations; rather than just domestic), especially those from the Minister of Environment and Forestry[37]. Broad environmental items include, Act (House of Representative/ President): 2004 Ratification on Kyoto Protocol To The United Nations Framework Convention On Climate Change.", 2009 Environmental Protection and Management; Government Regulation (President): 2012 Environmental Permit, 2012 Company's Social and Environmental Responsibility; and various MR Minister of Environment, ranging from Managing and Monitoring to Environmental Document for Business and or Activities that have Business Permit But Have No Environment Document.

- A listing of some laws and regulations applying to sustainable palm oil companies is shown in Table 24**,** adapted from "Annex 1. List of Some Regulations related to RSPO Principles and Criteria 2013 (as of June 2015)", by type and approval body (Act by House of Representative/President, Government Regulation, President Instruction, President Decree, President Regulation, Supreme Court Decree,

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[32] RSPO (2017), RSPO National Interpretations documents, http://www.rspo.org/key-documents/certification/rspo-national-interpretations, accessed 15 Jun 2017.

[33] *Ibid.*

[34] *Ibid.*

[35] *Ibid.*

[36] *Ibid.*

[37] Interview with Indonesia regulatory expert, 20 Jun 2017.

Minister Regulation, Minister Decree, other Decree and Indonesia National Standard), focusing on more recent items (2005 and after)[38]:

[38] RSPO (2016), The Indonesia NI (INANI 2016) of the RSPO Principles and Criteria was endorsed by the RSPO Board of Governors on 30th September 2016, http://www.rspo.org/key-documents/certification/rspo-national-interpretations, accessed 21 Jun 2017.

Table 24: Supplementary information on Indonesia laws and regulations relating to palm oil

Endorse/ Approval By	Time period	No. of items (all years)	No. of items (2005 and later)#	Recent items include
Act House of Representative/ President	1956-2014	50	17	2014 Industry, 2013 Prevention and Eradication of Forest Destruction, 2012 Handling Social Conflict, 2010 Prevention and Eradication of Money Laundering, 2009 Environmental Protection and Management, 2007 Spatial Planning, 2006 Ratification of the UN Convention Against Corruption, 2005 Ratification of the International Covenant on Economic, Social and Cultural Rights (ICESCR).
GR President	1973-2014	43	18	2014 Protection and Management of Peat, 2012 Environmental Permit, 2012 Company's Social and Environmental Responsibility, 2012 Procedure for Changing Allocation and Function of Forest Area, 2012 Forest Area Use, 2011 Management of Natural Preserve and Conservation Area, 2010 Plantation Cultivation, 2010 Procedure for allocation and Function of Forest Area, 2008 National Landscape.
PI President	2006-2013	3	3	2013 Action for Corruption Prevention and Eradication, 2011 Postponement for New Permit and Improvement of Primary Forest and Peatland Management, 2006 Biofuel.
PD President	1978-1998	7	0	1990 Protected Area Management, 1987 Ratification for Endangered species, 1978 CITES Ratification.
PR President	2005-2010	6	6	2010 Labor Supervision, 2005 Beijing Amendment to The Montreal protocol on Substances That Deplete The Ozone layer, 2005 Validation of Amendment To The Basel Convention On The Control Of Transboundary Movements Of Hazardous Wastes and Their Disposal.
MR Minister of Agriculture	2006-2013	12	12	2013 Guidance for Plantation Business Permit, 2013 Guidance for Determining Fresh Fruit Bunches Prices, 2011 Requirements and Procedure for Pesticide Registration, 2011 Guidance for Indonesian Sustainable Palm Oil, 2009 Guidance for Peat Land Utilization for Oil Palm Cultivation.
MR Minister of Environment	2006-2013	19	19	2013 Symbol and Label for Toxic and Hazardous Material, 2013 Measurement, Reporting and Verification for Mitigation Action of Climate Change, 2012 Emission Standard for Vehicle Type L3, 2012 Guidance for Composing Environmental Document, 2012 Community involvement and Information Transparency in the Process of Environment Impact Assessment (SEIA).
MR Minister of Manpower	1980-2013	16	11	2013 Minimum Wage, 2011 Procedure to Establish and Validate Company Regulation, and to Establish and Register Collective Labour Agreement (PKB), 2010 Personal Protective Equipment and Material Safety Data Sheet,
MR Minister of Forestry	2008-2014	6	6	2014 Guidance of Forest Utilization, 2013 Inaugural of Forest Area, 2009 Forest Fire Management, 2009 Procedure of Reducing Emissions from Deforestation and Forest Degradation (REDD), 2008 Implementation of Reducing Carbon Emission of Forest Degradation and Deforestation, 2008 Guidance for Human and Wildlife Conflict Prevention.
Minister of Home Affairs	2014	1	1	2014 Guideline of Recognition and Protection of Legitimate Customary Community.
MR Head of National Land Body	1999	2	0	1999 Guidelines for the Settlement of Problems Related to the Communal Reserved Land of the Customary Law Abiding Community, 1999 Location Permit (Ijin Lokasi).
MR Minister of Public Work	1993	1	0	1993 Riparian Strip, Riparian Utilization Area, Riparian Authorization.
MR Minister of Health	2010	1	1	2010 Requirement of Drinking Water Quality.

Endorse/ Approval By	Time period	No. of items (all years)	No. of items (2005 and later)#	Recent items include
SC Supreme Court	2008	1	1	2008 Mediation Procedure on Court.
MD Minister of Cooperatives	2004	1	0	2004 Standard Operational Procedure for Saving and Loan Cooperative Management and Unit.
CC Constitution Court	2012	1	1	2012 Customary Forest.
MD Minister of Agriculture (and Health)	1996-2007	6	2	2007 Pesticides Monitoring, 2006 Commodities Under Management of Directorate General of Plantation, Directorate General of Food Crops, and Directorate General of Horticulture.
MD Minister of Environment	1995-2005	11	1	2005 Guidance for Establishing Environment Management and Monitoring Plan Report, 2004 Quality Standard of Sea Water, 2003 Waste Water Standard for Domestic Industry, 2003 Technical Guidance for Assessing Palm Oil Effluent Utilization to Soil in Palm Oil Plantation Industry.
MD Minister of Manpower (and Transmigration)	1999-2012	13	1	2012 Guidance of Completion Occupational Accident and Disease Case, 2004 Provision of Implementation of PKWT (Temporary Labour Agreement), 2004 Overtime Period and Wages.
MD Minister of Forestry (and Estate)	1998-2008	7	2	2008 Plantation Permit, 2006 High Conservation Value Forest, 2004 Establishment of Forest Area, Status Changing and Function of Forest Area.
D Head of Environment Impact Control Body	1996	3	0	1996 Technical Guidance Social Aspect Assessment in EIA Process, 1996 Technical Guidance Relates to Air Pollution.
INS National Standard Body	2010-2011	3	3	2011 Allometric Equation to Estimate Forest Carbon Stock Based on Field Measurement, 2011 Carbon Stock Measurement and Calculation, 2010 Land Cover Classification.
Total		213	105	

Notes: Adapted from Annex in RSPO NI for Indonesia[39].

Act, GR Government Regulation, PI President Instruction, PD President Decree, PR President Regulation, SC Supreme Court Decree, MR Minister Regulation, MD Minister Decree, D Decree of, INS Indonesia National Standard.

Laws and regulations made 2005 and after considered to have more sustainability considerations included.

Please also refer to "Case study: Indonesia sustainability policy upgrading" in this report segment for a summary of new regulatory directions, especially those from 2015.

[39] RSPO (2016), Indonesia NI, http://www.rspo.org/key-documents/certification/rspo-national-interpretations , accessed 21 Jun 2017. The Indonesia NI (INANI 2016) of the RSPO Principles and Criteria was endorsed by the RSPO Board of Governors on 30th September 2016.

Appendix 11: Summary of laws and regulations relating to palm oil production in Brazil

(Please see **Section 8.4.5** in the main report).

As no RSPO NI Annex listing is available for Brazil, the following is reproduced from "Sustainability Regulations Applicable to Palm Oil Production in Brasil" by Agropalma Group[40]. Readers may also refer to reviews such as Brandão and Schoneveld (2015)[41].

Theme	Requirement	Subjects approached
TERRITORIAL AND LAND ACCESS REGULATIONS	Lei nº 4504/1964	Establishes the "Lands Statute" to regulate the access, possession and property of lands by private owners and assure the right of indigenous peoples to the lands they occupy. – In Brazil, there is no concession system, as it happens in Southeast Asia.
	Decreto nº 7.17/2010	Establishes the agro-ecological zoning for oil palm cultivation in Brazil, excluding areas of forest, conservation unities and indigenous lands.
	Lei Estadual 7398/2010	Approves the Ecological Economic Zoning of North and East of Para State, where oil palm plantations are located.
	ZEE Zona Leste e Calha Norte Volume 3	Volume 3 of Ecological Economic Zoning of North and East Zones of Para State, where oil palm plantations are located. It defines the guidelines for territorial management and land use and occupation.
	Lei nº 9985/2000	Establishes the National System of Conservation Unities of Nature (National Parks, Biological Reserves, Environmental Protection Areas, etc.). – In 2010, there were 1.174.258 Km^2 protected under conservation unities in Brazilian Amazônia.
	Lei nº 6001/1973	Establishes the "Indigenous Peoples Statute", recognizing their rights on the lands they occupy, the respect for their own tradition, culture and costumes and rights of indigenous people to have the same protection services established by the laws, as any Brazilian citizen. In 2010 there were 1.860.950 Km^2 of officially recognized indigenous lands in Brazilian Amazonia.
	Decreto nº 4887/2003	Establishes the procedures for identification, recognition, delimitation, demarcation and titling of land occupied by quilombola communities. – Quilombola are communities funded by African descendants, that run way from slavery condition and hidden in remote areas of Brazil, during the Portuguese domain and Imperial periods (up to 1889).
ENVIROMENTAL REGULATIONS	Lei nº 9433/1997	Establishes the National Policy on Hydric Resources, regulating the access to water aiming to preserve this resource and avoid conflicts related to water use.
	Lei nº 12561/2012	Establishes the new Forest Code, that regulates forests use and suppression, and determine the mandatory requirements to all farms and plantations in Brazil to keep Permanent Protection Areas along the water courses and Legal Reserve, that in Amazonia varies from 50% up to 80%.
	Decreto de 24 de abril de 2013	Authorizes the reduction Legal Reserve from 80% up to 50% in some specific areas of Para State (only in cases of restoration needs), as indicated Ecological Economic Zoning. The palm oil plantations are located in this region.

[40] Agropalma (2017), 'Sustainability Regulations Applicable to Palm Oil Production in Brasil', Agropalma Group, May 2017.

[41] Brandão F and Schoneveld G. 2015. The state of oil palm development in the Brazilian Amazon. Working Paper 198, Bogor, Indonesia: CIFOR, http://www.cifor.org/publications/pdf_files/WPapers/WP198CIFOR.pdf, accessed 15 Jun 2017.

Theme	Requirement	Subjects approached
HEALTH AND SAFETY REGULATIONS	Lei nº 7802/1989	Pesticides Law. Establishes strict rules on the research, development, production, transportation, commercialization, use, correct disposal of residues and empty packages, and control framework of pesticides.
	Decreto4074/2002	Complement the "Pesticides Law".
	Lei nº 9605/1998	Environmental Crimes Law. It establishes the penalties (fines and jail times) for deforestation, hunting, pollution, and other environmental crimes.
	Lei nº 2305/2010	Establishes the National Policy of Solid Residues Management, with requirements for recycling and final disposal.
	Resolução CONAMA nº 237/1997	Establishes the requirement of environmental licensing process for agriculture activities.
	NR 04	Establishes the requirements for the companies' internal services of Health and Safety in labor.
	NR 05	Establishes the requirements for the companies' Internal Commission of Labor Accidents Prevention.
	NR 06	Establishes the requirements for the use of Personnel Protection Equipment.
	NR 07	Establishes the requirements for the Plan for Medical Control of Occupational Health (PCMSO).
	NR 09	Establishes the requirements for the Program of Labor Environmental Risks Prevention (PPRA).
	NR 10	Heath and safety rules to work involving electricity.
	NR 11	Health and safety rules for transportation, storage and handling of materials and goods.
	NR 12	Health and safety rules for machinery and equipment operations.
	NR 13	Health and safety rules for boilers operation.
	NR 31	Establishes the requirements of health and safety in rural labor.
	NR 35	Health and safety rule for work at height.
LABOR REGULATIONS	Decreto Lei nº 5452/1943	The "Consolidation of Labor Laws" that establishes the main requirements and rules on labor relations, including worker rights (ex. minimum wage, annual 30 day of paid leave, 120 days of paid maternity leave and other maternity rights, prohibition of child labor, freedom to create and join unions and recognition of their official role as workers representatives, among many others).
	Lei nº 9029/1995	Forbids any employer from applying any form of discrimination in labor relations (including hiring processes), based on sex, ethnic or geographic origin, race, skin colour, civil state, familiar situation, disability, age, and others. Specifically, it prevents the employer from requesting pregnancy test or sterilization certificates during hiring processes.
SOCIAL PROTECTION REGULATIONS	Decreto Lei nº2848/1940	Establishes the Penal Code, defining, among others, the crimes against personal freedom and penalties for them (ex. crimes of sexual harassment, crime of coercion, crime of threat, and crimes against labor organization, among others).
	Lei nº 10406/2002	Establishes de Civil Code, that regulates, among others, society and business relations between private parties and require specific documentation for private properties transactions (including lands for farms and plantations) and conditions for a contract be considered legally valid.
	Lei nº 8069/1990	Establishes the Children and Teenagers Statutes, with their rights and protection legal devices.
	Decreto nº 6040/2007	Establishes the National Policy of Traditional Peoples and Communities Sustainable Developments, recognizing their right to their territories (approach other kinds of traditional peoples, rather than indigenous or quilombola).

Theme	Requirement	Subjects approached
	Lei 8213/1991	Regulates the Brazilian official retirement pension fund (available to all workers in Brazil). All employers and employees are obligated to contribute with this fund, to support employee's retirement payments.

Appendix 12: Case study illustrating different approaches to national applications of RSPO P&C for soil

(Please see **Section 8.5.1** in main report).

One area in which there is significant departure from the P&C of the RSPO is in dealing with soil.[42] **Table 25** lists some of the differences in definitions and guidance for Malaysia and Indonesia within the RSPO. The issues include:

(i) The use of technical and confusing terminologies that are challenging for most RSPO auditors and HCV/HCS assessors to apply accurately.

(ii) Different definitions for peat, marginal soils and fragile soils (RSPO vs. MSPO vs. ISPO vs. the HCS Approach (used by TFT traceability - Wilmar.

(iii) Difficulties in mapping peat soil location and depths, as well as inconsistent or conflicting maps of peat lands[43].

Table 25: Case Study: Soil considerations in the RSPO

	Malaysian Interpretation of P&C (2014)	Indonesian Interpretation of P&C (2014)
Problem/risky and marginal soils	Problem and marginal soils – may include podzols soils such as BRIS and kerangas soil, and potential or actual acid sulphate soils.	Risky and marginal soils – may include sandy soils, low organic content soils, and potential or actual acid sulphate soils.
Fragile soils	Fragile soils on which extensive planting shall be avoided – include peat soils and mangrove sites.	Fragile soils on which extensive planting shall be avoided – include peat soils, mangrove sites and other wetland areas.
Peat	Peat: Soil profile with more than half of the top 100cm consists of organic soil materials. Planting on peat areas with depth of 3m or more is not allowed within a new development. Planting on peat domes or fibric/woody peat should be avoided as well as any other areas identified to be excluded in EIA, HCV assessment and carbon stock assessment.	Peat: planting on peat areas with depth of 3m or more is not allowed within a new development. If planting is conducted on peat with <3 m depth, then the area shall meet the following requirements: a. Within designated cultivation area b. Proportion of <3m depth of peat soil and mineral soil (if any) is minimal 70% of the total concession area c. Peat soil maturity level is mature (sapric) d. Fertility level is eutrophic.

Note: Soil considerations in MSPO, ISPO and TFT's HCS Approach differ[44] Source: Adapted from Suksuwan (2017)[45]

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[42] Relevant P&C include Criterion 4.3: Practices minimise and control erosion and degradation of soils and Criterion 7.4: Extensive planting on steep terrain, and/or marginal and fragile soils, including peat, is avoided.

[43] Suksuwan, Surin (2017), 'Soil Considerations in Palm Oil Sustainability, HCV and HCS: A Practical Perspective of Key Issues' (Presentation), Proforest, CEH & CFF Workshop on Soil Quality Challenges in Malaysia and Indonesian Oil Palm Plantations, 2-3 March 2017, Semenyih, Malaysia.

[44] Suksuwan (2017): Soil considerations in MSPO: Fragile soils defined as problematic and marginal soils in which their utilisation requires higher production cost due to specific management requirements. Peat: soils with organic soil material which make up more than half the total cumulative thickness of the upper 100 cm. Soil considerations in ISPO: Planting allowed on peat soil in a block with depth < 3 m and proportion up to 70% of cultivated peat area, the mineral soil layer beneath the peat is not quartzite sand or acid sulphate soil, and on peatland with a sapric maturity level. HCS Approach: In addition to aboveground biomass, peatlands must be identified and conserved – no development on peat regardless of depth.

For Malaysia the RSPO NI includes national guidance on erosion (4.3.1 erosion on sloping land; and 4.3.4 about peat soils, see below), riparian buffer zones (4.4.2 refers to national best practice and national guidelines) and storage of pesticides (4.6.6 according to national regulations). It is notable that definitions vary on problem and marginal soil and extensive planting on fragile soils[46]

Protection of all soils with an organic layer of >15 cm in depth as a precaution to ensure that the soil carbon threshold is never exceeded.

[45] Suksuwan, Surin (2017), 'Soil Considerations in Palm Oil Sustainability, HCV and HCS: A Practical Perspective of Key Issues' (Presentation), Proforest, CEH & CFF Workshop on Soil Quality Challenges in Malaysia and Indonesian Oil Palm Plantations, 2-3 March 2017, Semenyih, Malaysia.

[46] Interview with sustainability implementation specialist, 5 July 2017.

Appendix 13: Further examples of voluntary palm oil-related voluntary initiatives and schemes

(Please see **Section 8.6** in main report).

Table 26: Summary table of examples for other voluntary palm oil-related initiatives and schemes

Topic		Characteristics
Name of initiative: The Terra Bella Colombia Fund		
Description: The Terra Bella Colombia Fund is designed to mobilize private equity investments to finance smallholder agriculture, non-timber forest products, and climate change mitigation in Colombia. The Fund utilizes an innovative public-private partnership structure, combining anchor investments from USAID/Colombia with private funds to deliver Colombia's first investment fund dedicated to smallholders and rural development, including for Afro Colombians, Indigenous and other community groups and cooperatives.		
Overview	*Lead by:*	Terra Global Capital (Fund Manager: Terra Global Investment Management, was founded in 2006)
	Partners:	USAID and private sector investors
	Demand / supply-side:	Supply-side focus targeting the production-end of value chains, focusing on the stages that are managed directly by the smallholder producers.
	Scope:	National. Non-timber forest products; smallholder support and rural development in Colombia.
	Objectives & targets:	To generate long-term returns for investors while delivering measureable environmental and social benefits by enabling transformation to sustainable landscape management and increased rural incomes, including through the sale of emissions reductions certificates generated from avoiding deforestation, promoting reforestation, and adopting climate-smart agriculture.
	Key activities:	Investing in climate-smart smallholder agriculture. Linked Technical Assistance Facility to "bridge the gap" that smallholders face in achieving readiness to access investment capital.
	Likely impact:	Unknown at this time
	Source:	http://www.terraglobalcapital.com/terra-bella-colombia-fund-0
Name of initiative: Nestlé SA Global Sustainable Palm Oil Programme and Commitment on (Zero) Deforestation and Forest Stewardship		
Description: In 2016, Nestlé bought 420,000 tonnes of palm oil, mostly from Malaysia and Indonesia. It has committed to zero deforestation in its supply chains by 2020, with an initial focus on the main forest-risk commodities in its supply chain (i.e. palm oil, soya, beef, timber products, coffee and cocoa); and has laid out a clear process by which it works with two NGOs – The Forest Trust and Proforest – to ensure that suppliers comply with, and are auditing against, Nestlé's policy and the requirements of its Responsible Sourcing Guidelines, which include Specific Requirements for Palm Oil, which go beyond the requirements of the RSPO Standard,		

particularly in relation to high carbon stocks and high conversation value forest and peatland.		
Overview	Lead by:	Nestlé SA
	Partners:	The Forest Trust and Proforest
	Demand / supply-side:	Combination
	Scope:	Global. Applies to all palm oil suppliers, including smallholders.
	Objectives & targets:	Zero deforestation by 2020.
	Key activities:	Development of palm oil specific principles and requirements within Sustainable Sourcing Guidelines; independent auditing of suppliers.
	Likely impact:	Significant given volume of palm oil procured, 'beyond RSPO" approach and independent NGO supplier audits. Nestlé approach cited as exemplar model by GCP and CDP in their review of the CGF Zero Net Deforestation by 2020 Commitment.
	Source:	http://www.nestle.com/csv/communities/responsible-sourcing/palm-oil and http://www.nestle.com/asset-library/documents/library/documents/corporate_social_responsibility/nestle-responsible-sourcing-guidelines.pdf
Name of initiative: Yum! Brands Palm Oil Policy		
Description: The Yum! Brands Palm Oil Policy sets goals across the company's restaurants (including KFC, Pizza Hut, and Taco Bell) to reduce use of palm oil as cooking oil, and to give preference to suppliers certified by the RSPO.		
Overview	*Lead by:*	Yum! Brands Palm Oil Policy
	Partners:	
	Demand / supply-side:	Supply-side
	Scope:	International. Affects all restaurants under the brand's purview.
	Objectives & targets:	Removal of palm oil as cooking oil restaurants by 2017, contingent upon what the market allows. Remaining palm oil used for cooking will be sourced from responsible and sustainable sources by the end of 2017; preference will be given to suppliers certified by RSPO, in addition to the following principles: • No development on HCV or HCS forests/landscapes • No development on peatlands regardless of depth • Compliance with country laws and regulations, and Yum! Brands supplier code of conduct • Prevention and resolution of conflicts with the principle of FPIC • Traceability to the extraction mill and validation of fresh fruit bunches • Respect and protection of human rights including not employing children or forced labourers

	Key activities:	Phasing-out of palm oil wherever feasible. Sourcing palm oil from certified suppliers.
	Likely impact:	Unknown. Possibly limited by market circumstances. Currently, 70 percent of the brand's global restaurants do not use palm oil as their cooking oil
	Source:	http://yumcsr.com/environment/environment-policies.asp http://yumcsr.com/food/nutritional-improvement.asp#palmOil
Name of initiative: Palm Oil Traceability Working Group		
Description: The Sustainable Trade Initiative (IDH) has assembled the Palm Oil Traceability Working Group (TWG) in order to align key stakeholders in terms of the definition and implementation of supply chain traceability.		
Overview	*Lead by:*	IDH – The Sustainable Trade Initiative
	Partners:	Cargill, First Resources, GAR, Hershey, IOI, Johnson & Johnson, Kuala Lumpur Kepong Berhad, Musim Mas, Neste Oil, P&G, Unilever, Wilmar
	Demand / supply-side:	Demand- and Supply-side
	Scope:	International
	Objectives & targets:	• To promote a common definition of traceability for all actors in the industry. • To achieve full traceability and sustainability to plantation level • That all TWG members follow a transparent process in achieving traceability and sustainability in their supply chains, including the prioritization of highest risk mills.
	Key activities:	Establishing common definitions, milestones, and methods. Cooperation amongst members in prioritizing high-risk areas and verifying shared mills.
	Likely impact:	Increased transparency across the industry
	Source:	https://www.idhsustainabletrade.com/uploaded/2016/07/TWG-concept-note.pdf
Name of initiative: andgreen.fund		
Description: The andgreen.fund aims to finance inclusive, sustainable, and deforestation-free commodity production, and so strengthen the case for a new rural development paradigm that protects valuable forests and peatlands and promotes high-productivity agriculture.		
Overview	*Lead by:*	IDH – The Sustainable Trade Initiative
	Partners:	Norway's International Climate and Forest Initiative
	Demand / supply-side:	Supply-side

	Scope:	International.
	Objectives & targets:	• Protect and restore tropical forests and peatlands • Improve smallholder livelihoods • Inclusively increase agricultural production • To attract commercial investors by mitigating their credit and environmental risk
	Key activities:	• Investing up to $400 million by 2020
	Likely impact:	Potentially more investment in smallholder producers
	Source:	http://www.andgreen.fund/ http://innpact.com/en/References/andgreen-fund
Name of initiative: Sustainable Palm Oil Investor Working Group (IWG)		
Description: The IWG is a grouping of investment organizations which support the development of a sustainable palm oil industry through the work of the RSPO		
Overview	*Lead by:*	United Nations-supported Principles for Responsible Investment
	Partners:	Allianz Global Investors, APG Asset Management, Arisaig Partners, Aviva Investors, Boston Common Asset Management, Christian Super, CDC Group Plc, DNB, DoubleDividend Investment Management, Ecofi Investissements, First State Investments, Generation Investment Management, Guardians of New Zealand Superannuation, Hermes Equity Ownership Services, Investec Asset Management, Kempen Capital Management, Local Authority Pension Fund Forum, Local government Super, MN, Natixis Asset Management, NEI Investments, Nelson Capital Management, PGGM Investments, RobecoSAM, Swedbank Robur, Stichting Pensioenfonds UWV, Trillium Asset Management, Triodos Investment Management, Union Investment
	Demand / supply-side:	Demand-side
	Scope:	International
	Objectives & targets:	• To expand investor interest in the palm oil industry as it relates to sustainable development goals • To encourage investee adherence to practices that are consistent with the development of a sustainable palm oil industry
	Key activities:	Engagement with buyers of palm oil to encourage them to purchase only CSPO, as well as engagement with the suppliers of palm oil to adhere to the principles and criteria established by the RSPO.
	Likely impact:	Unknown
	Source:	https://www.unpri.org/page/investors-urge-greater-sustainability-commitments-from-palm-oil-producers https://www.unpri.org/download_report/3864

Name of initiative: Wilmar Financing Sustainable Smallholder Replanting		
Description: A collaborative effort lead by Wilmar, an independent smallholder cooperative with 2,700 members who typically manage 2-5 Ha of land, which aims to provide financial support to palm oil smallholders.		
Overview	*Lead by:*	Wilmar
	Partners:	Nestle, IDH, L'Oréal
	Demand / supply-side:	Supply-side
	Scope:	Smallholders in Indonesia
	Objectives & targets:	To build increased future supply of sustainable palm oil production from smallholders by providing financial support to enable RSPO certification and replanting. The programme innovates through requiring upfront commitment, especially from downstream buyer companies that are customers of the palm oil mill where the smallholder fresh fruit bunches are delivered to.
	Key activities:	Financing of $4,000 per Ha over 15 years; benefits 2,700 independent smallholders
	Likely impact:	Increased adoption of RSPO certification by smallholders, who may benefit from premiums
	Source:	https://www.tfa2020.org/wp-content/uploads/2016/11/Wilmar-Financing-Sustainable-Smallholder-Replanting-2016.pdf http://www.wilmar-international.com/sustainability/wp-content/uploads/2016/10/Q3-2016-Sustainability-Policy-Implementation-Progress-Update.pdf
Name of initiative: PepsiCo Palm Oil Action Plan		
Description: PepsiCo's Palm Oil Action Plan details the company's commitments to source sustainable palm oil, which apply to all of the company's brands and products worldwide.		
Overview	*Lead by:*	PepsiCo
	Partners:	IDH Traceability Working Group, Proforest, Control Union
	Demand / supply-side:	Demand-side
	Scope:	International
	Objectives & targets:	• 100% traceability with independent verification • 100% mass balance physically certified palm oil by 2020
	Key activities:	• Conducting assessments of mills per the checklist developed by the TWG • Assessment visits to high-risk mills, and interventions to ensure compliance

	Likely impact:	Unknown.
	Source:	https://www.pepsico.com/docs/album/policies-doc/pepsico-palm-oil-action-plan-progress-report-august-2016.pdf?sfvrsn=4 https://www.environmentalleader.com/2017/08/pepsico-now-traces-90-palm-oil-back-mill-ensure-future-supply/
Name of initiative: South Sumatra Partnership for Sembilang-Dangku AIndscape Management MoU		
Description: The Memorandum of Understanding signed between SNV Netherlands Development and GAR/SMART is an agreement to work together to help palm oil smallholders increase field productivity and income, and apply for sustainable palm oil certification.		
Overview	*Lead by:*	SNV Netherlands Development
	Partners:	GAR/SMART
	Demand / supply-side:	Demand- and Supply-Side
	Scope:	South Sumatra, Indonesia
	Objectives & targets:	• To minimise risks of smallholder production activities which are not in line with GAR Social and Environmental Policy • To increase smallholder field productivity through best practice sharing, resulting in higher income • To support smallholders in applying for sustainable palm oil certification, such as ISPO, ISCC, and RSPO
	Key activities:	Training for smallholders in best practices, and support in applying for sustainable palm oil certification
	Likely impact:	Inclusion of smallholders in growth
	Source:	https://goldenagri.com.sg/partnership-snv-support-palm-oil-smallholders/
Name of initiative: Earth and People		
Description: Earth and People is the endowment fund of the Cérélia company, which is to provide support and/or financing for all public interest projects stemming from Cérélia's social responsibility commitments. PALMCI and the SIFCA Group are both leading palm oil producers; the former is the leading producer of crude palm oil in Côte d'Ivoire, while the latter operates internationally and is involved in every stage of the palm oil value chain.		
Overview	*Lead by:*	Cérélia
	Partners:	TFT, PALMCI, SIFCA
	Demand / supply-side:	Supply-side

	Scope:	International, with a focus on Côte d'Ivoire
	Objectives & targets:	Company-wide goals: • To buy 100% certified RSPO palm oil • To use 100% palm oil following Cérélia's more stringent criteria by 2018 Project-specific goals • To help develop the Ivorian sustainable palm oil industry by improving plantation yields without resorting to deforestation • To protect the environment • To improve living conditions for communities and producers who rely for part of their livelihood palm oil
	Key activities:	Two initial activities are being carried out to identify needs: • A diagnosis of Integrated Farm Units in Néka village, and their environmental impact • A map of the plantations to identify zones to be protected • A survey to identify the needs of the growers concerned After the completion of this initial phase, the rest of the programme will be implemented until 2020
	Likely impact:	Unknown
	Source:	http://www.cerelia.com/_media/files/Communique-Presse-07122015_EN.pdf http://www.tft-transparency.org/member/cerelia/
Name of initiative: Wilmar Action Plan to Address Labour Concerns in North Sumatra		
Description: Following an Amnesty International report, which raised the issue of plantation workers' welfare, Wilmar conducted multiple internal and external assessments in two plantations in North Sumatra, after which the company developed and implemented a comprehensive labour programme.		
Overview	*Lead by:*	Wilmar
	Partners:	Verité South East Asia
	Demand / supply-side:	Supply-side
	Scope:	Indonesia, with a focus upon Wilmar's plantations
	Objectives & targets:	The objective is to formulate sustainable solutions to systemic labour problems existing in the Indonesian palm oil sector, and to help ensure sustained company-wide conformance to social standards.
	Key activities:	• Measures to stop child labour, which include encouraging children to attend school, educating parents, and reinforcing the No Child Labour policy with all workers • Reducing the proportion of temporary workers, with priority given to female temporary workers • Increased healthcare benefits and health education for workers • Supporting worker unions • Re-assessment of OSH policies and OSH worker trainings

	Likely impact:	Improved conditions for labourers and communities
	Source:	http://www.wilmar-international.com/sustainability/wp-content/uploads/2017/04/Wilmar%E2%80%99s-Action-Plan-To-Address-Labour-Concerns-In-North-Sumatra.pdf http://www.foodnavigator.com/Business/Wilmar-announces-partnership-to-end-labour-violations-in-palm-oil-supply-chain
Name of initiative: Mars Palm Oil Policy / GOOD Program		
Description: The Mars Palm Oil Policy details the company's ambitions in terms of sourcing palm oil, while the GOOD program is a plan for collaborating with suppliers to help transform the way palm oil is produced.		
Overview	*Lead by:*	Mars
	Partners:	TFT, Wilmar
	Demand / supply-side:	Demand- and Supply-side
	Scope:	International, with a emphasis on Indonesia and Malaysia
	Objectives & targets:	General: • To source fully sustainable and traceable supplies that are free from deforestation and produced with respect for human rights. Program-specific: • Work with suppliers to simplify palm oil supply chain • Increase support for the Aggregator Refinery Transformation program in key landscapes that contribute to the company's supply chain • Work with strategic partner Verité on a human rights plan for palm oil • Continue to support the development of TFT's monitoring and verification framework
	Key activities:	• Working with the TFT to achieve 95% traceability of palm oil supplies to mill level • Continued collaboration with Wilmar and TFT as they implement the ART program • Playing an active role in the Consumer Goods Forum working group on forced labour in palm oil • Participating at major industry events including the 14th RSPO roundtable in Bangkok • Supporting TFT to pilot an innovative framework for monitoring and verification of policy compliance
	Likely impact:	Increased market presence for sustainable palm oil
	Source:	http://www.mars.com/docs/default-source/Policies-and-Practices/palm-update-q2-2017.pdf?sfvrsn=6
Name of initiative: Solaridad Smallholder Programme		
Description: An initial smallholder programme with a budget of €2.7 million, led by Solaridad, engaged with farmers in Honduras from 2013-15. The project area covered 100,000 Ha and reached 7,500 smallholders and 5,000 workers. A second project in Inodnesia will		

run from 2015-2020, and plans to engage 5,500 smallholders with a project area covering 16,000 Ha.		
Overview	*Lead by:*	Solaridad
	Partners:	Henkel, BASF (Indonesia programme only), WWF, Proforest, SNV, Good Return, Credit Union Keling Kuman,
	Demand / supply-side:	Supply-side
	Scope:	Honduras, Indonesia (West Kalimantan)
	Objectives & targets:	The aim of both projects is capacity-building amongst smallholders through investment in sustainable and inclusive palm oil supply chains.
	Key activities:	Generally, both projects aim to help smallholders attain requirements for certified palm oil production: • Direct training and support on (sustainable) best agricultural practices • Improved farm management practices • Training concerning areas of health and safety, environmental and social impact management
	Likely impact:	Increased palm fruit yields and increased smallholders' revenue. Farmers and companies participating in the Honduras project increased their yields by more than 25 per cent.
	Source:	Honduras project: https://www.solidaridadnetwork.org/news/henkel-and-solidaridad-foster-smallholder-programme-to-support-sustainable-palm-oil https://www.solidaridadnetwork.org/news/smallholder-programme-reaches-17500-farmers-in-honduras http://www.henkel.com/press-and-media/press-releases-and-kits/2016-06-08-smallholder-program-in-honduras-reached-17500-small-farmers-and-workers/688154 Indonesia project: https://www.solidaridadnetwork.org/news/solidaridad-henkel-and-basf-support-smallholders-in-poorest-regions-of-indonesia
Name of initiative: Wild Asia Group Scheme for Small Producers		
Description: The Wild Asia Group Schemes (WAGS) is intended to address the challenges of traceability in the palm oil supply chain, to understand the challenges palm oil suppliers face to meet "zero deforestation" commitments, and the challenges of smallholders in enhancing their productivity and best management practices. Since 2010, the scheme has supported smallholders across Malaysia in six areas, with four areas having achieved RSPO certification. These areas have experience dramatic yield increases.		
Overview	*Lead by:*	Wild Asia
	Partners:	Cargill, Solaridad
	Demand / supply-	Supply-side

	side:	
	Scope:	Malaysia
	Objectives & targets:	Capacity-building for smallholders, including the adoption of best agricultural practices and facilitation of RSPO certification.
	Key activities:	Providing smallholders and dealers with technical assistance, better access to technology, and the necessary expertise to help them adopt responsible and efficient practices to improve their crop yields and obtain the RSPO certification
	Likely impact:	Large increase in smallholder yields and RSPO certification, inclusive growth for smallholders
	Source:	https://www.cargill.com/2017/cargill-grows-base-of-certified-sustainable-independent-oil-palm http://oilpalm.wildasia.org/small-producers/wags/
Name of initiative: Dutch Alliance Sustainable Palm Oil (DASPO)		
Description: Successor to the Dutch Task Force Sustainable Palm Oil.		
Overview	Lead by:	MVO – The Netherlands Oils and Fats Industry, who provide the secretariat for DASPO and act as spokesperson for its members.
	Partners:	Dutch Bakery and Confectionary Industry (VBZ), Dutch Convenience Food Association (AKSV), Dutch Food Retail Association (CBL), Dutch Food Industry Federation (FNLI), Dutch Potato Processors' Association (VAVI), International Margarine Association for the Countries of Europe (IMACE-NL), The Dutch Feed Industry Association (Nevedi), and the Association of Dutch Producers of Edible Oils and Fats (Vernof). IDH, the Sustainable Trade Initiative is also a partner of DASPO.
	Demand / supply-side:	Demand-side.
	Scope:	Sectoral. Dutch food industry.
	Objectives & targets:	Three main commitments: 1. Maintain the commitment towards the level of 100% sustainable palm oil1 processed in the Netherlands and destined for the Dutch market. 2. Stimulate their members to use physical sustainable palm oil, palm kernel oil, fractions and derivatives in RSPO (Identity Preserved, Segregated and Mass Balance) or -equivalent to process or buy for the Dutch market. 3. To plea for, and stimulate the continuous improvement of certification systems for sustainable palm oil such as the RSPO or –equivalent in line with relevant developments.

	Key activities:	• Seeking to achieve '100 per cent sustainable palm oil processed in the Netherlands and destined for the Dutch market' through food sector and cross-sectoral collaboration. • DASPO members aim to increase the share of physical, certified sustainable palm oil by stimulating the demand for Identity Preserved, Segregated or Mass Balance trading models as much as possible. • Lobbying and working towards improvements in sustainable palm oil standards, in particular with a focus on improving the protection of high carbon stock areas and peatland; and supporting of sustainable palm oil production by (independent) smallholders to prevent them from being excluded from a sustainable palm oil supply chain.
	Likely impact:	The members of the DASPO will evaluate their commitment every year. All DASPO members are open for relevant input and knowledge from external stakeholders. NOTE: at the end of 2014 the Dutch food industry had achieved 72% sustainable palm oil use.
	Source:	http://www.taskforceduurzamepalmolie.nl/uploads/media/Dutch_Alliance_Sustainable_Palm_Oil_-_commitment_english.pdf and https://www.palmoilandfood.eu/sites/default/files/6_A%20150929%20EPOC%20and%20ESPO%20FINAL.pdf
Name of initiative: We Mean Business Coalition		
Description: Coalition of organisations and businesses working towards the transition to a low carbon economy. Acts as a platform for businesses to make public commitments to reduce emissions, which are automatically fed into the UNFCCC's NAZCA platform. Companies are encouraged to commit to one or more of several initiatives to reduce their emissions, including removing commodity-driven deforestation from all supply chains by 2020; and growing the market for sustainable fuels. To date, 765 companies and investors have made commitments.		
Overview	Lead by:	BSR, CDP, Ceres, The B Team, The Climate Group, wbscd.
	Partners:	UNEP Finance Initiative, cebds, WWF etc.
	Demand / supply-side:	Supply and demand– companies with commitments include major producers and traders of palm oil such as Bunge and Olam, manufacturers such as General Mills, and retailers such as Carrefour.
	Scope:	Global – businesses form around the world.
	Objectives & targets:	Amplify the business voice in climate change action.
	Key activities:	Public forum for commitments to emissions reductions.
	Likely impact:	Encouragement of bold climate commitments by businesses, as these commitments are recognised in a public forum.
	Source:	https://www.wemeanbusinesscoalition.org/take-action

Name of initiative: GAR Innovative Financing Program		
Description: Financing program, which allow independent smallholders to secure loans with affordable interest rates to fund their replanting under the umbrella of the Partnership for Indonesia's Sustainable Agriculture (PISAgro).		
Overview	Lead by:	Golden Agri Resources Ltd.
	Partners:	Indonesian Government
	Demand / supply-side:	Demand
	Scope:	Indonesia
	Objectives & targets:	• To increase smallholders' productivity and income while minimising additional land development • To engage farmers and build capacity via education and training • To support Government land certification program and legalise farmer's land ownership • To provide subsistence income during replanting growth period
	Key activities:	Assisting smallholders in securing loans for replanting of oil palm and helping to increase average CPO yield through provision of high quality seeds and encouragement of GAPs.
	Likely impact:	Local. Over 450 smallholders participate in the programme and to date, GAR has successfully assisted independent smallholders to secure a loan facility of IDR 100 billion from a state-owned bank to replant 1,200 hectares.
	Source:	https://www.tfa2020.org/en/reports/annual-report-2017/#landscape-fund-for-tropical-landscapes-and-forests
Name of initiative: LandMark		
Description: Online, interactive global platform mapping the lands collectively held and used by indigenous peoples		
Overview	Lead by:	The Instituto del Bien Común (IBC), World Resources Institute (WRI) and the International Land Coalition (ILC)
	Partners:	AMAN, RRI, Foundation for Ecological Security (FES) in India, Philippine Association for Intercultural Development (PAFID), Forest Peoples Programme (FPP), Rainforest Foundation United Kingdom (RFUK), the World Atlas of Indigenous Peoples' Territories (WAIPT), The Union of Indigenous Nomadic Tribes of Iran (UNINOMAD) and Red Amazónica de Información Socioambiental Georreferenciada (RAISG).
	Demand / supply-side:	Supply – tackling issues of land tenure.
	Scope:	Global but currently with a focus on
	Objectives & targets:	The global platform is designed to help Indigenous Peoples and communities protect their land rights and secure tenure over their lands.
	Key activities:	LandMark provides Indigenous Peoples and communities with an online global platform to make governments, development assistance agencies and others aware of the lands they hold and use. The site

		allows indigenous people to be proactive in their efforts to protect their lands.
	Likely impact:	Protection of land held by indigenous peoples in new palm oil developments.
	Source:	http://www.landmarkmap.org/
Name of initiative: Bonn Challenge		
Description: Global effort to bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.		
Overview	Lead by:	Overseen by the Global Partnership on Forest Landscape Restoration, with the International Union for Conservation of Nature as its Secretariat.
	Partners:	National governments
	Demand / supply-side:	Supply-side
	Scope:	Global
	Objectives & targets:	Bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
	Key activities:	Gathering commitments to increase area of world's degraded land under restoration pledges.
	Likely impact:	The restoration of 150 million hectares of degraded and deforested lands in biomes around the world will create approximately USD 84 billion per year in net benefits that could bring direct additional income opportunities for rural communities.
	Source:	http://www.bonnchallenge.org/
Name of initiative: Retail Palm Oil Transparency Coalition (RPOTC)		
Description: The Retail Palm Oil Transparency Coalition (RPOTC) is formed of companies working together to remove deforestation and exploitation from palm oil supply chains.		
Overview	Lead by:	Marks and Spencer
	Partners:	Tesco, Sainsbury's, Aldi, Boots, Co-operative Foods, etc.
	Demand / supply-side:	Demand-side
	Scope:	Global
	Objectives & targets:	▪ Achieve greater transparency of the progress European and US importers are making towards zero deforestation palm oil supply chains; ▪ Enable individual retailers and product suppliers/manufacturers to make more informed sourcing/purchasing decisions; and, ▪ Drive faster progress towards the supply of zero deforestation palm oil for European and US markets

		and helping the same globally through the take up of this or similar models.
	Key activities:	Development of a comprehensive survey that will be used to annually assess the individual performance of the First European and US Palm Oil / Kernel Importers covering a range of environmental and social issues.
	Likely impact:	Unknown.
	Source:	3Keel project database.
Name of initiative: Retail Palm Oil Group (RPOG)		
Description: The Retail Palm Oil Group is a non-competitive coalition of Retail Companies with a common aim of promoting the adoption of sustainable palm oil.		
Overview	Lead by:	Secretariat provided by member of the RSPO governing board in the UK
	Partners:	The group's participants are: Aldi-SOUTH Group; Asda (part of Wal-Mart); Boots UK; Coles (Australia); COOP (Switzerland); Delhaize Group; Federation of Migros Cooperatives; J Sainsbury; Marks & Spencer; Royal Ahold; Tesco; The Body Shop International; The Co-operative Food (UK); and Waitrose. The group's members are: Aldi-SOUTH Group; Asda (part of Wal-Mart); Boots UK; Coles (Australia); COOP (Switzerland); Delhaize Group; Federation of Migros Cooperatives; J Sainsbury; Marks & Spencer; Royal Ahold; Tesco; The Body Shop International; The Co-operative Food (UK); and Waitrose.
	Demand / supply-side:	Demand-side
	Scope:	Global
	Objectives & targets:	To improve transparency in palm oil sourcing for the retail sector; and promote the adoption of sustainable palm oil. All of the retailers in the Group have set their own goals and targets in relation to sustainable palm oil.
	Key activities:	Developing common criteria and assessing importers (processors and refiners), to provide information to all retailers.
	Likely impact:	Provides an important shared information source on the sustainability performance of palm oil importers, helping to inform global retailer sourcing policies and buying decisions.
	Source:	https://www.rspo.org/organisation/info/belinda-howell and https://corporate.marksandspencer.com/plan-a/our-approach/food-and-household/product-standards/raw-materials-commodities-and-ingredients/palm-oil
Name of initiative: Unilever Sustainable Palm Oil Sourcing Policy		
Description: As the worlds single largest end user of palm oil in the consumer goods industry, Unilever's Sustainable Palm Oil Sourcing		

Policy aims to drive transformational change in the palm oil supply chain.		
Overview	Lead by:	Unilever
	Partners:	Policy covers supply chain, as well as collaborating with key suppliers, governments, and NGOs
	Demand / supply-side:	Demand- and Supply-side
	Scope:	Global
	Objectives & targets:	To reach 100% traceable and physically certified palm oil in the company's supply chain by 2019, as well as to transform the broader palm oil market. Specifically, the Policy commits to: • No deforestation, including no conversion of HCV or HCS forests • No development on peat • No exploitation of people or communities, including FPIC for indigenous and local communities • Driving positive social and economic impact for smallholders and women • Transparency within the supply chain
	Key activities:	Ensuring that suppliers and third parties meet the policies above through adherence to the RSPO Principles & Criteria and New Planting Procedure, in addition to requirements on HCS and peat. High-risk sources are required to provide independent third-party verification. These requirements are accompanied by strategic investments in the supply-chain.
	Likely impact:	Possibility for raised standards across the industry
	Source:	https://www.unilever.com/Images/unilever-palm-oil-policy-2016_tcm244-479933_en.pdf
Name of initiative: Golden Agri-Resources Social and Environmental Policy (GSEP)		
Description: As the world's second largest palm oil plantation company, Golden Agri-Resources' SEP aims to achieve sustainable palm oil production throughout the company's supply chain, as well as to promote this policy across the palm oil industry.		
Overview	Lead by:	Golden Agri-Resources (GAR)
	Partners:	Policy covers supply chain, as well as engaging with community stakeholders, Government of Indonesia, civil society organisations and industry stakeholders
	Demand / supply-side:	Demand- and Supply-side
	Scope:	Indonesia
	Objectives & targets:	To attain palm oil operations that are deforestation-free, traceable, and bring benefits to the people and communities where GAR operates. The Policy commits to: • Environmental management, including no development of HCS or HCV forests or peatlands • Social and community engagement, including FPIC for indigenous and local communities

		• Work environment and industrial relations commitments • Marketplace and supply chain commitments, including traceable and transparent supply chain
	Key activities:	Ensuring that the above requirements are met across the company's vertically integrated supply chain, as well as third-party suppliers. This is accompanied by investments into yield improvements, continued development of the HCS Approach methodology, and collaboration with stakeholders.
	Likely impact:	Elimination of deforestation from the GAR supply chain
	Source:	http://goldenagri.com.sg/wp-content/uploads/2016/09/GAR_Social_and_Environmental_Policy-2.pdf
Name of initiative: Tropical Forest Alliance 2020 African Palm Oil Initiative (APOI)		
Description: The was the first regional partner initiative of the TFA 2020: 10 West and Central African countries engaged in the African Palm Oil Initiative of the TFA 2020, signing the *Marrakesh Declaration for Sustainable Development of the Oil Palm Sector in Africa* at COP22 in November 2016, pledging to develop a new regional market for sustainable oil palm sector across the region. This process would be guided by the Declaration's underlying principles in favour of sustainability, good governance, transparency, recognition of community and human rights, partnerships, and the equitable sharing of benefits. Together, the seven countries represent over 250 million hectares of tropical forests, or 13% of the world's total (TFA 2020, 2016)[47].		
Overview	Lead by:	Tropical Forest Alliance 2020
	Partners:	National Governments of Cameroon, Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Gabon, Ghana, Liberia, Nigeria, Republic of Congo, and Sierra Leone, as well as companies, civil society, and indigenous and local peoples groups
	Demand / supply-side:	Demand- and Supply-side
	Scope:	Regional
	Objectives & targets:	Specifically, deforestation-free palm oil development. More broadly, transforming the regional palm oil sector into a sustainable driver of low-carbon, socially beneficial development while protecting biodiversity-rich tropical forests.
	Key activities:	Development of national action plans to guide the expansion of palm oil cultivation in Côte d'Ivoire, Ghana, and Liberia, as well as the Marrakesh Declaration, a regional pledge by seven African governments to shift towards sustainable palm oil production.
	Likely impact:	Reduced deforestation, as well as improved smallholder incomes, and improved governance practice
	Source:	https://www.tfa2020.org/en/reports/annual-report-2017/#landscape-fund-for-tropical-landscapes-and-forests

[47] TFA 2020 Release – 16 November 2016: *Partners and Non-Partners of the Tropical Forest Alliance 2020 Announce Support for the Marrakesh Declaration for Sustainable Development of the Oil Palm Sector in Africa* (accessed 30 June 2017).

Name of initiative: Tropical Forest Alliance 2020 Latin America Initiative (LAI)		
Description: The majority of TFA 2020's work in Latin America to date has been focused on facilitating relationships between Brazilian producers and international companies and on boosting the efforts of existing national and subnational actors.		
Overview	Lead by:	Tropical Forest Alliance 2020
	Partners:	Brazilian and Colombian palm oil producers, the Brazilian Coalition on Climate, Forests and Agriculture, the governments of Brazil and Colombia.
	Demand / supply-side:	Demand- and Supply-side
	Scope:	Regional
	Objectives & targets:	Specifically, deforestation-free palm oil development. More broadly, transforming the regional palm oil sector into a sustainable driver of low-carbon, socially beneficial development while protecting biodiversity-rich tropical forests.
	Key activities:	• The Latin American Initiative have collaborated with WWF and Proforest to publish a report outlining the opportunities brought about by supporting legal compliance and zero deforestation in Brazil, including a mapping of 73 local tools and initiatives to facilitate better partnerships and connections[48]. • The TFA 2020 Brazil working group and the Brazilian Coalition on Climate, Forests and Agriculture have formed a joint team to work together to help companies comply with Brazil's Forest Code and identify how best practices can be better shared and implemented across the country. • TFA 2020 partners in Colombia are working to develop a platform for public private cooperation, aimed at meeting Colombia's deforestation goals.
	Likely impact:	Reduced deforestation, as well as improved smallholder incomes, and improved governance practice
	Source:	https://www.tfa2020.org/en/reports/annual-report-2017/#landscape-fund-for-tropical-landscapes-and-forests
Name of initiative: Tropical Forest Alliance 2020 Southeast Asia Initiative		
Description: The SEAI supports Southeast Asian partners, businesses, NGOs, and governments to eliminate deforestation from key commodities' supply chains. The focus of this initiative to date has been to develop regional adaptations of TFA 2020's *Better Growth with Forests* and *Financial Sector Engagement Initiatives*. A working group on Supporting Smallholder Farmers is also on-going.		
Overview	Lead by:	Tropical Forest Alliance 2020
	Partners:	Indonesia Palm Oil Pledge, Government of Indonesia, Peatland Restoration Agency, subnational governments in Indonesia and Malaysia,

[48] TFA 2020, WWF and Proforest - *Legal compliance and elimination of deforestation from commodity production in Brazil: useful tools and initiatives for value chain companies* (2016).

	Demand / supply-side:	Demand- and Supply-side
	Scope:	Indonesia and Malaysia
	Objectives & targets:	Eliminate deforestation from key commodities' supply chains by 2020
	Key activities:	• Creation of a Smallholder Farmer Task Force to exchange best practices on smallholder inclusion in sustainable supply chains and to show positive relationship between the development of sustainable land use models and the economic and social impact on rural populations • Promotion of leadership for sustainable land management • Promotion of investments in sustainable commodity production
	Likely impact:	Strengthened government efforts to transform the palm oil sector
	Source:	https://www.tfa2020.org/en/reports/annual-report-2017/#landscape-fund-for-tropical-landscapes-and-forests
Name of initiative: Ferrero Palm Oil Charter		
Description: The company's Palm Oil Charter aims to exceed RSPO standards in addressing deforestation and socio-economic sustainability concerns		
Overview	Lead by:	Ferrero
	Partners:	The Forest Trust (TFT)
	Demand / supply-side:	Demand-side
	Scope:	Global
	Objectives & targets:	To maintain and exceed RSPO standards in the company's supply chain, including: • Ensuring suppliers provide fully traceable palm oil, while including smallholders • No development in HCS or HCV forests, or on peat land • Not using fire to clear land • Respecting human rights, including FPIC for indigenous and local communities • Actively fighting corruption
	Key activities:	Agreements with suppliers, as well as independent third-party verification from NGO partners, including TFT, to assess suppliers, monitor progress, and publically report company performance
	Likely impact:	Improved standards in the palm oil sector
	Source:	http://www.tft-earth.org/wp-content/uploads/2015/01/Ferrero-Palm-Oil-Charter.pdf

Name of initiative: Forum for Sustainable Palm Oil (FONAP)		
Description: The aim of the Forum for Sustainable Palm Oil (FONAP) is to significantly boost the proportion of certified palm oil, palm kernel oil and their derivatives and fractions on the German, Austrian and Swiss markets. Together the member companies are working towards the goal of ensuring as soon as possible all the palm oil and palm kernel oil available on these markets is certified.		
Overview	*Lead by:*	FONAP Secretariat (hosted by GIZ), which assists a Steering Committee of elected member organisations to make decisions and provides advise on issues relating to sustainable palm oil.
	Partners:	46 members, including small, medium-sized and multinational companies from the food, chemicals, detergents and cleaning products sectors and the cosmetics industry, as well as NGOs, consultancy companies, associations and the German Federal Ministry of Food and Agriculture (BMEL).
	Demand / supply-side:	Demand-side focus targeting the main palm oil consuming sectors and industries in its constituent countries.
	Scope:	International – Germany, Switzerland and Austria. All palm oil consumed in these markets.
	Objectives & targets:	The FONAP has three pillars: 1. A switch to certified sustainable palm oil, palm kernel oil and fractions and derivatives 2. Discussions with suppliers on traceability and other add-on criteria (e.g. POIG or RSPO Next) 3. Detailed reporting on the achievement of objectives
	Key activities:	Five working groups on the following topics: communications, derivative-related issues, improving certification schemes, monitoring and reviewing progress against the FONAP Commitment and on proposals for concrete projects in producer countries.
	Likely impact:	According to the FONAP Secretariat all members already use 100% certified sustainable palm oil; and members are required to report their progress against the FONAP Commitment and that of their suppliers through an annual membership survey. Progress information is available for around 95% of FONAP members (see third link below).
	Source:	https://www.forumpalmoel.org/the-fonap and https://www.forumpalmoel.org/imglib/downloads/FONAP-Selbstverpflichtung-Mitglieder.pdf and https://www.forumpalmoel.org/imglib/news/Fortschrittsbericht%202016.pdf

Appendix 14: EC Sustainable Palm Oil Study: Summary notes from expert validation workshop

Date: 2 October 2017

Time: 09.00 – 17.30 CET

Venue: Conference Centre Albert Borschette, Brussels

Workshop objectives:

- To share and validate the main findings, messages and conclusions from the draft study with invited experts.
- To draw on the knowledge, skills and expertise of workshop participants in order to improve the deliverables from the study prior to finalization.

Purpose of these notes

This summary provides an overview of the key discussion points and comments from the expert workshop and is not intended to provide a complete verbatim note of the discussions that took place during the course of the workshop. They follow the agenda for the day and do not attribute comments to individual participants or the organisations that they represent.

Introductory plenary session:

The expert workshop was opened by Emmanuelle Maire (Head of Unit, ENV.F3 – Multilateral Environmental Cooperation at DG Environment, European Commission), who welcomed participants to the workshop and explained the importance of the palm oil study in the context of a number of European initiatives and policies.

Hélène Perier (Forest and Wildlife Policy Officer, Unit ENV.F3) then went on to describe the purpose and objectives of the palm oil study, including the multifaceted policy context for the study from issues and policy around deforestation, renewable energy and biofuels to food, trade, employment, development cooperation and research. This included consideration of the European Parliament's 4 April 2017 initiative on palm oil and deforestation of rainforests and the associated non-legally binding resolution and the Commission's recent (7 September 2017) response to this, as well as highlighting growing NGO and public concerns around the impact of palm oil production and consumption; international initiatives, like the Amsterdam Declaration; and the growing number of sustainable palm oil initiatives in the private sector.

The three main objectives of the palm oil study were to:

1) Broaden the knowledge base on the environmental, social and economic aspects of oil palm production and palm oil consumption, trade flows in palm oil, and actions undertaken by economic operators, EU governments and third countries (in particular India and China) focusing on palm oil.
2) Analyse existing sustainability standards (including RSPO, ISPO and MSPO), evaluate their completeness (especially concerning biodiversity and carbon aspects) and appraise the gaps between such standards and the environmental aspects to be considered in order to achieve relevant EU and international objectives.
3) Summarise and evaluate existing initiatives at the EU level and in EU Member States, as well as in India and China, concerning the sustainable production of palm oil.

It was noted that as the palm oil study was analytical in nature and does not discuss or recommend potential future policy developments in relation to palm oil discussion of

policy was out of scope of the workshop discussions. However, the recent Commission response to the European Parliament report and resolution provides a clear overview of the Commission's position on various policy areas.

Mark Barthel (3Keel) went on to provide an overview of research undertaken to date in the study and the activities required to complete the study.

Environmental and social impact analysis

Dr Steve Jennings (3Keel), provided an overview of the environmental and social impact analysis undertaken during the study with reference to the following themes:

- **Environmental themes**: deforestation, peatland conversion, biodiversity loss, greenhouse gas emissions, use of fire in land clearance, air and water pollution.
- **Social themes**: land rights, forced and child labour, terms and conditions of labour and smallholders.

During the Q&A session following this presentation the main discussion points included:

- Emphasising that the complexity of social and economic development benefits of oil palm cultivation and palm oil production in producer countries are highlighted in the study report (e.g. who gains better household incomes, and who doesn't, etc.).
- Reiteration of the differences between producer countries in South East Asia and in Latin America, where levels of deforestation, the use of fire to clear land and the use of forced labour are considered to be significantly lower.
- The need to compare the environmental and social impacts/benefits of palm oil with other vegetable oils (it was noted that this was out of scope for the palm oil study but was included in the scope of the European Commission's feasibility study into the development of a Global Deforestation Action Plan).
- The availability of existing and new studies and data on different modes and systems of palm oil production (e.g. smallholder cooperatives); abuses of land and labour rights (e.g. HCS social impacts study, RSPO complaints panel, Human Rights Commission); and the consequences of underlying legal frameworks for palm oil workers and their families (e.g. there are estimated to be 60,000 stateless children in Sabah as migrant workers cannot bring in their spouses).
- The potential to highlight best practice at the company-level in the palm oil sector and particularly with regard to smallholder engagement (noting that this is covered to some degree in the sections of the report covering voluntary initiatives in producer and consumer countries).

Analysis of palm oil sustainability certification systems and their coverage of environmental and social aspects required to meet EU and international policy objectives

Dr Steve Jennings (3Keel) then provided an overview of the four main sustainable palm oil standards and certification schemes assessed during the study (RSPO, MSPO, ISPO and ISCC) and the environmental and social aspects to be considered in order to achieve relevant EU and international objectives. For each of the schemes he described their key attributes and provided examples of where different standards and systems had different requirements (e.g. around transparency of reporting audit findings, independence of accreditation bodies); and different ways of addressing the environmental and social themes covered by the study (e.g. deforestation and land use rights).

This presentation was followed by another provided by Yu Leng Khor (LMC), covering the use of national interpretations in RSPO and jurisdictional approaches in sustainable palm oil certification schemes; and the legislative and enforcement regimes in the studies six case study countries (Indonesia, Malaysia, Colombia, Brazil, Gabon and Liberia).

During the Q&A session following these presentations the main discussion points included:

- The imminent publication of an IDDRI report on the benchmarking of sustainability standards and schemes (now shared with the project team).
- Reiteration that the RSPO principles and criteria are currently in he process of review, which seeks to address some of the issues raised in the study (information now shared with the project team).
- The sensitivities involved in comparing a legally based standard, like ISPO, to a sustainability standard, like RSPO – when the former may be considered more important by a producer country.
- Reiteration of the significant work that is going into strengthen the ISPO system, which may be finalised before the end of 2017, and which will take into account the findings from this study. The new ISPO Standard will include two additional criteria: traceability and human rights; as well as independent verification (information on the strengthening of the ISPO Standards has now been shared with the project team).
- The existence of a version of the RSPO Standard compliant with the requirements of the EU Renewable Energy Directive was noted, which has stricter criteria on HCV, HCS and peatland conversion.
- Similarly, the existence of an ISCC+ Standard that takes the same sustainability criteria as the ISCC EU Standard but is being used in the food (not biofuels) market was noted.
- Efforts to improve the complementarity of standards: e.g. RSPO working with ISPO and MSPO to harmonise the schemes.
- The ISCC Standard is seeking to improve its own transparency, with the prospect of audit reports being made publicly available.
- The need for robust legal and enforcement regimes in producer countries as the basis for stronger performance in all certification schemes.
- The need to address significant legal challenges in some producer countries – e.g. palm oil concessions being issued in violation of legislation; concerns over corruption.
- How to ensure the integrity of all certification systems when they are competing for market share.
- What can be done to improve the interaction between - and complementarity of – private and mandatory certification schemes?
- The opportunity to use jurisdictional approaches to make certification more accessible and affordable for smallholders and to address 'leakage' (e.g. deforestation that happens outside of plantation areas); and to drive demand for certification from China and India.
- The difficulties and costs inherent in assessing the on-the-ground impact and performance of the different certification schemes; and the woeful lack of peer reviewed academic studies as a result.

Market context, economics and economic sustainability: palm oils role in the vegetable oil sector

Dr James Fry (LMC) then provided a presentation illustrating the market context, economics and economic sustainability for palm oil (including for smallholders) and its current and future role in the vegetable oil market.

This presentation was followed by a presentation from Yu Leng Khor (LMC) on the impact of changes in commodity prices on deforestation and peatland drainage.

During the Q&A session following these presentations the main discussion points included:

- The high environmental impact of peatland conversion for oil palm cultivation and whether there is any publicly available evidence on the positive impact of the Peatland Moratorium in Indonesia.
- The fact that increasing incomes and the dietary aspirations of a growing global middle class will lead to increases in dairy, meat and poultry consumption, in turn requiring more soymeal, makes it likely that soybean production and consumption will increase in the future.
- The importance of the relatively high yields from the oil palm when compared to other vegetable oil crops, particularly in the context of growing global demand for vegetable oils, but that the comparison needs to take into account that other crops (e.g., soy) produce protein as well as oil.
- The potential for new oil palm plantings to increase palm oil yields – and, if done using existing best practice, and/or combined with intercropping with food crops can reduce demand for new land and reduce deforestation.
- Is it possible to isolate the conditions under which palm oil brings positive social development? What lessons can others learn from the success of the FELDA scheme?
- Will changes in legislation in Indonesia and Malaysia, enhancements to existing certification schemes (e.g. ISPO strengthening, RSPO Next), and a slowing down of new oil palm planting mean a reduction in deforestation and other environmental impacts in the sector in the future?
- Price and new seedlings - new seedlings are undifferentiated between replacing plantations and for new plantations. Is the any data to show the proportion of new seedlings used in new plantations versus new seedlings used to replant existing plantations, as the latter would increase production without increasing land pressure?

Public, private, NGO and other voluntary palm oil initiatives

Yu Leng Khor (LMC) provided an overview of the range of palm oil initiatives in the EU, EU Member States, India and China. This included a review of the demand for certified palm products of different types (e.g. mass balance, segregated and identity preserved and traceable) within the EU, China and India, illustrating the leading role that the EU is playing with respect to CSPO.

Mark Barthel (3Keel) then went on to describe the range of palm oil-related voluntary commitments and commitments globally, with reference to different types of initiative (group initiatives with shared / collective commitments, individual organisation commitments, sustainable trade and financial initiatives and technology or data driven initiatives). This included the on-going challenges facing those involved in voluntary commitments, the progress being made towards the achievement of commitments and the role of different actors in maximising the benefits arising from voluntary initiatives.

During the Q&A session following these presentations the main discussion points included:

- The focus of many studies on initiatives to drive the uptake of sustainable palm oil and its derivatives using RSPO certification. Can future studies look at the impact of other palm oil certification schemes?
- The importance of increasing demand for CSPO in China and India to prevent further 'leakage' and to bolster demand in what is currently a global oversupply situation.
- The potential for new seed varieties to increase yields up to 8 tonnes per hectare by 2026.
- If mechanisation is introduced in oil palm cultivation and harvesting to bring down the costs of labour, which is increasing by 8-10% every year in some producing countries, how will this affect rural communities and social development? There is a need to do some research on this issue.

- Some commitments and national Initiatives in Malaysia have not been considered in the report - e.g. initiatives to maintain at least 50% of forest cover since Rio summit (currently have more than 55% of forest cover in country), since 2009 no net loss of forest cover, national policy of biological diversity including sustainable forest development which addresses issues relating to sustainable development and peat development.
- The need to include more evidence of the various EU Member State national palm oil initiatives and the level of cooperation within and between them in the report (information on these national initiatives was provided after the workshop).
- The existence of other voluntary initiatives, some of which are supported by palm oil certification schemes (e.g. RSPO's group certification scheme and support fund for smallholders).
- The recent growth in RSPO members in China (35% growth).
- The role of retailers in driving demand for CSPO, particularly through group initiatives, such as the Consumer Goods Forum's Zero Net Deforestation Commitment by 2020.

Final Q&A session

The workshop concluded with a final Q&A session at the end of the day, providing workshop participants with the opportunity to ask questions about the study and make recommendations on how to improve the final report. Key discussion points from this session included:

- The need for clearer standards and definitions to avoid confusion over forests in land use classifications and physical classifications.
- The importance of applying the high carbon stocks approach to protect forests and peatland, particular where a zero net deforestation commitment (rather than a no deforestation commitment) was in place or being considered.
- The need to combine commitments and policies on CSPO with other on-the-ground approaches to drive real change (e.g. smallholder support, use of geo-spatial/remote sensing to monitor legal compliance and the progress being made against 'beyond legislation' voluntary commitments).
- The potential to use this study to improve sustainable palm oil certification systems; and to test whether existing principles and criteria may work against each other or not be stringent enough.
- The role of the palm oil study in highlighting areas where the science is poor or underrepresented and requires further research.

Closing remarks

Hélène Perier (DG Environment) summarised the day, thanking workshop participants in Brussels, Jakarta and Kuala Lumpur for their positive contributions and their perseverance given the time zone differences. She advised all workshop participants that the deadline for written comments on the report was Friday, 13 October 2017 and asked them to forward their comments to her and to the consultants at 3Keel.

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