



Palm Oil in Australia

Facts,
Issues and
Challenges

a report by

netbalance[✦]
foundation

Foreword

MARCH 2013

Palm oil is a versatile oil used widely as an ingredient of food and grocery products, such as baked goods, confectionary, shampoos and crèmes. Global consumption of palm oil has increased tenfold since 1980 and now stands at around 50 million tonnes per year, with some forecasts of 50 per cent further growth by 2050. Growing global demand for palm oil has driven the development of vast plantations, with both positive and negative impacts on key growing countries in South East Asia, as well as in emerging areas of production, such as West Africa and Latin America.

Palm oil is a very efficient crop, producing up to ten times more output per hectare than alternative vegetable oils. The recent boom in palm oil exports has undoubtedly resulted in economic growth and job creation in many relatively poor regions. However, the expansion of palm oil plantations is also a major driver of deforestation, destroying the habitats of critically endangered wildlife species, releasing vast amounts of carbon dioxide into the atmosphere and, in some cases, displacing local forest-dwelling communities.

WWF-Australia and the Australian Food and Grocery Council (AFGC) acknowledge that palm oil has both positive benefits and negative impacts. The two organisations have agreed to work together to promote increased use of more sustainable palm oil that conserves forests and secures livelihoods. As part of our collaboration, this report was commissioned from the Net Balance Foundation to provide a broad, independent overview of the facts, issues and challenges surrounding palm oil, and to provide a springboard for efforts to increase the supply of sustainable palm oil into the Australian market.

Ensuring that markets for palm oil contribute to economic development while also conserving precious ecosystems requires a major shift away from business as usual. Companies must work to ensure that unsustainable practices are phased out; governments must support strong corporate commitments with appropriate economic incentives and land use planning policies; scientists must inform better decision making with rigor, objective research; and NGOs must cut through the rhetoric and advocate more evidence-based, constructive and collaborative solutions.

Today, many of Australia's major importers, manufacturers and retailers of products containing palm oil have made strong commitments to sourcing only sustainable palm oil. These commitments are an encouraging first step but there is much work to be done to ensure they are met. This will require a better understanding of complex supply chains, aligning supply-side and demand-side expectations, and overcoming significant logistical challenges, among other things. To help advance this agenda for change, WWF-Australia and the AFGC have reaffirmed their support for the Roundtable on Sustainable Palm Oil (RSPO) and are looking at how further cooperation can help to increase the supply of Certified Sustainable Palm Oil (CSPO) onto the Australian market.



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Executive summary



01.

Executive summary

A growing global population and changing diets, combined with the production efficiency of the oil palm and the unique properties and versatility of palm oil for both edible and non-edible uses, means that palm oil cultivation, processing and use will continue – and likely grow – in the decades ahead. Ensuring positive economic and social impacts are realised and environmental impacts are minimised is vital to achieve a palm oil industry that is sustainable for all.

The Roundtable on Sustainable Palm Oil (RSPO) is proving an effective mechanism to engage major stakeholders across the value chain in the pursuit of more sustainable production of palm oil. While it has already achieved certification of more than 10 per cent of current palm oil production, complimentary actions from governments, major buyers, and large processors are also necessary – the agenda for sustainable palm oil cannot be left to the RSPO alone.

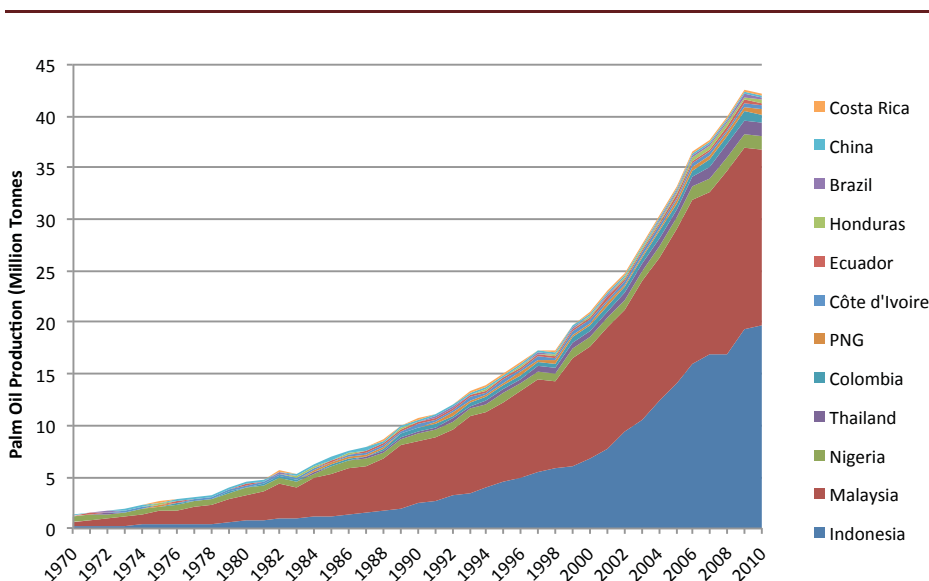
Palm oil's continued use in Australian grocery products and food service, while showing some evidence of declining, remains a contentious issue for Australian consumers and environmental advocacy groups, primarily due to the negative environmental impacts of palm oil cultivation. Many major Australian businesses have already made commitments to convert to using sustainable palm oil, yet significant work remains to fulfil these commitments. There are also opportunities for the Australian industry to be involved in projects in Indonesia, Malaysia and other palm oil producing countries in the region, given our geographic proximity.

This report provides a comprehensive snapshot and analysis of the palm oil sector that will be of use to industry, government and NGO decision makers. An understanding of the nature of the industry and the drivers for palm oil production and consumption will inform more effective solutions and the development of a more sustainable palm oil sector, with benefits for all along the value chain.

Facts and figures

Figure 1 highlights the upstream end of the palm oil industry. Together, Malaysia and Indonesia produce over three quarters of the palm oil consumed globally. Although the oil palm is native to Western and Central Africa, production is concentrated in Malaysia and Indonesia given their climate (palm oil will only grow in the humid tropics) and their political stability, which has encouraged a large amount of investment. Smallholders play an important part in production, accounting for up to 41 per cent of oil palm planted in Malaysia.¹ Growth in palm oil production has increased tenfold since 1980, and now stands at around 50 million tonnes per year and projections see 50 per cent further growth by 2050.² The area occupied by palm oil cultivation has expanded globally by 43 per cent since the 1990s.³

The major consumers of palm oil include China, the EU-27, Malaysia and Indonesia. According to Figure 2, the latter two countries' per capita consumption are the highest in the world. Australia currently imports around 110,000 tonnes of palm oil (approximately 0.2 per cent of global consumption), almost all of which comes from Indonesia and Malaysia.⁴ Worldwide, palm oil in food products comprise 80 per cent of current final end while palm oil as feedstock for biofuels accounts for 2 per cent of final end use.⁵



Top 12 palm oil producing countries, 1970 – 2010⁶

FIG.01

1. Rahman et al, 2008
2. USDA, 2013
3. UNEP-GEAS, 2011

4. WWF, n.d.
5. DEFRA, 2011
6. FAO, 2010

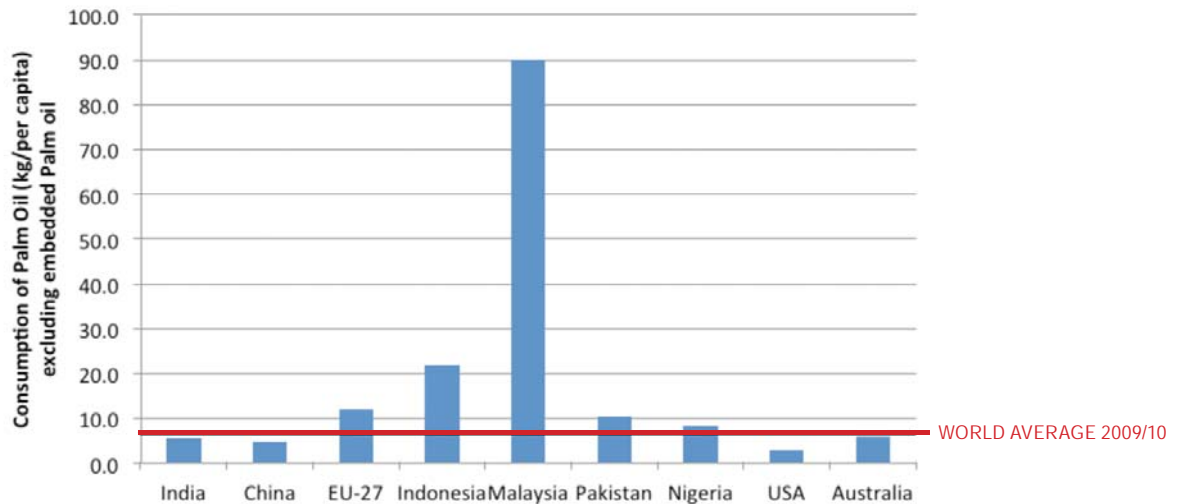


FIG.02

Per-capita consumption of palm oil (excluding embedded palm oil) in elected countries compared to world average in 2009-2010⁷

Current and future drivers

Increased demand for vegetable oils from developing and developed countries has contributed to the large increase in palm oil production.⁸ Palm oil has clear advantages, including a competitive price, product flexibility, limited processing requirements and a greater yield per hectare compared to other vegetable oils. As such, in 2009 palm oil held 34 per cent of the global market, while the market share for soybean oil, rapeseed oil and sunflower oil were 27 per cent, 16 per cent and 10 per cent respectively.⁹ As with all vegetable oils, palm oil does not contain trans-fats. A shift away from trans-fats has been one of the main drivers cited for the increased consumption of palm oil in developed countries.

There exists a variety of challenges for the palm oil industry. Limited land availability, fertiliser costs, sustainability concerns, weather variability (short term and longer term due to climate change) and land availability all threaten to dampen growth. Additionally, while the move away from trans-fats drove demand

initially, the high level of saturated fats in palm oil is encouraging a shift towards healthier oils.

On global commodity markets, palm oil is increasingly being supported by energy prices as demand for biofuels rises. Biofuels have linked vegetable oil to the energy market, as they are used for feedstock for biofuels. However energy prices are not the only influence and other factors will have a greater impact on prices, including short term effects (ie. the weather).

The market drivers in Australia are similar to those evident globally. Most of those in the industry needing to move away from trans-fats have already done so. With the need to reduce saturated fats and public concern over unsustainable palm use, some companies have been shifting their oil purchases away from palm oil. Lower prices and product versatility will ensure that palm oil remains in use, however, but there is not likely to be any significant growth in palm oil use in Australia in the decade ahead. Data on Australian imports of palm oil in recent years would support such a hypothesis.

7. Based on data from Development Prospects Group, World Bank, 2009

8. WWF, 2011

9. Teoh, 2010

The impacts of palm oil

As a rapidly growing agricultural commodity produced in the tropics, palm oil has a mix of positive and negative impacts across environmental, socio-economic and nutritional domains.

The most significant environmental impact associated with palm oil is deforestation in producer countries, particularly in Malaysia and Indonesia. Although other drivers of deforestation such as rural development, agriculture and industrialisation have played an historic and important role, in recent times palm oil is the main driver for forest losses in these countries (refer to Figure 3). Estimates suggest that between 2005 and 2010, approximately 30 per cent of oil palm expansion in Malaysia and Indonesia occurred at the expense of natural forests, and over the same period, approximately 30 per cent of forest loss was due to conversion to oil palm plantations.¹⁰ Deforestation has a variety of impacts, including forest fires, greenhouse gas emissions and biodiversity loss. Destruction and loss of orang-utan habitat as a consequence of expanding cultivation has become the public face of the negative impacts of palm oil.

The plight of the orang-utan has led to public engagement on the production and use of palm oil. However, the issues are far more complex, especially when consideration of the socio-economic benefits is added to the picture. Palm oil provides opportunities to support economic and social development in some of the poorest areas of the world and many have argued for the positive role palm oil plays in the macro-economic development of Malaysia and Indonesia. Positive impacts at the micro-economic level are less clear as issues with employment conditions, land and social conflicts (at least in the short to medium term)

undermined potential benefits to palm oil farmers, workers and communities.

From a nutritional and consumer health viewpoint, palm oil, with its lack of trans-fats, is considered to be a good alternative to animal and partially hydrogenated fats. However, with its high concentration of saturated fat, palm oil can lead to increased health risks when compared with other liquid vegetable oils such as canola, soy and olive.

While recognising that there are environmental, social and health impacts relating to palm oil use; in the context of a growing population and rising incomes, the use of palm oil—with its higher yield per hectre compared to any other vegetable oil—cannot be dismissed.

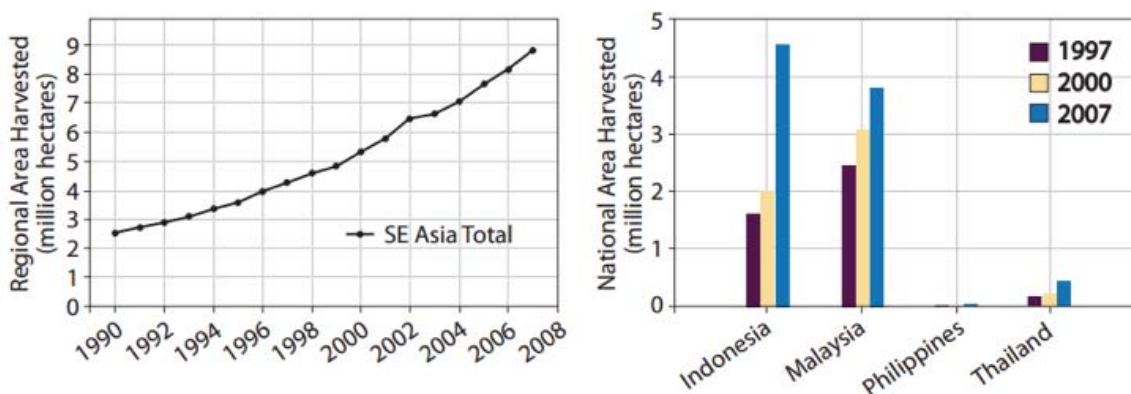
Towards sustainable palm oil

Palm oil cultivation, processing and use will continue and is likely to grow in the decades ahead. The challenge now and in the coming years is to meet demand in a sustainable manner by minimising negative environmental impacts and maximising socio-economic development opportunities. One major vehicle for pursuing sustainable palm oil has been the creation of a sustainability standard and certification system, similar to that used in other agricultural commodities. The standard setting and certification body for this system is the Roundtable on Sustainable Palm oil (RSPO).

The RSPO is a not-for-profit association that brings together stakeholders from five industry sectors, plus social and environmental NGOs. RSPO certified palm oil represents about 10 per cent of total global

The rapid growth in area harvested for palm oil, 1990-2008¹²

FIG.03



Note: Palm trees take several years to grow to harvestable size, so the data lags three or four years behind the data for area planted and even further behind those for area cleared for plantations.

10. WWF, n.d.

11. RSPO, 2011

12. UCSUSA, 2011

production of palm oil¹¹, with just over 50 per cent now traded and bought as certified palm oil. Despite its growth, the RSPO has in recent years come under scrutiny. Concerns and challenges have been raised by different stakeholders, including a pro-industry bias, weak criteria, poor monitoring and enforcement, limited demand for sustainable palm oil, and a lack of transparency in the supply chain. Nevertheless, while it is not the only mechanism for bringing together palm oil stakeholders, the RSPO certification has gained credibility and is seen as a benchmark for sustainable palm oil across the globe.

In addition to certification schemes, regulatory, economic, technological and consumer awareness raising measures are also necessary for sustainability. This may include introducing land use planning policies to incentivise oil palm plantations on already degraded land.

Australian palm oil using companies have been making efforts towards use of sustainable palm oil and most major supply chain actors have made sourcing commitments and set targets for conversion. There are, however, supply chain challenges that need to be overcome. A model for possibly overcoming these challenges is found in the Netherlands, where industry formed the Dutch Task Force for Sustainable Palm Oil. Together, the major palm oil users in the country are working to achieve 100 per cent of palm oil destined for the Dutch market to be RSPO certified.

Conclusions and recommendations

Realising a sustainable palm oil industry will be a challenge. The RSPO platform, standard and certification scheme is currently the most viable initiative for achieving sustainable palm oil sourcing and use. It has gained acceptance amongst a variety of different stakeholder groups, has done the hard work to certify producers and covers more than 10 per cent of global production.

Given the small Australian market for palm oil, it is unlikely that a 100 per cent shift to sustainably sourced palm oil in Australia will in itself have a marked effect on the overall level of sustainability in this global industry. Achieving this would, however, help develop the market for sustainable palm oil, strengthen the RSPO, and help ensure sustainable development in our region, especially in Indonesia, Malaysia and Papua New Guinea.


The following recommendations are made to advance progress of the Australian industry towards sustainably sourcing palm oil:

1. Encourage companies who import or use palm oil to become members of the RSPO and develop time-bound action plans to move to sustainable palm oil supplies.
2. Conduct further research on palm oil flows into Australia, its sources, and how they are changing and projected to change.
3. Explore the possibility of sustainable palm oil projects in our region, including the potential of international carbon, forestry and other ecosystem services instruments to accelerate sustainable palm oil production.



Preface

*Rationale, purpose, methodology and
structure for the study*



Rationale for the study

The use of palm oil in the Australian supply chain is widespread to the point where it is almost ubiquitous. Estimates suggest that 50 per cent of all packaged food products in our shopping trolleys contain palm oil.¹³ Globally, some 50 million tonnes of palm oil are produced per annum, of which six million tonnes are certified by the RSPO.¹⁴ The issues surrounding the growth, supply, use, and consumption of palm oil are numerous and contentious. In addition the impact of palm oil production on ecosystems has become a major concern.

Like most sustainability issues, the challenges of production and use of palm oil and its by-products are highly complex. These issues along with other facts and figures related to the production, use, supply and future trends in the palm oil industry have been explored in this report. The purpose is not to state if the use of palm oil is right or wrong but to state the facts and provide an informed discussion.

Purpose

Palm Oil in Australia – Facts, Issues and Challenges is commissioned by the Australian Food and Grocery Council (AFGC) and WWF Australia. Its purpose is to support the Australian food and grocery industry in its quest to achieve a more sustainable future.

The report has been undertaken by an independent researcher, Net Balance Foundation.

The report does not intend to place one point of view ahead of any other but rather illustrate the facts and, where relevant, articulate the positions held by various groups.

Methodology

The research behind the report included a desktop study and interviews with key stakeholders. In order for the research to further the discussion rather than merely synthesise information already available, the following methodological principles were followed:

- » A variety of sources were employed and where there were major discrepancies these were highlighted.
- » A neutral position has been adopted, and where a contentious issue is raised, both sides of the argument have been presented.
- » Interviews have constituted an important focal point for the research, providing an insight into the issues from the key stakeholders.

Limitations

This report has been prepared by the Net Balance Foundation and reflects research conducted between September 2010 and May 2011, and further desktop updates to information and figures in December 2012. The report is based on the conditions encountered and information available at these times. The authors disclaim responsibility for any changes that may have occurred after this time.

Some of the views expressed in this report are those of the participating organisations only and do not represent the position of the authors on the topic of palm oil.

The report has utilised currently available quantitative data. Where quantitative data was not available, inputs have been completed using qualitative information.

The report is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the advice included in this report.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioner.

The Conclusions drawn are the authors' own and do not reflect the position of the AFGC or WWF.

Structure

This report is split into several key sections. At the beginning of each section, 'highlights' are presented summarising the key messages for that section. The purpose of each section is described below.

Palm oil: Facts and figures

This section provides an introduction to the physical properties of palm oil, its cultivation, and global and local production and consumption trends. This provides the reader with an understanding of the nature and general volumes of palm oil being discussed.

Drivers of palm oil use: The versatility of palm oil

Palm oil is used for a variety of applications due to several factors which are explored in this chapter. The purpose of this section is to highlight the drivers for current and predicted demand for palm oil globally.

Impacts of palm oil use

As with any commodity, there are positive and negative impacts along the supply chain as a result of its use. The impacts of palm oil use have recently gathered prominence in the public sphere. The purpose of this section is to articulate these impacts.

Towards sustainable palm oil

Several initiatives have been undertaken that aim to move the palm oil industry in a direction that is more sustainable. This section highlights these initiatives and some of the challenges they face.

Conclusions and recommendations

In this section some general conclusions about palm oil use are made based upon the preceding analysis. Additionally, a number of recommendations of relevance to companies, governments, researchers and non-government organisations are made to further progress the Australian industry's transition to greater use of sustainable palm oil.

The following organisations participated in this study:



* Graincorp acquired Goodman Fielders edible oils and fats business in October 2012.
<http://www.accc.gov.au/content/index.phtml/itemId/1086365/fromItemId/751046>

Palm oil: Facts and figures

Chapter highlights

- » Palm oil and palm kernel oil are edible oils derived from the fruits of the oil palm.
- » The oil palm will only grow successfully in the humid tropics. The largest volumes of production are available in Indonesia and Malaysia due to the right climatic conditions but also due to the political stability in these regions.
- » There are many different supply chains for palm oil depending on the final use and the level of vertical integration of particular organisations.
- » Smallholders represent a large proportion of the industry, with up to 41 per cent of oil palm planted in Malaysia being in the hands of smallholders, who are either independent or operate under a government or state scheme.
- » Palm oil production requires less land and energy than crop-based vegetable oils such as soybean and rapeseed. While palm kernel oil accounts for only 5 per cent of all land in vegetable oil production globally, it amounts to 38 per cent of all vegetable oils produced.
- » Worldwide palm oil production has increased tenfold since 1980, primarily due to the increased demand for palm oil in food products (80 per cent of current final end use) and to a lesser extent newer non-edible markets such as biofuels (2 per cent of current final end use). Production is expected to increase by 50 per cent by 2050.
- » Malaysia and Indonesia, apart from being the biggest producers, are also the biggest consumers of palm oil per capita.
- » Australia currently imports about 110,000 tonnes of crude palm oil per year (about 0.2% per cent of global production).

03.

Palm oil: Facts and figures

What is palm oil?

Palm oil and palm kernel oil are edible oils derived from the fruit of the oil palm (*Elaeis guineensis*). Native to West and Central Africa, it is a tropical palm which is cultivated throughout the humid tropics.

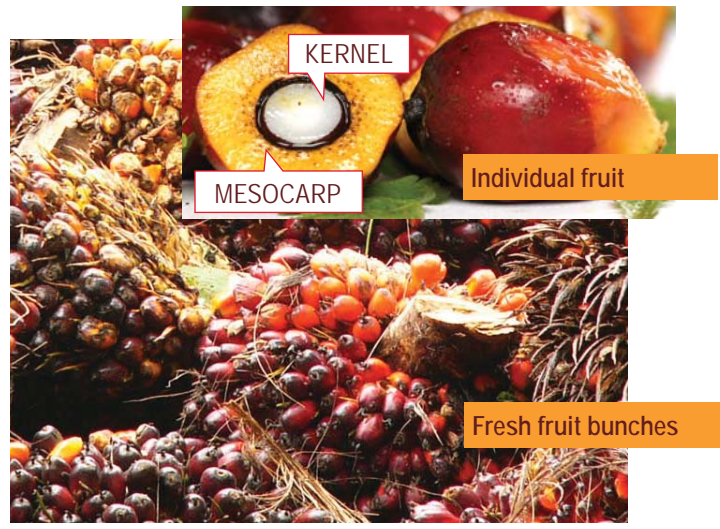
As highlighted in Figure 4, oil can be extracted from both the fruit (mesocarp) and the seed (kernel). Crude palm oil is extracted from the mesocarp and is mainly used in foods. Palm kernel oil is extracted from the kernel and is mainly used in non-edible applications such as detergents, cosmetics and plastics.¹⁵

Cultivation and processing

The oil palm will only grow successfully in the humid tropics. It needs deep, rich, flat and permeable soil, and grows well in year-long hot weather with lots of sun and rain. Seedlings are grown from germinated seeds for four to five months before being planted into a nursery where they will spend the next year. Once they have about 15 green leaves (at about 16-18 months old) they can be transferred to the palm grove. Oil palms will typically produce their first fruit three to four years after planting. Fruit needs to be milled within 48 hours of harvesting to produce high quality oil. For this reason oil palm mills are often built on the plantations. Yields increase with palm maturity, starting at about three tonnes per hectare in the third year and reaching up to 13 tonnes in the twentieth year.¹⁶

Figure 5 outlines the steps required to extract and process palm oil. At the mill the fruit bunches are threshed to separate the fruit. This is done either by hand or mechanically. The fruit is then pounded in a digester which breaks down the oil-bearing cells and releases the oil. The oil is then pressed or leached out of the mixture and separated from the impurities, cell debris and non-oily solids using hot water in a clarification process.

The residue from the press is sorted either by hand or mechanically to recover the kernels (which are often sent to a separate facility for processing to palm kernel oil) and fibrous residue which is used to fire the mills' boilers. Electricity is often generated using high pressure steam from the boilers to power the plant.¹⁷

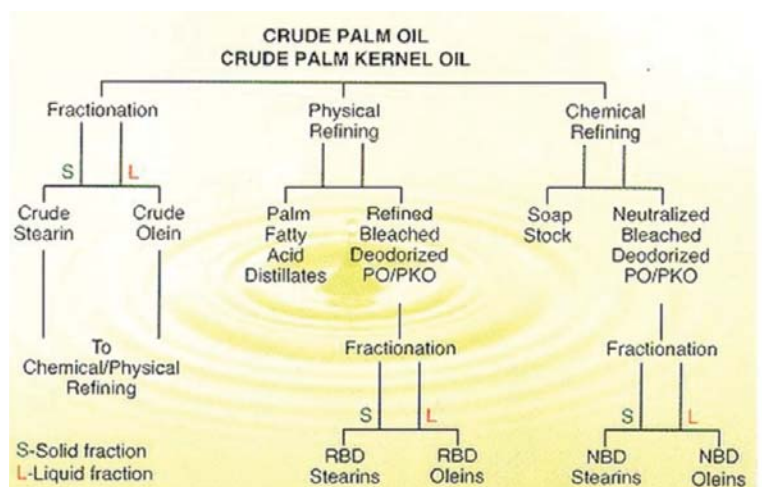


Palm oil fruit

FIG.04

About 70 to 75 per cent of the fruit bunch becomes waste (empty fruit bunches, palm fibre and palm kernel shell) as part of the milling process. In Malaysia and Indonesia regulations govern the disposal options for this waste. The solid waste is often used to generate electricity for the mill and/or returned to the plantation as soil cover to enhance moisture retention and provide organic matter for the soil. The liquid waste is treated (typically using a fermentation process) before being used as compost and/or irrigation for the plantation or released into the environment.

Palm kernel expeller is another key byproduct of the crushing and expelling of oil from the palm kernel. Known for its high fibre, energy, protein and good level of residual oil it has been used for a number of years as feed for livestock.



Palm oil extraction and processing¹⁸

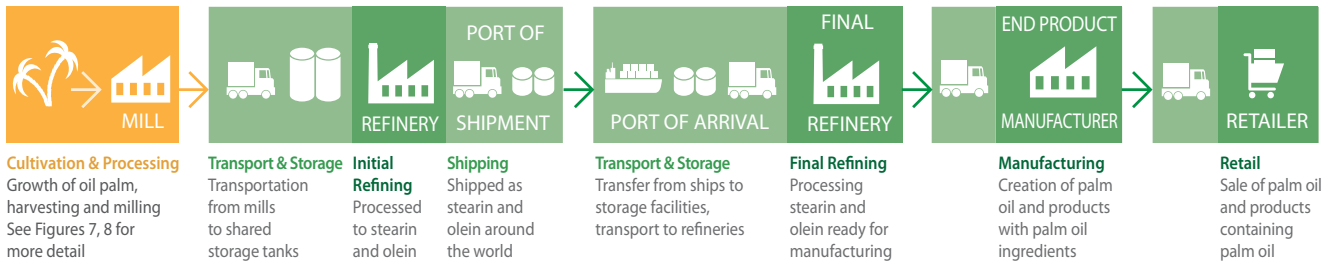
FIG.05

15. Centre for International Forestry Research, 2009

17. FAO, 2002

16. FAO, 1990

18. APOC, 2004



SOME MAJOR AUSTRALIAN SUPPLY CHAIN ACTORS

<ul style="list-style-type: none"> Malaysian smallholders (FELDA)¹⁹ Sime Darby Sinar Mas 	<ul style="list-style-type: none"> Sime Darby Sinar Mas 	<ul style="list-style-type: none"> Wilmar Southern Edible Oils 	<ul style="list-style-type: none"> Integro Peerless Cargill 	<ul style="list-style-type: none"> Various logistic companies 	<ul style="list-style-type: none"> Integro Peerless Cargill 	<ul style="list-style-type: none"> Unilever Nestle Goodman Fielder Cargill 	<ul style="list-style-type: none"> Woolworths Coles Aldi IGA
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GLOBAL MARKET SHARE CONCENTRATION ACROSS THE PALM OIL SUPPLY CHAIN

PRODUCING	PROCESSING	TRADING	MANUFACTURING	RETAIL
<ul style="list-style-type: none"> Diversified Many plantations & small holders 	<ul style="list-style-type: none"> Concentrated Top 5 ~ 60% share Largest player ~ 33% share 	<ul style="list-style-type: none"> Highly concentrated Top 5 ~ 80% share Largest player ~ 50% share 	<ul style="list-style-type: none"> Diversified Top 5 ~ 15% share 	<ul style="list-style-type: none"> Diversified Top 5 ~ 5% share

FIG.06 The palm oil supply chain²⁰

Crude palm oil is stored and then transported to refineries where it is processed into various products—typically refined, bleached and deodorised or neutralised, bleached and deodorised stearin and olein, depending on its intended use. Stearin and olein are respectively the solid and liquid fractions taken from refining crude palm oil.

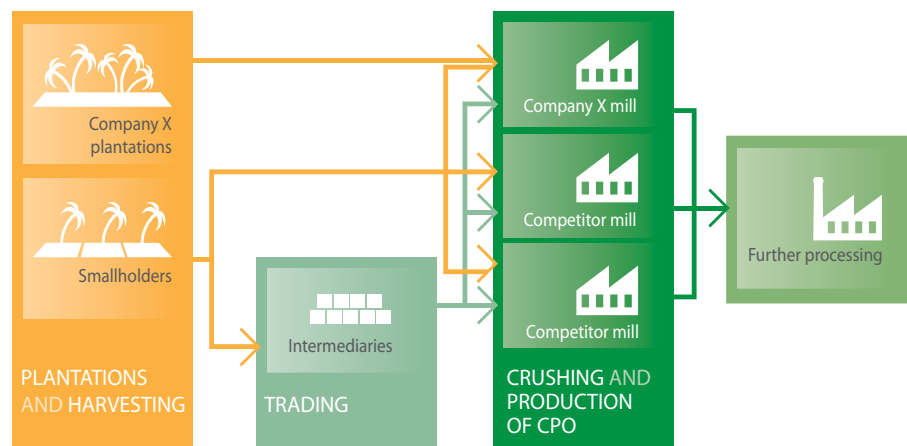
Palm oil is a light yellow liquid and semi-solid at room temperature, melting to a clear yellow liquid on slight heating. This can then be separated into solid and liquid fractions.²¹

Palm oil supply chain

Palm oil is a part of many different supply chains, depending on the final use and the level of vertical integration of particular organisations.

A typical supply chain journey for palm oil bound for the international export market is depicted in Figure 6. The process consists of five steps starting at production and finishing with customer purchase at a retail shop. Figure 6 also elaborates on some of the major Australian supply chain actors and explains the market share concentration across the entire global supply chain.

FIG.07 Interactions between actors in the first stages of the palm oil supply chain²²



19. FELDA: Federal Land Development Authority—a Malaysian Government organisation that resettles rural poor into newly developed areas

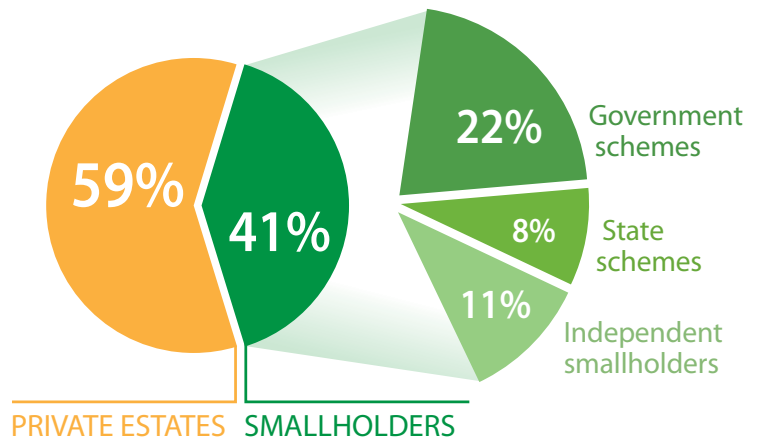
20. Developed by Net Balance with inputs from WWF, AFGC and Goodman Fielder, RSPO, 2009

21. FAO, 2002

22. Developed by Net Balance

Based on interviews with companies involved in the supply chain, Figure 7 expands the first stages of the supply chain in this critical area. There are multiple paths and actors for the oil palm in the early stages. Vertically integrated companies own plantations as well as mills. However, they also source oil palm from smallholders, either directly or through intermediaries. There is high competition for the raw material inputs, as there are many mills within a small geographical radius.

Smallholders represent a large proportion of the industry and their impact should not be discounted. Figure 8 shows that in Malaysia up to 41 per cent of oil palm planted are in the hands of smallholders, who are either independent or operate under a government or state scheme. In Malaysia, this represents approximately 120,000 individuals with an average land holding of 3.92 hectares.²³ It is estimated that one million smallholders are involved in palm oil production in South East Asia.



Distribution of oil palm plantations in Malaysia²⁴

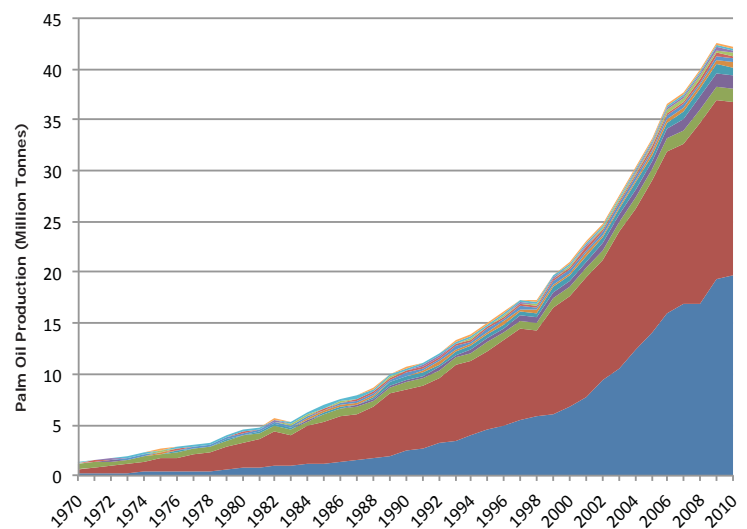
FIG.08

Global production, consumption levels and trends

Palm oil production requires less land and energy than crop-based vegetable oils such as soybean and rapeseed. In Malaysia and Indonesia palm oil is a substantial export. The industry has become a "central economic pillar in some tropical low-income countries."²⁵

Worldwide palm oil production has increased tenfold since 1980 (Refer to Figure 9), primarily due to the increased demand for palm oil in food products (80 per cent of current final end use) and to a lesser extent newer non-edible markets such as biofuels (2 per cent of current final end use). Growth forecasts vary, however most forecasts predict significant growth in the future. Greenpeace provides an indicative upper limit and has predicted a doubling in global production by 2030 and a tripling by 2050 (relative to 2000 production²⁶ figures quoted elsewhere in this report, which are relative to 2011 production).

This increase in production levels has resulted in more land being used for palm oil, particularly in Malaysia and Indonesia. Increases in yield as plantations mature and as more productive varieties are used have also contributed to meeting the demand.



These figures are based on information from the FAO website as at 5th September 2012²⁷



Top 12 palm oil producing countries, 1970-2010²⁷

FIG.09

23-24. Rahman et al, 2008

26. Greenpeace International, 2007

25. International Finance Corporation, 2010

27. FAO, 2012A

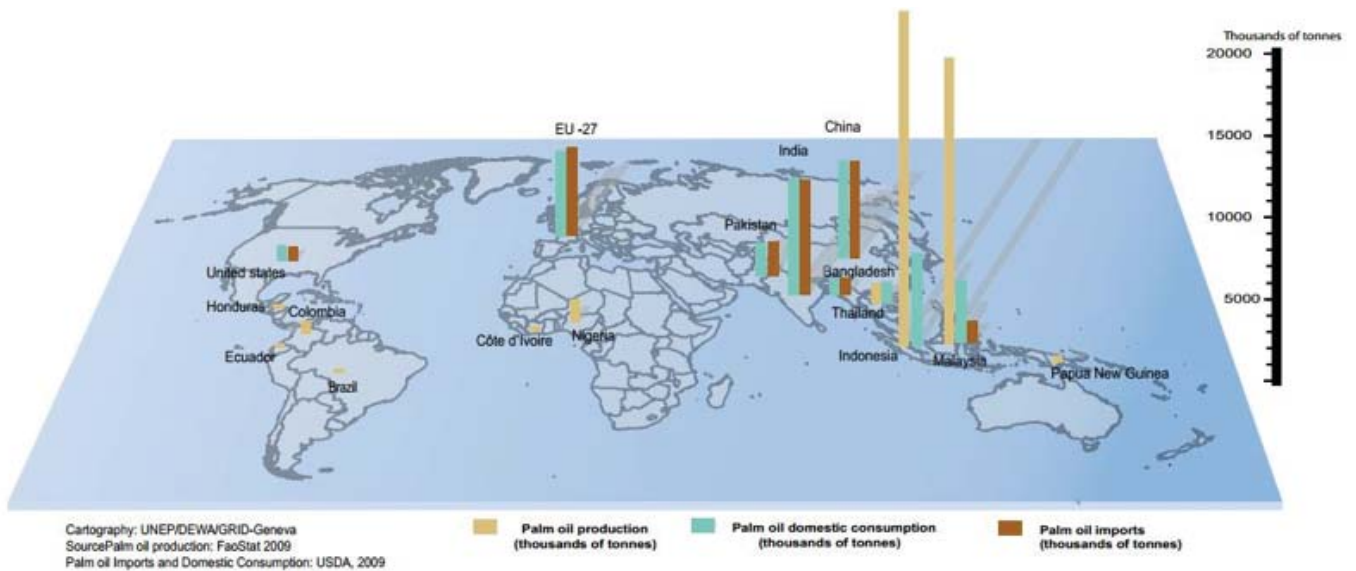


FIG.10

Palm oil producers, importers and consumers at a global scale²⁸

Figure 10 illustrates global palm oil production, as well as domestic consumption and imports in 2009 for major players.

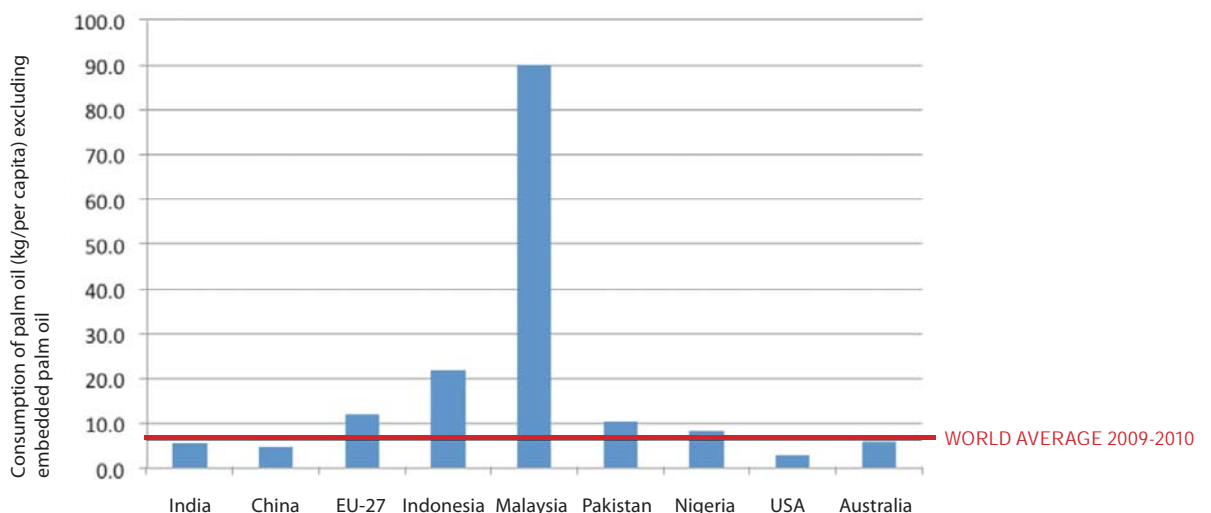
Since the 1990s, the total area occupied by palm oil cultivation has expanded by around 43 per cent driven mainly by demand from India, China and the EU who are predominantly importers. China does have some production, but it is small compared to demand.

The per capita consumption data in Figure 11 shows that Malaysia and Indonesia, apart from being the biggest producers of palm oil, are also the biggest per capita consumers.

However, care needs to be taken when drawing conclusions from this data, as a significant proportion of palm oil may be used to manufacture products that are subsequently exported.

FIG.11

Per-capita consumption of palm oil (excluding embedded palm oil) in selected countries compared to world average in 2009-2010²⁹



Australian consumption

Australia currently purchases about 110,000 tonnes of crude palm oil per year (about 0.2% per cent of global production).³⁰ Graincorp Oils/Integro Foods is the largest consumer of palm oil, acquiring more than half of the total palm oil purchased in Australia. The other seven large manufacturers and retailers are Goodman Fielder, Coles, Woolworths, Arnott's, Peerless, Snack Foods and Metcash Trading that consume the majority of the remainder each year.³¹

This palm oil is typically used to produce margarine, ice cream, biscuits, chocolate, chips, baked and fried foods. A number of imported shampoos, creams, toothpaste, cosmetics and soap also contain embedded palm oil.

The lack of clarity in volumes of palm oil being used by companies as well as the transparency of companies

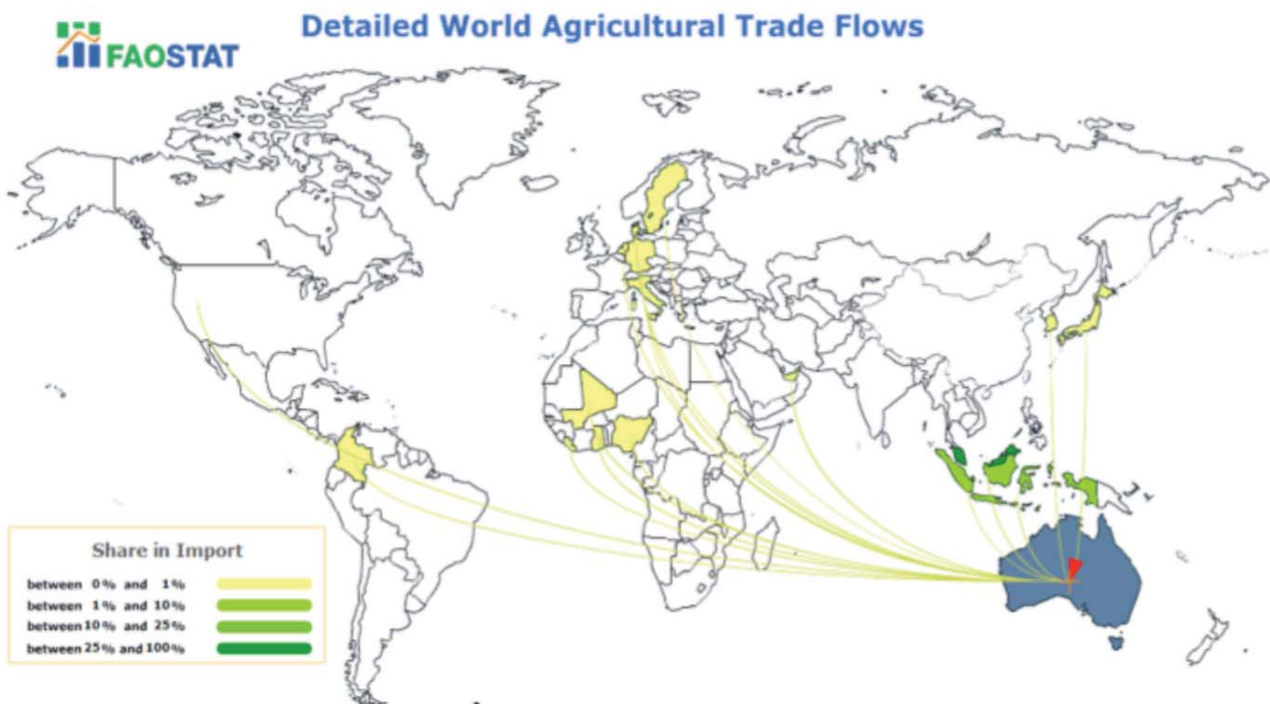
in making such data available reflects the challenges companies have in getting a clear picture of their palm oil supply chains.

Figure 12 demonstrates that the majority of imports to Australia originate from Malaysia and Indonesia. In addition, some non-producer countries may export palm oil to Australia as finished products after having imported it and refined it further. There are no exact figures to confirm the quantity of this palm oil. In the United Kingdom, palm oil imports in the form of finished products are estimated to be between 190,000 and 350,000 tonnes, which is an addition of 30 to 50 per cent on the total use of palm oil in the United Kingdom.³²

The same cannot be confirmed for Australia due to the lack of data. As a result, it is difficult to estimate this 'embedded' volume of palm oil, and it is not clear if it is significant compared to the 110,000 tonnes of CPO imported annually. This warrants further investigation.

Origin of palm oil imported to Australia for 2007³³

FIG.12



30. WWF, n.d.
31. WWF, 2011

33. FAO, 2010A
32. DEFRA, 2011

Drivers of palm oil use: The versatility of palm oil

Chapter highlights

- » Palm oil is a versatile product that can be used in a wide variety of both edible and non-edible products (eg. biofuels and stockfeed).
- » Global palm oil production exceeded soybean oil for the first time in 2005. By 2009, palm oil production of 45 million tonnes was equivalent to 34 per cent of the global market, while the market share for soybean oil, rapeseed oil and sunflower oil were 27 per cent, 16 per cent and 10 per cent respectively.
- » Reasons cited for the growth in palm oil include its competitive price, product flexibility, growing demand from emerging markets, product stability, a shift away from trans-fatty acids, concerns about the use of genetically modified organisms, limited processing requirements, greater yield per hectare compared to other vegetable oils and longer plantation productivity.
- » The palm oil market faces challenges including limited land availability for expanding palm areas, fertiliser cost, sustainability concerns, weather variability (short term and climate change related long term effects), labour availability and a high amount of saturated fats.
- » Biofuels link vegetable oil, including palm oil, to the energy commodity market.
- » The market drivers in Australia are similar to those internationally, however it is unlikely that there will be significant further growth in the years to come, as most of the growth, at least in the food industry, was in response to a move away from trans-fats. Modest growth trends over recent years support this hypothesis.

04.

Product performance

Palm oil is a versatile product used in edible and non-edible products. Currently edible products account for about 80 per cent of palm oil use.³⁴ However, this proportion is set to decrease with the discovery of new non-edible uses and the projected increase in the production of biofuel from palm oil.

Edible uses

Palm oil is used in a number of edible products, usually in the form of stearin or olein. It has the following properties:

- » Low price compared to other vegetable oils
- » No trans-fat content (particularly favourable when comparing stearin to hydrogenated vegetable oil alternatives used for baking and other uses)
- » High saturated fat content
- » Resistance to oxidation, giving products a long shelf life³⁵
- » Hardness and/or melting point versatility makes it suitable for a wide range of applications from liquid oil frying to solid fat shortening
- » Polymorphism, meaning that palm oil readily crystallises to the B phase that is desirable in shortening applications
- » Other physical properties such as colour, flash and combustion points.

Liquid palm oil (olein) is used as frying oil for food products, including instant noodles and snack foods. It is also used in the manufacture of ice cream and condensed milk.

Non-edible uses

In non-edible applications palm oil can either be used directly or by processing it to form oleochemicals. Uses include soaps, plastics, drilling mud, biofuel, candles, lotions, body oils, shampoo, skincare, rubber and cleaning products. Oleochemicals are derived from fats and oils that are analogous to petrochemicals. High temperature and pressure cracking or transesterification processes can be used to produce fatty acids or fatty methyl esters that are then used as part of the product manufacturing process.

In non-edible cosmetic applications, palm oil:

- » is moisturising
- » has cleansing properties to help remove oil or dirt particles from hair or the skin
- » can replace mineral oil which is non-biodegradable and derived from petroleum
- » is a conditioning agent for hair
- » contains antioxidants (Vitamin E) to treat ageing or sun-exposed skin.³⁶

Palm oil as a biofuel³⁷

Palm oil biofuel, also known as palm oil methylester (PME), differs from other types of biofuel in its grade of molecule unsaturation. PME is more saturated, which means it has a lower number of double carbon bonds in its molecules. For diesel engine applications, the degree of biofuel molecule saturation represents a compromise. Saturated fuels such as PME have high-ignition quality. However, they also harden at lower temperatures, making them difficult to use in cold weather. These properties limit their application in colder, northern hemisphere climates. However, in warmer climates, such as in palm oil producer countries, PME is a viable option.

Oil palm kernels for stockfeed³⁸

As mentioned previously, about 70 to 75 per cent of the palm fruit bunch becomes waste. One of these waste by-products is palm kernel expeller (PKE), which is not sidelined as waste but instead is used as animal stockfeed due to its high fibre, energy, protein and a good level of residual oil content.³⁹ Australia and New Zealand import large quantities of palm kernel stockfeed due to drought and high prices of locally grown supplementary feed. However, at the moment there is very little information available about the amounts of palm oil that enters Australia in the form of stockfeed. According to the Secretary-General of the RSPO, the international body set up to promote the growth and use of palm oil, "very little...would have been certified at all".

According to RSPO figures, only 10 per cent of the world's palm oil is CSPO. This means that only 10 per cent of the waste produced is also certified sustainable. At the moment, there is a very weak global supply chain that upholds the use of PKE as stockfeed. There is also no market that supports premium prices on the sale of certified stockfeed versus uncertified stockfeed.

There needs to be more research done to understand the amounts of palm oil that enter countries as palm kernel.

34. APOC, 2004

35. McNeill G. P. 2009, Vol.6, Issue 2

36. APOC, 2004

37. Rojas, 2007

38. Animal Feed Suppliers, 2010

39. FAO, 2002

05.

Market trends and drivers

Global situation

The edible oils and fats market has increased substantially as global populations and per capita consumption have grown. Amongst the commonly used major vegetable oils, the growth in production of palm oil has been significant, with a ten-fold increase from 1980 to 2009, as highlighted in Figure 13. This compares with soybean oil, which increased by 2.7 times.

Palm oil global production exceeded soybean oil for the first time in 2005. By 2009, palm oil production of 45 million tonnes was equivalent to 34 per cent of the global market, while the market share for soybean oil, rapeseed oil and sunflower oil were 27 per cent, 16 per cent and 10 per cent respectively.

Reasons cited for the growth in palm oil include:

- » Competitive pricing relative to alternative oils
- » Product flexibility
- » Demand from emerging markets
- » Increased usage in developed markets
- » Product stability
- » Concerns over the health hazards of trans-fatty acids (TFA) from animal fats and hydrogenated vegetable fats have encouraged manufacturers to use alternatives (palm oil generally requires little or

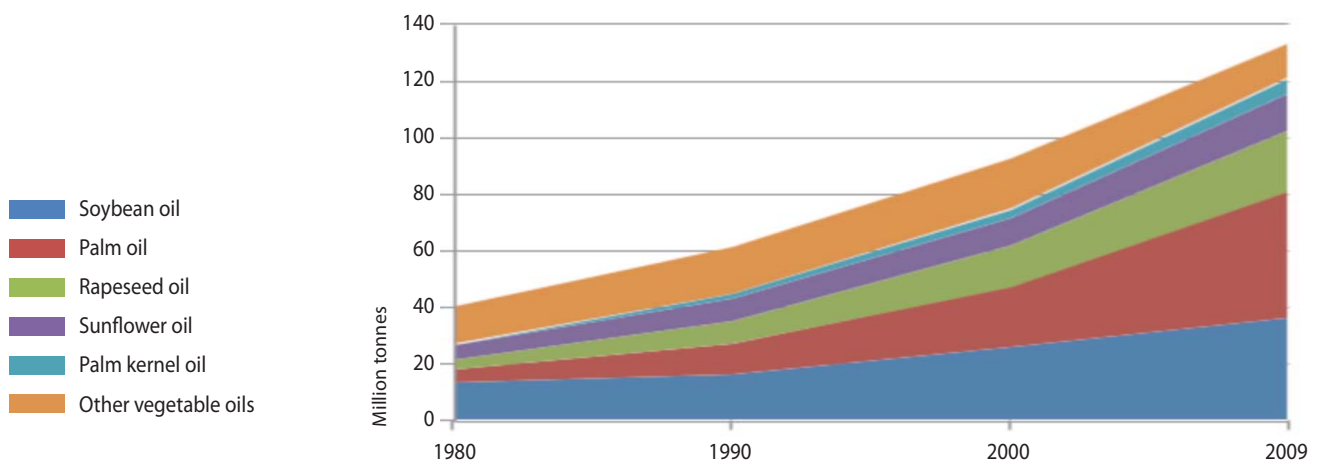
- no hydrogenation for use in the same applications)
- » Concerns about the use of GMO have encouraged the use of alternatives such as palm oil
- » Ease and/or lack of processing required before use
- » Greater yield per hectare compared to other vegetable oils
- » Oil palm plantations will often be productive for about 20 years, while other vegetable oil crops need to be replanted each year adding additional costs for land preparation and crop growth

However, the palm oil market does face a number of challenges:

- » Limited land availability for expanding palm areas
- » Fertiliser costs
- » Demand for sustainable palm oil
- » Weather variability (short term and climate change related long term effects)
- » Labour availability
- » High amount of saturated fats (the impacts of this are explored in Section 8).

Although several crop alternatives exist for olein that are not as high in saturated fats such as high oleic versions of traditional vegetable oils, they are not yet price competitive. It has been projected that by 2020 (refer to Figure 14) the total output for all vegetables oils including palm oil, will increase by 30 per cent, with this growth led by developing countries. In terms of palm oil specifically, Malaysia and Indonesia will increase their palm oil production by 45 per cent, seeing them climb to 36 per cent in terms of their share in the global output of all vegetable oils. China, Argentina, Brazil and the

FIG.13 Global production of vegetable oils⁴⁰



EU are seen as future centres of production growth. Growth is also expected in Canada, the Russian Federation and Ukraine. India and the United States on the other hand are expected to show only a modest increase.

Palm oil and biofuels

Given higher crude oil prices (i.e. often surpassing \$120 a barrel) and emissions reduction concerns, there has been a renewed interest in biofuel in recent years. Rapeseed, palm and soybean oil are the most common feedstocks for biofuel production.

More recently, owing to unfavourable weather conditions, input constraints such as labour and high demand from emerging markets such as India and China, palm oil and soy have been selling at prices higher than crude oil and have been seen as less favourable sources. It would appear the palm oil biofuel bubble burst in 2008, at least for now. For example, the Indonesian Government implemented a law mandating that there should be a 5 per cent biofuel blend by 2010, which would increase 15 per cent by 2020. However, when the prices of palm oil increased, they had to put subsidies over existing oil subsidies to make it profitable to use biofuel.

This does not mean that in the future demand for biofuels will not rise. With a number of countries taking keen interest in energy security and reducing their vulnerability to oil price shocks, the demand for biofuels is expected to almost triple in this decade.

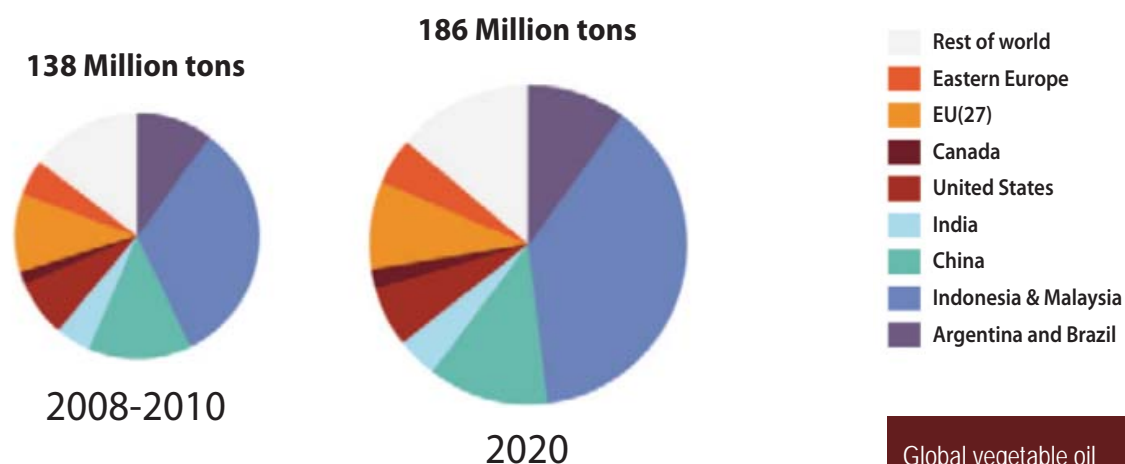
The Organisation for Economic Co-operation and Development and Food and Agriculture Organisation

High oleic oils increasingly used as an alternative to palm oil

High-oleic canola oil contains more oleic acid (a monounsaturated fat) and less polyunsaturated fats than regular canola oil. This fat profile makes high-oleic canola oil more stable, allowing for greater heat tolerance and longer shelf life. High-oleic canola oil is a healthier replacement for partially hydrogenated oils (which contain trans-fats) and palm oil (which contains high levels of saturated fat) used in food products and food service.⁴¹

There are a number of American companies using high oleic oils in their products, including:

- » **Country Choice**
 - Sandwich Cremes (high-oleic sunflower and/or safflower)
 - Vanilla Wafers (high-oleic sunflower and/or high-oleic safflower)
 - Oatmeal Raisin (canola, high-oleic sunflower and/or high-oleic safflower)
- » **Au Bon Pain**
 - Muffins (non-hydrogenated canola)
- » **Burger King**
 - Frying (non-hydrogenated canola)
- » **Frito-Lay**
 - Doritos, Cheetos, Tostitos (non-hydrogenated canola)
- » **Kraft**
 - Oreos (non-hydrogenated soybean).⁴²



Global vegetable oil production projections⁴³

FIG.14

41. Orthofer, 2005, Vol.17, No.5

43. Oil World, 2010

42. United States Department of Health & Human Services, FDA, 2005

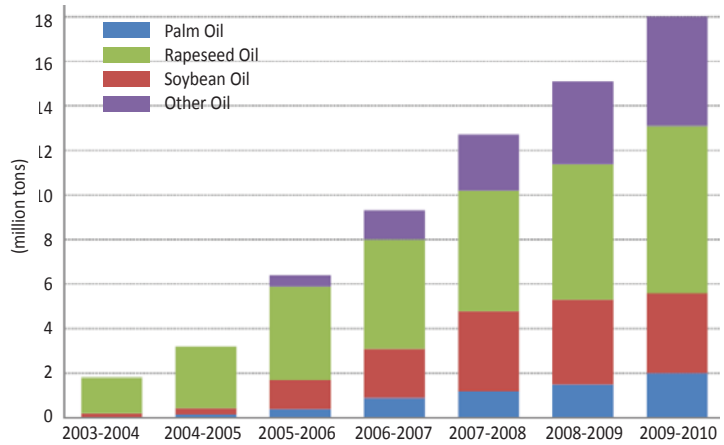


FIG.15 Global consumption of vegetable oils for biofuels⁴⁴

states that the EU and the United States will be the biggest players in pushing this demand as they are projected to become world's biggest biofuel-importing markets by 2019. The EU mandates biofuel blends as part of its goal to reduce greenhouse gas emissions while the United States' mandate is part of its energy security directive. However, with increasing concern over the relationship between deforestation and biofuel from palm oil, a number of western economies are reviewing their biofuel targets.

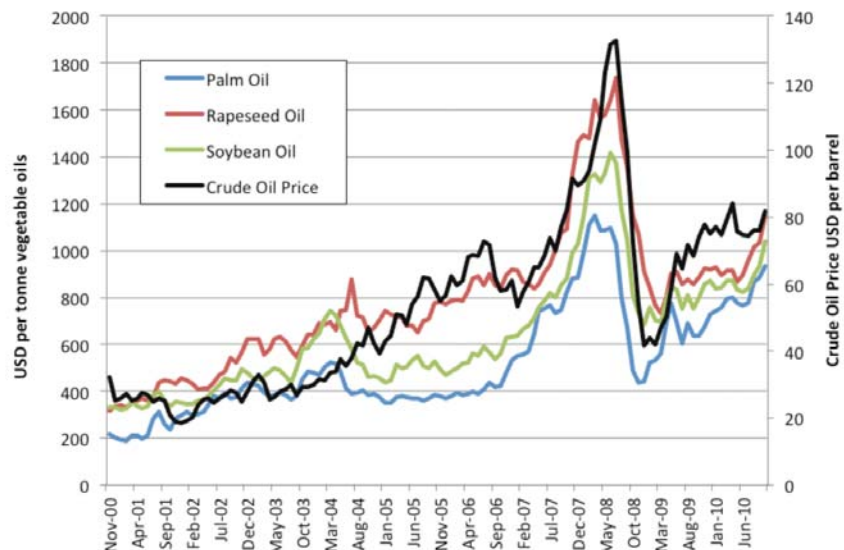
Although the quantity of palm oil destined for biofuel use is still relatively small, the rapid growth in biofuels from vegetable oils in recent years indicates that biofuels will be an increasingly important issue for the palm oil sector. Figure 15 illustrates the global consumption of vegetable oils specifically used for biofuels production from 2003.

The price of palm oil is increasingly linked to energy prices as demand for biofuels rises.⁴⁵

According to Figure 16 rapeseed oil roughly followed the crude oil price between 2003 and 2007, whereas palm oil and soybean oil did not. The fact that high quantities of (subsidised) domestic rapeseed oil were being used for EU biofuels production was part of the reason the link to energy prices was created. From 2007 onwards, the Crude Oil Price (COP) rose to a point where other unsubsidised vegetable oils also become competitive. This established a firmer link to energy prices, and palm oil and soybean oil have tracked the COP from 2007 onwards.

Energy prices are not the only factor influencing prices. Other factors, including short term effects such as the weather, can also influence the price of oils. The link could be weakened or broken by consistently low oil

FIG.16 Evolution in price of various vegetable oils compared to crude oil price over 10 year horizon⁴⁶



44. Oil World, 2010

45. Leow, 2010

46. Indexmundi, 2010

prices or a move away from biofuels. However this is unlikely in the medium to long term. In Malaysia, biofuel blends using palm oil have been compulsory for all vehicles since 2011,⁴⁷ strengthening the link with fuel prices.

The global versus Australian market for palm oil

The demand for palm oil continues to increase and as a result so does the significance of the product. This demand for palm oil is particularly high in the USA, as highlighted in Figure 17A below with rapid growth being seen in recent years. While this growth is high compared to Australia, absolute demand is low compared to India and China. Several factors have influenced the rapid growth of palm oil in the US, including an important regulatory change by the Food and Drug Administration which introduced trans-fat labelling requirements in force from 2006.

Given the size and purchasing power of the American market, this is an important development for palm

oil globally. However these figures are still lower in comparison with other consumer nations.

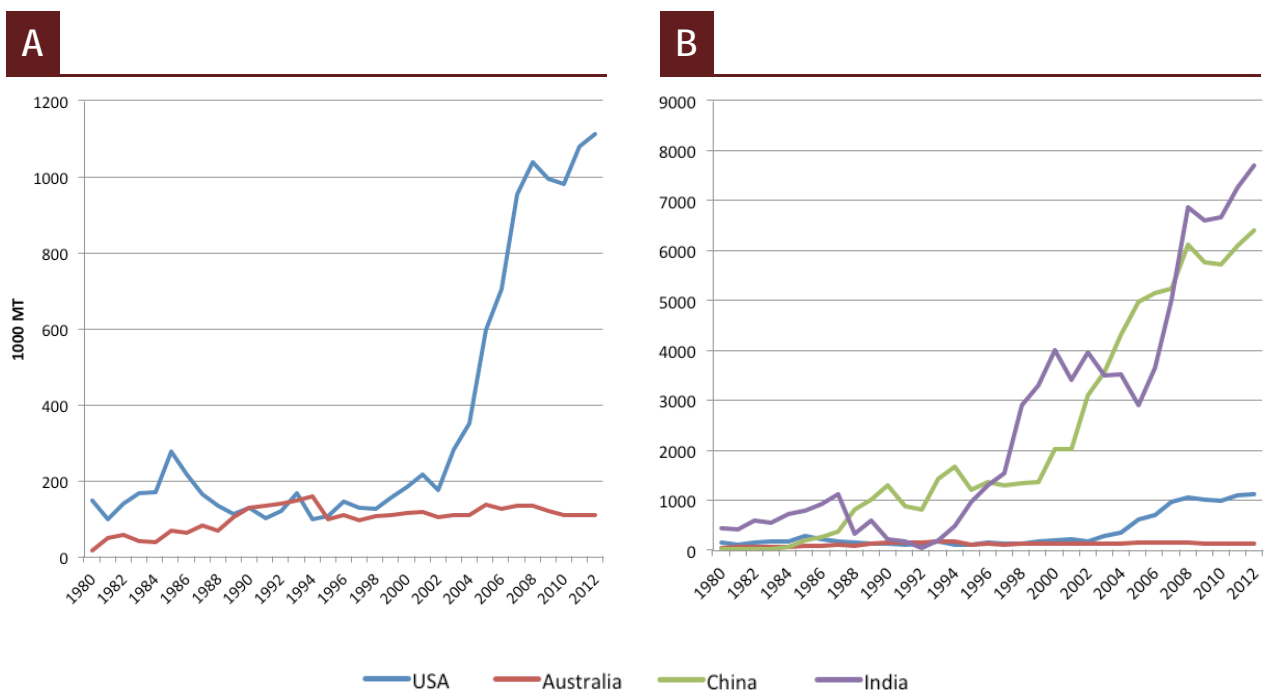
The market drivers in Australia are similar to those internationally, with lower price, product versatility and health benefits (no trans-fats) driving growth in demand and sustainability and health concerns (high saturated fats) dampening growth.

According to the Australian Oilseeds Federation, significant further growth in the years to come is unlikely, as most of the growth (at least in the food industry) was driven by the move away from trans-fats.⁴⁸ Given that most of the industry intending to move away from trans-fats have already done so and the need to reduce saturated fats, there is not likely to be a large increase in demand. Over the last five years there has not been a significant increase in imports of palm oil into Australia, which appears to support this hypothesis.

In comparison, China and India have soared in terms of their palm oil imports with 6,400 million tonnes and 7,700 million tonnes imported in 2012 respectively.

A. American vs Australian palm oil imports by year⁴⁹
 B. Australian palm oil imports in comparison to the United States, India and China by year⁵⁰

FIG.17



47. Leow, 2010
 48. AOF, n.d

49. FAO, 2010A
 50. ABS, 2010

The impacts of palm oil production and consumption

Chapter highlights

- » Palm oil is often linked to environmental, social and health impacts.
- » Deforestation is one of the key impacts in producer countries, particularly in South East Asia. Deforestation has a variety of impacts, including: forest fires, greenhouse gas emissions and biodiversity loss, including the decline of the orang-utan population.
- » There are claims that palm oil plays a significant economic development role in Malaysia and Indonesia. While this does appear to be the case at a macro-economic level, at the individual level, at least in the short to medium term, issues such as employment conditions, land and social conflicts are not positive contributions to development.
- » Palm oil, with its lack of undesired trans-fats, is considered to be a good alternative to animal and partially hydrogenated fats. However, with its high concentration of saturated fat, palm oil is considered to be more detrimental to health than other liquid vegetable oils such as canola, soy and olive.

06.

Environmental impacts

The palm oil industry, as with any industry, is associated with an array of environmental impacts. These impacts vary in scale, from the local to the global. In particular, deforestation has been a major issue. The flow-on environmental effects of large-scale deforestation, including biodiversity loss, loss of orang-utan habitats and increased greenhouse gas emissions are also substantial. Finally, biofuels from palm oil have been touted as environmentally friendly and the net environmental benefits of palm oil as a feedstock for biofuels is therefore examined.

Deforestation and palm oil: The broader context

Palm oil is often linked to deforestation in producer countries, particularly in Southeast Asia. The Food and Agriculture Organisation (FAO) reported in 2010 that although deforestation rates in Indonesia have dropped since 2000 compared to the 1990s, rates are still 'alarming high'.⁵⁰ Estimates suggest that between 2005 and 2010, approximately 30 per cent of oil palm expansion in Malaysia and Indonesia occurred at the expense of natural forests. Over the same period, approximately 30 per cent of forest loss was due to conversion to oil palm plantations.⁵¹ Figure 18 shows Indonesia loses over half a million hectares per annum; other organisations estimate up to two million hectares per annum. The rate of deforestation in Malaysia is lower, at less than a quarter of a million hectares per

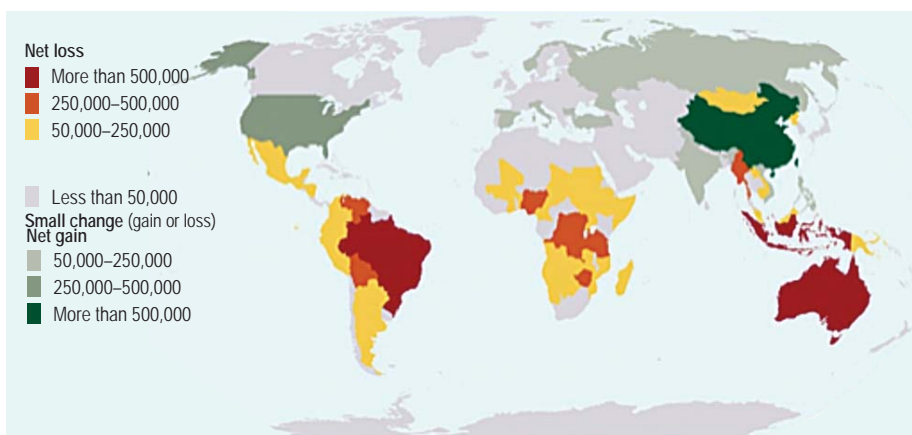
annum. However given that Malaysia is approximately five times smaller than Indonesia in terms of land-area, this figure is still significant.

Figure 19 illustrates the increase in palm oil cultivated areas over recent decades in the context of total forested and cultivated areas for other crops in Indonesia and Malaysia. It is clear that certain palm oil plantations have replaced natural forest cover.⁵² To highlight this, the rate of increase of palm oil land coverage was 22 per cent (2005-2008), compared with the next highest being maize at 9 per cent. Although the 'remainder' block is proportionally larger, its rate of increase is only 2.6 per cent over the same period.

Palm oil area grew by 11.5 per cent annually from 1997 to 2000, and by 15.8 per cent annually from 2000 to 2007.⁵³ Palm oil is the latest in a long list of drivers for deforestation in South East Asia. Rural development, agriculture and road construction by small landholders were major drivers of deforestation from the 1960s through to the 1980s, particularly in Brazil and Indonesia. The drivers have shifted now in the context of government efforts to secure economic stability within an increasingly global financial market. Worldwide commodity booms have also fuelled development by the private sector.

The rising demand for food and fuel, leading to the conversion of forests to agricultural production, as well as the rising standards of living in developing countries that require more land for urbanisation, are the latest drivers of deforestation.⁵⁴

Palm oil remains an important driver for further deforestation and has a considerable impact on biodiversity (see page 27). The palm oil industry will have an important influence on the rate of deforestation in the future.



Changes in net forest area (hectares per year) between 2005 and 2010⁵⁵

FIG.18

50-51. FAO, 2010

52. Koh uses United Nations Food and Agriculture Organisation data from 2005 to show that 55-59 per cent of palm oil expansion between 1990 and 2005 had occurred at the expense of natural forest cover (Koh, 2008). Also, Indonesian Ministry of Forestry statistics indicate that about 70 per cent of oil palm plantations in Indonesia between 1982 and 1999 (2.5 million hectares) were on forest estate (Centre for International Forestry Research, 2009)

53. FAO, 2010

54. Kissinger et al, 2012

55. FAO, 2010

Definition of forests

Care should be taken when interpreting Figure 19, as the definition of 'forest' varies. 'Forest' may include re-forested or degraded forest areas, alongside old-growth forests. Additionally, the type of deforestation that occurs as a result of palm oil plantation expansion would likely be different than that caused by urban expansion. This is particularly relevant when discussing the 'knock-on' effects.

How a forest is defined depends on a number of technical factors including latitude, temperature, rainfall patterns, soil composition and human activity.⁵⁶ It also depends on who is defining it. The debate on what constitutes forest can also be a significant factor in the discrepancies in deforestation claims made by NGOs and palm oil producers. As an example, the Food and Agriculture Organisation includes some degraded and secondary re-growth forest as part of forested areas, which are often excluded from other studies that only consider primary forest.⁵⁷ Other organisations classify palm oil plantations as forest. In other schools of thought palm oil plantations are not considered to be forests as they replace natural forest cover.

The issues

Forest fires

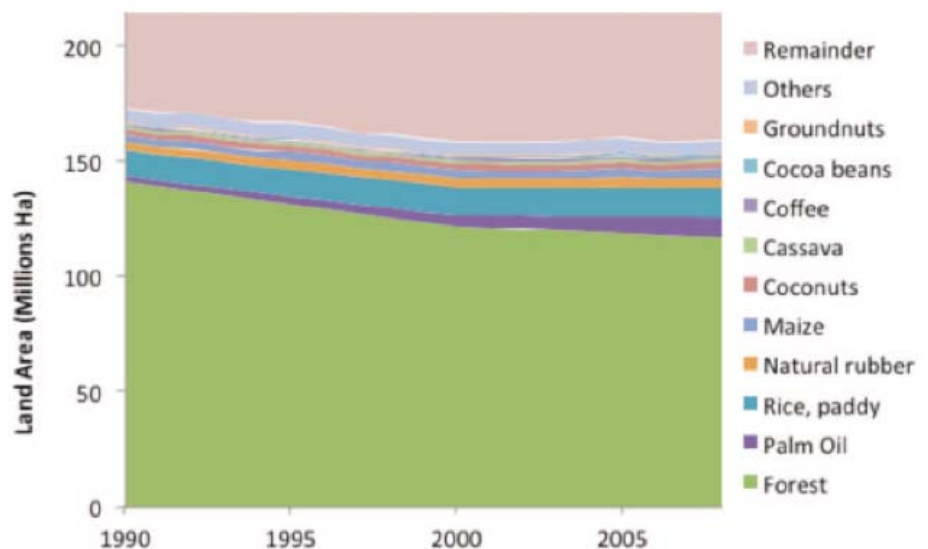
Palm oil activity has increased the incidence and frequency of forest fires by drying out forested areas through draining, logging, fragmentation and deliberate clearing fires. This has implications for both deforestation and increased carbon emissions. Despite a government ban on the use of fire to clear land in Indonesia in 1997, the trend of increasing fires resulted in the worst fires worldwide in 1997 and 1998. A third of these fires were lit specifically to clear land for plantations.⁵⁹

In addition to fires used to clear land for plantations, the risk of fire in surrounding forest is increased by making the forest more susceptible to drought as a result of the lowering of the water table in peat areas (to create conditions more favourable to the oil palm).

Human encroachment into forest areas increases the number of ignition sources, such as cooking and clearing fires. Burning is still widely regarded as the quickest and cheapest method of clearing forested land, due to the difficulties and cost of accessing appropriate clearing machinery. This is particularly true for peat based and/or dense forests, and small holders who lack access to capital.

FIG.19

Forested and cultivated areas in Malaysia and Indonesia as a proportion of total land area ('Remainder' refers to non-forested and non-cultivated lands, such as urban areas)⁵⁸



56. UNEP, 2009

57. FAO, 2010B Forest area is defined by the FAO as that which has trees over 5m and with greater than 10 per cent canopy cover (can include older palm plantations that meet the criteria).

58. FAO, 2010

59. World Bank, 2001



Greenhouse gas emissions

Deforestation and drainage of peatlands releases large volumes of greenhouse gases. Emissions from forestry land use changes, peat fires and decomposition make up nearly 80 per cent of Indonesia's total greenhouse gas emissions and have resulted in Indonesia becoming the third highest emitter (net) after China and the United States.⁶⁰

By drying and clearing forest areas, palm oil plantation activity releases emissions through the oxidation and decomposition of organic material. This is particularly true for peat land where the water table is lowered by drainage to make the land more suitable for oil palm. This draining exposes the peat to air leading to oxidation and emissions. It is estimated that over a quarter of plantations are on peat land. These emissions have been quantified at approximately 80 to 100 tonnes of CO₂ per metre depth of peat per hectare per year. The dried out peat is also more susceptible to fire.

In the absence of fire, emissions will continue over a period of decades. This is because a reduction in burning will only delay the emissions released. The reduction in the level of the water table and fires will also impact on nearby forest which is often degraded or destroyed despite not being used for plantations.⁶¹

The Wetlands Institute estimates emissions from Southeast Asia between 1997 and 2006 to be

approximately two gigatonnes per year (70 per cent fire-related and the remainder from drainage-related decomposition). Ninety per cent of this is estimated to have come from Indonesia. Studies indicate that by 2006, 45 per cent of the 27 million hectares of peatland in Southeast Asia had already been deforested and mostly drained.⁶²

World Growth and other groups supporting the palm oil industry argue that palm oil plantations can act as a carbon sink and that through their reduced need for fertilisers, pesticides and land area have a lower carbon footprint and environmental impact than other vegetable oils.

Germer estimated the net emissions of converting different land uses to palm oil plantations. Conversion of tropical grassland results in a net sink of 135 tonnes per hectare, whilst conversion of non-peat based forest results in a net release of 650 tonnes per hectare and conversion of peat based forest releases over 1300 tonnes per hectare (during the first 25 year plantation cycle).⁶³ This is to say that carbon sink claims fail to take into account those carbon emissions generated through the original deforestation or other land use change required for the oil palm production.

Of late, biofuels have gained significant attention. Palm oil can be used as a feedstock for biofuels; however, the net carbon benefits of biofuels are being questioned, mainly due to the emissions impacts

60-61. UNFCCC, 2008

62. Hooijer, 2009

63. Germer, 2008

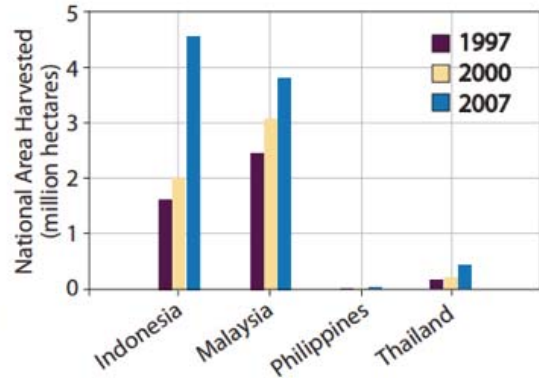
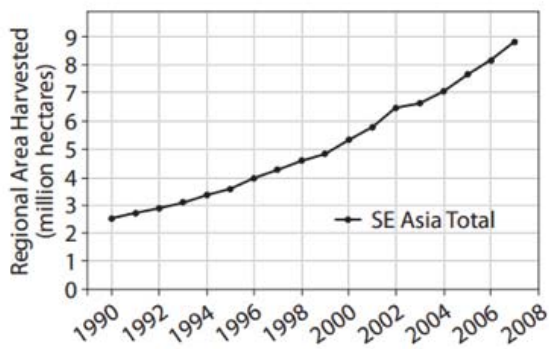


FIG.20 Growth in area harvested for palm oil, 1990 to 2007⁶⁴

generated through the land use change required to produce the biofuel feedstock. It has been shown in some cases that the net impacts of certain biofuels are higher than fossil fuels.⁶⁵ A 2009 report by the Center for International Forestry Research "The impacts and opportunities of oil palm in Southeast Asia", states that it could take as long as 400 years to repay the carbon debt if forests are converted to biofuel plantations in Indonesia.⁶⁶

Pollution

Oil palm plantations can cause pollution from their use of pesticides, herbicides and fertilisers. Soil erosion, increased sedimentation in rivers, the dumping of untreated palm oil mill effluent and air pollution from fires are also issues.

Approximately three tonnes of mill effluent are produced for every tonne of crude palm oil. Since palm oil fruit needs to be processed within 24 to 48 hours

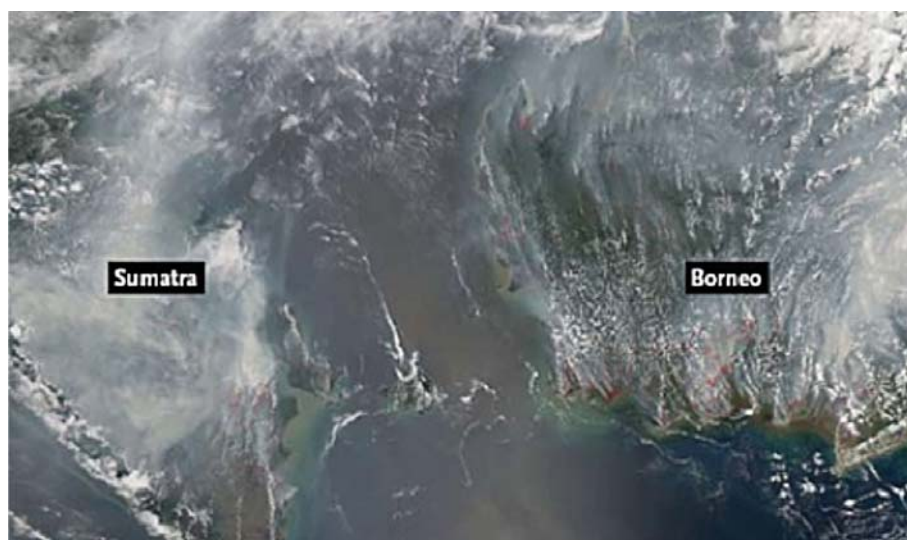
of harvest, mills are often located in close proximity to the plantation. If this effluent is not transported and/or treated appropriately, it can end up in local water bodies resulting in loss of aquatic life and loss of clean water for local communities.⁶⁷

Palm oil plantations as a pretext for logging

Due to the value of logged timber (US\$1,000–\$2,000 per hectare), it is more lucrative to set up a plantation on forested land than to use degraded land. The logging revenue can be used to offset plantation set-up costs which run for several years before palm oil can be harvested. This incentive has led to 'bogus plantations' being set up to harvest the timber, with no following plantation activity.

In some areas it is easier to obtain palm oil plantation permits than logging permits. Deforestation as a result of this activity, if included as part of the wider palm oil activity, is one of the reasons that figures for deforested

FIG.21 Fire and Smoke over Borneo and Sumatra, September to October 2006⁶⁸

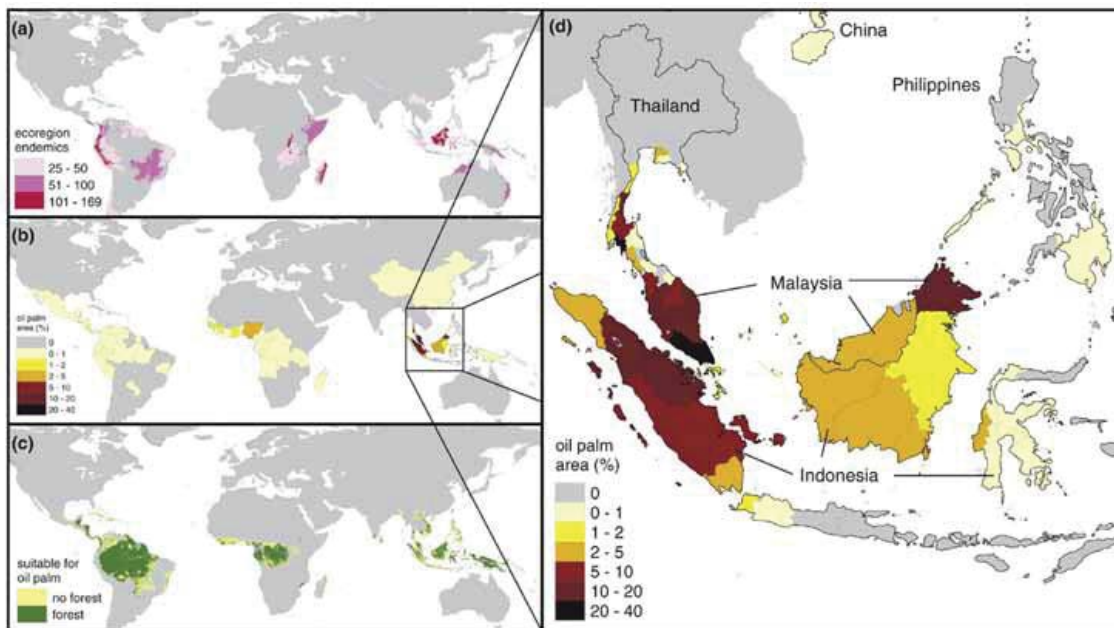


64. UCSUSA, 2011

65. One of the key issues which requires further study are emissions associated with indirect land use change (ILUC). Initial estimates suggest these are high enough to make the carbon intensity of biofuels twice that of fossil fuels. (EurActiv, 2009)(O'Hare, 2008)

66. CIFOR, 2009

67-68. UNEP, 2007



a) Areas of high terrestrial vertebrate endemism
 b) Global distribution of oil palm cultivation
 c) Agriculturally suitable areas for oil palm (with and without forest)
 d) Oil palm area in Southeast Asia

Global distribution of oil palm and potential conflicts with biodiversity⁶⁹

FIG.22

areas as a result of palm oil can vary significantly. As an example, in West Kalimantan, permits have been issued for oil palm developments covering 5.3 million hectares, but only one million hectares of oil palm have been planted.⁷⁰

Biodiversity loss

Southeast Asian tropical rainforests are home to a huge range of diverse species. Indonesia's forests alone are among the most biologically diverse ecosystems on Earth, providing habitats for 17 per cent of the world's birds, 16 per cent of reptiles and amphibians, 12 per cent of mammals and 10 per cent of plants.⁷¹

Plantations, logging, fires and other factors reduce rainforest habitat, hindering migration patterns and blocking travel corridors. Most Indonesian and Malaysian rainforest species can only survive in rainforests. They depend on the vast variety of trees, vines, shrubs, mosses and other plants, and cannot survive in the monoculture environment of a plantation. Plantations are estimated to provide habitat for no more than 20 per cent of the previously resident mammals, reptiles and birds. Studies have reported that only between 5 per cent and 53 per cent of the bird species recorded in the primary forest were also present in the oil palm plantations. While invertebrates are also involved in important ecosystem functions such as nutrient cycling and pollination, these are often overlooked in biodiversity assessments.⁷²

Small mammal communities have also been affected by the dramatic changes in the land cover. Studies show that the number of small mammals has declined in palm oil plantations and in nearby primary forest areas.

Indonesia currently has the highest number of threatened mammal species, with 183 out of approximately 670 under threat. In Malaysia, 70 mammal species out of 336 are threatened.⁷³

The threats to Southeast Asia's land mammals are exemplified by five species: the Sumatran and Bornean Orang-utans, the Sumatran Tiger, the Sumatran Rhino and the Asian Elephant. As larger mammals at the top of the food chain they are most dependent on large areas of interconnected rainforest in order to survive. In addition, long reproductive cycles make these mammals particularly susceptible to extinction. Each of these five species is now seriously threatened, mostly due to the loss, degradation and fragmentation of their habitat.

These mammals are also under threat from illegal hunting (rhino and tigers in particular are hunted for their pelts and other body parts for traditional medicine). Infrastructure built to support plantations also opens up more forest areas to illegal logging and hunting. In Indonesia, an estimated 80 per cent of logged timber is extracted illegally.⁷⁴

Roads and plantations fragment the rainforest and make animals more vulnerable to illegal hunting and poaching. Forest fragmentation has a disproportionate

69. FAO, 2010

70. Carter, 2007

71. Orangutan Foundation International, 2011

72. Fitzherbert, 2008

73. International Union for Conservation of Nature and Natural Resources, 2009

74. UNEP, 2007

effect on habitat loss for elephants, tigers and rhinos (amongst others) since they tend to stay one or two miles away from forest boundaries (including roads). These animals are at risk when entering plantations searching for food, and from clearing fires which sometimes burn out of control.

One of the more publicised endangered species is the Sumatran orang-utans. Prime habitat of around 260 hectares can support nine orang-utans. Marginal habitat will support only two. A genetically healthy subpopulation is considered to be around 500, which requires about 100,000 hectares in Borneo and 60,000 hectares in Sumatra (differences are due to variations in average home range area).

Estimates made in 2005 put the Bornean population at between 45,000 and 69,000, and the Sumatran population at about 7,300.⁷⁵ Since 1900, 91 per cent of the Sumatran orang-utans have died, most of these in the past decade. The remaining population lives in fragmented forest areas totalling about 10,000 square miles, much of which is marked for future palm oil development. At the current rates of decline, both species are likely to be extinct in the wild within ten years.

There has been significant public commentary around the 'orang-utan and palm oil' issue due to a number awareness campaigns, and heavy investment in orang-utan protection programs by palm oil producing countries such as Indonesia. However, more work needs to be done to protect this and other species.

The public remains focused on the impacts to orang-utan rather than the complex inter-play between economic development, environmental protection, health and nutrition and growing demands on commodity markets.

Indirect land use change

Apart from the direct impact of the plantation itself, the amount of forest land may also decline due to the flow-on effects of the expansion of palm oil plantations.

These effects include the infrastructure built to service the plantation, and displaced people moving on to subsistence farming elsewhere. Land set aside for palm oil development is sometimes cleared but not developed with oil palm due to plantation failures, bankruptcies and timber-theft and land-clearance frauds, where palm oil concessions are obtained on forested land which is logged and then abandoned.

In this way palm oil plantation activity can act as a catalyst for deforestation and forest degradation that reaches beyond the borders of the plantation.

07.

Socio-economic impacts

The previous section highlighted the environmental impacts of unsustainable palm oil production and consumption. However, palm oil production, like many other tropical agricultural commodities, offers opportunities for employment and incomes for small farmers in some of the poorest countries in the world. Palm oil has been credited with fuelling significant socio-economic development in Malaysia and Indonesia.

This section discusses the socio-economic impacts of the palm oil industry, focusing on the experience in the two countries. While there is certainly a case for positive socio-economic impacts from palm oil production, especially at a national level, this may not always be the case for farmers, workers and their communities. Complementary efforts to improve livelihoods and maximise socio-economic outcomes and minimise environmental impacts are required.

Development: At what level?

An analysis of the socio-economic impact of palm oil needs to examine two levels:

1. the macro-economic or national level, which looks at palm oil's impact on the national indicators; and
2. the micro level, which considers the impacts of palm oil on the lives of those involved, in particular with regard to poverty.

While related, development at the two levels does not necessarily progress at the same rate or even in the same direction, as inequalities may increase even as Gross Domestic Product (GDP) increases.

At the national level, economic development is typically assessed through the analysis of macro-economic indicators, as they can be relatively easily benchmarked against other countries. From this perspective, palm oil related activities that contribute to an increase in GDP (such as an increase in value added services, in the value of exports and in the number of jobs) can be considered to enhance economic development. The involvement of large multinational companies in the palm oil supply chain can also contribute to a country's economic performance and stability, not only through the payment of taxes and investment in infrastructure, but through the maintenance of a stable supply chain, for example Unilever's involvement in Indonesia.⁷⁶

75. Centre for Science in the Public Interest, 2005

76. Oxfam and Unilever, 2005

Palm oil and sustainable agriculture

“It is a red herring to focus on palm oil. The debate should be focused on sustainable agriculture, not sustainable palm oil.”

Quote from a prominent retail chain

Any analysis of palm oil and its production and consumption must take account of broader trends in population growth, changing diets, rising demand for oils, and sustainable agriculture in general. Interviews conducted for this report highlighted that in the absence of palm oil, another crop could cause similar environmental and social impacts. It was noted that palm is generally a highly efficient crop, producing large amounts of oil per area of cultivation.

Figure 23 illustrates that while palm kernel oil accounts for only 5 per cent of all land under vegetable oil production globally, it amounts to 38 per cent of all vegetable oils produced. While there can be a lot of variance in yields from palm oil production, at its best, palm oil is high yielding and can produce a lot of oil from small amounts of land area. An additional consideration is that many of the alternatives to palm oil are cultivated in more developed nations.

If concerns over palm oil use displaced palm oil cultivation with a lower yielding source of oil, it could drive greater deforestation or create a different set of social or

environmental impacts, not to mention remove a source of livelihoods for farmers and workers in developing nations. In this context, as one of the respondents highlighted, perhaps the debate should be around sustainable agriculture land use, especially considering the need to feed a growing global population.

Palm oil's land use to oil production efficiency may be an important part of meeting rising demand for food globally. Given oil palm is a formidable competitor with other vegetable oil crops in terms of oil yield per hectare, maximising yields from existing land under cultivation and directing new plantings to utilise already degraded or non-forest lands may not only be important activities towards sustainable palm oil, but more sustainable agriculture more generally. As another respondent noted, 'looking at palm oil sustainability, you are looking at a piece of the overall agriculture picture'. From a practical perspective, you 'need to start somewhere.'

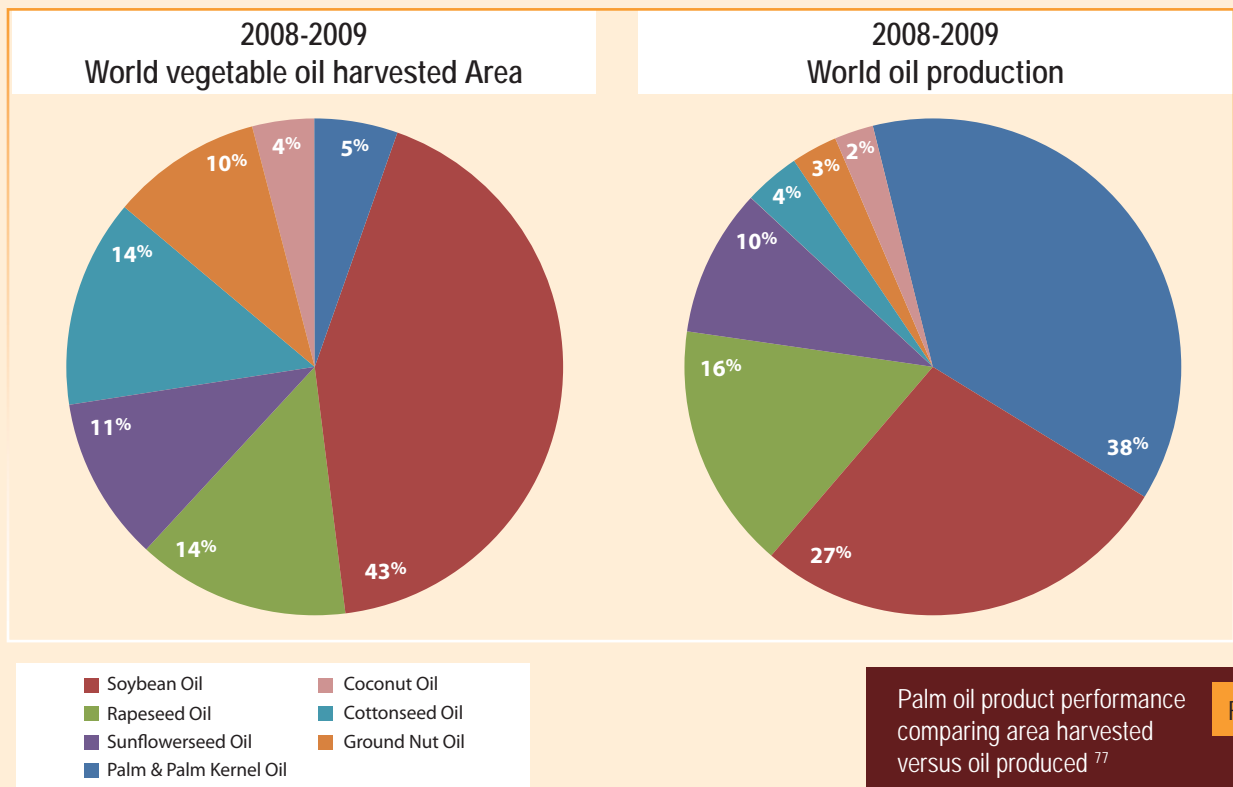


FIG.23

The micro level impacts of palm oil are difficult to ascertain, but can be considered by examining a combination of socio-economic factors that do not refer exclusively to monetary transactions but also consider health, education, community and cultural fabric as well as economic dependency and resilience, gender and other equality issues.

Palm oil and macro-economic development

Historically, primary industries (agriculture and extractive industries) have played an important role in economic development, with developing countries using their land-based resources as the main productive asset and cheap labour as a competitive advantage. As these countries develop industrial capacity, more sophisticated service industries and more value-added products emerge, as capital is accumulated and can be reinvested. Some analysts argue that palm oil has facilitated this transition in Indonesia and Malaysia.⁷⁸

Macro-economic indicators

Figure 24 was compiled with data from various sources, and shows Indonesia's GDP growth, export growth, and growth in crude palm oil production from the mid-90s until 2007. Although it would be erroneous to conclude from this graph alone that a correlation exists between palm oil production and GDP, it is likely that palm oil production (along with other factors) has contributed positively to Indonesian GDP and export growth.

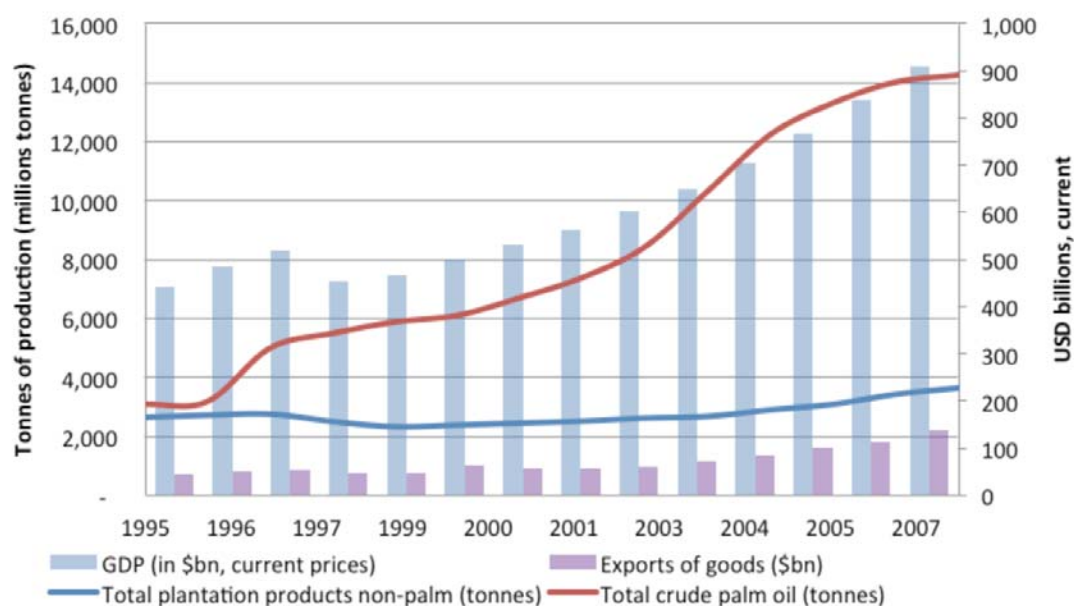
The importance of palm oil to Malaysia is also evident. In 2003, it was reported that agriculture accounted for 11 per cent of Malaysia's gross domestic product, and that 70 per cent of that 11 per cent was attributable to palm oil.⁸⁰

From a macro-economic perspective, exports are important, as they bring money into the country. Both Indonesia and Malaysia export the vast majority of their palm oil output — Indonesia currently exports 70 per cent and Malaysia exports approximately 87 per cent.⁸¹ The World Bank reports that the palm oil industry generated \$7.9 billion in exports in 2007 for Indonesia and \$19.6 billion for Malaysia in 2008,⁸² where a smaller proportion of the production is consumed locally.

In Indonesia, a significant proportion of the population is still rural and agriculture still contributes to around 15 per cent of the GDP (down from 22 per cent in 1988).⁸³ Unemployment is still around 30 per cent according to some estimates⁸⁴ or 10 per cent according to others,⁸⁵ and 17 per cent of the population is still below the national poverty line.⁸⁶ In Malaysia, agriculture contributes to 10 per cent of the GDP (down from 20 per cent in 1998), but only about one third of the population is now rural. Five per cent of the workforce, or 400,000 people are employed in the palm oil sector.⁸⁷ According to the World Bank, unemployment in Malaysia in 2007 was minimal (3.2 per cent,⁸⁸ as has been the case since the beginning of the 1990s).

When looking at an international indicator of poverty as opposed to a national poverty line, poverty is still a significant issue in producing countries.⁸⁹

FIG.24 Indonesian GDP and plantation production 1995-2007⁷⁹



78. World Growth, 2009

79. (OECD) and (Indonesian Statistical Office), n.d

80. Bhattacharjees, 2003

81. World Growth, 2009

82. World Bank, 2010

83. World Bank, 2009A

84. Friends of the Earth, 2005

85. World Bank, 2010

86. World Bank, 2009A

87. Friends of the Earth, 2005

88. World Bank, 2009B

89. World Growth, 2009

		1995	2000	2005	2007
Malaysia					
Population*	Million	20.7	23.5	26.1	27.2
Employment in agriculture*	per cent	20.0	16.7	14.6	14.8
Poverty indicator**	per cent	11.0	-	7.8	-
Indonesia					
Population*	Million	194.8	205.8	219.9	225.6
Employment in agriculture*	per cent	44.0	45.3	45.0	43.7
Poverty indicator**	per cent	84.6	-	53.8	-

* Percent of total employment

** Percent of population with less than US\$2 per day.

Indicators for 1993 and 2005 in Indonesia, and 1995 and 2005 in Malaysia

Key macroeconomic indicators
Malaysia and Indonesia
1995 to 2007⁹⁰

FIG.25

One interpretation is that a large proportion of the population is still living on \$1 to \$2 a day in Indonesia, despite rises in GDP (refer to Figure 25).

Key macro-economic issues facing the industry

One widely reported benefit of the palm industry is high yield per hectare compared to other oil crops. As we have seen in the previous chapters, while palm oil accounts for only 5 per cent of all land in vegetable oil production globally, it accounts for approximately 38 per cent of all vegetable oils produced (refer to Figure 23). Considering this, the economic returns from palm oil production at a national level and for an individual business owner might be expected to be quite high. However, there are significant disparities observed between the best and the worst performing plantations. The World Bank reports that the best estates in Southeast Asia are producing more than 7 tonnes per hectare area whereas some smallholders are producing less than half a tonne. The causes of this variation are diverse, including access to fertilisers, suitable agronomic advice, and the suitability of soils. Some analysts highlight the opportunity to increase yields as a way to both increase revenues and reduce demand for land.⁹¹ What may also be required is more investment in improving the yields and increasing the efficiency of the palm oil production process in order to ensure that economic returns occur not only at a macro level but also at individual landholder levels. Then again, there is a question as to whether this is possible while preserving the interests of smallholders and traditional landholders.⁹²

A related concern on the underperformance of palm oil that has emerged is that key producers, in particular Indonesia, do not deploy their land assets efficiently in

the production of palm oil. It is believed that the area of palm oil actually planted is several times smaller than the area of land authorised to be cleared for that purpose, particularly in Indonesia,⁹³ leading to wastage and land degradation, among other issues. This may reflect plantation failure, but it is likely to also reflect forest being cleared under the guise of establishing a plantation, but with the actual objective of harvesting valuable timber and offsetting plantation set up costs through logging revenues. Recent government moves to address this may reduce this problem in to the future.

Recent analyses point out that palm oil prices have been declining since 2008 while production costs have risen (fertiliser costs represent up to 50 per cent of the total production costs and are linked to fossil fuel prices),⁹⁴ eroding margins. While prices for palm oil have increased as a result of demand for biofuels, they are also subject to the volatility of the petroleum market. The Centre for International Forestry Research points out that 'there must be a balance between [palm oil] prices being low enough for biofuel production while remaining high enough for oil palm plantations to be profitable', and that converting palm oil into biofuel currently requires subsidies.⁹⁵ This highlights the complex links between yield and fertiliser use, with the possible consequences of raising the cost of production, creating pollution issues and making growers dependent on distributors of fertilisers.

Another aspect of the versatility of palm oil uses and the globalisation of markets is the potential to price local food use out of the market.⁹⁶ Countries, including Indonesia, are both large producers and users of palm oil: when international demand and prices increase, supplying local markets may become uncompetitive for producers and local prices for palm oil and substitutes may increase.

90. World Growth, 2009

91. Global Oils and Fats Business Magazine, 2009

92. Gingold, 2010

93. CIFOR, 2009

94. Teoh, 2010

95-96. CIFOR, 2009

Palm oil and micro level impacts

1. Employment

The palm oil industry provides considerable levels of employment. Largely due to the low level of mechanisation, which is highly variable from plantation to plantation, oil palm plantations employ about 30 times more people per hectare than substitute oils such as soybean. The RSPO estimates that three million people are directly employed in the industry in Indonesia⁹⁷ (although other sources mention one million)⁹⁸ and up to six million worldwide. Job creation is higher where smallholders are involved. It is estimated that 40 per cent of the palm area in Southeast Asia is under smallholder management, involving one million smallholders. This proportion is higher in sub-Saharan Africa at around 80 per cent.⁹⁹

Due to the higher standard of living in Malaysia, Indonesia out-competes Malaysia in terms of labour cost by five times and in cost of land by four times. Indonesia is therefore the cheapest producer of palm oil in the world.¹⁰⁰ Looking ahead, other equatorial countries (in sub-Saharan Africa, for example) could compete with Indonesia on this basis. This puts some pressure on wages and revenues, although productivity and other production costs must also be taken into consideration in determining the competitive advantage of various countries.

2. Land and social conflicts

Land and social conflicts are major challenges for the palm oil sector.¹⁰¹ More than 40 million people in Indonesia rely on forests for their livelihood.¹⁰² With little or no formal land rights, forest dwelling people have struggled to hold on to their customary lands. As demand for palm oil increases, governments in Malaysia and Indonesia are under increasing pressure to develop land held under Native Customary Rights. In West Kalimantan, five million forest dwellers are at risk of being displaced by palm oil development.¹⁰³

The Consortium for Agrarian Reform in Indonesia collected data on human rights violations from land conflicts from 1998 to 2002 and reported numerous instances of human rights violations. Although a direct link between these human rights violations and palm oil is far from concrete, there is a link between increased land pressure and the potential for conflict. Conflict can occur between smallholders, local communities, indigenous peoples and plantation companies, as well as the government. Many of the issues relate to questions concerning land rights and ownership, land use and land acquisition.¹⁰⁴ Several detailed studies have been performed, highlighting it as a real issue for the palm oil industry.

3. Individual income, poverty and livelihood

While there is evidence of a direct link between palm oil and increased employment, there is debate on the conditions of employment and whether incomes derived by either workers in the industry, or smallholders cultivating oil palm on their own land, are enough to reduce poverty and create a flow-on impact for the economy by increasing disposable income.

Key issues include:

- » Low salaries for labourers
- » Poor working conditions and social safeguards such as healthcare
- » High performance targets, which put pressure on workers to bring in family to help
- » Inequalities between permanent and casual workers (including imported workforce) and gender
- » Dependency of smallholders on one distribution channel (often controlled by a big conglomerate company)
- » Exposure to fluctuating international prices for palm oil.

In Malaysia there is mixed opinion on this topic. On the one hand, the incidence of poverty in agriculture as a whole had reduced from 68.3 per cent in 1970 to 11.8 per cent in 1997.¹⁰⁵ Recent statistics are not available but some claim that 'the oil palm farmer in FELDA (Federal Land Development Authority) gets a monthly income which is well above the national poverty line.'¹⁰⁶

On the other hand, in 2001, an agreement on minimum wages stipulated that oil palm workers will receive a guaranteed monthly wage of RM325 (US\$92) which was criticised because it represented only 80 per cent of the basic poverty-level wages in the country.¹⁰⁷

CIFOR notes that "90 per cent of the plantation labourers in Sabah (Malaysia) are Indonesians and do not necessarily get the rights and protection that a Malaysian labourer would demand."¹⁰⁸

This does not mean that actions cannot be taken to address these issues as work on sustainable supply chain progresses. For example:

- » Investigate an increased proportion of land allocations for small holders
- » Integrate cattle to the palm oil plantation to increase and diversify incomes
- » Enforce regulations around minimum wages and working conditions
- » Provide smallholders with sufficient advice and training with a view to increase productivity and hence revenues¹⁰⁹
- » Remove intermediaries between producers and socially conscious multinationals.¹¹⁰

97. World Bank, 2010

98. Friends of the Earth, 2005

99. World Bank, 2010

100. Friends of the Earth, 2005

101. World Bank Group, 2010

102. Colchester, 2006

103. Tauli-Corpuz, 2007

104. World Bank Group, 2010

105. Friends of the Earth, 2005

106. Global Oils and Fats Business Magazine, 2009

107. Bhattacharjees, 2003

108. CIFOR, 2009

109. World Bank Group, 2010

110. OXFAM and Unilever, 2005

Health and nutritional impacts

As palm oil is primarily used as an edible product in a wide variety of foods, the health and nutritional impacts of the oil is important.

Fats in the food supply

Fats are one of the six major classes of nutrients in food (along with carbohydrates, minerals, proteins, vitamins and water). Fats are made up of fatty acids and can be grouped into two major classes – saturated and unsaturated (polyunsaturated and monounsaturated). Trans-fats occur naturally in animal products and can be formed in the process of turning liquid oils in to solid fats (hydrogenation).¹¹¹

Figure 27 summarises the different types of fats. Generally, fats contain a mixture of saturated and unsaturated fatty acids. Fats with a higher saturated fatty acid content tend to be solid at room temperature, and those with higher unsaturated fatty acid content tend to be liquid.

The physical properties of fats dictate their suitability for various uses. Fats that are solid at room temperature

(those with higher saturated and/or trans-fat content) are suited to baking applications, since these fats give the end product a firm or crisp texture. These products are typically biscuits, cakes and pastries. Both solid and liquid (sometimes called hard or soft) fats are suitable for frying applications.

Palm oil is relatively high in saturated fatty acids compared to other vegetable oils at about 50 per cent (compared to canola 6 per cent, sunflower 11 per cent and olive 14 per cent). Two fractions of palm oil are typically used, stearin which is harder and has about 60 per cent saturated fatty acids and olein which is softer and has about 45 per cent saturated fatty acids. Stearin is solid at room temperature and typically used for baking, olein is a liquid and typically used for frying.

Good fats, bad fats

The links between fats in our food, cholesterol in our blood and risk of coronary heart disease has been widely studied. It is the single largest cause of death in Australia, resulting in over 26,000 deaths (nearly 20 per cent) nationwide in 2002.¹¹²

Cholesterol is largely made up of high-density lipoprotein or 'good' cholesterol and low-density lipoprotein or 'bad' cholesterol. These have become known as good and bad cholesterol due to their raising or lowering the risk of coronary heart disease. How much good and bad cholesterol we

Right to development

Developing countries such as Indonesia and Malaysia have a right to utilise their natural resource base (such as forests) as developed nations have already done to achieve economic development.

The 'right to development' viewpoint was mentioned in the context of palm oil by those interviewed for this report. This argument is based on the idea that developed nations, whose growth was historically driven in large part from what would today be deemed 'unsustainable', should not stop developing nations from using their own resources for a similar goal.

This issue, which was also a fundamental point of disaccord during the UNFCCC negotiations in Copenhagen, is contentious and often rekindles post-colonial tensions between developed and developing nations.

Sovereign control over resources for development is a strong motivator in developing countries, and external interference on the grounds of 'sustainability' is often resisted quite strongly.

For those working towards more sustainable palm oil, engaging and partnering with national governments of major palm oil producing countries is essential. Enabling governments to achieve economic and social development, while preserving environmental resources and minimising environmental damage, would appear to be a necessary platform. Those looking to ban palm oil completely are likely to face strong opposition.

111. The Food Group, 2009

112. Australian Institute of Health and Welfare, 2004

have in our blood is influenced by the types of fats we eat. Saturated fatty acids tend to raise LDL, so these fats are often called 'bad fats'. Monounsaturated and polyunsaturated fatty acids tend to increase HDL, these are called 'good fats'. Trans fatty acids have a dual effect of both increasing the bad cholesterol and reducing the good cholesterol. For this reason health authorities are recommending that trans-fat intake be minimised (<1 per cent of energy intake recommended by the World Health Organisation¹¹³) and many Western countries have required that trans-fat content be displayed on food packaging. As a result a number of manufacturers have adopted palm oil as a substitute for trans-fats due to its ability to replicate some properties of oils high in trans-fats without the trans-fat content.

Palm oil, with its lack of trans-fats, is considered to be a good alternative to animal and partially hydrogenated fats which contain trans-fats (Figure 28). However, due to its high concentration of saturated fat, palm oil can lead to increased health risk when compared with other liquid vegetable oils high in unsaturated fats such as canola, soy and olive.

Efforts have been made to develop alternatives to hydrogenated oils and palm oil to avoid the health issues associated with trans-fats and highly saturated fats. The purpose of this work has been to produce oils with higher stabilities, giving them longer shelf lives and better thermal properties enabling them to endure high temperatures without breaking down. An example is high-oleic oils where canola, corn, soybean, sunflower and safflower versions are available.

Dow AgroSciences have developed high-oleic canola and sunflower crops which can be used in a range of applications including frying and baking.

Palm oil substitutes

The use of palm oil in food has increased due to its versatility. While low in trans-fats, it does however increase the risk of coronary heart disease compared to unsaturated fats and oils. For this reason processors and manufacturers are looking for alternatives.

In its liquid form (olein), palm oil is typically used for frying applications. Ideally replacement oils would contain no trans-fat and have low saturated fat content, and consequently high unsaturated fat content and would provide similar function and quality in terms of product performance. Many of the other vegetable oils are suitable for such applications, and blends of less than 20 per cent saturated fat have been used in commercial fryers in Australia for over a decade. McDonald's adopted unsaturated frying oils in 2004¹¹⁴ and KFC has recently announced the use of Australian grown canola oil.¹¹⁵

However, replacing palm oil in its solid form (stearin) is more difficult. Stearin is typically used as shortening in baking applications due to its hardness, lack of trans-fats and cost. Typical alternatives currently include butter and hydrogenated fats, both of which contain trans-fat, and so are not recommended alternatives from a health and nutrition perspective. Despite these difficulties, there are alternatives using more stable

FIG.27 Fat type summary¹¹⁶

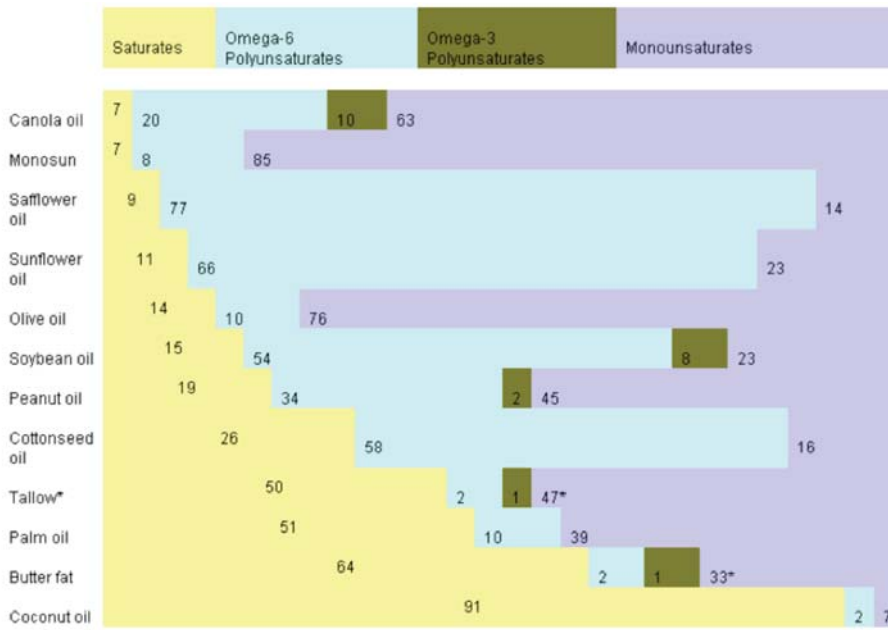
Nutrition	Fat type	Examples	Uses	Alternatives
Worst	Trans	Animal fats Hydrogenated vegetable fats	Baking	
	Saturated	Palm oil Animal fats	Stearin (baking) Olein (frying)	Stearin (developing) Olein (canola, sunflower)
Best	Unsaturated	Canola Soy Sunflower	Frying	

113. WHO, 2003

114. The Food Group, 2009

115. The Food Group, 2009

116. AOF, n.d



* Tallow and butter fat contain approximately 5% trans fat which is declared as a monounsaturated in this table

Fatty acid composition of common fats and oils ¹¹⁷

FIG.28

(harder) fats created by interesterification.¹¹⁸ There are more stable versions of canola, soy and sunflower oils available and some brands are starting to use these e.g. Whole Foods and Country Choice in the United States. However, these alternatives are more expensive than stearin.¹¹⁹

Consumer preferences

The move towards palm oil and away from trans-fats, and the broader discussion of 'healthy oils' is not something familiar to most consumers. To date, NGO campaigns on the negative impacts of unsustainable palm oil and the coverage of these campaigns in the mainstream media as well as the attempted legislation on palm oil labelling, have given primacy to consumer attention on sustainability. This also reflects trends in broader areas than palm oil, with NGO and consumer attention to sustainability credentials on the increase

generally (e.g. Fairtrade), and successful targeting of companies on other commodities such as coffee and cocoa.

The communication of the trans-fats issue, and the changes to ingredients associated with producing healthy products more generally, is a missed opportunity for industry to engage consumers and explain their sourcing activities. Although most consumers would indicate their preference for sustainable products, the health impacts of certain foods are much more influential to buying decisions. For example, according to the Australian Oilseeds Federation, on a product that contains a high-oleic oil substitute to palm oil, if a Heart Foundation 'tick of approval' is on the label this will be much more influential than a 'palm oil free' label.¹²⁰ While this may be true, at the moment, the primary issue in the public domain for palm oil is the sustainability of its production. Its health implications are poorly understood.

117. AOF, n.d

120. AOF, n.d

118. The Food Group, 2009

119. Centre for Science in the Public Interest, 2005

Towards sustainable palm oil

Chapter highlights

- » Palm oil will continue to be used in the long term, meaning the challenge in the coming years will be to meet current and future demand in a sustainable manner.
- » The main initiative towards sustainable palm oil has been sustainability certification, a process by which palm oil that is produced according to certain principles and guidelines is deemed sustainable. The main certification body for this is the Roundtable on Sustainable Palm Oil (RSPO).
- » The Roundtable on Sustainable Palm Oil (RSPO) is a not-for-profit association that brings together stakeholders from five industry sectors, plus social and environmental NGOs.
- » At the end of 2011, RSPO certified palm oil represented about 10 per cent of total global production of palm oil.
- » The RSPO has come under scrutiny. Several concerns and challenges have been raised regarding processes by different stakeholders, including a structural pro-industry bias, weak definitions and criteria, monitoring and enforcement, ease of membership, weak demand for certified sustainable palm oil, non-compliant new members, traceability, lack of an independent monitor, low premiums for CSPO, and a lack of transparency in the supply chain. Yet, the RSPO is the only organisation that brings all the major growers and users of palm oil together in the same forum to promote the growth and use of sustainable palm oil.
- » Regulatory, economic, technological and consumer awareness raising measures could be designed and implemented in parallel to certification schemes.
- » There are a number of recent initiatives at an industry level that may serve as useful models for a potential approach in Australia, e.g. the Dutch Task Force for Sustainable Palm Oil, that is pursuing 100 per cent sustainable palm oil for the Dutch market by 2015 through industry collaboration.
- » Company partnerships and initiatives to achieve more sustainable palm oil outcomes are also evident, for example a project partnership between Nestlé, leading palm oil supplier GAR and the NGO 'The Forest Trust' & a project by integrated palm oil producer New Britain Palm Oil to achieve 100 per cent RSPO certified palm oil supplies by the end of 2012.

Towards sustainable palm oil

Given the current global drivers palm oil will continue to be used, despite its sometimes negative social and economic impacts. Growing demand is likely to lead to an expansion in overall output. The challenge will therefore be to meet demand in a sustainable manner.

A number of initiatives already exist to encourage a sustainable palm oil industry. The main initiative and driver is sustainability certification, a process by which palm oil that is produced according to certain principles and guidelines is deemed sustainable. The main certification body is the Roundtable on Sustainable Palm Oil. Regulatory, economic, technological and consumer awareness raising measures complement the RSPO certification process.

Defining sustainable palm oil

Before discussing measures of sustainability, it is important to define what sustainability means in the context of palm oil. There is no clear, universally accepted definition of sustainable palm oil. Although several definitions exist, some are perceived as biased towards the interests of the group presenting the definition.

The RSPO definition has been developed and adopted by a multi-stakeholder system and has a large international acceptance. The RSPO offers a comprehensive set of 39 criteria with corresponding indicators. These criteria are grouped under the following eight principles:

1. Commitment to transparency
2. Compliance with applicable laws and regulations
3. Commitment to long-term economic and financial viability
4. Use of appropriate best practices by growers and millers
5. Environmental responsibility and conservation of natural resources and biodiversity
6. Responsible consideration of employees, individuals and communities affected by growers and mills
7. Responsible development of new plantings
8. Commitment to continuous improvement in key areas of activity.¹²¹

As a starting point, the RSPO definition provides a workable and generally agreed framework for discussing sustainable palm oil.

Sustainability certification

The Roundtable on Sustainable Palm Oil

The RSPO is a not-for-profit association formed to 'promote the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders.'¹²² It brings together stakeholders from seven sectors of the industry (producers, processors and traders, consumer goods manufacturers, retailers, banks and investors and non-governmental organisations) to develop and implement global standards for sustainable palm oil.¹²³ Based on the roundtable philosophy, each stakeholder group has equal rights and opportunities to bring group-specific agendas to the roundtable.¹²⁴ The RSPO was established in April 2004 by Aarhus United UK Ltd, Golden Hope Plantations Berhad, Migros, Malaysian Palm Oil Association, Sainsbury's, Unilever, and the World Wildlife Fund (WWF).¹²⁵

The RSPO has 1,189 members as at 1st March 2013, 33 of which are Australian organisations. Members of the RSPO are required to adhere to the Code of Conduct. The RSPO has also developed a set of standards called the *Principles and Criteria (PandC)*¹²⁶ that define the practices for sustainable palm oil production.

According to the RSPO *Code of Conduct*, producer members of the RSPO are expected to implement the *PandC* and to subsequently have their palm oil production facilities RSPO certified. Non-producers are expected to implement equivalent standards in their procurement and use of palm oil.¹²⁷



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121-124. RSPO, 2012C
126. RSPO, 2009A

127. The full document can be found online at: [http://www.rspo.org/files/resourcecentre/RSPO per cent20Principles per cent20and per cent20Criteria per cent20Document.pdf](http://www.rspo.org/files/resourcecentre/RSPO%20Principles%20and%20Criteria%20Document.pdf)

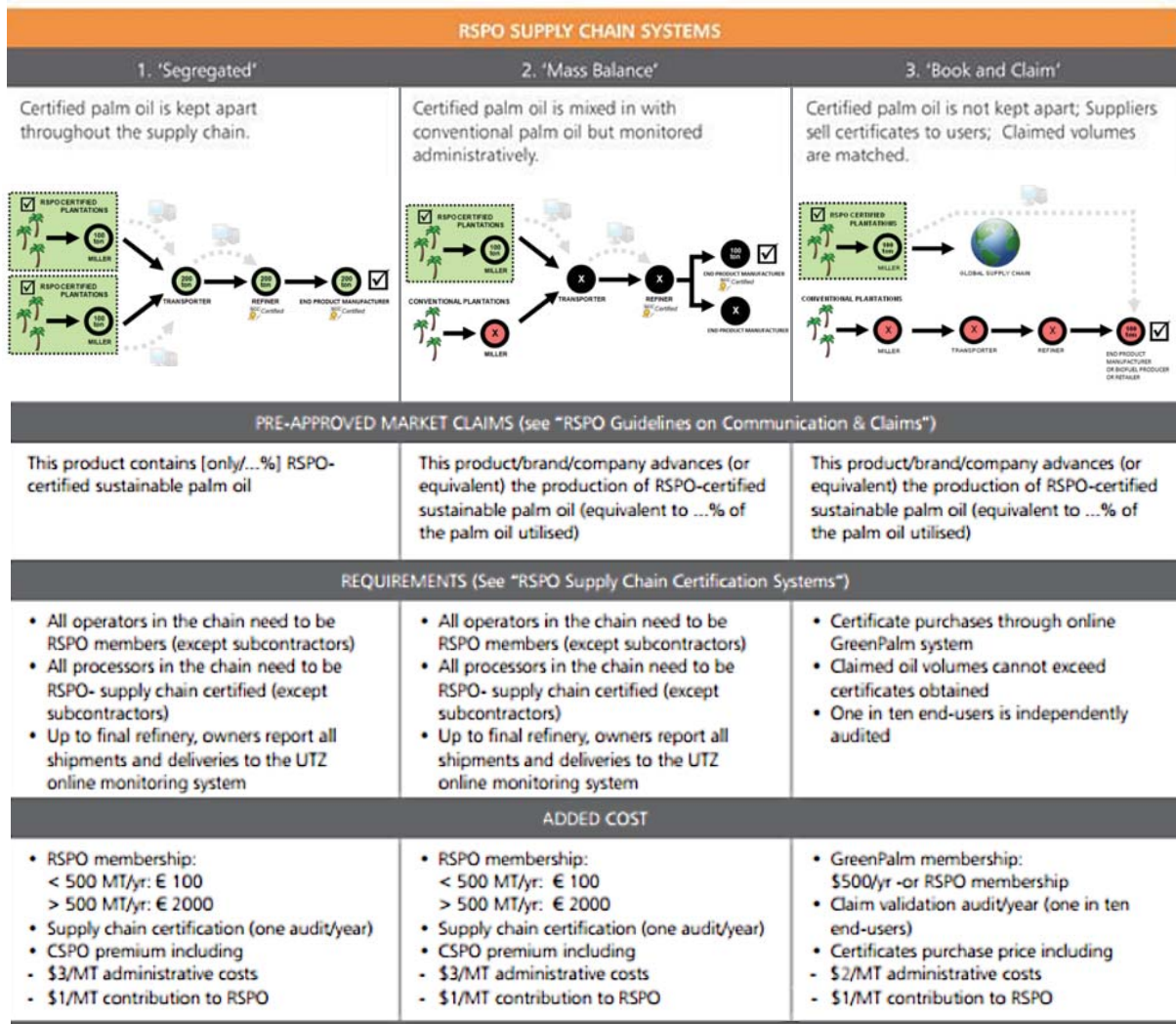


FIG.29 RSPO certification methods ¹²⁸

The RSPO supports three methods of bringing Certified Sustainable Palm Oil (CSPO) to the market—segregation, mass balance or book and claim. These different methods are illustrated in Figure 29.

At the 2010 meeting of the RSPO, a RSPO trademark logo was launched to enable consumers to identify products containing CSPO ingredients.¹²⁹



Summary as of 31 July 2012

		2008	2009	2010	2011	2012 Total	Jul'12	2008-2012 Total
Certification	No of SCC Companies	n/a	n/a	n/a	n/a	45	6	183
	No of SCC Facilities	n/a	n/a	n/a	n/a	103	8	378
	No of Grower certified	5	5	9	10	5	0	34
	No of Palm Mills Certified	16	18	43	58	23	4	158
Production	Production Area (ha)	106,384	264,952	644,816	1,130,969	-	1,302,998	(> todate)
Annual Production Capacity	FFB (mt)	2,151,916	5,709,784	16,066,742	26,680,440	-	29,349,738	(> todate)
	CSPO (mt)	619,012	1,473,912	3,522,207	5,573,202	-	6,300,062	(> todate)
	CSPK (mt)	154,335	338,740	803,999	1,296,488	-	1,468,694	(> todate)
Supply	CSPO (mt)	163,364	1,357,511	2,773,567	4,798,512	3,568,124	545,864	12,661,078
	CSPK (mt)	41,811	321,322	640,316	1,111,998	828,513	127,296	2,943,959
Sales	CSPO Sales through SG, MB	0	98,044	438,515	831,010	469,877	67,341	1,837,446
	CSPO Sales Through B&C	4,452	245,813	842,619	1,659,516	1,464,459	123,648	4,216,859
	CSPKO Sales through B&C	3,520	6,636	82,464	269,665	161,049	4,595	523,334
	Total CSPO Sales	4,452	343,857	1,281,134	2,490,526	1,934,336	190,989	6,054,305
Uptake	CSPO Sales / Supply (mt)	2.7%	25.3%	46.2%	52.0%	54.2%	35.0%	-

Palm oil certification, production, capacity, supply, sales and uptake ¹³⁰

TABLE 01

Global CSPO production and consumption

Table 1 indicates volumes of certified palm oil sold and produced globally, as well as production capacity and the number of RSPO certificate holders. While the RSPO has seen relatively high participation (see Figure 30), with RSPO membership accounting for

approximately 35 per cent of the global production of palm oil in 2009, only one tenth of this oil was certified as sustainable.¹³¹ However as at July 2012, 158 mills had been certified with a production capacity of 6.3 million tonnes. CSPO represents about 10 per cent of total global production of palm oil.

RSPO members growth by category ¹³²

FIG.30

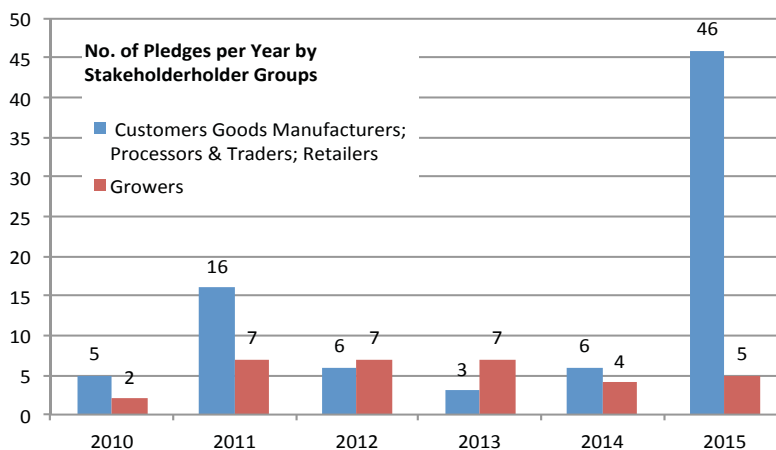


130. RSPO, 2012A

131. Laurence, 2009, Vol.24, No.2

132. RSPO, 2012A

FIG.31 No. of companies pledging to switch to sustainable palm oil by 2015 ¹³³



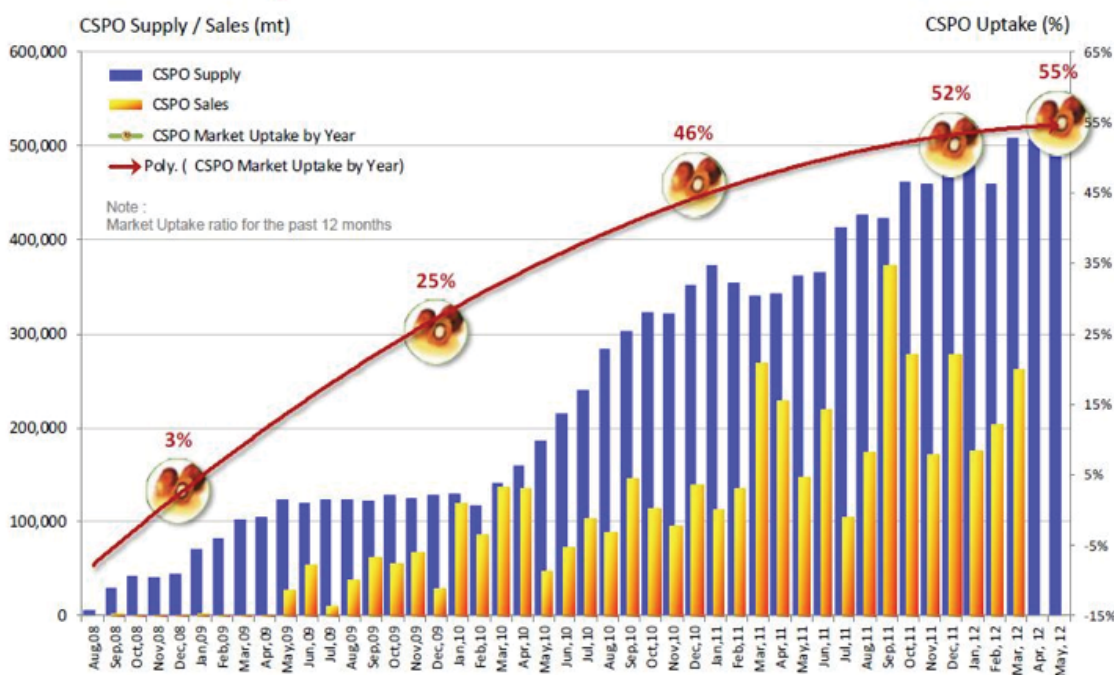
Increased pledges by companies to source sustainable palm oil (see Figure 31) have helped CSPO demand grow to 50% of a rapidly growing supply in recent years, as demonstrated in Figure 32, which shows the evolution of sales vs. supply. In the Australian context, many major palm oil users have made commitments to sustainable palm oil sourcing, yet actual use is still very low. There needs to be further investigation to understand why companies who have made these commitments are not yet able to meet them and what it would take for them to do so by the target years they have specified.

Globally, the CSPO demand and supply gap is due in large part to the behaviour of the largest current and future consumers of palm oil. China and India have

negligible uptake of CSPO and hence there is limited infrastructural development to isolate CSPO from the standard or regular product. The cost of CSPO may be a factor for business in these countries, with CSPO costing 8-15% more than uncertified palm oil.¹³⁴ Despite the presence of a large Chinese delegation at the 8th Roundtable meeting of the RSPO in November 2010,¹³⁵ there is no indication of a concerted push for CSPO from industry, government and civil society in these countries.

Further stimulating global demand for CSPO may require complimentary activities to increase uptake, such as regulatory or economic measures, that are discussed in the chapter Alternative pathways to sustainable palm oil.

FIG.32 Supply, sales and uptake of CSPO by year ¹³⁶



133. RSPO, 2012A

134. Laurence, 2009, Vol.24, No.2

135. CSR Asia, 2010

136. RSPO, 2012A

Organisation	RSPO Member Since	Pledge/Notes
Goodman Fielder Ltd	26/07/2005	Cover all PO used in the company's Australia and NZ retail branded products by 2015. ¹³⁸
Mission NewEnergy Ltd	6/11/2008	The company is developing its own sustainable biofuel feedstock material through contract farming of Jatropha. While Jatropha is ramping up, Missions Energy is using palm oil that is fully certified by the ISCC as sustainable (International Sustainability and Carbon Certification System). ¹³⁹
Peerless Holdings Pty Ltd	9/04/2010	Supports an industry wide commitment to source sustainable palm oil by 2015 and is actively working to establish a viable, sustainable and reliable supply chain. ¹⁴⁰
Australian Food and Grocery Council	25/06/2010	Encourage members to join RSPO and use CSPO. ¹⁴¹
Unilever	18/05/2004	Leading buyer of CSPO, over 35 per cent in 2010, aiming for 100 per cent by 2015. ¹⁴²
Cadbury	18/10/2004	Substituted palm with cocoa where possible, use CSPO where not. ¹⁴³
Nestlé Oceania	16/11/2009	Committed to using only "Certified Sustainable Palm Oil" by 2015, when sufficient quantities should be available. ¹⁴⁴
Coles	20/09/2010	Use only CSPO in all Coles branded products by 2015 ¹⁴⁵
Woolworths	3/09/2010	Use only CSPO for all private labels by 2015. ¹⁴⁶
Procter and Gamble	19/09/2010	Purchase and use only palm oil that we can confirm to have originated from responsible and sustainable sources. ¹⁴⁷
Cargill	28/06/2004	Palm oil supplied to our customers (excluding PKO) in EU, the United States, Canada, Australia and New Zealand will be RSPO certified by 2015. 100 per cent CSPO for all business by 2020. ¹⁴⁸

* Based on active RSPO membership, palm oil policy, purchase of CSPO and time bound pledges to increase CSPO purchasing.

Key members of the RSPO active in Australia¹⁴⁹

TABLE 02

Australian CSPO consumption

In 2009 WWF developed a European Palm Oil Buyer's Scorecard¹⁵⁰ which assessed the performance of European companies on sourcing sustainable palm oil. In 2010 an Australian version was released that benchmarked some of the Australian players against the Europeans. An updated international scorecard was released in 2011¹⁵¹ assessing more than 140 European, Australian and Japanese retailers and consumer goods manufacturers with regard to their commitment to, and use of, sustainable palm oil.

The 2011 Scorecard found Australian companies are making progress, with Goodman Fielder, Coles Supermarkets and Woolworths demonstrating progress on commitments and actions since the 2010 report. It is the European companies, though, who demonstrate the greatest leadership. This is reflected in sustainable

palm oil policies and internal systems to control the use of palm oil. Most of the larger players in Australia have now made some form of commitment to purchase more sustainably produced palm oil.

Goodman Fielder and Woolworths announced plans to source 100 per cent CSPO by 2015.¹⁵² Unilever has plans to purchase sufficient Green Palm Certificates to cover their use in Europe, Australia and New Zealand. Nestlé Oceania, which purchases some 7,000 tonnes of palm oil annually has committed to purchasing 100 per cent of corresponding Green Palm Certificates from 2010 onwards. Commitments of major Australian palm oil users towards sustainable palm oil are summarised in Table 2. If the pledges are met, the majority of palm oil used in Australia should be CSPO or equivalent by 2015.¹⁵³

137. WWF, 2010

141. RSPO, 2010A

145. Coles, 2010

149. RSPO, 2010D**

151. WWF, 2011

138. Goodman Fielder, 2010

142. Unilever, 2010

146. Woolworths, 2010

150. WWF, 2009

152. WWF, 2010

139. RSPO, 2010B

143. BBC, 2010

147. P&G, 2010

153. WWF, 2011

140. RSPO, 2010C

144. Nestlé, 2010

148. Cargill, 2010

** There are other Australian RSPO members, only large ones have been included - <http://www.rspo.org/?q=countrystat/Australia>

Laurence (2009) critiqued the RSPO from an environmental perspective and identified ways to increase its effectiveness in reducing threats to tropical ecosystems.

Challenges

Both the membership and executive boards are numerically dominated by industry. This structure is in contrast to other seemingly similar organisations such as the Forestry Stewardship Council where interest groups are equitably represented.

The RSPO provides insufficient protection to peat forests which are being preferentially targeted despite their relative unsuitability to oil palm due to their general ease of access, limited legal protection and relatively few land-right conflicts.

Non compliance by members to the Code of Conduct and the Principles and Criteria may be widespread according to reports from NGOs. These typically include destruction and cultivation on primary rainforest and peat forests by members and/or their immediate subsidiaries despite assurances to the contrary.

The RSPO lacks the budget or the apparent will to effectively monitor and police members.

Membership is considered to be too easy. Organisations can become ordinary members without having any certification provided they are putatively working toward certification and abiding by the code of conduct.

The climate change mitigation benefits of maintaining the often targeted lowland oldgrowth rainforest have been undervalued by the RSPO. This includes their carbon stocks and albedo effect of clouds from evapotranspiration.

The RSPO has also suffered from weak demand for CSPO. CSPO is between 8 and 15 per cent more expensive than uncertified oil. The two largest global markets of China and India have thus far shown little interest. In addition, the RSPO criteria are not sufficiently stringent to meet EU directives for renewable energy and fuel quality.

Potential solutions

Correct the pro-industry bias within RSPO, which should enable it to return to its mission to promote environmental sustainability.

Develop a credible monitoring and enforcement capability.

Take a stronger stance against deforestation, especially by its members.

Set up an independent watchdog to increase the credibility of the RSPO.

Promote the use of certified palm oil.

Place pressure on Governments to favour certified palm oil.

Label palm oil in products.

TABLE.03

Stakeholder concerns and challenges as highlighted in Laurence (2009)

RSPO: Concerns and challenges

The RSPO has come under scrutiny from stakeholders.¹⁵⁴ For example, in 2008 a Greenpeace Netherlands report stated that United Plantations, a prominent Malaysian oil palm plantation and the first company to be certified under the RSPO, was certified "despite gross violations of RSPO Standards."¹⁵⁵ Although the validity of these claims may be debated, a lack of confidence in a certification scheme can reduce the added premium that the label attracts, regardless of the validity of the claims. As such, it is in the interest of all stakeholders

to understand the concerns and challenges and work towards overcoming them.

In Table 3, Laurence (2009) presents some of the challenges and potential solutions from his book 'Improving the Performance of the Roundtable on Sustainable Palm Oil for Nature Conservation. In order to get a more recent view on the RSPO, the Net Balance Foundation interviewed some major players in the palm oil sector. Their perspectives have been presented on the next page. Rather than going into detail on each perspective, the purpose of this report is to highlight that a variety of concerns exist.

154. Laurence, 2009, Vol.24, No.2

155. Greenpeace Netherlands, 2008

Perspectives on the RSPO



"The RSPO is a key player due to the rigour with which it was formulated. It has engaged well with the NGOs and understands and at least has a foot in the door with important organisations."



"Believes that the only credible way is to go RSPO certified. That there is no pressure from these countries (China and India) for CSPO is the biggest issue for RSPO in terms of credibility."



"RSPO has been responsible for a lot of the progress that has been made in the industry. It is not an easy process. One of the issues is that unlike FSC certified sustainable timber, palm oil is not so easily traceable as a) derivatives issue b) traded as a commodity, oils get mixed together by trading companies in e.g. Rotterdam, so it is difficult to trace which plantation it comes from. If one is purchasing small quantities it is not practical to source it directly from the plantation. RSPO have faced one or two hurdles but they are making progress. One of the criticisms was that the RSPO was made up of growers and producers, to overcome difficulties of traceability and getting CSPO to end user, retailers are needed. In 2006 when Boots joined the RSPO it seemed like a large task to get industry moving on this – progress has been made."



"Nestlé is a member of RSPO and it is seen as a very important body, and only body of its kind so important to support. Nestlé has been a member for a long time and is an active member. Taking an industry approach is important as issues won't be solved by one company, need to work together. Also need to tackle issues as they relate to the company specifically."



"(We) haven't had an adequate voice, nor a meaningful dialogue with the RSPO. It is possible to hide behind the RSPO. For example, if one of your plantations is certified and many others are uncertified, you can still be 'RSPO certified'. RSPO cannot tell us who is buying CSPO. Chain of custody (segregation) is the only one supported by the Palm Oil Action Group."



"In an ideal world the RSPO guidelines should meet Nestlé guidelines – but TFT don't take this for granted when working with suppliers and plantations – experience has shown(TFT) that certification doesn't guarantee compliance. TFT in general does not endorse one scheme over any other. TFT respect the RSPO, but recognise that it has issues. TFT have joined the RSPO and are/will be feeding their learnings back into RSPO."



"There needs to be more recognition of the good work that the RSPO has done. The willingness has been there and growers need recognition from the market and to be given thanks for all the efforts they have made."

Based on interviews conducted by the Net Balance Foundation

The future of the RSPO

The RSPO is the only organisation that brings all the major growers and users of palm oil as well as social environmental NGOs together in the same forum to promote the growth and use of sustainable palm oil.

The 2011¹⁵⁶ growth analysis showed year-on-year supply of CSPO increased by 73 per cent and the

year-on-year sales volume surged by 94 per cent.

In that year the RSPO witnessed its highest ever presence from members all over the world. In addition, a number of resolutions were passed and a new vision statement was adopted. An important feature of these achievements is the growing interest, participation and commitment of members towards sustainable palm oil.¹⁵⁷

156. RSPO recently released its inaugural qualitative review entitled: '2011 RSPO CSPO Growth Interpretation Narrative' (GIN) - the first of its kind narrative for any sustainable commodity - an annual report aimed at recording and analysing the growth and trends of RSPO and CSPO in the global marketplace. It is available on www.rspo.org

157. RSPO, 2012B

Alternative sustainability certification initiatives

Producer country certification schemes

Given national and cultural differences among producer countries, Cheng Hai Teoh, the first Secretary-General of the RSPO, suggested that producing countries should develop their own certification systems that could then be accredited by the International Organisation for Standardisation (ISO).¹⁵⁸

In 2011, GAPKI (the Indonesian Palm Oil Association) withdrew its membership from the RSPO and now support the mandatory government driven Indonesian Sustainable Palm Oil (ISPO) scheme. The ISPO scheme is designed to make palm oil production sustainable in compliance with Indonesian laws and regulations. In 2012 the Indonesian Government asked producers to submit applications to the mandatory scheme so that all palm oil plantations are certified by 2014.^{159 160}

Similar talks are underway in Malaysia where the Malaysian Government plans to develop their own palm oil scheme similar to that adopted by Indonesia.¹⁶¹ A major issue with country specific certification schemes is that in order that they are acceptable to foreign markets they need to be credible. At the moment the relationship between these country schemes and RSPO remains uncertain.

Rainforest Alliance Certified Palm Oil

The Rainforest Alliance and other NGO members of the Sustainable Agriculture Network (SAN) developed the first certification standard for sustainable agriculture in the early 1990s, which has been extended to palm oil.

Farms that meet the exacting criteria of the SAN standard for palm oil can earn the Rainforest Alliance certificate.

This collaboration has been successful in training 600,000 smallholder farmers and plantation managers in best practices and brought certified sustainable products to mainstream markets.

Palm oil producers are being taught to reduce the environmental impacts and increase the social benefits on farms, and prepare to meet the SAN standard without which the Rainforest Alliance certification cannot be claimed.¹⁶²

11.

Pathways to sustainable palm oil

Supply side measures

Malaysian and Indonesian governments

Efforts have been made by both Malaysia and Indonesia to reduce levels of deforestation. In Malaysia more than 55 per cent of land has been reserved for forest, and in Indonesia this figure is 25 per cent.¹⁶³ Both the Malaysian and Indonesian Governments have banned the use of clearing fires. In Indonesia it is now illegal to develop land with a peat depth of more than three metres and some areas are protected under national park and forest protection initiatives.

The Indonesian Government has implemented a number of measures to promote the use of already degraded lands for palm oil plantations. With financial help from Norway it has announced a two-year moratorium on new concessions to clear natural forests and peatlands. Although this is not specifically targeting the palm oil industry, it will impact the industry directly, encouraging greater productivity measures in the absence of new land (including the removal of subsidies that incentivise forest clearing, clarification of land tenure and land classification, and the withdrawal of inactive concessions). A 2012 report from the World Resources Institute identified approximately 7 million hectares of degraded land as potentially suitable for oil palm production in the Indonesian provinces of West Kalimantan and Central Kalimantan alone, while experts have predicted a total of 3 to 7 million hectares of oil palm cultivation expansion in all of Indonesia.¹⁶⁴

Complementary to this, the Indonesian Government launched initiatives which aim to reduce the amount of illegal logging and forest destruction. An example is the training of specially equipped ranger units to protect the parks.

Although the initiatives are in principle in the right direction, several challenges exist:

- » A lack of institutional capacity, unclear governance structures, and weak management systems mean that policies are not being effectively translated into action. Problems occur at various levels, meaning that although governments of major producer countries may have appropriate laws and regulations, poor planning and weak enforcement, particularly with regard to land development, could put high conservation value land at risk.¹⁶⁵

158. Teoh, 2010

159. World Bank, 2010

160. UNEP, 2007

161. Commission of the European Communities, 2008

162. Xenophon, 2009

163. Asia Green Capital, 2009

164. WRI, 2012

- » Significant under resourcing could limit the ability of groups (e.g. park rangers) and organisations with an environmental mandate to contribute to a sustainable palm oil industry. The UNEP's World Conservation Monitoring Centre has called for substantial strengthening to deal with the scale of the immediate problem of deforestation.¹⁶⁶

Technological pathways

Improving productivity

Improving land productivity is a solution that brings not only net economic benefits but also environmental benefits. It is one of the most effective ways to improve the profitability of the sector and mitigate rising production costs. Additionally, increased productivity could reduce the pressure to open new land.¹⁶⁹

Improving yields in Indonesia to those of Malaysia (ie. a 20 per cent improvement) could fulfil around a quarter of projected growth by 2020.¹⁷⁰ Many of those interviewed, including the Australian Oilseeds Federation, Unilever and palm oil growers and producers saw this pathway as one of the most cost effective and efficient means of achieving sustainable palm oil.

Capturing waste streams for power generation

A promising area for applying technology to achieve more sustainable palm oil production is the use of organic waste material from palm kernel processing in energy generation. The development of biogas plants, for example, could reduce waste and greenhouse gas emissions from decaying organic matter, and generate

electricity for palm oil processing or other commercial or community activities. Opportunities in this area are currently limited by the strength of the carbon market and access to finance and local capacity, but are worth exploring as part of a broader approach to sustainable palm oil.

Economic pathways

Recently governments in developed countries have been working with the Indonesian Government to provide financial incentives to reduce deforestation and consequent greenhouse gas emissions under the United Nations Program for Reducing Emissions from Deforestation and Forest Degradation (UN REDD+).¹⁷¹ For example, Norway has made up to US\$1 billion available to Indonesia based on emissions reduction performance over the next seven years.

The basic idea of REDD+ is for developed countries to compensate forest-rich developing countries to preserve their forests. It involves placing a value on forest carbon that will enable forest conservation to compete financially with the traditional drivers of deforestation. In addition to addressing climate change, REDD+ could also deliver significant co-benefits, such as conserving biodiversity, and reducing poverty.

However, although the overarching principle of REDD+ is relatively straight-forward, determining how it will work in practice is proving complex and progress has been slow. Issues such as land tenure, indigenous rights, funding mechanisms, corruption and emission baseline levels are topics of much debate among government, corporate and community stakeholders.

What makes a company switch to sustainable palm oil?

From interviews with palm oil actors, three main reasons for company switches and commitments to sustainable palm oil were identified. Quite often, it was a matter of emphasis for companies between the three reasons, with the drivers very often inter-related.

1 Supply chain pressure

Requirements from large customers, including retailers, to disclose on ethical and sustainable sourcing and meet product specifications on sustainable palm oil.

2 Consumer and NGO demands

High profile NGO campaigns (e.g. Greenpeace, WWF) and mobilisation of consumer segments asking companies to shift to sustainable palm oil.

3 Corporate positioning

Decisions by companies, particularly driven by strong Corporate Social Responsibility agendas and sustainability reporting, and tied to ethical and sustainable sourcing.

165. World Bank, 2010

166. UNEP, 2007

167. Commission of the European Communities, 2008

168. RSPO, 2011

169. World Bank, 2010

170. World Bank, 2010

The initial stages of the agreement between Indonesia and Norway are policy and governance reform, which may provide the land use planning processes, land tenure clarity and law enforcement capacity needed to reform 'business as usual' and support a sustainable palm oil industry. A condition of the funding agreement was a two year moratorium on all new concessions to clear primary forests or peat lands.^{172 173}

Demand side measures

EU sustainability criteria for biofuels

Amid the increasing demand for biofuels and the associated environmental concerns of feedstock production, the EU introduced a directive requiring clear sustainability criteria for biofuels to contribute to national biofuels targets, and thus be subsidised by national governments.

These criteria have been in place since 2010 and relate to emissions reductions, land with high biodiversity value, land with high carbon stock and agro-environmental practices.

The EU encourages industry, governments and NGOs to set up 'voluntary schemes' to certify biofuel sustainability. Independent auditors check the whole production chain, from the farmer and the mill, via the trader, to the fuel supplier who delivers petrol or diesel to the filling station.

The directive also clearly states that EU Member States have to meet binding, national targets for renewable energy and that only those biofuels with high greenhouse gas savings count for the national targets. The directive mandates a 35 per cent reduction in carbon emissions (excluding land use change contributions) when compared to fossil fuel use, rising to 50 per cent in 2017 and to 60 per cent (for biofuels from new plants) in 2018.¹⁶⁷ RSPO is being considered

for recognition for one of a range of voluntary standards that can be used to prove compliance.¹⁶⁸

The impact of this measure on the sustainability of palm oil is unclear, as it does not mean that 'unsustainable' palm oil cannot be imported to the EU. A variety of market forces will determine the extent that this measure effects sustainable production of palm oil.

Labelling

The major regulatory issue on the consumer side is related to labelling. In Australia a number of NGOs and Zoos Victoria have run an awareness-raising campaign calling for palm oil to be labelled in consumer products. In 2009 a food labelling bill was put to the Senate suggesting an amendment to the current labelling legislation requiring palm oil use (either in the product or manufacturing process) to be declared. Manufacturers would also be required to state whether certified sustainable palm oil has been used.¹⁷⁴ This was opposed by the Australian Food and Grocery Council on the basis that food labels should only be used to provide information relating to health, nutrition and safety.¹⁷⁵ The Food Standards Australia and New Zealand rejected a similar application made in 2006 on the basis that labelling to reduce palm oil use and the associated environmental issues went beyond the scope of the current labelling act.¹⁷⁶ According to the Australian Oilseeds Foundation, if labelling indicating the sustainability of one particular ingredient was to be included on a label, then all ingredients should be treated equally and have their sustainability assessed.

Legislation in the EU requires food manufacturers to declare the use of vegetable oils on food products by 2015, a deal which has been welcomed by stakeholders. The difference between this legislation is initially treating labelling for all vegetable oils in the same manner and slowly pushing for the requirement for labelling palm oil.¹⁷⁷



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171. United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, 2009
172. Cronin & Santoso, 2010

173. Angelsen, 2012
174. Xenophon, 2009
175. AFGC, 2010
176. Food Standards Australia New Zealand, 2008

Unlike the EU, the Australian push for palm oil legislation only was seen negatively by manufacturers. However, it is argued that labelling of sustainable palm oil is unlikely unless a major paradigm shift occurs in Australia towards sustainability certification in general.

Consumer awareness raising

Recent NGO campaigns have highlighted the potential influence and impact campaigns can have on the purchasing decisions of multinational corporations. In turn, these multinationals are applying pressure to the palm oil industry to improve their sustainability. Sustainability credentials are increasingly becoming important criteria alongside price and quality when selecting palm oil suppliers.¹⁷⁸

12.

Industry initiatives

There is no single solution to ensure sustainable palm oil. However, a number of interesting industry initiatives from around the globe serve as useful models for a potential approach in Australia.

The Dutch Task Force¹⁷⁹

The Dutch Task Force for Sustainable Palm Oil (or the *Duurzame Palm Olie*) is a joint initiative between a variety of industry groups and associations covering the major consumers of palm oil in the Netherlands. It was launched in November 2009. The Task Force consists of nine industry associations who commit themselves to promoting the cultivation and use of sustainable produced palm oil. These parties represent the Netherlands-based links in the palm oil chain, namely the palm oil refiners, the various sectors processing palm oil and the retail offering consumer products that contain palm oil.

Together, these entities have set a target: 'By the end of 2015 all palm oil destined for the Dutch market has to be sustainable.' Task Force members hope that this target, and the activities of the members, will reduce pressure from environmental groups such as Greenpeace and Friends of the Earth. If this goal is achieved, the Netherlands will be the first country in the world to use only certified sustainable palm oil. This initiative is the first of its kind at a national scale

and has the potential to strengthen the market for RSPO certified palm oil, raise awareness for the issue and highlight that a switch to sustainable palm oil on a national scale is economically viable.

Management of the Task Force

The Dutch Product Board for Margarine, Fats and Oils (MVO) have taken up the chairmanship and the secretarial office of the Task Force. MVO manages the joint interests of all the links in the oils and fats production chain and constitutes the platform for producers, importers, processors and buyers within the chain, as well as for consultation with the government and civil society organisations. The MVO product board functions as a centre of expertise, identifies social, scientific and market developments and supports the operational management in the sector.

Reporting

The Task Force has developed an action plan for 2011 to 2015. It includes a description of activities and initiatives to encourage businesses to choose sustainable palm oil. Against this plan, members formulate a plan, which must be submitted before October 31st each year.

Once a year participants in the Task Force report on the results they have achieved through the action plans. In the report, each participant describes which activities have been carried out (through qualitative monitoring); also, the amount of sustainable palm oil bought (or its equivalent in certificates); and the choice for book & claim, mass balance or segregation is monitored. The total amount of palm oil bought that year is also disclosed (through quantitative monitoring). The annual report must be submitted by March 31st each year.

One joint report with the results of the Task Force is developed where qualitative monitoring is reported per sector and aggregated quantitative monitoring is reported at the level of the entire Task Force. This report is also made public.

177. EurActiv.com, 2011

178. Ponyton, 2010

179. Task Force Sustainable Palm Oil Manifesto, 2010

Nestlé

Independent verification: Nestlé and The Forest Trust

Nestlé has engaged The Forest Trust to verify independently their CSPO, thus going beyond the standard requirements. By engaging TFT to independently trace the source of its palm oil and conduct sustainability audits on its supplier plantations, Nestlé has added a level of rigour to the CSPO which many have seen as lacking.

According to Nestlé Global, Nestlé buys approximately 320,000 tonnes of palm oil a year (about 0.7 per cent of world palm oil production). The approach taken by TFT is that of a bi-lateral approach. These large volumes are having a real impact on influencing the industry. This partnership has the potential to provide lessons to large industry players on how to implement sustainable palm oil supply chains

Nestlé, GAR and TFT

The partnership between Nestlé, leading palm oil supplier Golden-Agri Resources, and the NGO 'The Forest Trust' is a good example of how collaboration on a sustainability issue can change operating practices, business models and have a simultaneous effect on the supply chain.¹⁸⁰

Nestlé has committed to a global no deforestation target by 2020 along with other members of the Consumer Goods Forum. By working with Golden-Agri Resources, Nestlé aims to address and bring substantive change on issues such as forest clearance and peat land use. This is a big step in the sustainable palm oil sphere considering Nestlé is the world's largest food company, and Golden-Agri Resources is the second largest palm oil company.

Key aspects of this partnership include :

- » A new forest conservation policy for GAR in collaboration with TFT
- » Collaborative monitoring of progress around more sustainable palm oil development
- » Development of new policies and incentives on all sides to make the system more sustainable
- » Engagement with local grassroots NGO networks

Implications for Australia

The Dutch Task Force and Nestlé examples demonstrate the proactive role industry can play in shifting the market towards sustainable palm oil. In the Australian context, these two examples point to complimentary actions:

- » Industry-wide planning, action and reporting
- » Program activities in palm oil growing regions

Industry-wide planning, action and reporting

While many Australian companies involved in the palm oil supply chain are members of the RSPO and have public commitments to sustainable palm oil, achieving 100 per cent sustainable palm oil remains challenging. There appears to be little competitive advantage for companies in shifting to sustainable palm oil (i.e. capacity to charge a premium, ability to capture consumer market share). This situation creates the opportunity for pre-competitive collaboration and activity, similar to that demonstrated in The Netherlands. Such an initiative may be an opportunity for the Australian Food and Grocery Council through involvement of its members. Engagement with key NGOs campaigning for sustainable palm oil may also be beneficial, though it is notable that the Dutch approach is an industry-only initiative. Pursuit of the Dutch Task Force approach in Australia would need to be mindful of anti-competition legislation.

Program activities in palm oil growing regions

Given Australia's proximity to the major palm oil growing nations, Australian companies are well placed to assist palm oil plantations, small farmers and other supply chain actors in Indonesia, Malaysia, PNG and Thailand to produce palm oil more sustainably. The example of Nestlé's partnership with Golden-Agri Resources is informative, as are programs in coffee and cocoa pursued by partnerships between the private sector, governments, non-government agencies (e.g. Oxfam), and multi-lateral agencies (e.g. Asian Development Bank). Such initiatives would recognise the importance of palm oil production for social and economic development in neighbouring countries, work to ensure negative environmental and social impacts are minimised, and secure supply of sustainable palm oil for the Australian market.



Conclusions and recommendations: The future of palm oil

Conclusions

Analysis of facts, figures and trends in this report suggest that a growing global population and changing diets, combined with the oil production efficiency of the oil palm and the unique properties and versatility of palm oil for both edible and non-edible uses, will mean that palm oil cultivation, processing and use will continue – and likely grow – in the decades ahead. On the positive side, this demand has significant potential for economic and social development within developing nations, including providing livelihoods for millions of farmers and workers. However, the negative impacts – across environmental, social, and health domains – need to be addressed and managed, and where possible reversed. A sustainable palm oil industry is in everyone's interests.

Dealing with adverse environmental impacts of palm oil cultivation, in particular, avoiding further deforestation, must be a priority in a shift towards sustainable palm oil. Investment in ensuring yields of existing crops are maximised will go some way to minimising further negative environmental impacts, while also offering opportunities to further positive livelihoods outcomes for farmers and workers associated with palm oil cultivation. Additionally, directing new cultivation to already degraded, non-forest lands, which are readily available in some countries, will be another important strategy.

The Roundtable on Sustainable Palm Oil is proving an effective mechanism for engaging major stakeholders across the value chain in the pursuit of more sustainable production of palm oil. Despite its critics, it has already achieved certification of more than 10 per cent of current palm oil production, a figure likely to increase rapidly as the dates committed to by major buyers and users of palm to convert to sustainable palm oil draw closer (mostly targeting 2015). Complimentary actions from governments, major buyers, and large processors are also necessary – the agenda for sustainable palm oil cannot be left to the RSPO alone. This report has highlighted some of these possible approaches.

In Australia, the import volume of crude palm oil has largely plateaued in recent years, and demand may even decline to some extent in the coming decade, in contrast to the overarching global trend. Despite this, palm oil's continued use in Australian grocery products and food service is a contentious issue for Australian consumers and environmental advocacy groups (it should be noted that non-edible uses have received

little attention). Use of palm oil remains contentious primarily due to the impact palm oil cultivation has on tropical forests, biodiversity and in particular the habitat of orang-utans. Australia's geographic proximity to the two largest palm oil producing (and consuming) nations, Indonesia and Malaysia, and the associated economic and political ties, also makes the sustainability of palm oil production an important matter.

It is encouraging that already many of the major Australian businesses involved with palm oil have made strong commitments to convert to using sustainable palm oil. Significant work remains to fulfil these commitments, in particular understanding and overcoming supply chain challenges. Given the small Australian market for palm oil, it is unlikely that shifting entirely towards sustainably sourced palm oil in Australia will in itself have a marked effect on the overall level of sustainability of this global industry, particularly in volume terms. However, Australian industry and government initiatives may provide useful models that help develop the market for sustainable palm oil in larger countries, promote innovation in different segments of the value chain (e.g. group certification of small palm oil users), or demonstrate the value of productivity improvements (e.g. increasing yields). In turn, demonstrated demand and investment may entice governments in producer countries, especially Malaysia and Indonesia, to legislate and enforce stricter sustainability requirements across the whole industry. Beyond such opportunities, the use of sustainable palm oil by Australian companies will address ongoing consumer concerns, protect their brand reputation, and fulfil their obligations as good global corporate citizens.

The authors are acutely aware that this report has been written over a lengthy period of time and in a highly dynamic environment. Much has changed over the course of the report's preparation. Every attempt has been made to update information accordingly. Palm oil producing countries, in particular, are moving to address some of the concerns raised regarding negative impacts. The implementation of the recommendations and actions should take account of this. That being said, this report provides a comprehensive snapshot and analysis of the palm oil sector that will be of use to industry, government and NGO decision makers. An understanding of the nature of the industry and the drivers for palm oil production and consumption will inform more effective solutions towards a more sustainable palm oil sector, with benefits for all along the value chain.

Recommendations for building a sustainable palm oil supply chain

1. Encourage companies who import or use palm oil to become members of the RSPO and develop time-bound action plans to move to sustainable palm oil supplies.

To assist in developing such a pathway to sustainable palm oil, it is important that a follow up piece of work be undertaken to investigate the barriers, opportunities, and costs and benefits associated with Australian businesses using segregated supplies of certified sustainable palm oil.

An Australian industry working group, involving key actors along the palm oil supply chain, would be a constructive step to further exploring these issues and developing targeted solutions that assist industry to meet their public commitments. Such a group may be able to facilitate faster, lower cost transition to sustainable palm oil in line with the various commitments made by individual companies. It could look to solve common problems, develop pre-competitive strategies for overcoming supply chain constraints, unblock bottle necks associated with supply and certification, and communicate a common position to NGOs, consumers and government. Any such approach would need to be mindful of anti-competition legislation. The Dutch industry-led initiative outlined in this report may provide a suitable model for the Australian industry.

2. Conduct further research on palm oil flows in to Australia, its sources, and how they are changing/ projected to change.

While the flows of crude palm oil in to Australia, primarily for edible use, is well understood, the volumes of palm oil being imported already embedded in imported ingredients or products is not. As highlighted in this report, palm oil in finished products imported to the UK represented up to a further 50% of palm oil volumes. Additionally, the volumes and use of palm kernel expeller for agricultural feedstock warrants further understanding. Finally, the recent plateauing of crude oil volumes suggests some move away from palm oil use in Australia. Researching and analysing projected future flows of palm into Australia, including short versus long term displacement and substitution of volumes with other oils, will further inform the opportunities and challenges associated with a move towards sustainable palm oil. A supplementary analysis on the comparative environmental and social impacts of substituted oils and palm oil may also be useful.

3. Australian business explore possibilities of sustainable palm oil projects in our region, including the potential of international carbon, forestry and other ecosystem services instruments, to accelerate the sustainability of palm oil production.

This report concluded that actions complimentary to the certification of production and consumption of palm oil under Roundtable on Sustainable Palm Oil standards were highly desirable in order to reduce the negative impacts of palm oil cultivation. Australia's proximity to Indonesia, Malaysia, and even Papua New Guinea (though much smaller volumes than the other two), mean that there are significant opportunities for conducting on-the-ground projects towards more sustainable palm cultivation. Given the potential for such projects to meet economic development and sustainable agriculture objectives of the Australian Government for the region, as well as those of producing countries and other regional development entities (e.g. Asian Development Bank, International Finance Corporation), there may be additional finance and partners available for such projects. There may also be opportunities associated with carbon markets (i.e. avoided carbon emissions from preservation of peat lands) and other emerging environmental markets and financing instruments to support any such initiatives.



Abbreviations and references

15.

Abbreviations

ABS: Australian Bureau of Statistics
 AFGC: Australian Food and Grocery Council
 ANZ: Australia New Zealand Bank
 AOF: Australian Oilseeds Federation
 APOC: American Palm Oil Council
 BBC: British Broadcasting Corporation
 CIFOR: Centre for International Forestry Research
 CSR Asia: Corporate Social Responsibility Asia
 CSPO: Certified Sustainable Palm Oil
 COP: Crude Oil Price
 CSPKO: Certified Sustainable Palm Kernel Oil
 DEFRA: Department of Forestry, Environment and Rural Affairs
 FAO: Food and Agricultural Organisation
 GDP: Gross Domestic Product
 GMO: Genetically Modified Organisms
 MVO: Dutch Product Board for Margarine, Fats and Oils
 OCED: Organisation for Economic Co-operation and Development
 PKO: Palm Kernel Oil
 PME: Palm Oil Methylene
 RSPO: Roundtable on Sustainable Palm Oil
 TFA: Trans Fatty Acids
 TFT: The Forest Trust
 UNEP: United Nations Environment Programme.
 UNFCCC: United Nations Framework Convention on Climate Change
 UN-REDD+: United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
 WEF: World Economic Forum
 WHO: World Health Organization
 WWF: World Wildlife Fund

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References

Australian Bureau of Statistics (ABS) (2010) 'ABS Statistics.' Retrieved November 2010, from abs.gov.au

Australian Food and Grocery Council (AFGC) (2010, Apr 27) 'Palm oil labels won't save wildlife.' Retrieved September 2010, from Australian Food and Grocery Council: Media Releases: <http://www.afgc.org.au/mediareleases/191-palm-oil-labels-wont-save-wildlife.html>

Angelsen, A., Brockhaus, M., Sunderlin, W.D. and Verchot, L.V. (eds) (2012) 'Analysing REDD+: Challenges and choices.' CIFOR, Bogor, Indonesia. Retrieved from http://www.cifor.org/publications/pdf_files/Books/BAngelsen1201.pdf

Animal Feed Suppliers. (2010) 'Palm Kernel Expeller (PKE).' Retrieved from http://www.onlinesupplements.co.nz/index.php?option=com_virtuemart&view=productdetails&virtuemart_product_id=12&virtuemart_category_id=2&Itemid=121

Australian Oilseeds Federation (AOF) (n.d.) 'Technical Data.' Retrieved September 2010, from Australian Oilseeds Federation: http://www.australianoilseeds.com/australian_oils_natures_fi_nest/technical_data

American Palm Oil Council (APOC) (2004) 'Palm Oil Story.' Retrieved September 2010, from American Palm Oil Council: <http://www.americanpalmoil.com/story.html>

Asia Green Capital (2009) 'IEA Bioenergy Task40 Seminar – Overview of Liquid Biomass Trade Opportunities.' Retrieved from <http://www.bioenergytrade.org/downloads/tsukuba16hendriksoverviewofliquidbiomasstradeo.pdf>

Australian Institute of Health and Welfare (2004) 'Heart, Stroke and Vascular Diseases: Australian Facts 2004.' Canberra: Australian Institute of Health and Welfare.

Australia New Zealand Corporate (2010) 'Corporate Responsibility.' Retrieved September 2010, from ANZ Corporate Website: <http://www.anz.com/about-us/corporate-responsibility/customers/responsiblebusiness-lending/industry-analysis/>

British Broadcasting Corporation (BBC) (2010) 'Panorama - Cadbury.' Retrieved September 2010, from Panorama documentation: http://news.bbc.co.uk/1/hi/shared/bsp/hi/pdfs/panorama_cadbury.pdf

Bhattacharjees, A. (2003) 'The price of Malaysia's palm oil expansion.' *The Asian Times.*

Cargill. (2010) 'Sustainable and Responsible Palm Oil.' Retrieved September 2010, from Cargill: Corporate Responsibility: <http://www.cargill.com/corporate-responsibility/pov/palm-oil/index.jsp>

Carter, C (2007, 109) 'Palm oil markets and future supply.' *European Journal of Lipid Science and Technology*, pp. 307-314.

Centre for Science in the Public Interest. (2005) 'Cruel Oil: How Palm Oil Harms Health, Rainforest and Wildlife.' Washington DC: Centre for Science in the Public Interest.

- Center for International Forestry Research (CIFOR) (2009) 'The Impacts and Opportunities of Palm Oil.' Retrieved from http://www.cifor.org/publications/pdf_files/OccPapers/OP-51.pdf
- Colchester, M. (2006) 'Promised Land, Palm Oil and Land Acquisition in Indonesia. Implications for Local Communities and Indigenous Peoples.' Forest Peoples Programme.
- Coles (2010) 'Ethical Sourcing.' Retrieved September 2010, from Coles Corporate Website: <http://www.coles.com.au/About-Coles/Sustainability/Ethical-sourcing.aspx>
- Commission of the European Communities (2008) 'Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources.' Brussels: Commission of the European Communities.
- Cronin, T. and Santoso, L. (2010) 'REDD+ politics in the media: a case study from Indonesia.' Working Paper 49. CIFOR, Bogor, Indonesia. Retrieved from http://www.cifor.org/publications/pdf_files/WPapers/WP-49Santoso.pdf
- Corporate Social Responsibility Asia (CSR Asia) (2010) 'Challenges towards sustainable palm oil post RT8.' Retrieved from http://www.csr-asia.com/weekly_detail.php?id=12198
- Department for Environment, Food and Rural Affairs (DEFRA) (2011) 'Mapping and understanding the UK palm oil use, Final Report to the Department for Environment, Food and Rural Affairs.' Published by the Department for Environment, Food and Rural Affairs, London
- Development Prospects Group, World Bank (2009) 'Palm Oil.' Washington DC: International Finance Corporation.
- Ethical Corporation (2012) 'Analysis: sustainable sourcing – Partners pour oil on troubled waters.' Retrieved from http://events.ethicalcorp.com/rbsusa/content6.php?utm_source=green%2Bmoney&utm_medium=e%2Bshot&utm_campaign=green%2Bmoney%2Be%2Bshot
- EurActiv. (2009, December 11) 'EU biofuel sustainability criteria 'inconsistent'.' Retrieved September 2010, from EurActiv: Climate and Environment: <http://www.euractiv.com/en/climate-environment/eu-biofuelsustainability-criteria-inconsistent/article-188224>
- EurActiv (2011) 'EU food labelling rules ready, new round to start.' Retrieved from <http://www.euractiv.com/consumers/eu-food-labellingrules-ready-ne-news-506334>
- Food and Agricultural Organisation (FAO) (1990) 'The Oil Palm.' Retrieved September 2010, from Better Farming Series: <http://www.fao.org/docrep/006/10309e/10309e00.htm>
- Food and Agricultural Organisation (FAO) (2002) 'Palm Oil Processing.' Retrieved September 2010, from FAO Agriculture Services Bulletin -148: <http://www.fao.org/DOCREP/005/y4355e/y4355e04.htm#bm04>
- Food and Agricultural Organisation (FAO) (2010)A. 'Detailed World Agricultural Trade Flows.' Retrieved from <http://faostat.fao.org/DesktopModules/Faostat/WATFDetailed2/watf.aspx?PageID=536>
- Food and Agricultural Organisation (FAO) (2010)B 'Global Forest Resources Assessment 2010: Key Findings.' Rome: FAO.
- Fitzherbert, E. B. (2008, October) 'How will oil palm expansion affect biodiversity?' Trends in Ecology and Evolution, pp. 538-545.
- Food Standards Australia New Zealand (FSANZ) (2008) 'Rejection of Application A593 Labelling of Palm Oil.' Food Standards Australia New Zealand.
- Friends of the Earth (2005) 'The oil for ape scandal: How palm oil is threatening orang-utan survival.' London: Friends of the Earth Trust.
- Germer, J. (2008) 'Estimation of the impact of oil palm plantation establishment on greenhouse gas balance.' Environment, Development and Sustainability, 10:697-716.
- Gingold, B. (2010) 'Personal Communication.' World Resources Institute.
- Global Oils and Fats Business Magazine. (2009) 'Oil Palm Already Sustainable.' Global Oils and Fats Business Magazine.
- Goodman Fielder. (2010, March) 'Goodman Fielder Uses Certified Sustainable Palm Oil.' Press Release.
- Greenpeace International (2007) 'Palm Oil: Cooking the Climate.' Retrieved from <http://www.greenpeace.org/international/en/news/features/palm-oil-cooking-the-climate/>
- Greenpeace Netherlands. (2008) 'United Plantations certified despite gross violations of RSPO standards.' Retrieved from <http://www.greenpeace.org/usa/Global/usa/report/2008/11/united-plantations-certified-d.pdf>
- Hooijer, A. (2009) 'Current and future CO2 emissions from drained peatlands in Southeast Asia.' Biogeosciences Discussions 6, pp. 7207 - 7230.
- IFC (2010) 'Key Sustainability Issues in the Palm Oil Sector.' Retrieved from [http://www.ifc.org/ifcext/agricultconsultation.nsf/AttachmentsByTitle/Discussion+Paper/\\$FILE/Discussion+Paper_FINAL.pdf](http://www.ifc.org/ifcext/agricultconsultation.nsf/AttachmentsByTitle/Discussion+Paper/$FILE/Discussion+Paper_FINAL.pdf)
- Indexmundi. (2010) 'Indexmundi commodity prices.' Retrieved from <http://www.indexmundi.com/commodities/>
- Indonesian Statistical Office (n.d.) Retrieved October 2010, from http://dds.bps.go.id/eng/tab_sub/view.php?label=1anddaftar=1andid_subyek=54andnotab=2
- International Finance Corporation (2010). Retrieved October 23, 2010, from IFC Agribusiness: <http://www.ifc.org/ifcext/agribusiness.nsf/content/palmoil?OpenDocumentandExpandSection=2>
- International Union for Conservation of Nature and Natural Resources. (2009) 'Wildlife in a Changing World: An analysis of the 2008 IUCN Red List of Threatened Species.' Switzerland: IUCN.
- Kissinger, G., M. Herold, V. De Sy (2012) 'Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers.' Lexeme Consulting, Vancouver Canada.

- Koh, L. P. (2008) 'Oil palm: disinformation enables deforestation.' *Trends in Ecology and Evolution* Vol 24 No 2, pp. 67-68.
- Laurance, W. F. (2009, Volume 24, No. 2) 'Improving the Performance of the Roundtable on Sustainable Palm Oil for Nature Conservation.' *Conservation Biology*, 377-381.
- Leow, C. (2010, April 1) 'Energy Prices 'Create a Floor' for Palm Oil, LMC's Fry Says.' Retrieved from Bloomberg Businessweek: <http://www.businessweek.com/news/2010-04-01/energy-prices-create-a-floor-for-palm-oil-lmcs-fry-says.html>
- McNeill, G. P. (2009 Vol.6 Issue 2) 'Excellent Shortening... from palm oil.' *Global Oils and Fats Business Magazine*, pp. 49-50.
- Nestlé (2010, July) 'Update on deforestation and palm oil.' Retrieved September 2010, from Nestlé Corporate Website: http://www.Nestlé.com/MediaCenter/SpeechesAndStatements/AllSpeechesAndStatements/statement_Palm_oil.htm?wordId=D7E0005D-F7D9-4AD3-85D7-AA631CBA0E8E
- Organisation for Economic Co-operation and Development (OECD) (n.d.) 'OECD country statistical profile 2010 - Indonesia.' Retrieved October 2010, from <http://stats.oecd.org/Index.aspx?DataSetCode=CSP2010>
- O'Hare, M. (2008, January 17) 'Greenhouse Gas Emissions From Indirect Land Use Change.' Sacramento, CA: University of California, Berkeley.
- Oil World (2010) Retrieved from <http://www.Nestlé.com/Resource.axd?Id=156ED129-AAA0-481A-BF17-6AF3D74154F2>
- Orangutan Foundation International (2011) 'Indonesian Forest Facts.' Retrieved from <http://www.orangutan.org/rainforest/indonesianforest-facts>
- Orthoefer, F. T. (2005, Vol.17, No.5) 'Performance of trans-free vegetable oils in shortenings and deep-fat frying.' *Lipid Technology*, 101-106.
- Oxfam and Unilever (2005) 'Exploring the Links between International Business and Poverty Reduction: A Case Study of Unilever in Indonesia.' Oxfam GB, Novib Oxfam Netherlands and Unilever.
- Poynton, S (2010, October) 'Executive Director TFT.' E. Briggs, Interviewer
- Proctor and Gamble (2010) 'Palm Oil.' Retrieved September 2010, from Proctor and Gamble Corporate Website: http://www.pg.com/en_US/sustainability/point_of_view/palm_oil.shtml
- Rahman, A. K., Abdullah, R., Shariff, F., and Simeh, M. A. (2008) *The Malaysian Palm Oil Supply Chain: The Role of the Independent Smallholders*. *Oil Palm Industry, Economic Journal*, 17-27.
- Rainforest Alliance (2012) 'The Rainforest Alliance and Palm Oil.' Retrieved from <http://www.rainforest-alliance.org/agriculture/crops/palm-oil>
- Rojas, M. (2007) 'Assessing the Engine Performance of Palm Oil Biofuel.'
- Round Table for Sustainable Palm Oil (RSPO) (2009) A. 'General Information on the RSPO.' Retrieved September 2010, from RSPO - Promoting the Growth and Use of Sustainable Palm Oil: <http://www.rspo.org/?q=page/501>
- Round Table for Sustainable Palm Oil (RSPO) (2009)B 'RSPO - Promoting the Growth and Use of Sustainable Palm Oil.' Retrieved September 2010, from www.rspo.org
- Round Table for Sustainable Palm Oil (RSPO) (2009, November) 'RSPO Supply Chain Certification Systems.' Retrieved from <http://www.utzcertified.org/index.php?pageID=225>
- Round Table for Sustainable Palm Oil (RSPO) (2010)A 'Australian Food and Grocery Council.' Retrieved September 2010, from Roundtable on Sustainable Palm Oil - Promoting the Growth and Use of Sustainable Palm Oil: <http://www.rspo.org/?q=om/1294>
- Round Table for Sustainable Palm Oil (RSPO) (2010)B 'Mission New Energy Ltd.' Retrieved September 2010, from Roundtable on Sustainable Palm Oil - Promoting the Growth and Use of Sustainable Palm Oil: <http://www.rspo.org/?q=om/317>
- Round Table for Sustainable Palm Oil (RSPO) (2010)C 'Peerless Holdings Pty Ltd.' Retrieved September 2010, from Roundtable on Sustainable Palm Oil - Promoting the Growth and Use of Sustainable Palm Oil: <http://www.rspo.org/?q=om/1015>
- Round Table for Sustainable Palm Oil (RSPO) (2010)D 'RSPO members in Australia.' Retrieved September 2010, from Roundtable on Sustainable Palm Oil - Promoting the Growth and Use of Sustainable Palm Oil: <http://www.rspo.org/?q=countrystat/Australia>
- Round Table for Sustainable Palm Oil (RSPO) (2011) 'Growth Interpretation Narrative.' Published by the Roundtable on Sustainable Palm Oil.
- Round Table for Sustainable Palm Oil (RSPO) (2012)A 'Key Statistics.' Retrieved from <http://www.rspo.org/file/CSPO%20Uptake%20&%20Production%20-%20ChartsTemplate-May2012.pdf>
- Round Table for Sustainable Palm Oil (RSPO) (2012) B 'RSPO 8th General Assembly Concludes with Quorum Achieved.' Retrieved from http://www.rspo.org/news_details.php?nid=84
- Round Table for Sustainable Palm Oil (RSPO) (2012)C 'History.' Retrieved from <http://www.rspo.org/en/history>
- Sorrell, J (2012) 'Can palm oil be sustainable.' *Making it magazine*, 5th September 2012. Retrieved from <http://www.makingitmagazine.net/?p=5467>
- Tauli-Corpuz, V. (2007) 'Oil Palm and Other Commercial Tree Plantations, Mono-cropping: Impacts on Indigenous Peoples' Land Tenure and Resource management Systems and Livelihoods.' *United Nations Permanent Forum on Indigenous Issues*.

- Task Force Duurzame Palm Olie. (2010, November) 'Manifesto of the Task Force Sustainable Palm Oil: Initiative to promote the use of RSPO certified palm oil in the Netherlands.' Retrieved from http://www.taskforceduurzamepalmolie.nl/Portals/4/download/Manifesto_Task_Force_Sustainable_Palm_Oil.pdf
- Teoh, C. H. (2010) 'Key Sustainability Issues in the Palm Oil Sector.' Washington DC: International Finance Corporation.
- The Food Group (2009). 'Palm oil, fats and health: A Discussion Paper.' The Food Group.
- The Forest Trust (TFT) (2010, May 17) 'Nestlé becomes TFT's newest member.' Retrieved September 2010, from TFT: Delivering Responsible Products: <http://www.tft-forests.org/news/item.asp?n=10303>
- Unilever (2010) 'Sustainable Palm Oil.' Retrieved September 2010, from Unilever Corporate Website: http://www.unilever.com/sustainability/environment/agriculture/palmoil/index.aspx?WT.LHNAV=Sustainable_palm_oil
- United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REED) (2009) 'Home.' Retrieved September 2010, from UN-REDD Programme: <http://www.un-redd.org/>
- United Nations Environment Programme (UNEP) (2007) 'The Last Stand of the Orangutan.' United Nations Environment Programme.
- United Nations Environment Programme (UNEP) (2009) 'Vital Forest Graphics.' Retrieved from <http://www.unep.org/vitalforest/Report/VFG-01-Forest-definition-and-extent.pdf>
- United Nations Environment Programme (UNEP) (2011) 'Global Environmental Alert Service (GEAS).' UNEP. Retrieved from http://www.grid.unep.ch/products/3_Reports/Dec_11_Palm_Plantations.pdf
- United Nations Framework Convention on Climate Change (UNFCCC) (2008) 'GHG total including LULUCF.' Retrieved October 2010, from UNFCCC: http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3842.php
- USDA 2013, Table:11 Palm Oil: World Supply and Distribution, United States Department of Agriculture. Retrieved from <http://www.fas.usda.gov/psdonline/psdreport.aspx?hidReportRetrievalName=BVS&hidReportRetrievalID=710&hidReportRetrievalTemplateID=8>
- US Department of Health and Human Services Food and Drug Administration. (2005) 'Petition for Rulemaking to Revoke the Authority for Industry to Use Partially Hydrogenated Vegetable Oils in Foods.' Washington DC: US Department of Health and Human Services Food and Drug Administration.
- World Economic Forum (WEF) (n.d.) 'Global Risks 2010.'
- Woolworths. (2010, March) 'Woolworths News:Sustainable palm oil action plan.' Retrieved September 2010, from Woolworths Corporate Website: <http://www.woolworths.com.au/wps/wcm/connect/website/woolworths/about-us/woolworths-news/news-content/palmoilactionplan>
- World Bank (2001) 'World Development Indicators: deforestation and biodiversity.' Washington DC: World Bank.
- World Bank (2009)A 'Indonesia at a glance.' Washington DC: International Finance Corporation.
- World Bank (2009)B 'Malaysia at a glance.' Washington DC: World Bank.
- World Bank (2010) 'The World Bank Group's Framework for Engagement in the Palm Oil Sector.' Washington DC: International Finance Corporation.
- World Bank Group (2010) 'The World Bank Group's Framework for Engagement in the Palm Oil Sector.' Pennsylvania: World Bank.
- World Health Organisation (WHO) (2003) 'Diet, Nutrition and the Prevention of Chronic Diseases.' Geneva: World Health Organization.
- World Resources Institute (WRI) (2012) 'How to Identify Degraded Land for Sustainable Palm Oil in Indonesia.' World Resources Institute. Retrieved from <http://www.wri.org/publication/identifying-degraded-land-sustainable-palm-oil-indonesia>
- World Wildlife Fund (WWF) (2009) 'Palm Oil Buyers' Scorecard Europe.' WWF.
- World Wildlife Fund (WWF) (2010) 'Palm Oil Buyers' Scorecard Australia.' WWF.
- World Wildlife Fund (WWF) (2011) 'Palm Oil Buyers' Scorecard 2011 - Measuring the Progress of Palm Oil Buyers.' Retrieved from http://awsassets.wwf.org.au/downloads/fs058_g_palm_oil_buyers_scorecard_2011_22nov11.pdf
- World Wildlife Fund (WWF) (n.d.) 'What is palm oil?' Retrieved from http://www.wwf.org.au/our_work/saving_the_natural_world/forests/palm_oil/
- Xenophon, N. (2009) 'Food Standards Amendment (Truth in Labelling—Palm Oil) Bill 2009.' Canberra: Australian Senate.

Notes

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