OCCASIONAL PAPER

Managing oil palm landscapes

A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa

Lesley Potter

CIFOR

OCCASIONAL PAPER 122

Managing oil palm landscapes

A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa

Lesley Potter
Crawford School of Public Policy, ANU College of Asia and the Pacific, The Australian National University

Center for International Forestry Research (CIFOR)

Occasional Paper 122

ISBN 978-602-1504-92-5
DOI: 10.17528/cifor/005612

Potter L. 2015. *Managing oil palm landscapes: A seven-country survey of the modern palm oil industry in Southeast Asia, Latin America and West Africa.* Occasional Paper 122. Bogor, Indonesia: CIFOR.

Photo by Lesley Potter
An oil palm estate in Lamandau District, Central Kalimantan, Indonesia.

CIFOR
Jl. CIFOR, Situ Gede
Bogor Barat 16115
Indonesia

T +62 (251) 8622-622
F +62 (251) 8622-100
E cifor@cgiar.org

cifor.org

We would like to thank all donors who supported this research through their contributions to the CGIAR Fund. For a list of Fund donors please see: https://www.cgiarfund.org/FundDonors

Contents

List of figures and tables

Figures

Tables

Acknowledgments

I would like to acknowledge the assistance of the following people with this work:

From CIFOR Bogor: Pablo Pacheco (for his many suggestions and his patience), Sophia Gnych; Indonesia: Piers Gillespie, Peter Kanowski, Gary Paoli, Adi Susanto; Malaysia: Colin Barlow, Rob Cramb; Colombia: Carmenza Castiblanco-Rozo, Carmilo Colmenares, Andres Etter, Sonia Hortua Romero, Vicky Marin-Burgos; Peru: Ayme Muzo, Miguel Pinedo-Vasquez; Brazil: Marcello Brito, Joel Buecke, Silas Cezar da Silva, Pieter Sijbrandij; and Cameroon: Patrice Levang. The comments and suggestions of three referees have also been useful in improving the overall report. This work has been conducted in the context of the Oil Palm Sentinel Landscape with funds provided by the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative program aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CATIE, Agricultural Research for Development (CIRAD), the International Center for Tropical Agriculture and the World Agroforestry Centre.

Omissions and errors are of course my responsibility.

1 Introduction

1.1 The countries under study

The author was commissioned by CIFOR to compile a literature review for a project called Sentinel Landscapes to focus on the impacts of recent oil palm expansion (post-2000) in seven countries: Indonesia, Malaysia, Colombia, Peru, Brazil, Nigeria and Cameroon. The countries under study provide a series of contrasts – in the overall importance of the palm oil industry to the national economy; in palm oil's contribution via exports to the global supply chain; in the longevity of the industry; and in the production models in use.

The countries were selected to include the major players in the industry and to provide representative examples from the tropical regions of Asia, Latin America and Africa. Indonesia and Malaysia are the obvious choices with which to begin, as together they are responsible for about 86% of global palm oil production. Not only are they the dominant force in the industry in terms of exports of palm products,[1] but oil palm has made a huge impact on local landscapes and employment in these countries. Despite their competitiveness, Indonesia and Malaysia can almost be viewed as one palm oil economy, with large numbers of Indonesians representing an essential source of labor on Malaysian estates, while many Malaysian-owned plantations have been established on Indonesian land.

Indonesia and Malaysia have been the target of much international (and some national) criticism on both environmental and social grounds. Indonesia has been castigated for its high levels of forest loss linked to the rapid expansion of oil palm. Despite now forming their own 'sustainability' organizations, the ISPO and MSPO, Indonesia and Malaysia still provide the backbone of membership of the RSPO (the Round Table for Sustainable Palm Oil), the leading global organization promoting improved standards on plantations and among smallholders and certifying the product of those in compliance with the standards.

Indonesia and Malaysia also represent the Asia-Pacific group of palm oil producing countries, which include Thailand (No. 3) and Papua-New Guinea (PNG) (No. 7) in world production rankings. Although unique and interesting in their own right, Thailand and PNG have been omitted from this study in favor of examples from Africa and Latin America.[2]

The countries ranked 4 and 5 in global production terms are Colombia and Nigeria. Colombia, the Latin American leader, has had a difficult recent history of narco-related violence, much of it in oil palm areas. Particular types of smallholder business models have been instituted, while the country has developed a large palm oil-based biodiesel industry, mainly locally focussed. The leading zone of Colombia's production is in the east, the Orinoco

1 Palm products also include palm kernel oil, which is produced by extracting the kernel from the nut as part of the milling process. In 2012, Indonesia produced 1.7 million t of palm kernel oil; Malaysia produced 1.1 million t. Most of the oil was exported, with the EU, China, the USA and India the main recipients (*Oil World Annual* 2013). The oil, which is a lauric oil, resembling coconut oil and semisolid at room temperature, is used in commercial cooking and in the manufacture of soaps, detergents, pharmaceuticals and cosmetics. (See Nigeria chapter for the early trade in palm kernel oil).

2 Byerlee et al. (2014, 32) have described Thailand as "the only Asian country to develop a smallholder oil palm industry". By this comment they mean that unlike plantation-dominated Indonesia and Malaysia, smallholders with less than 8 ha control the industry in Thailand, accounting for 70–80% of the production. "Most smallholders work independently and most mills are not running their own plantations." Although yields are low, Byerlee et al. recommended the Thai approach to a country such as Myanmar, which is just beginning to establish an oil palm industry.

savannas, where expansion has been largely into underutilized cattle pastures rather than forests.

Nigeria, the leader among the West and Central African states, is different, with its traditional industry based on semi-spontaneous village groves, a smaller plantation sector and inadequate levels of local production. Nigeria now hosts oil palm plantations operated by Wilmar International, Asia's leading agribusiness group. Wilmar's experiences in Cross River State illustrate the difficulties that may arise when companies attempt to insert themselves into a very different cultural environment. Cameroon, Nigeria's smaller neighbor, offers similarities, with the coexistence of the traditional and agro-industrial systems (with local elites partly controlling the former), and providing a further example of an oil palm-based 'foreign land grab' (Herakles Farms) but under environmental conditions which have brought universal condemnation.

Brazil and Peru, two Latin American states occupying parts of the Amazon Basin, are currently small producers of palm oil, but with a different perspective on the use of the forests. Brazil has large areas capable of development into oil palm, but regulations specify that this must only be on already deforested lands, while in Peru deforestation is more actively taking place, predominantly at the hands of large plantation companies. In Peru, smallholder cooperatives tend to be separate from plantations, funded by outside organizations with oil palm presented as a substitute for coca. Both Peru and Brazil have had smaller scale 'foreign land grabs' (either actual or attempted), with Singapore-based American Dennis Melka representing a more significant figure in Peru. In Brazil, Malaysia's Felda Global Ventures made one unsuccessful attempt in Amazonas, and has been contemplating a further push into the main palm oil producing state of Pará. Brazil and Peru are actively promoting palm oil as a feedstock for biodiesel. However, in the case of Brazil, oil palm is cultivated in only a few states and contributes only a small proportion of the total biodiesel mix that is largely focussed on soybean oil and animal fats.

Table 1 summarises the main characteristics of the countries under study from 2000 to 2012, together with a few others included for the sake of comparison. As shown in Table 1, Indonesia and Malaysia dominate both area and production. In both countries, the industry is highly organized, with an emphasis on large corporations with extensive plantations, and various groups of assisted and independent smallholders.

In Indonesia and Malaysia, there have been strong impacts on local forests, village lands and livelihoods as the industry continues to expand. This has occurred in Indonesia, especially in Sumatra and Kalimantan and in Malaysia, in Sarawak and Sabah. Plans for an areal expansion in Indonesia from the present 10 million ha to 20 million ha by 2020 are not matched in smaller Malaysia, whose largest corporations, having participated in the Indonesian industry for many years, now seek new lands in other parts of the Asia/Pacific, Africa and Latin America.[3]

It is clear from Table 1 that yields vary considerably; the leaders are Malaysia, Indonesia and Costa Rica, while Papua New Guinea also performs reasonably well. Thailand and Ecuador, with large numbers of smallholders, still have some way to go in bringing yields up to the world average in 2012 (3.77 tonnes(t)/ha[4]) as do the African states. Yields depend on the use of high quality planting materials, the age of the trees, adequate fertilizing, frequent harvesting and good tree maintenance, together with climatic factors outside the control of planters. In Indonesia, Malaysia, Colombia, Brazil and Peru, yields from estates are noticeably higher than those from smallholder plots. In Nigeria and Cameroon, some of the plantations can still only manage low yields, but this is beginning to change.

---

3 The world's largest upstream CPO producer, Malaysian Sime Darby Berhad, has recently taken over at least 51% of the shares of PNG's New Britain Palm Oil (NBPOL), from the Malaysian Kulim Company. Sime Darby management has said they will assume management of NBPOL and 'grow' the company, although happy to partner with the New Guinea Government, which has an 18% share in NBPOL (Zainul, 2014). Such a takeover would increase Sime Darby's total plantation area to 605, 174ha and extend its geographical spread: Malaysia 51%, Indonesia 34%, PNG 13%, Liberia 2%. NBPOL also operates a 300,000 t/ annum refinery in Liverpool, UK (fully certified by the RSPO), which would complement Sime Darby's 450,000 t/ annum refinery in the Netherlands. NBPOL is the largest employer in PNG (*Moody's Credit Outlook* October 2014). Felda Global Ventures (GFV) had also been interested in acquiring NBPOL, but has subsequently withdrawn because of the expense and the low price of CPO (Kaur 2014).

4 *Oil World Annual* 2013

Table 1. Production, yield and mature area of oil palm, selected producers, 2000–2012.

Country and rank	Production (000 t) CPO				Yield (CPO) t/ha				Mature area (000 ha)			
	2000	2005	2010	2012	2000	2005	2010	2012	2000	2005	2010	2012
1. Indonesia	6,950	13,920	22,100	29,600	3.45	3.77	3.85	4.14	2,014	3,960	5,740	6,500
2. Malaysia	10,840	14,961	16,993	18,785	3.63	4.21	4.11	4.31	2,986	3,552	4,130	4,360
3. Thailand	560	685	1,350	1,600	2.81	2.45	2.29	2.48	199	280	590	645
4. Colombia	524	661	753	967	3.91	3.90	3.02	3.22	134	170	251	300
5. Nigeria[a]	740	800	885	940	2.06	2.16	2.06	2.06	360	370	430	457
6. Ecuador	250	319	458	540	2.31	2.13	1.97	2.51	108	150	194	215
7. PNG	296	310	500	530	4.23	3.52	3.70	3.71	70	88	135	143
11. Brazil	108	160	250	310	2.70	2.81	2.35	2.74	40	57	90	113
13. Costa Rica	123	210	225	260	4.11	4.20	3.98	4.13	30	50	56	63
14. Cameroon	159	154	250	245	2.79	2.76	2.16	1.98	57	58	116	124
16. Peru#	39	29	70	119	3.96	na	na	3.06	10	na	na	33

a Commercial areas only, #Peru: Ministerio de Agricultura (2012a).

Note: Countries studied are highlighted. Countries omitted with intermediate rankings were: Côte d'Ivoire (8), Ghana (8), Honduras (10), Guatemala (11), Democratic Republic of Congo (DRC) (15). There are some differences between the figures reported here from *Oil World* and those in FAOStat and Indexmundi, but these differences mainly occur in the countries of West and Central Africa, where statistics are not very reliable.

Source: *Oil World Annual* 2013, 2010

Palm oil prices, with their many fluctuations, have affected the rates of growth of the industry in all the countries under study. The early part of 2000 and 2001 saw low prices at levels that have not been replicated up to the present. Prices began to rise from 2002 and especially after 2006, when interest in palm-based biofuels became strong. After the global financial crisis of 2008–9 had subsided, in 2010 and 2011 CPO prices soared again to high levels, encouraging new planting by independent smallholders and plantations alike. Prices began to retreat towards the end of 2012 and through 2013 and this decline has continued (Figure 1). By September 2014, CPO prices were stated to be the lowest since 2009 (McFerron, 2014).

Smallholders in Indonesia were complaining that prices were below production costs, while others were 'lazy to harvest' or threatening to no longer care for their palms (*Jurnal Asia* 2014, kupasbengkulu.com, 2014). At the opposite end of the production scale, a representative of Malaysia's largest corporation, Sime Darby, said that production costs in Malaysia and Indonesia were about RM1400/tonne (t), so they could still 'make money' although prices had dropped below RM2000. The prediction was that prices would rise again by the end of the year, once the market had absorbed the competition from a bumper soybean crop (Pakiam 2014).

Indonesia and Malaysia dominate the world export trade in crude palm oil and semi-processed palm products, which have recently occupied an increasing share of the market. As illustrated in Table 2, this domination has persisted through the period under study, though it is notable that in 2000, Malaysia was the stronger of the two, to be gradually overtaken by Indonesia. With a much smaller population, Malaysia's internal consumption of palm products, in 2000 mainly for food, was much lower than Indonesia's, leaving a large surplus for export. With the recent growth of the biofuels and oleochemical industries in both countries, internal consumption has been expanding. In Indonesia, for example, for the Market Year (MY) beginning October 2013, the total distribution of CPO (production + stocks)

Figure 1. Monthly CPO Prices, February 2010 to December 2014.

Source: Indexmundi

Table 2. Main exporters of CPO: selected years.

Country	2000	2005	2010	2012
Indonesia	4,140 26.9%	10,436 39.3%	16,450 45.0%	19,094 46.8%
Malaysia	9,300 60.4%	13,439 50.6%	16,664 45.7%	17,576 43.1%
Total for 2 countries	13,440 87.3%	23,875 89.9%	33,114 90.7%	36,670 89.9%
Annual global total	**15,401**	**26,545**	**36,475**	**40,780**

Source: *Oil World Annual* 2001, 2009, 2013

was 32.8 m t. Of that 62.1% was exported and domestic consumption absorbed 28.6%, with food occupying 16% and industry around 12 %, with the remainder left as stocks (Wright and Wiyono 2014, 7).

Table 3 provides a detailed picture of CPO exports from Indonesia from 2000 to 2012. It is notable that the proportion going to the EU has been slowly declining, although the volume of exports has grown. India has generally been the leading recipient of Indonesia's CPO, though occasionally replaced by 'Asia –Other', including Pakistan and Bangladesh. The general direction of the trade towards Asia (which is shared by Malaysia with a strong focus on China) is also notable, with only 12.6% of Malaysia's CPO going to the EU in 2012. Indonesia and Malaysia also contribute CPO to the giant Neste biodiesel plant in Singapore, which is compliant with EU specifications and exports its product to Europe.

Largely as a result of the Neste plant, palm oil has become the second most important feedstock for the EU's biodiesel after rapeseed oil, moving from 5.3% of the market in 2010 to 14.6% in 2013 and an anticipated 15.5% in 2014 (Flach et al. 2014:20). The drop in CPO prices in 2013 and 2014 also attracted buyers from other European biodiesel factories. While palm oil- based biodiesel reportedly 'does not provide enough winter stability in northern Europe' a mix of rapeseed, palm oil and soya bean oil is suitable (Flach et al. 2014:23). For palm oil

Table 3. Indonesia: Exports of CPO ('000 t) selected years, by recipient country or area.

Year	EU	Europe (O)*	Africa	Asia-China	Asia-India	Asia (O)*	Americas	Total
2000	908	26	323	693	1639	478	73	4140
	21.9%	0.6%	7.8%	16.7%	39.6%	11.5%	1.8%	99.9%
2005	1879	333	737	1825	2572	3035	56	10437
	18.0%	3.2%	7.1%	17.5%	24.6%	29.1%	0.5%	100.0%
2010	2725	574	1687	2365	5292	3584	222	16449
	16.5%	3.5%	10.3%	14.4%	32.2%	21.8%	1.3%	100.0%
2012	2736	728	2144	3132	5304	4752	298	19094
	14.3%	3.8%	11.2%	16.4%	27.8%	24.9%	1.6%	100.0%

* (O) ='other'

Source: *Oil World Annual* 2001, 2009, 2013.

Table 4. Generalised production, trade and consumption, 7 countries studied, 2012.

Country	Production (000 t)	Exports (000 t)	Imports (000 t)	Consumption (000 t)
Indonesia	26900	19094.0	22.0	6798.0
Malaysia	18785	17575.5	1628.0	2267.0
Colombia	1040	200.0	140.0	965 biod. 520 other 445
Brazil	310	65.2	243.6	488.4
Peru	130	0	25.1	145.1
Nigeria	940	18.0	870.0	1805.0
Cameroon	245	10.0	69.9	287.9

Source: *Oil World Annual*, 2013

to meet the EU's sustainability criteria, it must be certified by the RSPO and the plantation from which it is sourced must practise methane capture from its mill emissions[5]. This is an expensive process, but the larger plantations in Indonesia and Malaysia are beginning to comply with it. The alternative for both countries is to continue to concentrate their trade on their Asian recipients, who so far are not as demanding in their regulations.

It is evident from Table 4 that countries such as Peru and Brazil, where oil palm has been commercialized quite recently, are still dependent on imports to meet consumption needs, especially if the consumption also includes the manufacture of biodiesel. Colombia's large biodiesel industry now absorbs 50% of consumption, but production has grown sufficiently, despite problems with disease in part of the crop, to meet the requirement and allow some minor exports. Nigeria is anxious to break its reliance on imports of cheap crude palm oil (CPO), which are still necessary to maintain its palm-based food manufacturing, but impede the development of a viable local agro-industry. Cameroon is managing quite well, thanks to its smallholders and their mills. However, largely due to growth in its downstream manufacturing, it is also experiencing some deficits in overall production. The plantation sector in Cameroon can do much more to increase its yields, a problem which it is now beginning to address.

5 CPO sourced from plantations where methane has been captured at the mill save 62% of GHGs; unspecified CPO 35% GHGs (Flach et al. 2014, 7)

1.2 The organization of the report[6]

Four questions have been identified around which to structure the analysis and these have been addressed in all of the countries concerned. The questions are as follows:

1. What has been the role of oil palm expansion on economic development and land use change?
2. What has been the importance of state policies as against corporate strategies in shaping oil palm development?
3. What have been the socioeconomic outcomes of the disparate business models employed?
4. What are the possible initiatives that could provide more sustainable and inclusive oil palm production?

In the first question, which examines the background to oil palm's recent expansion, some characteristics of the geography of each state are mentioned, in particular rainfall patterns, where the existence of an annual dry season (e.g. Cameroon and Nigeria) or unusually dry spells (e.g. an El Nino year in Indonesia) can have a marked effect on production. The seasonality of production in African states also impacts on availability of mills and market prices. However, tests in Indonesia have shown that new drought tolerant seeds are resistant to weak or moderate El Ninos (Wright and Wiyono 2014). Similar findings in Brazil have made possible a series of fine adjustments on one plantation in Pará, using different seeds to suit the vagaries of local microclimates (fieldwork, Agropalma October 2014).

Three distinct rainfall regimes are found in Indonesia: an 'equatorial' type with a double rainfall maximum, a 'monsoon' type with more distinct dry season, and a 'local' type with much variability. As much of East and West Kalimantan fall into the 'equatorial' regime, their yields should be higher than the more monsoonal rainfall of most of eastern Sumatra. Exceptionally heavy rainfall and floods, which occurs at times in the central zone of Colombia, can be disastrous to oil palm. Also in Colombia, the high humidity of some parts of the country makes trees more susceptible to diseases such as bud rot.

Although 'cold tolerant' species of *Elaeis guineensis* have been discovered in the northwest plateau of Cameroon near Bamenda, the plant usually requires year-round high temperatures, with cold spells occasionally causing havoc, again in Colombia's central zone. Topography is also a limiting factor, the crop preferring lowland areas, where it sometimes comes into direct competition with lowland rain forests. Peat swamps, which are especially prevalent on the east coast of Sumatra, the coasts of West and Central Kalimantan and Sarawak, have in recent years become a popular location for new plantings in both Indonesia and Malaysia, as the lands tend to have fewer tenure claims than those with mineral soils, despite being less fertile and more difficult to manage.

While Nigerian and Cameroonian palm groves are still likely to have a high proportion of unselected and low yielding *dura*[7] stock, mixed with sterile *pisifera*, experimentation in different seed types and international exchanges of germplasm are characteristic of modern oil palm plantations. The Deli Dura type imported to Bogor (Indonesia) in 1848, which formed the basis for the original Indonesian and Malaysian industries, was relatively high yielding, but things have moved on from there. Most plantations now use hybrid stock of the *dura/pisifera* mix, which produces high yielding *tenera* seedlings. Tenera fruits have a high proportion of the oil rich mesocarp and a smaller kernel. Reliable supplies of hybrid planting materials are often in short supply among smallholders in Indonesia. If they buy cheap seedlings, these may well turn out to be a low performing *dura* variety. In Colombia and parts of Brazil that are susceptible to diseases such as bud rot or fatal yellowing, a different type of hybrid between *Elaeis guineensis* and the Latin American palm *Elaeis oleifera* is used, which is not affected by such diseases. A study by Cochard et al (2005) has a useful discussion on the genetic improvement of oil palms, considering disease resistance, tolerance of climatic fluctuations and fertiliser requirements. Whether new strains specific to the needs of smallholders should be developed is considered but rejected, as it is argued that smallholders need the best possible varieties to suit local conditions. The one

6 This section is lightly referenced. The reader is directed to the detailed referencing in the substantive chapters.

7 The names refer to the type of shell covering the palm fruit: dura (thick), pisifera (shell-less), tenera (thin). The thin shelled *tenera* produces much more oil, while in *dura* fruit the kernel is larger.

exception is the traditional use of 'red oil' in Africa and Bahia (Brazil), where the culinary qualities of the product are all-important and where breeders could develop a specific 'niche' material to fit those requirements.

Oil palm development and its resulting land-use change has become a highly emotive topic, both nationally within many of the countries concerned and internationally, with criticism aimed at important environmental and social issues. On the environmental front, destruction of high conservation value forests and invasion of peat forests (with their strong risk of burning and emitting large amounts of carbon) have been major topics. Also seen as very important is the reduction of plant and animal biodiversity through the imposition of monocultures over wide areas. On a more local scale, questions of environmental pollution have arisen, resulting both from mill emissions and overuse of chemicals in plantation processes, affecting water quality in streams and downstream livelihoods.

Increased sophistication of satellite imagery and methods of estimating greenhouse gas emissions have brought more scientific techniques to bear in researching past land-use change through oil palm and in predicting future levels and directions of change. In addition to the felling of productive lowland and peat swamp forests, the establishment of large oil palm plantations has replaced mosaics of mixed peasant cultivation or more passive forest use by small farmers, but equally, unproductive cattle pastures, old rubber groves and patches of *Imperata* grassland. The possibility of confining future plantation development to such 'degraded' land raises the question of defining 'degradation' and remains largely academic in Indonesia, where the major corporations still have large land banks. A similar situation persists when one attempts to measure the impact of Indonesia's 'moratorium'[8] on future logging of high conservation value forests and peat forests.

The second question highlights political, legal and often historical factors that have affected the establishment of oil palm. Some of the abandoned plantations present in Nigerian landscapes are an artefact of political decisions taken back in the 1960s, while the 'labor lines' still in use in Cameroon's Debuntscha plantation (part of CDC) are much older and go back to the German colonial period pre-World War I (and the forced labor from the northwest which prevailed at the time).

In contrast, the critical statement that planting oil palm in Peru was 'in the national interest' was made only in 2000. The Indonesian Government has directed the development of its industry largely through the passage of laws that are favorable to plantations, for example specifying the proportion of company land that must be available to smallholders. In Malaysia, however, the Malaysian Palm Oil Board (MPOB) has usually taken a more 'hands-on' role, for example stationing staff at mills to detect the 'culprits' who are bringing poor quality fruit.

Almost all governments have ambitious plans for the industry, specifying its rate of growth, often by a specific year, the most popular being 2020. These potential growth rates are sometimes linked to a particular numerical mix of palm oil based biofuel in petroleum-based diesel (as in Colombia) or to a particular level of 'development' (as in Cameroon and Malaysia). Studies using complex statistical techniques to predict a range of future scenarios have been carried out for Indonesia and Colombia. These future plans to 'grow' the industry sometimes seem to envisage just its lateral extension by placing more and more land under oil palm, with little attention given to yield improvements or alternative ways of proceeding.

The business models developed at various scales and stages along the value chain to grow and process the oil palm fruit are the subject of question three. Most important have been the upstream models of large-scale plantations, together with various systems of smallholder outgrowers, either assisted financially by plantations and their mills (sometimes also by banks or credit unions) or independent of such credit.

A recent CLUA report provides a warning to Indonesia that all is not well in the rural sector: "despite a decade of unprecedented demand and record prices for edible oils, industrial scale plantations remain insignificant to the economy in terms of value added" (Elson 2014, 2). In

8 See Indonesia chapter for more detailed discussion of the moratorium

examining the socioeconomic impacts of oil palm's expansion in Colombia, Castiblanco et al. (2014) remind us of the perils of the 'staple trap', over-specialization in one or more commodities, a risk which hangs over Colombia through its susceptibility to several palm oil diseases, but no less over Indonesia or Malaysia, where the specialisation in oil palm monoculture is so much greater.

Again in Colombia, Hortua-Romero (2014) refers to the interesting work by German agronomist and environmental historian Frank Uekoetter called *The Magic of One: Reflections on the Pathologies of Monoculture.* Despite the fact that "monocultures exhaust soils, breed plant diseases, produce horrendous pest and weed problems, all in addition to the labor problems and economic risks that go along with a sole reliance on a single crop", yet "monocultures rule the world"(Uekoetter 2011, 3). In attempting to understand this phenomenon, Uekoetter argues that "monocultures are highly unnatural entities, and that means that they require some kind of human blueprint to develop: a conscious endeavor to build a production system around a single plant" (Uekoetter 2011, 4).

The industrial oil palm plantation is a prime example of this kind of blueprint, which evolved from a multi-crop system in traditional African groves to a mono-crop system in Southeast Asia. That system "which has become entirely dependent on man for its survival and propagation" (Gerritsma and Wessel 1997, 471) has subsequently been transferred back to Africa and to some tropical locations in South and Central America. In Malaysia, better climatic conditions, careful breeding, improved cultivation techniques (especially fertilization) and efficient processing has led to greatly increased yields, so that complete domestication of the plant has been claimed. However, Gerritsma and Wessel argue that the process is still continuing, and the end product is "optimal yield levels from economically viable and ecologically sustainable production systems" (Gerritsma and Wessel 1997, 474). Despite growth in production since 1997, yields have remained below optimum levels. Although the crop is economically viable, this viability may depend on low prices being paid for labor; whether production systems are yet ecologically sustainable also remains uncertain.

Social issues have included: 'land grabbing' by the plantations, especially of village lands with insecure tenure (sometimes with associated violence and despite resistance); the economic opportunities, risks and likely debt burdens resulting from the variety of outgrower schemes; and the sourcing and treatment of plantation labor. Gender issues have been only lightly reported, but in many cases entire families, including children, are drawn in to work, both on plantations and on smallholder farms. As Li (2011a, b) has indicated, lack of employment, especially permanent employment, is common on Indonesian plantations for the surrounding communities and conditions may be poor, while Vargas (2012) has presented much the same story in Colombia. Labor shortages are now being claimed on some Malaysian estates, as Indonesian workers prefer to stay at home, following wage increases. Labor shortages are also claimed by established estates in parts of Pará, Brazil. Increased smallholder incomes, while leading to improved living standards, have at times resulted in prostitution, gambling, alcoholism and other social ills (Potter 2014).

In addition, questions have been raised (especially in Brazil, Colombia and Cameroon) about the impacts of smallholder monocultures on food security, given that plantations are not generally receptive to mixed cultivations, including food crops, which farmers would generally prefer. The overall social situation is relevant here, with small farmers disadvantaged by the government support provided to larger players and powerless to improve their bargaining ability.

Detailed case studies of some specific plantations or smallholder groups have been included in the discussion of this question for Indonesia, Malaysia, Brazil and Colombia, while for Nigeria and Cameroon there has been a detailed focus on the 'land grab' properties owned by Wilmar and Herakles Farms.

Techniques of downstream milling and processing, from simple and traditional to highly mechanised and integrated (including processing into biofuel where relevant) are important in terms of the demand for the product and its marketing. In Nigeria, the focus has been particularly on the milling process as the 'special palm oil' produced in industrial mills is required for downstream processing into food and other products.

The final question considers suggestions for alternative models that might provide better and more sustainable outcomes for participants, especially smallholders. Here the question of mixed cultivation for small farmers and palm oil agroforests is discussed in some depth, using a range of examples from Cameroon, Brazil, Colombia and Indonesia. National and international measures to regulate palm oil development and certify the sustainability of its production processes (by organizations such as the RSPO and local variants) are very relevant here and are examined especially from the point of view of best practice for estates and improving the possibilities for smallholders. There is no doubt that the culture around oil palm and its cultivation is changing, especially in Indonesia, where certification is seen as a necessary step to ensure access to markets, even for smallholders. The pronouncements by Singapore's Wilmar International that in future their policy will be 'no deforestation, no peat, no exploitation' following a similar agreement by the giant Indonesian company Golden Agri Resources (GAR) are continuing to have an impact. Malaysia appears more resistant to implementing change. Some officials remain in denial about such topics as deforestation in Sarawak, while plans for the new 'Malaysian sustainable palm oil' (MSPO) seem focussed on keeping NGOs out of the organization.

In conclusion, as well as a brief summary of findings, the question of what aspects have not been covered or have been inadequately reported will be raised. This review is done in the context of a massive expansion of the industry since 2000, with a concomitant explosion of the literature analysing this phenomenon in both its positive and negative aspects. Thus the question is quite difficult to answer. There is an abundance of references available in English, in both the standard and 'grey' literature, though more must also be sought in the major languages of the countries concerned – Indonesian/Malay, Portuguese, French and Spanish – to ensure adequate coverage. Although one topic, such as the role of middle-level producers, outside the imposed statistical categories of large estates and smallholders, appears an obvious one that needs more research, the statistics need improvement for easy cross-country comparison; this sometimes comes down to the financial capability and willingness of government agencies to conduct the necessary surveys. In such a multicultural study, the fear of the author is rather that important materials may have been inadvertently overlooked.

2 Indonesia

2.1 The influence of oil palm expansion on economic development and land-use change

2.1.1 Background

Although the ancestors of the famous Deli Dura oil palm trees were planted in Bogor's Botanic Gardens in 1848 and their progeny transferred to Sumatra in 1911, it was not until the 1920s that full-scale plantations began to appear in North Sumatra and Aceh. The area reached 31,600 ha in 1925, rising to 92,300 ha by 1938 (Hartley 1977).

The difficulties of the World War II period and generally unstable conditions in rural areas after the war meant that recovery was slow. The former Dutch estates were nationalized in 1957, while those belonging to other nationalities, such as the Franco-Belgian Socfindo, which had also been seized, were returned to their private owners in 1967 after the Suharto Government came to power (Lubis 2008). By that year, there were 106,000 ha of oil palm: 62% was government owned, known as PTP (*perseroan terbatas perkebunan*), and 38% was private. There were no smallholders (*DirJen Perkebunan* 2012–2014). The government-owned estates were organized into seven entities and rehabilitated with funds from the World Bank during the 1970s. In 1979 they began to operate a contract farming smallholder scheme.

They also started to expand cultivation beyond the original locations. West Kalimantan was one of the first new provinces to be opened up in 1979, followed in 1980 by Riau and West Sumatra, and in 1981 by East Kalimantan and Banten (West Java) (Lubis 2008). Other provinces, such as Jambi, South Sumatra and South Sulawesi followed later, all with government estates. By 1980 there were 294,000 ha under oil palm, two-thirds of it on government estates. Smallholders were credited with 6000 ha, grown through nucleus estate–smallholder arrangements (in Indonesia PIR, *perkebunan inti rakyat*) somewhat similar to those which were operating in parts of Africa at that time with World Bank support.[9] The smallholders (known as *plasma*) cultivated around 60% of the plantation area and brought their fruit to the company factory for processing. The estate operated the balance of the land, known as the *inti*. Smallholders gave 5 ha of land to the company, receiving 2 ha planted in palm, 0.75 ha for a food garden and 0.25 ha as a house plot (Potter and Lee 1998, 3,21).

Private estates had been slower to expand, but were assisted from 1986 to 1995 by a new government program using transmigrant labor, mainly from Java (PIR–Trans). This had a dramatic effect in encouraging private estate participation, so that by 1989 they had more land under oil palm than the government-owned properties and their relative proportions have continued to rise. In 1990, the area under oil palm reached 1 million ha and by 1995, it was 2 million ha, with 658,000 ha owned by smallholders, 962,000 ha by private estates and only 405,000 ha in government estates (*DirJen Perkebunan* 2012–2014). Under the PIR–Trans scheme, and its successor (from 1995) the KKPA,[10] local smallholders had to give up 7.5 ha. This was originally in order to accommodate a transmigrant family as well as their own, but in the KKPA scheme, the need for transmigrant labor was dropped in favor of local farmers.

9 See Nigeria and Cameroon chapters for similar World Bank initiated schemes during the 1970s.

10 Under the KKPA (*Kredit Koperasi Primer Anggota*), a cooperative acts as liaison between the smallholders and the company and runs the financial affairs of the smallholders in terms of credit repayment and income from sale of fresh fruit bunches (FFB).

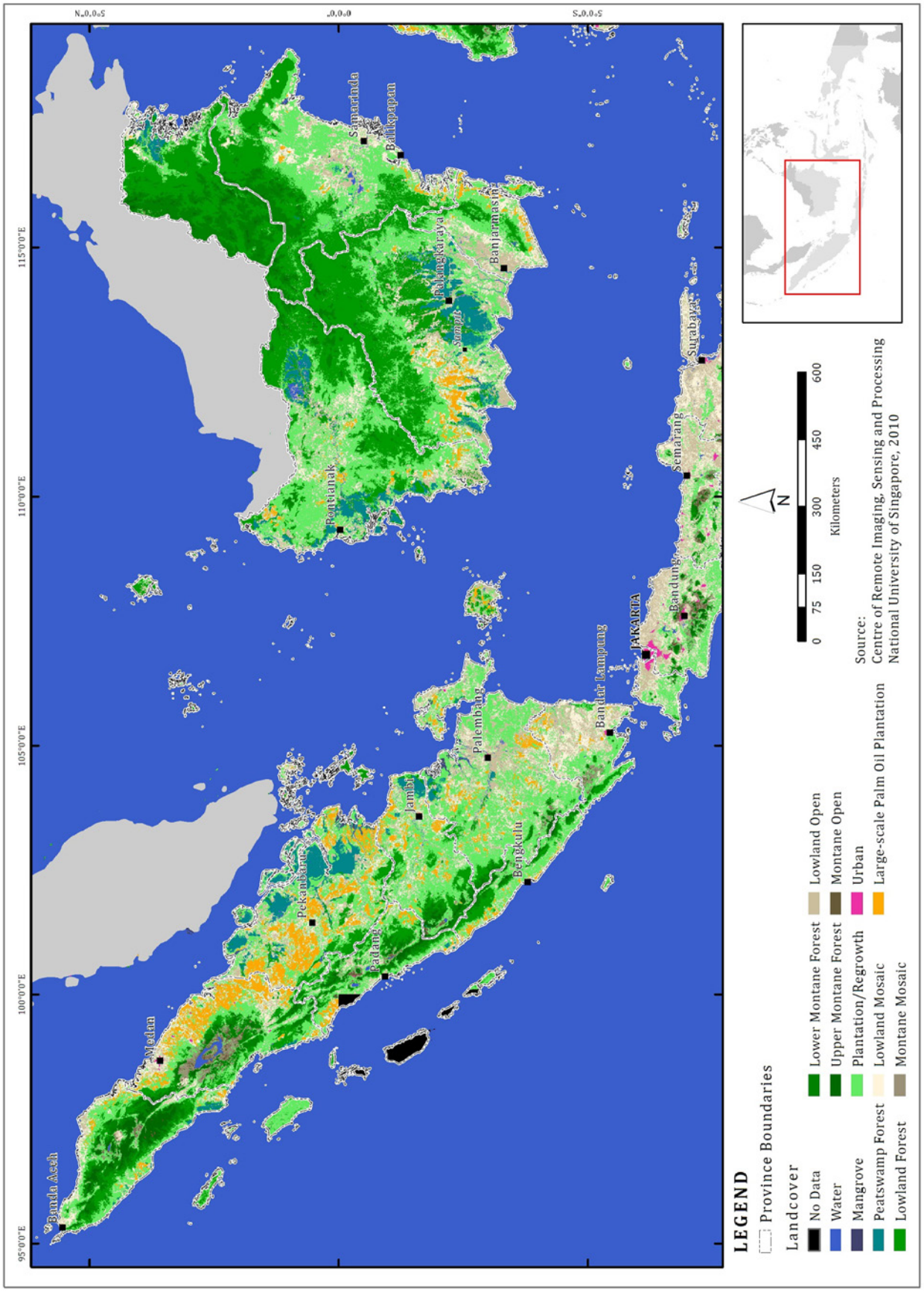

Figure 2. Indonesia: Land Cover, focussing on Sumatra and Kalimantan, the areas of greatest oil palm development.

For a few months in 1997, new oil palm development shifted to 'eastern Indonesia' (including Kalimantan) and Sumatra was closed to new foreign investment, but this was scrapped during the Asian Economic Crisis of 1998, when several companies experienced economic problems and production actually declined (Casson 2000, 2002). Between 1995 and 2000, the area under oil palm doubled to 4,158,077 ha; by 2010 it had doubled again, to stand at 8,385,394 ha (*DirJen Perkebunan* 2012–2014). Indonesia overtook Malaysia in 2006 as the world's largest palm oil producer.

2.1.2 The present scene

Palm oil production in Indonesia continues to grow rapidly, with 31 million t forecast for MY 2013/14.[11] With 90% of the increased production based on extensions in area and only 10% on yield increases, oil palm plantings were expected to reach 10.8 million ha and the mature harvested area, 8.1 million ha (USDA 2013).[12] The USDA calculated that the rate of increase – 600,000 ha per annum between 2011 and 2013 – was actually higher than the 500,000 ha per annum over the previous decade, despite the 2011 'forest moratorium.'[13] The authors suggested that the plantations did not suffer as a result of the original moratorium because collectively they had 6–7 million ha in a land bank which they could draw upon for their extension (USDA 2013, 1). Nevertheless, a report on the Golden Agri Resources group (GAR), which has Indonesia's largest area of planted oil palm (471,100 ha[14]) expects growth of the company's holdings to slow in the next 5 years "especially in Indonesia where area expansion capacity is limited given the lack of land and the moratorium on forest conversion" (*Indonesia Agribusiness Report* 2013, 116)[15].

In 2013 the area under oil palm was largely confined to Sumatra (64.1%) and Kalimantan (32.0%), with a small extension to Sulawesi (2.9%) and the balance in Papua and West Java (*DirJen Perkebunan* 2012–2014). The oil palm industry in Indonesia is dominated by a number of very large consortia (several of Malaysian origin) with extensive plantation holdings scattered across the main producing areas. Government-owned estates now constitute just 6.9% of the total area under oil palm. Smallholders account for 44.1% of the area but only 34% of the production, a likely reflection of the increased numbers of independent smallholders, whose yields tend to be lower than those attached to estates[16]. Around 77% of the total area managed by smallholders is in Sumatra, where they occupy 53% of the oil palm land.

The industry is growing fastest in Kalimantan, where a high proportion of the crop is still immature, so productivity there will be expected to increase. Much allocated land remains unplanted, which may explain GAR's complaint that room for expansion is limited. Across Kalimantan it is estimated that between 2000 and 2010, 79% of allocated leases remained undeveloped: full lease development would convert around 90% of available forest lands, 'including 41% intact forests', allowing oil palm to occupy 34% of lowlands outside protected areas (Carlson et al. 2012a). Obidzinski et al. (2012) suggested that large areas of forest allocated to oil palm have been cleared but remain unplanted, being targeted by companies as a source of timber (see also Fitzherbert et al. 2008). This practice has been especially common in East Kalimantan, where it was suggested that supposed oil palm projects

11 MY = market year

12 The Direktorat Jenderal Perkebunan (Plantation Crops Office) is more cautious, with an estimated planted area in 2014 of 10.2m ha.

13 Inpres No 10/2011. The Moratorium was designed to protect forests by restricting agricultural development in specific areas of dryland and peat swamp forest. It has been argued that the dryland forest areas selected were not generally at risk, but the peatlands were vulnerable to oil palm expansion (Sloan et al. 2012)

14 GAR Sustainability Report 2013

15 The suggested land banks for 7 of the largest palm oil companies operating in Indonesia, as printed in the *Indonesia Agribusiness Report* 2013 (p16) are flawed because the planted area of companies such as Sime Darby and Wilmar is 'global', and includes holdings in Malaysia and Africa, while yields apply to Indonesia.

16 Unfortunately the oil palm statistics do not separate out the different types of smallholder, which is a serious disadvantage.

were just used as a way to 'spy out' timber (Potter 2011:185)[17].

Movement of large plantations into the peatlands, which hug the eastern Sumatran coast and coastal areas of Central and West Kalimantan, has increased markedly in recent decades. For the province of West Kalimantan, a further study by Carlson et al. estimated that by 2007-8, oil palm directly caused 27% of total deforestation and 40% of deforestation of peatlands. The rate of peatland use accelerated over time: while 81% of plantations were located on mineral soils in 1994–2001, this changed to 69% on peat by 2008-2011 (Carlson et al. 2012b). This research expanded the analysis of Koh et al. (2011), who found the most extensive areas of cleared peatland to be in Riau, Sumatra (about 450,000 ha) and Central Kalimantan (400,000 ha), with smaller amounts in South Sumatra and Sarawak. A further study by Miettinen et al. (2011) suggested a decline in peat swamp forests between 2000 and 2010 of 5.2% for Sumatra and 2.8% for Borneo (including Sarawak and Sabah), compared with general deforestation rates for Sumatra and Borneo of 2.7% and 1.3% respectively.

The most exhaustive studies on this topic may be found in the *Reports from the Technical Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil (RSPO)* eds. Killeen and Goon (2013). Complementary chapters by Gunarso et al. (2013) and Agus et al. (2013) covered land-use change and greenhouse gas emissions across Indonesia, Malaysia and Papua New Guinea over three time periods: 1990 to 2000, 2001 to 2005 and 2006 to 2010. The studies focused on the question of oil palm on peat, as well as the changes in 22 different types of land cover as they were converted to oil palm. Gunarso et al.'s main findings are of considerable interest. Only 4% of plantations were converted directly from undisturbed forest, with the processes being complex and generally involving earlier conversions, often through logging or wildfire to disturbed forest, scrub and grassland. While 44% of plantations resulted from conversions of these varied kinds of disturbed forests in Kalimantan, in Papua the figure was 61%, in Sarawak 48% and Sabah 62%. In Peninsular Malaysia and Sumatra the land-use change was rather from rubber plantations or agroforests to oil palm.

In the paper by Agus et al. (2013) with a focus on the peat swamps, the oxidation of the peat through drainage was shown as responsible for 64% of emissions linked to land use. Agus et al. compared the findings from their work with those of Carlson et al. (2012b). A further study – Harris et al. (2013) – then projected land use and emissions between 2010 and 2050 over the same area, presuming that total production of oil palm would double by 2050. There are three scenarios: 'business as usual' (BAU), in which increased supply comes from spatial expansion; 'moratorium on peat' (MRT) in which improved productivity allows expansion to shift away from the peatlands; and 'recovery of the peatlands' (RET), in which existing plantations are removed and the natural environment restored. Under the BAU scenario, net cumulative carbon emissions are estimated at 15 gt, with Kalimantan, Sumatra and later Sarawak as the main sources. Halting the expansion into peat areas in the MRT scenario is modelled to reduce emissions by 50%, while restoring the peat to native forest vegetation and maintaining a stable group of highly productive oil palm plantations on mineral soil can bring annual emissions close to zero (Harris et al. 2013).

Another question of interest in the debate over the impacts of oil palm on forests, especially peat swamp forests, is to examine the environmental role of the smallholder sector compared with that of the larger estates. Riau (Sumatra) is a province with the largest area of oil palm in the country; 64% of that area was managed by smallholders in 2013 (*DirJen Perkebunan* 2012–2014). Sampling across three oil palm growing districts in Sumatra, Lee et al. (2013a) compared the magnitude of forest and carbon loss, which could be attributed to large private estates, government estates and smallholders. Building on the data from Koh et al. 2011, a GIS analysis of land-cover change indicated that the highest levels of deforestation in both peat swamp and lowland

17 In January 2013 the Chairman of the East Kalimantan Permit and Investment Board stated that a moratorium would be implemented on the issue of permits for new oil palm plantations until all existing lands under permit had been planted. Although permits had been issued for 2.4 million ha, only 1 million ha had been planted. The official indicated that it was hoped to shift investment to food crops, especially rice, making East Kalimantan 'the country's food hub' (Mattangkilang 2013).

forests were in Riau,[18] and were caused mainly by large private plantations. The general findings of Lee et al. in Sumatra showed private plantations to be the overwhelming cause of the loss of both lowland and peat forests. Smallholders, where they were guilty of deforestation, were generally not in the peat swamps (too demanding of capital and expertise), while the large plantations caused 90–91% of carbon emissions from that source[19]. One conclusion is that "halting the expansion of oil palm private enterprises over peat swamp forests and lowland forests is a crucial first step to mitigate carbon dioxide emissions from Indonesia's oil palm industry" (Lee et al. 2013a, 7).

Several studies researched the extensive fires, covering 140,000 ha that took place in June 2013, with 95% of the hot spots occurring in Riau province. In two blogs for CIFOR's *Forest News* Gaveau and Salim (2013a, b), using the new LANDSAT 8 satellite, concluded that most fires were on peat, predominantly in areas of established plantation use. Some plantations appeared to exist in areas not shown as having concessions, perhaps indicating that the publicly available maps were wrong, as claimed by the companies.[20] Although large plantations (of *Acacia crassicarpa* and oil palm) accounted for 21% of the burned area, the majority were "small and medium holder plantations".

Despite the evidence of the serious environmental impacts of oil palm expansion in Indonesia, the industry has been hailed as "an economic pillar" of the country by the Chairman of GAPKI (Bahroeny 2009). Bahroeny quoted the value of exports of CPO, which in 2008 generated USD 12.4 billion in foreign exchange. McClanahan 2013 (in the *Guardian*) reported that the industry accounted for 11% of total export earnings in 2012 and generated USD 5.7 billion in export taxes for the government. In 2012, the value of exports had risen to USD 17.6 billion.[21] Despite lower prices, in 2013, palm oil retained its position as the second highest contributor to total exports (after coal) and contributed 10.5% of total export earnings, worth USD 19.2 billion (Widhiarto 2014).

In terms of employment, in mid-2013, Obidzinski indicated that the oil palm sector employed 0.4 persons per hectare, or a total of 4.1 million households (Obidzinski 2013)[22]. In a paper focusing on the socioeconomic impacts of oil palm expansion in the 'frontier province' of Central Kalimantan, Obidzinski et al. argue that while rapid increases in the area under oil palm in particular districts have certainly lifted output and employment, that employment is not always available to local people as workers are often brought in from outside: "if oil palm cultivation does not offer sufficient income or provide employment to all members of the local community, it may leave many of the poorest households marginalized and vulnerable" (Obidzinski et al. In press). In Central Kalimantan, the labor coefficient for oil palm plantations in 2005 was calculated at 0.28, i.e. 0.28 persons per hectare. That is considerably lower than the overall figure of 0.4 persons per hectare calculated by Obidzinski, but it reflects the low number of smallholders in the province and the early date. The expansion of oil palm in Central Kalimantan has happened recently, with the area planted doubling between 2007 and 2010. The narrow focus of the industry, with much of the CPO being exported unprocessed and the lack of forward linkages (there was only one refinery in Central Kalimantan before 2010) has also limited its economic impact (Obidzinski et al. In press).[23]

18 See also Miettinen et al. 2012

19 A rather different picture emerges from Cacho et al 2014, where one of two case study villages in Riau showed high rates of deforestation by independent smallholders on peat, with the costs of building drainage canals being subsidized by local authorities 'to make land available for development'(p325)

20 See also Greenpeace 2013b, Reyes 2013. These concessions could also be illegal, as mentioned by Sloan (2014). The RSPO has followed up on the allegations (mainly from Greenpeace) that specific RSPO member companies were involved in burning and is now insisting that concession maps be available on the RSPO website (RSPO 2013; Reyes 2014).

21 USD 19 billion when palm kernel oil is included.

22 These figures refer only to actual employment in the plantations sector. Downstream processing and associated services and remittances employ many more, maybe up to 20m people (Varkkey 2012b, 6)

23 There is more discussion on this topic under Section 3, business models.

2.2 The role of policies and corporate strategies in shaping oil palm development

An important economic strategy of the Indonesian Government has been an attempt to encourage local production of palm oil biodiesel in order to reduce the country's reliance on imports of diesel oil, especially for the transport sector. Blending targets were set and companies provided with incentives to build processing plants, with 60 being established by 2006 (Obidzinski et al. 2012). Those early efforts largely failed as the prices of diesel oil were cheaper than biofuel, especially when palm oil prices soared in early 2008. However relative prices through 2013 were in favor of biodiesel as prices eased for CPO. Meanwhile, high oil and gas imports increased Indonesia's current account deficit, which reached record levels in the second quarter of 2013 (Suharto 2013). Although the mandatory level of biodiesel was only 2.5% from 2010, the oil company Pertamina had been using 7.5% and the blend was increased to 10% in September 2013. Power plants were supposed to blend 20% from January 2014 (Rusmana and Listiyorini 2014). The July GAIN report did not expect that the power industry would actually reach the B20 target "as the power generation sector has not yet adopted biodiesel" (Wright and Wiyono 2014).

According to data from the Asosiasi Produsen Biofuel Indonesia (APROBI), at present there are 18 biodiesel plants with a joint capacity of 3.2 million litres (l), the largest being Wilmar's factory in Dumai (Riau) with a capacity of 1 million l, while the capacity of a second Wilmar plant in Gresik (near Surabaya) was 600,000 l (APROBI 2014 *in* http://www.infosawit.com/index.php/pages/page/industry-biodiesel/). The jump in palm oil requirements for biodiesel will increase local consumption of CPO to the point that exports are unlikely to increase in 2014 over the 2013 figure of 21.22 million t (Rusmana and Listiyorini 2014). Exports to China and India, Indonesia's largest markets for CPO, actually declined in the first quarter of 2014 in favor of soy, which became equal to palm oil in terms of price competitiveness (Wright and Wiyono 2014). The November 2014 GAIN report indicated a drop in CPO production of 500,000 t but predicted that exports would remain at 21 million t. The government's biodiesel subsidy has led to a rapid adoption of B10 blends and the country is now moving toward B20 (Wright and Abdi 2014). However, the recent slashing of the price of crude oil may again present a setback to the industry.

Lower CPO prices have also encouraged more downstream processing, with the aim of exporting 60% of processed products and just 40% of CPO, a proportion that had already been reached in 2012 (*Oil World Annual* 2013). The new tax structure introduced in 2011, dropping the export tax on processed products from 25% to 10% and increasing taxes on higher priced CPO makes downstream investments more attractive. An investment of USD 2.7 billion will be made by 20 local and foreign processors (including Sinar Mas Group, Musim Mas group and Unilever), building oleochemical and oleofood plants. Tax holiday facilities will be available for major investments (Yulisman 2013b).

Despite encouraging the expansion of oil palm, with plans to lift CPO production to 40 million t by 2020, the Yudhoyono Government had expressed the need to cut Indonesia's greenhouse gas (GHG) emissions by 26% in the same year, while maintaining annual 7% GDP growth (Paoli et al. 2013, 13). One way to reduce emissions is to reduce the invasion of peatlands by oil palm companies; although it was criticized for not protecting all the peatlands, the moratorium at least goes some way towards this (Murdiyarso et al. 2011; Djalal and Steer 2013).[24]

Inevitably, the moratorium brought protests from affected pro-oil palm groups. GAPKI, the Indonesian Palm Oil Association, opposed the original moratorium, a spokesman suggesting that it would "translate into losing 50,000 to 80,000 jobs and 2 million t of production" (Joko Supriyono in *Jakarta Globe* 2011). The extension of the moratorium for a further 2 years from May 2013 prompted another negative response. Tungkot Sipayung, GAPKI's director of law and advocacy,

24 Sloan et al. 2012 and Sloan 2014 are much more critical, noting many irregularities in the various revisions of the moratorium. In the later paper, Sloan (2014) highlighted 0.47 million ha of illegal oil palm concessions found within the forest estate when the 2012 revision was taking place. While the presidential office wished to retain these areas within the moratorium, the Ministry of Forestry successfully argued to excise them. The ministry later issued regulations granting permits to all such "concessions of uncertain legality" (Sloan 2014, 39).

stated that it would limit development; he felt that the peatlands should be removed from the moratorium and allowed to be put under oil palm. He indicated that palm plantations and palm processing sectors 'absorbed 6.7 million workers and contributed IDR 30 trillion (USD 3.16 billion) to state income in 2006–12 from crude palm oil alone' (Lubis 2013).

In spite of the efforts of the central government, largely through the former president, to limit deforestation and GHG emissions, former government departments (especially Agriculture and Forestry) have generally designed regulations that assist the oil palm companies. Although a number of parastatal oil palm companies (the former PTPs) still exist[25] and played a vital role in establishing the industry in the early 1980s, the large private corporations now have much more power. It has been alleged that there are significant ties between the government and the palm oil lobby, to the extent that "many conglomerates are rumoured to be influential in setting national policies impacting the palm industry" (Accenture 2012, 21). See also Varkkey 2012a, 318-9 for discussion of patronage networks.

A separate lobby group – APIMI – represents the estates of Malaysian origin.[26] Some, such as Sime Darby and Tabung Haji Plantations, are Malaysian Government-linked companies (GLCs), while others are private, usually Chinese-owned companies with close ties to the Malaysian Government. The APIMI group, located in Jakarta, strongly defends the activities of Malaysian plantations in Indonesia. This happens even in blatant cases of open burning (against Indonesian law) and the recent haze problem in Riau (Varkkey 2012b).

McCarthy (2011) when looking at policy decision-making at the district level, argues that a pro-plantation bias is evident in some districts. Gillespie echoed this sentiment: "The district and sub-district's close alignment with plantations adversely influences the plantation-smallholder relationship". The result is "an environment where the government's traditional role of oversight and accountability is both philosophically and functionally limited" (Gillespie 2010, 326).

Gillespie (2011) outlines three of the most influential policies which have worked to the advantage of plantations: 1) the Basic Agrarian Law (1960); 2) the Plantations Law, No18 of 2004; and 3) the Agricultural Ministerial Regulation No 26 of 2007 (This Regulation was replaced in 2013 by Regulation No 98 of 2013. See discussion under footnote at paragraph 3 line 4).

The Basic Agrarian Law gave the state control over land and natural resources: while recognising that *adat* or traditional law and rights to land still existed, the law subordinated them to state law.[27] The Plantations Law spelt out the limited circumstances in which *adat* might be formally acknowledged,[28] while at the same time providing generous land licence options for companies (Gillespie 2011, 25; Paoli et al. 2013, 52). Under this law, it became the responsibility of the company (and not the district government) to obtain agreement with landowners over the surrender of their lands, the presumption being that such surrender would occur. The unequal power relations between plantations and small farmers meant that the process was inevitably one-sided. The law also permitted plantations to use

25 The parastatal companies (PT Perkebunan Nusantara or PTPN) are scattered across Indonesia. Many of them were originally former Dutch plantations nationalised in the 1950s. The companies have since been consolidated, so that most have several holdings under one management. The 14 companies include five in Java which mainly produce tea, sugar, coffee and tobacco. Companies 1–7 cover Sumatra: PTPN V, for example, is in Riau, with 51 oil palm estates covering 161,617 ha. By way of contrast, PTPN I in Aceh has only 6 estates and 26,409 ha of oil palm. No 13 (PTPN XIII) covers all of Kalimantan, with 113,348 ha in 23 oil palm estates and 44,082 ha of rubber. PTPN XIV deals with Sulawesi, Maluku and NTT (oil palm, rubber, cocoa, coconut, nutmeg). The new oil palm plantations in Papua are operated by PTPN II, which also has estates in North Sumatra (Source: company websites, annual reports).

26 APIMI is the 'Association of Palm Oil Plantation Investors of Malaysia in Indonesia'

27 An improvement in this situation, at least in regard to customary village forests (*hutan adat*) has been to remove them from the state forest, in a 'landmark;' decision of the Constitutional Court (Constitutional Court Ruling 35/PUU-X/2012 16 May 2013). This is seen as one step toward giving traditional people legal control over their land (DTE 2013).

28 There had to be: a clear designation of adat leaders in the community; strict boundaries designating *adat* land; a functioning system based on traditional justice and laws; and acknowledgment by the state of such a system through regional legislation.

the local 'security apparatus' (meaning police and occasionally the army) to maintain security on the estates, with several articles listing punishments if there was seen to be any threat to the plantation.[29]

The Agriculture Ministerial Regulation (No 26/Permentan/OT140/2/20-07 'Concerning Guidance for Plantation Permission') reflected the desire of plantations to have more control over their land. A clause in the regulation permitted companies to own and control up to 80% of their land, allowing the surrounding community just 20%[30]. Earlier subdivisions of land between the plantation 'nucleus' (*inti*) and surrounding outgrowers (*plasma*) had been more generous, with 70/30 ratios in favor of smallholders being common (Potter and Lee 1998; McCarthy et al. 2012), but the plantation owners argued that low smallholder yields often meant that mills were running below capacity. The fact that palm oil prices were increasing with the biodiesel 'boom' also meant that the plantations were pushing to increase their output. Another aspect of this regulation meant that the plantation could now work all the land under what is called a 'partnership' (*kemitraan*) or 'under one roof' *(satu atap*) and just pay the smallholder a rent, which is considerably less than they would receive if they worked it themselves (Gillespie 2010; McCarthy et al. 2012).[31]

McCarthy (2010) outlined the ways in which changes in government policy towards oil palm production have impacted on small farmers, in particular on their chances of securing a reasonable livelihood from the crop or of being excluded and in many cases eventually becoming landless. He showed how transmigrants in Jambi province, together with local elites, were in a better position to benefit from the original 'state agribusiness model' (PIRTrans) while many indigenous *Melayu* held back. In the 1990s a new 'transitional model' (KKPA) included less state supervision and control. At this time *Melayu* farmers began to participate, but often missed out due to elite manipulation, especially 'because of the lack of secure and enforceable rights over both private and village common land'(McCarthy 2010, 838). After 1998 and the fall of the Suharto Government, a neoliberal, market-driven approach was adopted. The state retired from providing direct assistance to smallholders, leaving this to the plantation, which gained more and more control, capturing and compromising district authorities. McCarthy's conclusion was a sober one "The success of oil palm as a commodity makes it appear extremely attractive to farmers. Yet paradoxically…without significant outside support, large swathes of rural landowners may not be able to access oil palm under the terms where they can hope to prosper" (McCarthy 2010, 847).

29 One important change has subsequently been made. Two articles (21 and 47) relating to 'disturbance of the activities of the estate' and the punishment which should follow, were struck out by the Constitutional Court in 2011. That meant that people can no longer be automatically jailed for demonstrating against some aspect of plantation management.

30 The new Regulation 98 of 2013 is similar, except that the 20% of the total plantation area which must be available to smallholders must now be found *outside* the company's concession area, not within it. The eligible community must also hold legal titles on the land to be developed. These changes make compliance with this Regulation more difficult for the plantations (aidenvironment 2014: 25).

31 While it may be argued that smallholders would do better if they allowed the more productive estates to work their lands, the problem is that the estates charge the smallholders for this service, in addition to the normal credit charges for fertilizer and other inputs. Gillespie noted that in one of the plantations he studied in Sanggau (West Kalimantan) which was using the 80/20 system and the *satu atap* approach, 40% of the farmer's potential income was taken for 'plantation costs', 30% towards repayment of credit (until paid off), with 30% only remaining as income, from an area of land which was on average, only 1.3 ha, not the 2 ha minimum that *plasma* farmers would normally receive (Gillespie 2010).

2.3 Socioeconomic outcomes from disparate business models in oil palm development

2.3.1 An Indonesian Plantation Corporation, Golden Agri Resources (GAR): Profitability? Sustainability?

In an overview of the giant corporation Golden Agri Resources, the Indonesia Agribusiness Report (Q3 2013) noted that GAR operated the world's second largest palm oil plantation area, located in Indonesia and valued at USD 1.5 billion. The group's strengths included the benefits from economies of scale and distribution channels because of its vertical integration. Its yields and extraction rates were "relatively high by industry standards", indicating good plantation management. Yet its weaknesses included declining operating margins and the fact that all of its plantations were in Indonesia, making it vulnerable to fluctuations in export taxes. While there were opportunities to acquire land in Africa (Liberia), "palm oil production expansion could be unsuccessful, complicated by *pressure to subscribe to 'sustainable practices', which means increasing production costs*".[32] The core net profit of the group declined by 29% in 2012 to USD 404 million, partly a result of lower CPO prices.[33] The report recommended the push toward the sale of refined products from Indonesia's downstream sector as a way of increasing revenue, although it was pointed out that there would be competition, as numbers of new refineries were coming online, with total capacity growing by 68.5% between 2012 and 2013. The corporation's revenue by country in 2012 was 68% from exports from Indonesia, 11% from local sales in Indonesia and 21% from its subsidiary in China. In terms of product, CPO brought in 44% of revenue, and unbranded refined palm products 29%, with small amounts from branded products and soybean products, again from China (*Indonesia Agribusiness Report* 2013). So the corporation was already moving towards more downstream products, as is now characteristic of the Indonesian industry. However, GAR was still seen as less profitable than some of its major peers, such as Astra Agro and Indofood Agri.

GAR's 160 plantations are located almost entirely in Sumatra and Kalimantan, with just one in Papua. The planted area of 471,100 ha is made up of a nucleus of 371,102 ha, together with 100,000 ha of *plasma* or 'scheme' smallholdings. Just over half of the mature oil palm area has been certified by the RSPO (including half of the smallholders' land) with 19 of the 41 mills, 3 (out of 8) kernel crushing plants and 2 (out of 4) refineries. In mid-2014, just 36,000 ha and three mills had been certified by the ISPO, the take-up there obviously being slow.

Although the company is still expanding its area (by 16,000 ha in 2013), it is also implementing an improved yield policy, both for the nucleus estates and the plasma. In 2013, estate yields of CPO for prime age trees were 4.76 t/ha, scheme smallholders 4.65 t/ha (both these yields were above the Indonesian average). In 2015 the target yields are 5.80 t/ha for the nucleus and 5.60 t/ha for the plasma.

Total employment in 2013 was 175,000, consisting of 47,000 direct employees, 66,000 'scheme' smallholders and 62,000 casual plantation workers or 0.37 workers per ha. Many of the plantation jobs are short-term, as revealed in the following statement: "The casual worker scheme offers flexibility due to the seasonal nature of oil palm cultivation. This allows casual workers to earn extra income whilst allowing them to tend to their own farmland or other personal responsibilities" (GAR *Sustainability Report* 2013:41). One might legitimately ask what happens to such workers outside the main cropping season, especially if they do not have their own farmland to work? Women make up almost half of the casual workforce (44%), being assigned less physically demanding tasks such as weeding. Again there is an inference that such employment is not too important "the high percentage of women among casual workers reflects the traditional family structure where men are the main breadwinners" (GAR *Sustainability Report* 2013:40).

The legal minimum wage, which is used to calculate the wages of Indonesia's oil palm workers, has risen in rupiah terms over the past 2 years. The rate varies among provinces, but GAR has averaged it among the provinces where the company is represented and increased it slightly. Between

32 Emphasis mine

33 A further decline in profits – by 21% - was experienced in 2013, again as a result of weaker CPO prices (*Golden Agri Resources Sustainability Report*, 2013)

2011 and 2013, the wage for GAR's casual workers increased from IDR 49,500 per day to IDR 61,900 per day. However, in US dollar terms the wage went up only from USD 5.63 to USD 5.95 (*GAR Sustainability Reports* 2011 and 2013).

In 2009, Greenpeace subjected GAR subsidiary PT SMART to heavy public criticism for various violations of RSPO guidelines, such as carrying out forest clearance without receiving permits, burning, clearing and draining areas of deep peat and operating contrary to the findings of a High Conservation Value Assessment. There was a call for RSPO member companies such as Nestle and Unilever to stop buying products from GAR, which was complied with. The following year, GAR worked with Greenpeace to begin to implement a forest conservation policy (FCP), which was launched in 2011, after which the ban was lifted.

In March 2013, GAR and SMART announced that they would begin a pilot project on high carbon stock (HCS) forest conservation, using as their model plantation KPC (PT Kartika Prima Cipta) in Kapuas Hulu, West Kalimantan. This was one of the plantations that had been targeted in the original Greenpeace exposure. The FCP was to focus on "no development on land containing HCS forests, High Conservation Values and peatlands; respect for indigenous and local communities and compliance with all relevant laws and regulations as well as internationally accepted certification principles and criteria" (joint GAR/SMART press release 13 March 2013).

However, an independent review of the position at plantation KPC, conducted in July 2013 (Colchester et al. 2014) was critical of the activities of the plantation, especially its treatment of local (Dayak) people. The proposed HCS 'set-asides' ignored local peoples' own land use and were very unpopular. After discussions, the company stopped pressuring some communities to surrender their lands and is no longer clearing forests, peat and HCV areas. However, plasma smallholdings have been granted to some Dayaks who surrendered lands under a 'partnership' scheme (80/20). The recipients are receiving much less than the 20% anticipated as the peatlands, high conservation value (HCV) areas and 'set-asides' have been subtracted from their plasma area. In addition, a debt of USD 5200 per hectare is to be repaid to Bank Mandiri once production from the smallholdings becomes substantial. In this remote district of Kapuas Hulu there is widespread lack of community understanding of HCS forests, so there are huge cultural problems with this scheme. In referring to the local swidden practices, Colchester noted, "the imposition of (forest) categories based on their current carbon content thus breaks up a dynamic system of land use and regrowth" (Colchester et al. 2014, 43). Such problems were no doubt not anticipated by the RSPO when their forest categories were established. They add a further layer of difficulty to GAR's efforts to adopt more sustainable practices and foreshadow the need for the RSPO to reexamine the impacts of their forest categories at a local level. GAR commented that they were implementing an action plan to address the issues identified.

As such a large and influential company, it would seem that GAR still has some way to go to fulfill its claims of sustainability, though obviously it is making an effort.

2.3.2 The smallholders

There are two basic 'business models' of smallholders: 'tied' or 'scheme' smallholders receive credit from a plantation for planting and inputs; 'independent' smallholders are unassisted but generally use an estate mill to process their fruit.[34] While the small plots of scheme smallholders (about 2 ha) tend to be part of the original estate, their owners are unlikely to engage in cutting forests, but the holdings of the independents may be larger, their crops more diverse and their locations more remote.

The attempts to identify those responsible for the Riau fires indicated that "as well as small and large-scale operators, a third category of 'local, mid-level entrepreneurs' has economic and environmental impact on Sumatra" (Ekatinata et al. 2013). Lee et al. (2014a) also mentioned wealthy transmigrant smallholders with large holdings who did

34 There were 46 independent mills in Riau in 2009. 'Mills without plantations rely heavily on FFB purchased on the open market. These independent mills are privately owned by small companies without corporate purchasing policies and buy FFB from any supplier without checks of legality and sustainability concerns' (WWF 2013:5).

An independent smallholder has his palm fruit weighed by a local trader (toke). Indragiri Hulu district, Riau, Sumatra. (Photo by Lesley Potter)

deforest.[35] The existence of this 'middle' group of oil palm farmers is a phenomenon that requires further analysis.

A *Diagnostic study on oil palm smallholders in Indonesia* (Molenaar et al. 2013), was published as a follow-up to a preliminary report on the same topic (Aidenvironment 2013), which identified a lack of information on this group as part of the International Finance Corporation (IFC)'s engagement in Indonesian palm oil. The aim was to understand the needs of smallholders and explore techniques of funding them so they could produce certified sustainable palm oil (IFC Workshop Jakarta, June 2013). It was suggested that little "unbiased, robust research" was available on either the agricultural and social landscape of smallholders or the level of investment on independent smallholder farms (Aidenvironment 2013; Molenaar et al. 2013).[36] The work was carried out among 1069 farmers with 1509 plots, of which 478 were 'scheme' and the rest 'independent'.[37] Locations were initially in West Sumatra, South Sumatra and Riau, later extended to South and West Kalimantan. While a gap in yields (t FFB/ha) was expected, results show that the gaps are very wide – between independent and scheme smallholders (32%); between scheme smallholders and the plantation (35%); and between independent smallholders and the plantation (102%) (Aidenvironment 2013, 6; Molenaar et al. 2013). Other major findings included low fertilizer application among independent smallholders and difficulty in securing

35 I would add from field observation that not only transmigrants but wealthy businessmen from Jakarta and regional cities have opened small plantations (100 or 200 ha) in both Riau and Central Kalimantan. They are not technically smallholders, and unlikely to be observed, as falling outside the major categories. See also the WWF report on illegal oil palm encroachment on the Tesso Nilo forest complex in Riau, in which 524 individuals were identified, with an average plantation size of 50 ha: "far above the typical size for a smallholder, suggesting the availability of significant capital" (WWF 2013, 3).

36 In contrast to the IFC's perceived lack of information, Sayer et al. assert that "there is an abundant recent literature on the issues surrounding smallholder cultivation of oil palm" (Sayer et al. 2012, 116). While their statement is partially correct, the results of this study for the IFC are very useful as it focusses particularly on independent smallholders. This kind of detailed information has not been collected before.

37 Smallholders under *satu atap* arrangements, where all the work was done by the plantation, were omitted from the sample.

hybrid planting materials; again these results were expected from the literature, but the fact that only 25% of independents had secure access to hybrid seedlings is shocking. A further finding that "independent farmers rarely have adequate loans for plantation establishment or replanting" reiterates McCarthy's conclusion that "oil palm is a rich man's crop that requires expensive inputs if it is to be farmed successfully" (McCarthy 2010, 826). Thus social stratification is shown to be widespread and increasing among small farmers in the oil palm areas. Farmers may "prefer oil palm" (Feintrenie et al. 2010) (Rist et al. 2010) as it brings higher returns than alternative crops, but that does not help if they are facing "adverse incorporation" (McCarthy 2010) and unable to obtain a reasonable yield through lack of basic financial resources.

Another paper which addresses much the same issues is Lee et al. (2014b). The researchers surveyed 379 smallholders in 15 Sumatran villages in the same provinces as the IFC study. After excluding 'managed' smallholdings (those operating under the 80/20 or *satu atap* system, allowing full management by the plantation), they had a data set of 426 smallholdings, of which 281 were independent and 145 came under a 'scheme' and received plantation assistance.[38] The average area was 2–3 ha, with a yield of 15.4 t FFB/ha. It was found that the independent smallholders obtained a yield 25% below that of the scheme smallholders in the early years of production and 38% lower in later years. In this study the emphasis was similarly on agronomic practices, together with the enabling environment. Like the IFC study, they mentioned the "growing socioeconomic gap among oil palm smallholders in Indonesia" (p. 10).

Potter (2014) has provided a detailed account of the ways in which the plantations, both parastatal and private, have encroached on the lands and livelihood systems of indigenous Dayak farmers in parts of Sanggau district (West Kalimantan) from the early 1980s to the present. She has especially noted the range of outcomes, with some plantations more lenient in terms of areas of land provided by participating farmers (*plasma*), while others fitted the 'adverse incorporation' model, especially the one example of 80/20 studied in depth by Gillespie (2010). Some villages simply refused to join a plantation. In other cases, an elite group from such a village would grow oil palm independently and participate on their own terms, but keep elements of their traditional systems, especially rice fields. In other nonparticipating villages, several farmers became plantation laborers, but managed to retain their rubber groves. While most of the *plasma* (or 'scheme') farmers had improved their incomes, considerable stratification was evident between plantations and their cohorts of smallholders, between participating and nonparticipating villages and within the nonparticipating villages. Fortin (2011), reporting from the Meliau sub-district of Sanggau found evidence of a range of problems, with some farmers being unfairly deprived of a smallholding to which they were entitled, high rates of landlessness and differences in treatment between transmigrants and indigenous farmers. Semedi and Bakker (2014), working in the same area discovered more positive outcomes demonstrating farmers' initiative, including the fact that smallholders had refused to give the required area of land to the companies. This was apparently quite widespread, as previously reported by Potter (2009) and Gillespie (2010). Gender issues were highlighted in Kembayan sub-district by Julia and White (2012), where women workers were forbidden to collect loose fruit from the plantation (usually a source of income) and prostitution in 'cafes' along the major roads was causing stress in families.

One aspect which has received less attention has been the position of plantation workers, especially the casual workers, known as BHL (*buruh harian lepas*). Estates wishing to be certified by the RSPO are not supposed to employ such workers, who generally suffer from uncertain and low-paid employment and often must bring members of their families, including their children to assist them in fulfilling their targets. Smallholders, both scheme and independent, also hire workers to assist with harvesting and maintenance; these are predominantly BHL. A study carried out in several plantations and smallholder farms in Riau province concluded that: "Not only are casual workers still rampant in the sector, but there is also no fixed form of employment (and payment)… each plantation company may have its own form of employment practices" (Sinaga 2013, 75). She also argued that incomes received were insufficient for "decent living" and would result in food insecurity.

38 It was explained that about 60% of farmers operating scheme or managed smallholdings also owned an independent smallholding.

A plantation labor force in remote areas is sometimes supplied by a new transmigration scheme that operates at the district level between sending districts (usually in Java or the poor province of East Nusa Tenggara) and receiving districts in parts of Kalimantan, Sumatra and Sulawesi. In each group, 50% of places must be reserved for local people. One study which focused on Central Kalimantan discovered that settlers struggled with deep peat soils, poor living conditions and corrupt officials while they waited for oil palm estates to be established, eventually securing casual jobs at or just below the minimum wage. Although life was hard and many of the newcomers left the schemes, the Javanese in particular were better off than the local Dayaks who joined the schemes but faced constant discrimination (Potter 2012).

SERBUNDO, the Indonesian Trade Union Alliance, presented a statement to the 11th RSPO Annual Meeting in Medan (November 2013), asking that a labor working group be formed in the RSPO to ensure decent wages for laborers and revoke certification for plantations that violate the rights of "laborers, farmers and local communities". They also asked for RSPO member companies to eliminate "outsourcing, day laborers, piece rate laborers and contract laborers in the positions of harvesters, sprayers and all works that use chemicals and are dangerous to health and work safety"(Aliansi Serikat Buruh Indonesia [SERBUNDO] 2013).

2.4 Initiatives towards more sustainable and inclusive oil palm production

Koh and Ghazoul (2010), responding to the Indonesian Government's plans to expand oil palm production to 40,000 t by 2020 and at the same time, reduce GHG emissions, developed a series of scenarios with different aims, attempting to protect forests and biodiversity, reduce carbon emissions, secure the supply of food (notably rice) and yet still expand oil palm. For example, a REDD or REDD+ approach would increase carbon stocks but drastically reduce the availability of land for rice production. With increased population, it obviously would not be tenable to prioritize a strategy of strict forest preservation and ignore food supply, hence a 'hybrid' approach (targeting oil palm expansion on degraded land with agricultural land least suited to rice) was deemed the to be the most politically suitable and socially acceptable. Wicke et al. (2011) have suggested that oil palm should be planted on degraded land if a sustainability scenario for the future, instead of a 'business as usual' approach is adopted. Although such land is difficult to define, whether it will be able to accommodate the projected oil palm increase was seen to depend largely on the yields obtained, with the likelihood that yields would be lower.

The above scenarios do not specify the particular business models under which oil palm should be grown, bearing in mind both the role of the crop in the national economy and the aims to reduce poverty and protect biodiversity. One attempt (Koh et al. 2009) suggested "designer landscapes", with intensive, highly efficient plantations and smallholder agroforests between patches of HCV forest. The agroforests would shelter the HCV forests from the 'edge effects' of oil palm plantations, and might themselves contain oil palm, together with other plants, to provide a secure living for smallholders, though at a lower level. Arguing that a huge potential exists for oil palm yields to increase dramatically (including yields of smallholders), large areas of forest could therefore be spared[39]. Koh et al. saw a mosaic effect with retention of agroforests, the diversity of which

39 A further contribution to the 'land sharing/land sparing' debate is a new study by Lee et al (2014**c**)**.** Following the technique developed by Koh and Ghazoul (2010) (and also used for Colombia by Garcia-Ulloa et al 2012), the authors simulated the future expansion of oil palm in Sumatra with environmental (largely forest sparing) or socio-economic trade-offs, using four scenarios. These either assumed 'business as usual' BAU; higher levels of domination by high yielding industrial estates (ESTATE); by low yielding 'scheme' smallholders (SMALLHOLDER); or scheme smallholders with improved yields (HYBRID). The fourth scenario was deemed the most suitable, provided that increased support was provided to improve smallholder productivity and that 40% of land was provided by estates to the scheme smallholders. While the 40% would be desirable, such an outcome appears unlikely. The other problem with this study is that the independent smallholders (a large and rapidly expanding group) could not be included.

is often favored by local communities,[40] although they recognized that there would be a temptation among the farmers concerned to transform them into oil palm monocultures, as representing greater economic value.

The model was criticised by Struebig et al. (2010) who argued that macro efforts in rehabilitating degraded lands and keeping plantations out of forests would yield greater conservation benefits than agroforestry. In a further contribution to the debate, Yaap et al. (2010) suggested that designer landscapes could promote net positive or negative biodiversity impacts, depending on whether the "designer estates" replaced non-forest or forest. The comment was part of a wider examination of conceptual frameworks for biodiversity conservation, which included directing estates on to degraded land or 'wildlife-friendly production', with reduced chemical input and retention of habitat features, as well as the agroforest approach.

Under "strategies to improve smallholder performance", four measures were suggested by the IFC/Aidenvironment team. The first two concerned the implementation of good agronomic practices among smallholders to increase yields. These included the use of hybrid seedlings, replanting where necessary,[41] proper fertilizer application and regular and frequent harvesting. Lee et al. (2014b) also emphasised increased frequency of harvest, which was instrumental in increasing yields. Both studies noted that smallholders required training in these practices and in financial management of their holdings.

The IFC's third strategy recommended short linkages between smallholders and mills, for the product and for the flow of information for prices and grading standards. It was noted that farmers selling palm fruit directly to a mill received 20% higher prices than selling through a trader. However, most independents used traders (Aidenvironment 2013, 15; Molenaar et al. 2013). Some mills refuse to allow independent smallholders to sell directly and would always give preference to their own scheme growers (Aidenvironment 2010, 33; personal communication from Gillespie, 2014). In other cases, independent smallholders lacked transport or were disadvantaged because of distance and poor road conditions. Lee et al. (2014b) commented that marketing costs for independent smallholders in Riau were twice those for the scheme smallholders. Inadequate information about the mills' grading standards and financial incentives for quality, together with lack of transparency in fresh fruit bunches (FFB) price calculations also disadvantaged growers. The final strategy concerned smallholder access to finance for on-farm investments. It was concluded that there was a 'business case' for investing in the upgrade of smallholder farms, with the main constraint being accessibility of finance, rather than its cost (Aidenvironment 2013; Molenaar et al. 2013).[42] The study by Lee et al. (2014b) strongly advocated more direct government involvement. Quoting McCarthy (2010) they saw the *laissez faire* approach, which basically left independent smallholders vulnerable to global market processes, as not working.[43]

In addition to the work of cooperatives, NGOs and credit unions,[44] the RSPO, working with the IFC, has launched a smallholder support fund to help smallholders gain certification (Lubis 2013b). This fund, using 50% of the RSPO's annual income surplus, acknowledges the "dominant role" of smallholders in oil palm production.

40 In places where scheme smallholders have paid off their plantation debt and are free to plant, they will often move away from oil palm monoculture to a mixture of species. Providing improved oil palm seedlings so that farmers are able to achieve good yields from small areas would free them up to plant other crops, such as improved rubber.

41 The study noted that the average age of palms for scheme smallholders was 19 years, with replanting recommended urgently for many farmers. Palms belonging to independent growers were younger, averaging only 9 years. However, replanting was also suggested for independent smallholders with poor quality and low yielding trees.

42 Not much is said in GAR's report about independent smallholders; the company is planning to assist 400 independent farmers in Riau to replant their plantations, supplying high yielding seeds, fertilizers and technical assistance. The farmers will secure loans at reasonable rates through cooperatives, with funding from the Indonesian Chamber of Commerce (*Global Agri Resources Sustainability Report* 2013).

43 It is worth noting that the Malaysian Government, through the Malaysian Palm Oil Board, is implementing a number of strategies to improve the yields of independent smallholders (see Malaysia section).

44 In Kalimantan, but apparently not in Sumatra.

Despite such initiatives, the cost of RSPO certification, including the auditing process, is likely to be beyond the means of many smallholder groups (Darussamin 2013). While the certification cost (including corrective actions where needed) has been calculated as very moderate for a large estate, this is partly a reflection of economies of scale, and likely to be more stringent for small enterprises. Segregation, in which the oil must be kept separate throughout the supply chain, will be more expensive again (WWF 2012, 17). In its argument for its own alternative certifying body, the MSPO, Malaysian government sources have stated that certification is too expensive for its smallholders (*Environment News Service* 2013).

Writing in general of smallholders in Indonesia and Malaysia, members of a Malaysian NGO offering a group scheme for Malaysian smallholders make a sober prediction:

> A range of factors, such as limited awareness of new technologies and best practices and lack of financial resources, make it difficult for these small farmers to meet the requirements of the RSPO, placing them at a considerable disadvantage… As global demand for certified sustainable palm oil (CSPO) increases, these small farmers could find themselves excluded from the global CSPO supply chain (Azmi and Nagiah 2012, 5).

This conclusion is even more applicable to Indonesian smallholders, but specifically to independent smallholders in Sumatra. The lack of large deepwater port facilities in Kalimantan[45] has meant that exporters must ship their crude palm oil (CPO) to Sumatra, use the port of Tawau in Sabah, or concentrate on supplying local demand for palm oil products in Kalimantan and Java. Producers have tended to adopt the third strategy, with 82% of Kalimantan's production being consumed domestically in 2010 (Slette and Wiyono 2112b, 2012c). Smallholders in Kalimantan are therefore less likely to have their product enter the international supply chain. While this could mean lower prices, they are also provided with more 'breathing space' before they need to comply with international regulations (but they will still eventually need licensing by the ISPO).

The decision of the Netherlands, Belgium and major companies such as Unilever and Carrefour to use only sustainable palm oil from 2015 or 2020 has stirred some producers to make more attempts to work towards meeting the standard. The Netherlands absorbed about 7.5% of Indonesian palm oil exports in 2012, about half the EU total of 14.3% (*Oil World* 2013). While Indonesia is the world leader (48%) in production of certified sustainable palm oil (CSPO), both the premium price and market uptakes remain low, resulting in considerable scepticism from some business interests and the Indonesian Government, which has supported an alternative standard, the ISPO (Suhardi 2013). The fact that a large proportion of Indonesia's CPO exports goes to Asian markets (27.8% to India and 16.4% to China in 2012), which to date have not joined the EU countries in threatened restrictions, has taken some pressure off the Indonesian producers.

However, the ISPO is now introducing its own compulsory sustainability criteria. It was slow to become organized, but by March 2013 the ISPO provided certificates of sustainability to 10 plantations belonging to 9 important companies, with a further 15 in process. It was stressed by the Minister of Agriculture that ISPO certification was mandatory, that it needed to be done by the end of 2014 and that there was the possibility that companies not complying would have their licences revoked (Rosalina 2013). In January 2014, it was announced that 40 companies out of roughly 2500 plantations had received ISPO certification, while 153 had applied for it. GAPKI has recommended that the deadline be postponed but so far the government has refused (*Agrofarm* 2014; *The Jakarta Post* 2014a). A proposal from Indonesia to combine the two kinds of registration (RSPO and ISPO) for those companies already possessing RSPO certification and needing to hold that from the ISPO has been welcomed by the RSPO (Yulisman 2014b). The Malaysian companies have also been caught up in the rush, one comment being that "Many are grappling to obtain ISPO approval and at the same time looking elsewhere for their new land bank expansion, namely Africa and Central/ South America" (*The Financialist* 2013).

45 This situation may be about to change as new President Joko Widodo aims to speed up construction of a number of ports, including four in Kalimantan (Suhendra 2014).

One new bill that may come into implementation, but only after 5 years, has been drafted by the parliament to restrict foreign ownership of plantations from the current maximum of 95% to 30%. The aims are: to open up the sector to smaller local players, protect indigenous people and tighten environmental controls, making it easier to prosecute companies that cause forest fires. The draft law has caused concern about a likely reduction in investment, with foreign firms likely to reduce their stakes in Indonesia, although the prediction is that it will not pass without significant amendment, especially as former President Yudhoyono was anxious that it might expose Indonesia to litigation (Taylor 2014; Taylor and Supriatna 2014c, Yulisman 2014c).

An important recent study (Paoli et al. 2013) aims to strengthen oil palm governance and optimize development outcomes. It places the focus squarely on the ISPO and the need to involve the leadership of powerful stakeholders such as GAPKI[46] to make that system "a valuable and internationally recognized part of Indonesia's green development strategy" (p7). Three main sets of recommendations cover:

1. the location of oil palm licences – calls for improved land-use planning, so that plantations are located on suitable land. A review of regulations on oil palm development on peatland is recommended, together with ways to make non-forested land within the forest zone available for agriculture. A further suggestion, to explore opportunities for creation of smaller mills with fewer suppliers, would work to the advantage of independent smallholders, though it is unlikely to be popular with the large mills.[47] ;
2. the environmental impacts of plantations and mills – "to create incentives for companies to maintain undeveloped (presumably forested) areas in plantations" (p. 8), while reductions in pollution by mill effluents are targeted;
3. company-community relations – the provision of adequate information for smallholders and communities at all stages of the palm development process, including price mechanisms, with standard guidelines for community engagement including negotiation support.

The main audience for these recommendations is the ISPO and RSPO, together with relevant central and district government agencies (such as the Ministries of Agriculture, Forestry and Environment, together with heads of oil palm districts) and most specifically, plantation management. This list of recommendations identifies the main problems within the plantation sector of the Indonesian palm oil industry and the major impediments that still exist to the development of 'sustainable palm oil'. In an earlier paper, Paoli et al. (2010, 444) suggested that "Company officials must fully accept sustainability as a business model… Sustainability should not be an add-on burden for plantation managers to bear, but rather an overarching strategic framework for realistic development planning".

As a counter and addendum to their 2013 work, Paoli et al. have produced six case studies of the best management practices in the Indonesian palm oil industry "to make these success stories and related technical information more widely known within industry and among actors in government, civil society and the donor community…"(Paoli et al. 2014, vi). The case studies include such aspects as company-supported smallholder cooperatives (PT Inti Indosawit Subur); company-supported farmer income generated activities, spreading the benefits of plantations within the wider community (Astra Agro Lestari Group); zero waste practices including methane capture (Musim Mas Group); yield improvement through best management practices (Cargill); measuring, tracking, reporting and reducing GHG emissions from plantation and mill (PT Rea Holdings); and biodiversity conservation within oil palm plantations (Wilmar).

The huge Singapore-based Wilmar International, which controls 45% of the USD 50 billion annual palm oil trade, had been heavily criticized in the past for the activities of some of its plantations

46 The Indonesian Palm Oil Producers Association

47 See discussion on the pros and cons of more mill competition, including 'mini mills' in aidenvironment 2010, 42. Recent expansion of production by independent smallholders in West Kalimantan has led sub-district authorities in parts of Sintang and Sanggau districts to plan for construction of mini-mills, as existing plantation mills cannot absorb all the produce on offer (Potter, fieldwork, May 2014). It is also worth noting that many 'stand-alone' small mills serve smallholders in Malaysia.

in Indonesia.[48] Further criticisms had followed the fires in Riau in June 2013 (in which it was alleged that a Wilmar subsidiary was implicated) and there have been allegations against another subsidiary accused of clearing peat forest near Tanjung Puting National Park (Central Kalimantan). The group had been under pressure from Greenpeace, together with Unilever, which declared a sustainability policy in November 2013.

In December 2013, assisted by The Forest Trust and consultancy group Climate Advisors, Wilmar International announced that it will follow GAR in implementing a "No deforestation, no peat, no exploitation policy", to apply to all its operations worldwide, including subsidiaries and third party suppliers. The main points are:

- no development in high conservation value (HCV) areas;
- no burning;
- progressively reduce emissions on existing plantations;
- no development on peat, regardless of depth;
- exploration of options for peat restoration;
- facilitate the inclusion of smallholders into the supply chain;
- respect the rights of indigenous and local communities to give or withhold consent to operate on their lands;
- resolve all complaints and conflicts through an open, transparent and consultative process (Wilmar 2013, 1).

In July 2014 Malaysian companies Sime Darby, Kuala Lumpur Kepong and IOI Corporation, together with the Musim Mas group and Asian Agri signed a "Sustainable Palm Oil Manifesto" outlining similar aims (Ecobusiness 2013b; Sime Darby 2014).

2.5 Conclusion

The oil palm industry in Indonesia is continuing to expand, with attention still focussed on increasing the area under the crop (often through deforestation of peat swamps) rather than improving yields, though some companies (GAR, for example) are beginning to change. Yield gaps are explicable to some extent by the poor quality of planting materials obtained by independent smallholders. With 44% of the crop now in the hands of smallholders, this situation needs to be addressed.

Issues given greatest attention over the recent period have included questions of deforestation and peat (related to the moratorium); the June 2013 fires in Riau (again on peat); and GHG emissions from plantations (linked to the RSPO meeting in Medan and that organization's revised principles and criteria, which insist on emissions studies by plantation companies). These questions have provoked strong arguments in the industry and considerable negative reactions to the RSPO.

The position of independent smallholders has finally been thoroughly investigated by the IFC. Increasing socioeconomic gaps have been found among smallholders, with many suffering 'adverse incorporation', and some commentators arguing that participation is only for the rich. Current government policies of disengagement are seen not to be working. These findings are linked to important issues of certification of smallholders, the ISPO and worries that some groups will miss out as deadlines approach. The sustainability declarations of major players such as GAR and Wilmar constitute another reaction to these approaching deadlines, but they are an indication of major changes occurring in the industry, especially important to Indonesia, which is such a dominant player.

The public policy debate has focussed most attention on efforts to change the mind-set of large plantation firms, with many suggestions as to how improvements should occur. The question of the role of government in improving smallholder conditions may be seen as relating to the cost, especially of bringing independent smallholder productivity up to a certification standard. If this is eventually considered not possible, alternatives such as oil palm agroforests, designer landscapes, or a boutique/organic status may be explored, but so far these suggestions have seemed academic. Even the conclusion that future development should be on degraded or deforested land has scarcely been heeded.

48 As a result of complaints from the Office of the Advisor/Ombudsman (CAO), the World Bank, through its financing arm the IFC, withdrew global funding for the oil palm industry until the IFC could ensure that its investments contributed to sustainable development (Teoh 2010).

Other questions relate to increased wage levels in the plantation industry.[49] Recent CLUA publications are scathing about the performance and direction of Indonesia's rural economy, with the well-supported plantation sector expanding and profiting from immiseration of workers and villagers, with the exception of a group of small- and middle-level producers (Elson 2014).

Downstream industrial activity, largely by plantation firms, is providing more 'value added' to the industry, with Indonesia moving away from simply being a source of cheap CPO, although exports to Asia remain important.

Still unsolved issues focus on continuing poor behaviour of some plantation companies, environmentally and socially. This includes continuing deforestation, continuing land conflicts between farmers and palm oil plantation companies and poor treatment of casual estate workers.

Several knowledge gaps have been identified. One is the question of small estates, those properties which are somewhere in between the large plantations and smallholders. While there have been some observations about the existence of this group, no in-depth analysis has been undertaken. The control of the Malaysian plantations in Indonesia also needs further examination, especially since the existence of APIMI has been revealed.

There is a gap in knowledge concerning the real progress or otherwise of ISPO and the international reaction to it, although this 'gap' may be premature as it is still quite a new organization. However certification of plantations according to ISPO criteria is proceeding only slowly and new questions will arise as the deadline (31 December 2014) has now passed. The compulsory certification has the potential to greatly improve Indonesia's oil palm industry, provided that it is carried through rigorously.

A further gap concerns statistics. Details emanating from Indonesian plantations have been described as inadequate compared with those from Malaysia, while official statistics that do not distinguish between different types of smallholders impede attempts to measure the differential progress of these groups[50].

49 These were obviously needed, but there is now a suggestion that some provinces may have gone too far, pricing Indonesian labor out of regional markets (*The Jakarta Post* 2013). There seems to be a problem in Malaysia, with fewer Indonesian laborers now wanting to travel there to work on oil palm estates (see discussion in Malaysia section).

50 It is possible to obtain more detailed information from provincial Estate Crops offices, but not from the official statistics available in Jakarta.

3 Malaysia

3.1 The influence of oil palm expansion on economic development and land-use change

Palm oil is Malaysia's most valuable agricultural crop, with palm oil and palm-based products being the fourth largest contributor to the country's economy, accounting for 8% of GNI per capita and with annual exports reaching a record value of USD 27 billion in 2011. The industry remains private sector driven and heavily skewed towards upstream activities associated with plantations and mills, with 74% of exports consisting of crude palm oil (CPO), together with palm kernel oil (4.9%) and palm kernel cake (9.2%). Just 9% of exports consisted of processed products such as oleo-chemicals, while biodiesel was a mere 0.2% (Choo 2012).

The industry has been identified as one of Malaysia's 12 national key economic areas (NKEA) as part of its Economic Transformation Programme to become a high income nation by 2020. Government growth plans are focussed on gains in productivity, especially on reducing yield gaps between high performing plantations and smallholders, together with more involvement of large companies in downstream activities, including processed foods, biodiesel and oleo-chemicals (ETP Handbook 2010, Ch 9; ETP Annual Report 2012).

The oil palm planted area in December 2013 was 5.2 million ha, 4.5 million ha of which was mature. The largest planted areas were in Sabah (1.5 million ha) and Sarawak (1.2 million ha). The 11 states of the peninsula together recorded 2.6 million ha, the leaders being Johor (0.73 million ha) and Pahang (0.71 million ha) (MPOB 2014). Those two states, with the addition of Perak, provided 70% of the Peninsula's oil palm area (MPOB 2014). Potential plantation expansion is limited to 1.3 million ha, of which 1 million ha is located in Sarawak. Oil palm already occupies 71% of the total agricultural land of Malaysia and 90% of Sabah's agricultural land (Lajiun 2012).

Latest figures divide the planted area into private estates: 62%, federal government land settlement schemes: 18%, state schemes: 6%; independent smallholders: 14% (MPOB 2014). The proportion of oil palm land in private estates in Sabah was 74% in 2007, considerably above the national average (Bernard and Bissonnette 2011, 127). The overall proportion of land planted by independent smallholders has increased since 2007 (up from 11%), while that in government schemes has shown some decline.

Teoh (2013) has outlined the process whereby British trading or plantation companies such as Sime Darby and Guthries were 'Malaysianized' during the 1970s.[51] The Federal government now owns a considerable stake in Sime Darby, the largest plantation company, which with THP (Tabung Haji Plantations Berhad) is classified by Varkkey as a GLC or government-linked company, therefore "almost untouchable" (Varkkey 2013c, 387).[52] Such companies were joined by local firms such as IOI and PBB (which later became Wilmar). As the oil palm industry developed further, in the 1990s the corporations began internationalizing, first into Indonesia, then Papua New Guinea and Solomon Islands (Kulim), while

51 The Malaysian decolonization experience, as far as estates were concerned, was thus more gradual than in Indonesia, where Dutch estates were abandoned around the time of Independence and industries such as oil palm took some years to recover. Malaysia had already eclipsed Nigeria as the world's leading palm oil producer in 1966.

52 Varkkey quotes officials from the Human Rights Commission of Malaysia saying that, "it is very difficult for us to discuss Sime Darby's actions, because the government is so involved with them".

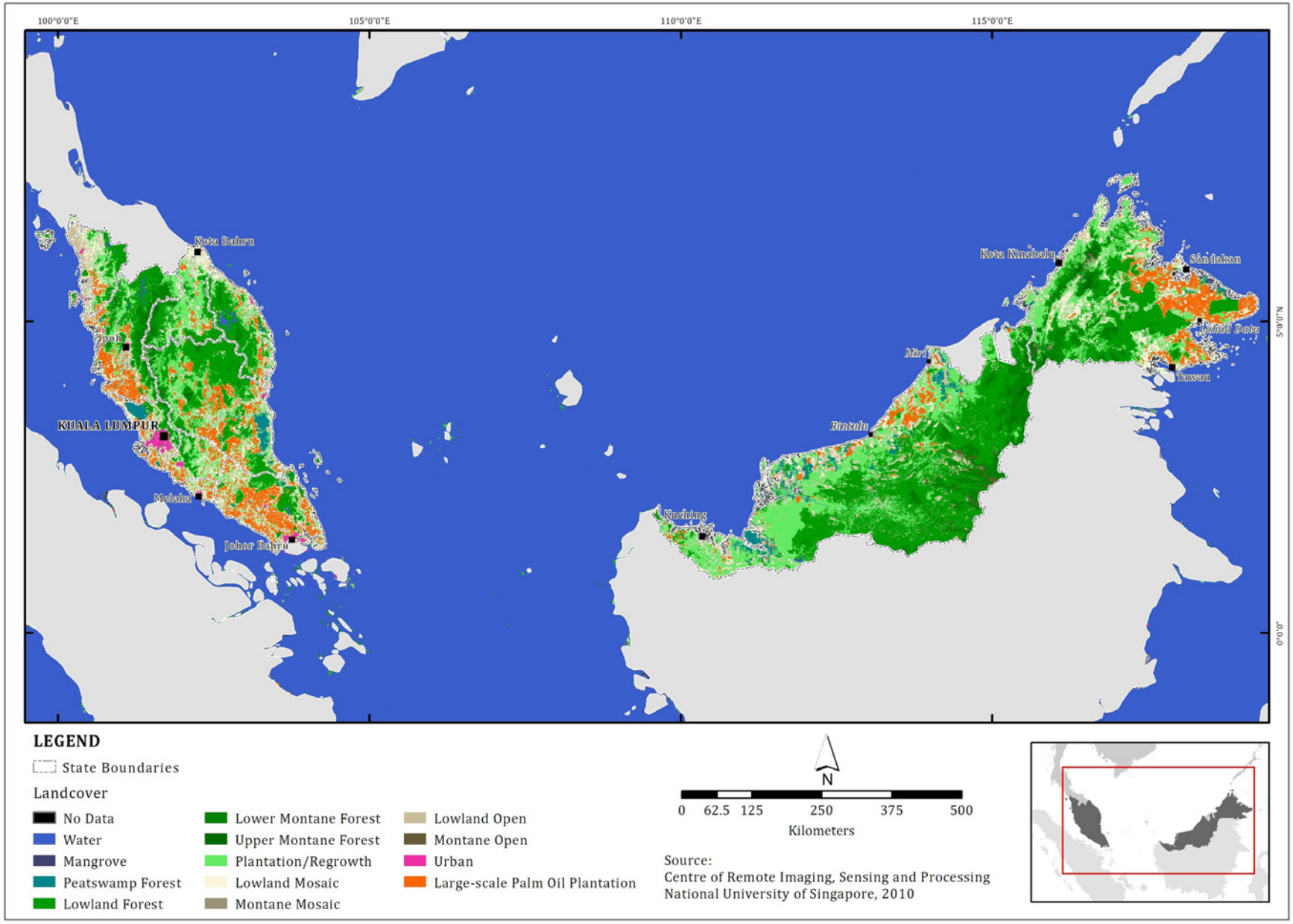

Figure 3. Malaysia: Land Cover. Note distribution of oil palm areas between Peninsular Malaysia and East Malaysia (Sarawak and Sabah).

Wilmar left Malaysia for Singapore after merging with the Kwok group there. More recently, aware of the shortage of land in Malaysia, some companies have moved further afield, with Sime Darby[53] going to Liberia and looking for other locations.[54] Wilmar, with its largest holdings in Indonesia and Malaysia, has growing oil palm interests in Africa, including the Ivory Coast, Ghana, Uganda, Gabon and Cross River State, Nigeria.[55] In Latin America, Felda Global Ventures has been considering a land purchase in Pará state, Brazil, while Singapore-based American Dennis Melka, who had a plantation in Sarawak, has been establishing his own oil palm foothold in parts of the Peruvian Amazon.[56] Corporations such as IOI have also set up downstream processing plants in Europe, while a strategy of other firms has been to open refineries and chemical plants in India and China.

In 2009, Malaysian companies owned 25% of the oil palm plantations in Indonesia (*ETP Handbook* 2010, 283). Malaysian and Singaporean investors, through joint ventures with local companies, are now said to control more than two-thirds of Indonesia's oil palm plantation area, with 162 plantations in Indonesia having links to Malaysian companies (Varkkey 2013c, 382).

In terms of impacts on land-use change, in parts of Peninsular Malaysia, oil palm was planted on former rubber land, so the original deforestation took place much earlier, much of it for 1960s FELDA schemes (e.g. in the Jengka Triangle of Pahang).[57] However, between 1990 and 2005, oil palm expanded far more than any decline in land under other crops; such expansion was most likely taking place at the expense of forests, in many cases previously logged forests. The relative proportions, according to Koh and Wilcove (2008), were 55–59% from forest conversion and 41–45% from substitution of oil palm for other crops.[58]

Subsequent studies have been more site-specific and more concentrated on conversion of the peat swamp forests, especially in Sarawak. This focus was partly because of their role in enhanced GHG emissions, once cleared and especially when burned, but also because it was suspected that much new oil palm development had been at the expense of those highly biodiverse forests (Raman et al. 2008). Wetlands International conducted the first overall study of the peatlands (2010), in which they found that with the exception of Johor, much of the Peninsula's peat forests were still in reasonable condition. Sabah has only small areas of peat, including parts of the Kinabatangan wildlife sanctuary, sections of which are under oil palm. The team was precluded from obtaining accurate recent information from Sarawak, but was alarmed at the heavy intrusion of oil palm into the peat swamp forest near Sibu and the clearing of the unique Bakong/Baram peat dome, a globally significant area for biodiversity conservation (pp. 64, 67–71).

Sarvision (2011) was able to obtain much better data for remote sensing analysis of the Sarawak peat forests, obtaining results for the period from 2005

53 Sime Darby is now the world's largest plantation company through a merger in 2007 with Golden Hope Plantations Berhad and Kumpulan Guthries Berhad. It operates a variety of businesses in more than 20 countries (Teoh 2013).

54 See footnote 4 on Sime Darby's recent bid for NBPOL (PNG).

55 See discussion on Nigeria.

56 See discussion on Peru.

57 The FELDA schemes originally began as rubber settlements to provide opportunities for rural Malays to move out of poverty, with oil palm planting starting in 1962. When it was realized that settlers growing oil palm achieved much higher incomes, future schemes were based on oil palm and holdings were increased from 2 to 4 ha. While most settlers eventually gained title to their land, the schemes have been basically managed and worked as plantations, with little scope for farmer initiative but strong emphasis on discipline and modernization. Facilities were good, milling, marketing and downstream processing well organized and settler incomes quite high, but settlers' children have increasingly opted for urban occupations. Shortages of workers on existing schemes and lack of clients for new settlements meant that after 1991 any new settlements began to operate as plantations, using mainly Indonesian immigrant labor (Brookfield et al. 1995, 90).

58 The study returned a similar value for Indonesia: at least 56% of land-use change during 1990–2005 was from conversion of forests to oil palm.

to 2010. These data indicated that 41% of the peat was covered by oil palm plantations, and that 65% of the deforestation on peat was attributable to oil palm. Miettinen et al. using a pair of 250 m spatial resolution land cover maps of insular Southeast Asia for 2000 and 2010, included the Sarawak peatlands in their analysis, as well as those in Sumatra. They arrived at a very high rate of 45.3% decline in Malaysia's peat swamp forests over the decade. Noting that Malaysia's general annual rate of forest loss (1.3%) was even higher than Indonesia's, they concluded that "the high nationwide deforestation figures in Malaysia were almost entirely caused by the decline of peat swamp forests in Sarawak" (Miettinen et al. 2011, 2265).

A study of land-use change in Malaysia by Malaysian foresters (Rashid et al. 2013), members of the RSPO 'Greenhouse Gas Working Group', was undertaken before the much wider research of other members of the group, which encompassed the entire region including Indonesia, Malaysia and Papua New Guinea (Killeen and Goon 2013). Rashid et al. identified 34% of the oil palm area in Sarawak as located on peat soils in 2009, an increase from 3% in 2000. Their figures for conversion of forests to oil palm between 1990 and 2009 were 14% on the peninsula (with 23% from ex-rubber land), 8% in Sarawak (excluding the peat areas, called 'wetlands', not forests) and 5.5% in Sabah. Such figures are much lower than others in the literature and include only seven land cover categories, compared with 22 in the studies of Gunarso et al. (2013) and Agus et al. (2013). It is, for example, odd that the dominant land cover in Sabah before oil palm was allocated as 'others': "land use related to horticulture, shifting cultivation, grassland, bare land, coconut, paddy and other features that can't be identified from satellite images" (Rashid et al. 2013, 126). However, this paper contains valuable maps, especially of the spread of oil palm over time in Sabah and Sarawak.

Foster et al. (2011), researching forest and oil palm landscapes in Sabah, explored the questions of the loss of biodiversity and changed ecosystem function that accompany forest conversion to oil palm. While others have studied the loss of biodiversity (Fitzherbert et al. 2008; Koh and Wilcove 2008; Meijaard and Sheil 2013), Foster et al. argued for the development of mosaic landscapes, which contain not only oil palm but also old growth forests. The authors pleaded for more data on forest fragments, such as steep slopes and riparian strips, as reservoirs for taxa of various kinds, though they rejected the idea of a palm agroforest. The management of the crop habitat within the plantation to increase ecosystem complexity and diversity was seen as important but underresearched, together with changes over time as the palms mature, over a lifespan lasting up to 30 years. Understorey layers, for example, might add biological pest control, while epiphytes act as foraging sites for birds. The conclusion is that: "the development of a biodiverse and properly functioning oil palm landscape is a vital conservation priority of the modern era" (Foster et al. 2011, 3287).

Although oil palm remains very important in Peninsular Malaysia, many of the plantations and smallholdings there are now old and in need of replanting.[59] There is little opportunity for new planting, as areas of forest, national parks and protected areas are largely stable. The growth of urban and industrial areas on the peninsula with associated employment has taken the pressure off new agricultural developments. With good transportation and associated facilities, these are mature oil palm landscapes, unlike the new frontiers, which are still evolving in Sarawak and to some extent in the interior of Sabah. It is mainly in Sabah and Sarawak that the ongoing plantation developments remain contested, especially among the indigenous population.[60]

3.2 The role of policies and corporate strategies in shaping oil palm development

As in Indonesia, the neoliberal model of market dominance has been adopted in Malaysia, though the government is closer to the private plantation sector than its Indonesian counterpart and exercises more control over much of the smallholder

59 There was a big replanting push during 2012 and this partly continued in 2013, which eased the position somewhat (*ETP Annual Report* 2013, 99).

60 The indigenous Orang Asli of the Peninsula do occasionally challenge the takeover of their gazetted lands by outside oil palm interests, for example the Semelai of Bera, Pahang. Their land was taken by FELCRA to form an oil palm plantation for neighboring (non *Orang Asli*) villagers (Asian Indigenous Peoples' Pact 2012).

sector.[61] The MPOB is a powerful government body (from the Ministry of Plantation Industries and Commodities)[62] which controls research and development and regulation of the industry. Government policies have tended to focus on increasing oil palm productivity and quality as well as expanding export markets – policies which are supported by the leading corporations. The government policies are strongly focused towards the Economic Transformation Programme (ETP), aiming to transform Malaysia into a high-income nation by 2020. Oil palm forms a key sector in this transformation, with a proposed contribution of MYR 178 billion (about USD 57.4 billion) to the gross national income by 2020 (*ETP Annual Report, 2012*).

Eight 'entry point projects' (EPPs) were identified in the ETP's 2012 Report. They were:

1. *Accelerating the replanting and new planting of oil palm*: eventually 450,000 ha of low-yield and old trees will have to be replaced by new, productive seedlings. Replanting is not easy when CPO prices are high, but as they slackened during 2012 and 2013, this process was more successful. In 2013, the government allocated more funds for independent smallholders' replanting and new planting initiatives, granting MYR 9000 per ha for smallholders in Sabah and Sarawak and MYR 7500 for those on the peninsula.
2. *Improving fresh fruit bunch (FFB) yield*: Here the plan is to lift the output of FFB from the current 18.89 t/ha to 26 t/ha by 2020. Again, smallholders are targeted as their yields are generally below those of the plantations. Cooperatives have been set up across the country to increase awareness of best practices and new technologies, with 23 smallholder palm oil clusters being established by the MPOB, 12 on the peninsula and 11 in Sabah/Sarawak.
3. *Improving worker productivity:* The tightening of foreign labor regulations and an exodus of Indonesian workers following wage increases in Indonesia have been creating labor shortages on plantations, slowing the harvest of FFB and lowering crude oil production. New labor-saving techniques have been introduced, such as the CANTAS motorized sickle (for harvesting) and the diamond sharpening tool and were gradually being taken up by both plantations and smallholders.
4. *Increasing the oil extraction rate (OER*): In recent years the OER has remained below 20.5%. The plan is to raise it to 23% by 2020 through improvements to grading and milling of crops. MPOB 'enforcement officers' will be stationed at selected mills.
5. *Developing biogas facilities at mills*: The plan is to capture methane resulting from the milling process by installing biogas facilities in all palm oil mills by 2020 ; 57 plants are already installed and two are supplying electricity, while around 160 mills are planning or developing the facility. There are 439 palm oil mills altogether through the oil palm areas (Datuk Uggah Embas addressing Annual Dinner of Palm Oil Refiners Association of Malaysia, 26/10/2013).
6. *Developing high value oleo derivatives and bio-based chemicals:* There is a global shift from petrochemicals to green oleo-chemicals, which could lead to big changes in the demand for palm oil. This EPP will steer production from basic palm oleo-chemicals to higher value products such as agrochemicals, biolubricants etc. Seven major companies are boosting investments in the oleo-chemical business, but face competition from Indonesia, which is moving in the same direction.
7. *Commercializing second-generation biofuels:* The report comments that "the rapid growth of biofuels has become controversial. The support that biofuels had enjoyed just 4 years ago has diminished amid criticism that their production is linked to rising food prices and uncertain ability to replace fossil fuels". Bio-oil, derived from oil palm biomass (empty fruit bunches, trunks and tree fronds) can be used to generate electricity.
8. *Expediting growth in food and health-based segment*: This EPP aims to tap into the application of palm-based derivatives in food and health products, such as tocotrienols, a good source of vitamin E (ETP Annual Report 2012).

---

61 van Dijk (2012, 152) has described the relationship as "very close". "The Malaysian Government and various state funds own almost 70% of Sime (Darby), the country's largest company" (Palm Oil HQ 4 September 2009).

62 All producers must pay a cess to the MPOB (USD 3.50 per t of CPO) to assist in its R&D work as well as industry regulation.

If one examines these EPPs, they could be summarized as first, improving the output and quality of the palm oil crop (EPPs 1-4), then branching out into new types of manufacturing associated with palm oil (EPPS 5-8), on the assumption that the current uses of the product will be changing. The impact of the latest regulations in the EU regarding biofuels places certain restrictions on palm oil. Palm-based biodiesel can only be approved for the renewable fuels standard (the 10% minimum target for renewable energy consumed in the transportation sector) if it is certified under the RSPO. Methane capture (through biogas facilities) must be installed at all mills (De Lavigne 2013, 17).

The shortage of labor on plantations is a current worry for their management. In 2012, there were 435,763 workers on Malaysia's oil palm plantations. Foreigners (334,000) made up 77% of the total. They were mainly Indonesians and were employed in harvesting, field maintenance etc. (Choo and Ismail 2013).[63] The palm oil national key economic area suggests a reduction of 110,000 workers by 2020. Although labor saving devices are being invented and coming into use, the question is whether they will substitute for missing workers. Increased minimum wages in Indonesia are leading to an exodus of skilled workers. It was suggested that a labor shortage could keep average CPO yields at 4 t/ha, much lower than the government's targeted yield of 6 t/ha by 2020 (*Wall Street Journal* 2012). A further study (Raghu 2014) stated that there is a now a chronic labor shortage on the Malaysian oil palm plantations. Indonesian applicants for jobs in the Malaysian palm oil sector only reached 38,000 in 2013, compared to 100,000 in the two previous years. Even though they can earn about MYR 900 per month in Malaysia, compared with about MYR 700 in Indonesia, their expenses are higher in Malaysia.

Exports of oil palm and its products are expected to rise to 37.8m t by 2020, bringing an income of MYR 103 billion. However, in a speech on 14 April 2014, Datuk Uggah Embas, Minister of Plantation Industries and Commodities, was critical of export earnings and volume during 2013 – only 61% of the year 2020 target was reached in terms of value and 68% in terms of volume. Datuk Embas argued that the composition of palm exports needed to be changed, from their current semi-processed form (78%) to high value-added downstream food and oleochemical products. The government had allocated MYR 492.3 million as matching grants to cover investments in these high value-added products (Embas 2014). In addition, MIDA (the Malaysian Investment Development Authority) would provide 100% tax relief for 5 years for high tech industries. Export taxes on CPO had been revised upwards, but there would be no such taxes on finished products. In addition, the government had invested MYR 827 million to develop further palm oil industry clusters (POIC). These clusters had port facilities to expedite exports and were intended as industrial hubs, to manufacture biodiesel and other downstream products.[64]

The relatively low prices for CPO during 2013 meant that it was economic to substitute small amounts of palm-based biodiesel for some of the expensive diesel oil that Malaysia had to import. De Lavigne (2013) noted that the relative prices had not been so much in biodiesel's favor since the price crash of 2008. Malaysia decided to introduce a mandatory biodiesel blend of 5% by July 2014 and 10% in 2015. Such mandates, if they come into force (and there is some doubt whether B10 will really succeed in 2015), will require large amounts of CPO.

While the federal government has considerable power over the eleven state governments in Peninsular Malaysia, Sabah and Sarawak are more independent, especially in such areas as land allocation, forestry and agriculture. Sabah and Sarawak are also the only Malaysian states that derive revenue directly from the palm oil industry; Sabah imposes a 7.5% sales tax per tonne of CPO, while in Sarawak the tax varies between 2.5% and 5% depending on the CPO price (Majid Cooke et

63 In answer to a question on the MPOC labor report, Mr. Ismail explained that the land/labor ratio for fieldwork in Malaysia is 1 worker to 10.9 ha. However, this varies by region: on the peninsula, 1/13.51ha, in Sabah 1/7.75 ha and Sarawak 1/11.81 ha. Topography was one factor influencing the high land/labor figure for Sabah. Sabah also has the largest number of foreign workers, 88.2%, followed by Sarawak 77.8% and the Peninsula 64.8%.

64 The Lahad Datu POIC in Sabah was to be the site for the first factory to produce bio-oil using biomass such as trunks, branches and empty fruit bunches from Sabah's oil palm industry.

al. 2011, 15).[65] While both states look to increasing their CPO production, in Sabah suitable land is now more restricted and must be found inland of the estate dominated eastern coastal strip. Sarawak is seen as the last frontier for oil palm in Malaysia, with expansion at around 10% per year. In 2006 the crop occupied 5% of the total land area and 57% of the area under cultivation (Cramb 2011, 275). By 2012 these figures had risen to 8.7% of the land area and 71.6% of the area cultivated (*Sarawak Agricultural Statistics* 2012)

Both Sabah and Sarawak have sizable non-Malay indigenous populations with rights over large areas of native customary land (NCL), which the governments have characterised as unproductive.[66] They have attempted to set up partnerships to develop oil palm on native customary lands. The policies of the Borneo states toward the palm oil industry have developed in accordance with local political agendas. While many of the plantations are branches of the same large corporations that dominate the industry on the peninsula, others are entirely locally owned and operated in a proliferation of different schemes (see Cramb 2011, 284 for the range of schemes in Sarawak in 2006).

3.3 Socioeconomic outcomes from disparate business models in oil palm development

Malaysia is very different from Indonesia in the role taken by government organizations in continuing to manage much of the smallholder sector of the industry. On the peninsula, 317 FELDA settlement schemes still operate, with settlers selling their crop to dedicated mills and receiving inputs from the organization in a highly controlled manner.[67] Smaller areas are under FELCRA (*in situ*) schemes located in existing villages and RISDA (cooperatives farming former rubber land) (Khailany 2011). In Sabah and Sarawak, FELDA schemes requiring resettlement of indigenous people were never popular, but state agencies such as the Departments of Agriculture, the Sarawak Land Consolidation and Rehabilitation Authority (SALCRA), the Sabah Land Development Board (SLDB) and its Sarawak counterpart the Land Custody and Development Authority (LCDA) have provided assistance of different kinds to smallholders, with the SLDB and LCDA both involved in allocation of lands in joint venture schemes.

3.3.1 Smallholder schemes

Peninsular Malaysia: FELDA land settlement schemes

FELDA is an agency under the prime minister's department dealing with settler-owned areas. There are 112,635 settlers (ethnic Malays) living in 317 schemes that are clustered through the southern half of the peninsula, from Pahang to Johor. They collectively own 397,600 ha of oil palm smallholdings and 82,165 ha of rubber (Lim 2014a). Settlers own 4 ha of cropland, plus a small house plot. Most are now over 50 years old (no new settlers were recruited after 1990) and do not work the land themselves.[68] Around 80% of the land is managed by FELDA and worked by its operating body, Technoplant using legal Indonesian labor in a formal plantation system. Other settlers prefer to manage their own land, but still hire Indonesian labor. Technoplant settlers are said to earn around MYR 2200 per month (USD 710) or MYR 73 per day when FFB pay MYR 500/t, from which Technoplant deduct MYR 200, at yields of 22 t/ha. However, loans must be deducted from this amount (personal communication from Barlow, 2014). While the LS schemes are still seen to have a 'social purpose' and originally enabled people to be lifted out of poverty, they are also a political force, strongly supporting the current Barisan Nasional Government (personal communication from Barlow, 2014).

Felda also operates a plantation company, Felda Global Ventures (FGV) but that is run on entirely commercial lines, with no smallholder component.

65 It was claimed in 2011 that the Sabah government derived between 40 and 50% of its state budget from the palm oil sales tax (Teo 2011).

66 In an expose of corruption in land dealings by the family of the former Chief Minister of Sarawak (Global Witness 2012), a family member described the native customary landowners of Sarawak as "squatters" on government land.

67 Large-scale group replanting has been a recent activity, in response to the government's concern about the large numbers of aged trees on smallholder farms (Kailany 2011).

68 Settlers' children are able to inherit the land but not sell or subdivide it. Various schemes are now assisting settlers' children and grandchildren (Lim 2014a).

It has 49 subsidiaries along the palm oil supply chain and in commodities such as rubber, soybean and cocoa. It owns estates in Indonesia and has many other foreign interests. In February 2012, plans were announced to float FELDA Global Ventures Holdings on the Kuala Lumpur stock market. The IPO took place on 28 June 2012, raising MYR 10.4 billion (USD 3.4 billion). In the process it provided a bonus of MYR 15,000 to the 112,635 FELDA settlers.

Sarawak: The konsep baru or joint venture models, compared with *in-situ* schemes and independent smallholders

The Sarawak Government has supported a top-down plantation-village type model; the former Chief Minister describes his vision of "rows of plantations and villages well organised in centrally managed estates with a stake of their own in them" (*Sarawak Tribune* 1984 *in* Cramb 2013). This "dualist system" (Cramb 2011, 279) – large-scale, capital-intensive agriculture transforming a traditional sector – has translated into joint venture oil palm schemes on NCL land, in which the customary landholders assign their rights over a block of at least 5000 ha to the LCDA, which forms a joint venture company with a private plantation, leasing the land for 60 years. The company has 60% equity, the landowners 30% and the LCDA 10%.

These joint venture schemes have been studied extensively for Sarawak by Ngidang (2002), Majid Cooke (2006), McCarthy and Cramb (2009), Cramb (2011), Cramb and Ferraro (2012), and Cramb (2013). Although the landholders (predominantly ethnic Iban) were supposed to receive dividends from the working of the schemes according to the area of land contributed, by 2009 only one scheme out of an original 34 had been able to issue a dividend. This outcome led to protests, blockades and legal action from the participants. Problems were said to include "inefficient management, low productivity, high costs and high debt levels" Cramb (2013, 87). In his 2011 paper, Cramb concluded: "The main game has been to facilitate the transfer of land to the rapidly expanding private estate sector, which accounts for nearly 80 per cent of the total oil palm area. This strategy creates the maximum opportunities for surplus extraction and patronage…" (Cramb 2011, 290). A case study of the Kanowit scheme, the earliest and largest (Cramb 2013, 93) indicated that the surplus extraction was largely done through subsidiaries of the plantation company (including the mill), which were making profits while the plantation accrued heavy losses. Payment of advance dividends by the company was instituted to appease participants, but the Ministry of Land Development was beginning to acknowledge that a new model was necessary – perhaps a nucleus and smallholder scheme following the Indonesian pattern.

In a further study, Cramb and Ferraro (2012) modelled three joint venture (JV) schemes and compared them with an *in situ* managed smallholders (SALCRA) project. SALCRA (the Sarawak Land Consolidation and Rehabilitation Authority) was established in 1976 to develop native customary land "for the benefit of the owners", the aim being to provide opportunities for poor rural people rather than maximise profits. Following the owners' agreement, the authority would then declare a tract of land around 5000 ha to be a "development area". The costs of development in oil palm were charged to the participants, who paid back the debt from their harvests. They would also receive a full title to the land (Cramb and Ferraro 2012, 3). Despite the low yields obtained on the SALCRA scheme (due to poor soils and inadequate management) and the fact that the landowners were not directly involved in growing their own oil palm (preferring to use Indonesian labor), the SALCRA project was seen to be preferable. Although theoretically profits should be lower than the commercially managed JV schemes, they all accrued to the landholders. "As the scheme provides substantially more benefits to local landholders, it is therefore to be preferred on equity grounds" (Cramb and Ferraro 2012, 17). It was also seen to be more efficient as the JV schemes borrowed heavily at high interest rates and in practice their yields were no better (Cramb and Ferraro 2012, 17).

The alternative, independent smallholders, was also explored by Cramb and Sujang (2011) and Cramb and Sujang (2013). Iban villagers have found their own ways to insert themselves into the industry and secure diversified livelihoods, although again yields were lower than recommended. Nevertheless, the independent smallholders in Miri district investigated by Cramb and Sujang (2013)

using their own 3–4 ha of land, family labor and a variety of other small income sources, were able to produce a crop of oil palm (around 12 t FFB/ha), with no credit or other assistance. With the price for FFB at MYR 400/t such a crop would bring them MYR 70 per day, not very different from the peninsular FELDA settlers with higher yields but more expenses. If the price of FFB reached 600/t they could earn MYR 120/day "even with low yields and poor grade fruit" (Cramb and Sujang 2013, 147). The yields also depended on fertilizer application, so Cramb and Sujang suggested that some kinds of targeted support and technical advice would have raised yields and incomes even further.

The Keresa group smallholder scheme in Sarawak involved an arrangement between an Iban-owned plantation with high yields and RSPO certification in developing a support programme to provide training and incentives to surrounding Iban smallholders. This was to help them increase their yields and generally improve their agronomic, environmental and social performance, so that they could also achieve certification. Initial funding was provided through Wild Asia and Solidaridad, allowing the plantation to hire a "scheme manager" to oversee the training. All the smallholders used their own labor and were able to generate much higher profits than through schemes such as SALCRA. The 'local' factor has been of some importance here, as JV schemes generally involved large plantations from Peninsular Malaysia; the relations between this plantation and smallholders were amicable and open from the start. One important aspect needing attention for such a scheme remained tenure security, so the efforts of these smallholders were not lost. A further concern was food security, as rice-growing areas were being turned over to oil palm. The participants asserted that they preferred to have control over agricultural developments on their land and to be able to manage the profits from the sale of their FFB, rather than join a state-led partnership project (Majid Cooke et al. 2011, 54).[69]

Sabah: Failed FELDA (*ex-situ*) schemes: Joint ventures and independent smallholders

On the east coast of Sabah, a large FELDA resettlement scheme of 107,000 ha (Sahabat)[70] to assist indigenous Sabahans was set up during the 1980s. It was located on the Dent Peninsula near Lahad Datu, designed along the lines of the authority's counterparts in Peninsular Malaysia. However, out of 64 proposed schemes, only seven attracted smallholder settlers (a total of 1665 settlers), as indigenous people generally had access to more than 3 ha of land (the eligibility maximum) or showed little interest in moving out of their villages (Bernard and Bissonnette 2011, 131). In keeping with FELDA's national decision to open no new settlements after 1990, the rest of the land was turned into oil palm plantations using foreign (mainly Indonesian) workers (Sutton 2001). The present Sahabat plantations (101,930 ha) were criticized by Sutton for ignoring the recommendations of an environmental management plan for the Dent Peninsula by WWF Malaysia, such as retaining small forest patches for settlers' collecting, fishing and hunting, and preserving other forests on steep slopes and riverbanks. He commented that, together with other plantation companies, "FELDA is contributing greatly to the conversion of both the land use and the landscapes of eastern Sabah into a vast oil palm plantation" (Sutton 2001, 102).

When the float of Felda Global Ventures on the Kuala Lumpur Stock Exchange was proposed for June 2012, the Sahabat plantations were included. Opposition interests in Sabah accused FELDA of not being transparent in its operations, not revealing how much land was developed and returned to the original owners, or how many local settlers were living within the scheme (To 2012). They called FELDA to return the Sahabat plantation land, either to the original owners or the State government, arguing that the land belonged to Sabah and should be used to resettle landless Sabahans[71] (*Borneo Post* 2012).

69 A different kind of partnership scheme is located in Perak, Peninsular Malaysia, where Cargill, Wild Asia and Solidaridad have a 3-year plan to provide technical assistance, training and capacity building to over 2500 independent oil palm smallholders. Cargill's aim is to make the entire oil palm supply chain sustainable – from independent producers, dealers and mills to refiners and end users, with increased production of RSPO certified sustainable palm oil (Cargill 2013).

70 Together with two small schemes near Tawau – Umas and Kalabakan

71 Such a proposition was given little credence by FELDA. After a highly successful float, the company announced that it would buy oil palm estates in West Kalimantan and plant new trees, to rejuvenate its image and boost productivity (*Malaysia Chronicle* 2013).

Sabah's indigenous groups – Kadazan-Dusun, Murut and Bajau – make up 50% of the state's population. Under the Sabah Land Ordinance (1930), they are entitled to apply for native title for up to 8 ha of land. The problem is that such applications may take many years, as there is a large backlog (Majid Cooke et al. 2011; Majid Cooke 2012). Untitled lands, especially swidden fallows and secondary forests, although in customary use, are considered 'idle' and at risk of state intervention in the name of 'development' or poverty alleviation. Majid Cooke (2012, 241, 245) has pointed out that indigenous Sabahans have "enthusiastically embraced" smallholder oil palm whether their lands have titles or not, and will also plant oil palm to demonstrate that their lands are *not* idle, in order to prevent "land grabbing" by the big companies. In this context of tenurial uncertainty, partnership or joint venture (JV) schemes, which will speed up the land titling process, are perceived as having advantages.

The Sabah Land Development Board (SLDB) owns no land and must generate its own operational funding. It does this through profit-sharing mechanisms, organizing JV schemes in which it manages villagers' land for oil palm production. Majid Cooke et al. (2011) and Majid Cooke (2012) analyse two such schemes, Dalit and Lalampas, both in the interior of Sabah. The Dalit scheme, with five villages, began in 1997 but the agreement was not signed until 2005. It was organized on a 60/40 profit-sharing basis for 20 years, with villagers receiving 60%. Though it was claimed as a success by the government, the researchers had reservations. Village households finally began receiving quarterly payments from SLDB in 2007, but the amounts were considered too low to raise their economic position, though it was useful as supplementary funds for other activities. Only one-third of the participants worked part-time on the plantation, which depended heavily on migrant labor. Land for rice growing had been reduced, so people often had to buy rice from their oil palm income and had asked for a nearby forest reserve to be degazetted to meet subsistence needs. The community was precluded from participating in decision-making or monitoring the venture's performance (Majid Cooke et al. 2011).

Malaysian researchers conduct an interview with a well established smallholder farmer. Bukit Garam, Kinabatangan, Sabah. (Photo by Lesley Potter)

The second scheme, Lalampas Agropolitan Project, begun in 2009, was one of the first examples of a communal title (CT), which was developed as a "fast tracking" method to make available a much larger area for oil palm development, with 16 villages involved. It was argued that villagers would simply sell their land if they received individual titles, although there was provision for eventual subdivision if this was universally agreed. In this arrangement, for 30 years, the SLDB would receive 70% of the proceeds after costs and the villagers, 30%, described as "rent". Once again, there was a lack of communication and many uncertainties for the beneficiaries, although as many had had their individual claims rejected in favor of plantation claims or had lost land to developments in their area, they saw the CT as providing more tenurial certainty. They did not know how long they would need to wait for "rent" to be received. Again, there was likely to be a problem of food security for some of the farmers. A community economic zone would offer housing and land for cash crops such as chilies and turmeric to 300 of the 1022 participants, but the rest would have to continue with their usual farming on reduced land (Majid Cooke et al. 2011).

Concluding their analysis of the JV schemes in both Sarawak and Sabah, Majid Cooke et al. (2011) saw a further case of McCarthy's "adverse incorporation", as communities underwent the transition from an agrarian economy to "the ambiguous position of being both laborers and shareholders without decision-making powers" (Hew 2011, 600). Majid Cooke et al. strongly supported the independent smallholder sector in both Sarawak and Sabah, which they regarded as "a more robust model for poverty alleviation and capacity building" (p. 16). They noted that, "in locations where oil palm mills are in place, smallholders are already motivated to grow oil palm, and only need supplementary assistance in the form of information and training to ensure the quality of fresh fruit bunches (FFB)… and access to quality seedlings and inputs such as fertilizer and pesticides" (Majid Cooke et al. 2011, 16). Local landowners "seek to play an active role in developing their land" and must be viewed as "major drivers of change" (Majid Cooke et al. 2011, 17). Their conclusion echoes that of Cramb and Sujang (2013) who write of smallholder "strategising and resilience…against the odds".

The smallholders living in villages close to the PPB (Wilmar) plantations near Sandakan (Sabah) studied by Norwana et al. (2011) were in a favorable position, as not only could they use the nearby estate mill for their fruit, but they were also tenured, which gave them great confidence in the crop. However, they possessed only an average of 3.59 ha, a little more than half the average for Sabah of 6.87 ha (Rahman et al. 2008; Omar et al. 2012) and many of their trees were already 20 years old, so that replanting would soon be necessary. The fertile Beluran district, in which the villages are situated, was recently selected as the site for a sustainable oil palm cluster (SPOC), the first in Sabah, with funding from the MPOB. Wild Asia, an independent social enterprise NGO, is assisting with training the farmers to go through the RSPO certification process, beginning with Kampung Toniting, one of the villages studied by Norwana et al. (Wild Asia Group Scheme 2012).

3.4 Initiatives towards more sustainable and inclusive oil palm production

Although most of Malaysia's large plantation companies (24) are members of the RSPO, they have been increasingly critical of the voluntary body, especially its lack of success in marketing certified sustainable palm oil (CSPO), which should attract a price premium. Smaller companies faced more difficulties in complying with RSPO principles and standards and were behind a plea for a Malaysian standard as an alternative to the RSPO. The RSPO's stricter principles and criteria, revised in February 2013, include minimizing net GHG emissions from new planting development, no planting on peatland and more ethical business practices, with more attention to aspects such as human rights and forced labor (RSPO 2013). Malaysian companies have long been criticized for their treatment of the immigrant labor force (Accenture 2012; Pye et al. 2012) and these criteria signalled more attention to such aspects. Plantation companies were outvoted by other members, especially NGOs and downstream firms, when the new principles and criteria were accepted.

Only 17% of the 5 million ha of oil palm in Malaysia has been certified under the RSPO. One company, IOI Corporation, has had its certification process suspended due to a

longstanding conflict with native customary land claimants in Sarawak (Toh 2013). This case brought strong criticism of the RSPO's Dispute Settlement Facility and Complaints System as being "both tardy and ineffective" (Colchester et al. 2012, 23) and unduly lenient to the IOI company.

In August 2013, a number of NGOs grouped to form the Malaysian Palm Oil NGO Coalition (MPONGOC) "to engage more effectively with the major players in the palm oil industry" (*The Star* 2013a). WWF-Malaysia executive director said that they were concerned that the oil palm industry, though generating foreign exchange and employment "was continuing to expand and operate in an unsustainable manner", while the executive director of Partners of Community Organizations (PACOS) Trust, noted that "indigenous people were often at the losing end in oil palm development".

The following month the group showed concern that key players were planning to leave the RSPO. They argued that the RSPO standards were internationally accepted and trusted, while the alternative MSPO standards "may side step the hard things that need to be done". As the MSPO has stated that they will not engage with civil society, their standards may not be accepted internationally as legitimate. One member commented that maximizing profits for shareholders, while a valid goal, "was not realistic long-term as the sole corporate function of the entire industry" (LEAP 2013).

The statement by Wilmar, committing to "no deforestation, no peat, no exploitation" was received with some anger in Sarawak, where much new oil palm planting is on peatland and deforestation continues. Wilmar, which has operated a refinery in Bintulu for 10 years, is the biggest buyer of CPO from Sarawak (1.7 million t annually). James Masing, the land development minister, vowed to look for new markets in China and India, stating that: "We have to cut trees and continue planting oil palm in order to improve our economy and people". He also suggested that Wilmar's decision was a result of pressure from countries producing competing oils, such as soybean or sunflower (Nagrace 2014). The Sarawak Oil Palm Planter Owner's Association said that Wilmar's conditions meant that only scrub and grassland areas could be planted with oil palm, and as Sarawak had none of those, the entire industry would have to stop (Lim 2014b).

Wilmar responded that their policy did not apply to existing suppliers until after 2015, nor to smallholders and that they would help local communities achieve sustainable development. But they also argued that, "with noticeable environmental damage and climate change, consumers globally are all moving towards sustainable production of commodities. The palm industry must therefore adjust to meet market needs and expectations if it wants to remain competitive… We are convinced that big corporates have to lead in the drive towards sustainability…" (Butler R. 2014a).

In April 2014, the NGO coalition suggested that the commitment made by Wilmar should be adopted by other growers and traders, as there was growing demand from customers for certified sustainable palm oil. "Mponggoc's view is that buyers of palm oil and products containing palm oil globally will demand evidence of high social and environmental standards. This view is not just acceding to extreme Western demands, but a result of the realization that the boundaries between Western and Asian markets will become less sharp, and that people globally will want to see more equal emphasis given to social, environmental and economic elements of all commodity production" (Butler R. 2014c).

M.R. Chandran, with over 50 years' experience in the agro-commodities industry and an advisor to the RSPO, argued strongly for the retention of the RSPO standard: "RSPO-compliant operations are simply more profitable, in terms of benefits conferred, both directly and indirectly on both the estate operations and the environment in which the estate operates… We should therefore recognize that extra costs of compliance with enhanced levels of sustainability are the price which producers must pay for retaining the support of the ultimate consumers of our products." He went on to emphasise the importance of an international sustainability standard for a commodity like palm oil which has become such a universal product "RSPO enhances the acceptability of palm oil not just in Western markets, but worldwide" (Chandran 2014).

His arguments carried little weight, however, among those wanting a Malaysian standard. Drafts of the new arrangements have already been circulated, with uncertainties mainly about whether the new rules would be compulsory (as with the Indonesian ISPO) and whether Malaysia will pull out of the RSPO, as recommended by some planters (Adnan 2014). The Sarawak Oil Palm Plantation Owners Association (Soppoa) has confirmed its commitment to the MSPO (Borneo Post 2014. 24 April 2014).

At a recent oil palm sustainability conference in Kota Kinabalu the chief executive officer of the Malaysian Palm Oil Council suggested that 80% of Sarawak's forests were still undeveloped (Kaur 2014). This was despite the fact that two recent surveys had noted extensive deforestation, one claiming that only 11% of Sarawak's forests remained intact, the other suggesting perhaps 20% had survived (Butler 2013b, Butler 2014b).

In November 2014, Datuk Douglas Uggah Embas, the Minister of Plantation Industries and Commodities announced that a new Malaysian palm oil certification council would be in operation in 2015 to supervise the MSPO standard, after various trials had been successfully completed. There would be somewhat different rules for plantations and organised smallholders, independent smallholders and palm oil mills (*Oils and Fats International* 2014). At present the system was voluntary (*The Malaysian Insider* 2014).

3.5 Conclusion

The issues that have been given greatest recent attention in Malaysia include the well-planned government mantra about the importance of 2020, by which time all should be properly organised in the oil palm industry, even recalcitrant smallholders being brought into line. However, the latest version of the *Economic Transformation Programme* (2013) indicates that during the previous year, only half of the nominated smallholders engaged in replanting, while yields, supposed to increase by 5%/ha/yr, only increased by 0.7%. A number of other indicators were performing below target, though that was not admitted in the accompanying description.

Countering the authoritarianism which is characteristic of schemes such as FELDA on the peninsula is the much more inchoate situation in east Malaysia, where individual agency manages to flourish. There are many studies of ineffective government schemes to control NCL land in both Sabah and Sarawak, which have been referred to in the text, while independent smallholders are managing to do better.

A public policy debate is raging about the RSPO, MSPO and sustainability issues, with the declaration of Wilmar causing great concern, especially in Sarawak. Some officials continue to deny that deforestation has occurred in Sarawak. This attitude of denial, when such claims can be easily refuted, does the Malaysian palm oil industry no service.

A further topic of debate is the labor position on the plantations, with some Indonesian workers, having received increases in the minimum wage, opting to stay home. Almost all growers of oil palm, even the smallest producers, are dependent on Indonesian labor, so it is potentially a serious difficulty. Development of improved tools for mechanising important processes, such as cutting, is being pushed ahead.

One main issue is the poor treatment of indigenous people by some estate companies, with confiscation of their lands. A perceived shortage of land, even in Indonesia, sees Malaysian corporations, such as FGV and Sime Darby, roaming the world looking for alternatives.

The main knowledge gaps would probably include the need for more detailed case studies in particular areas to get an up-to-date and clearer picture of local situations. For example, Barlow is beginning a survey of FELDA schemes, which should be a useful exercise as it is a long time since detailed studies were done. The 'hollowing out' of the schemes as the settlers' age and their children do not want to live in the countryside are critical questions for the future of FELDA.

In Sabah and Sarawak, more in-depth environmental analyses are needed, not on forests, which seem to be covered, but on local aspects such as effluents from mills. Given the high percentage of land occupied by oil palm in Sabah, there is the likelihood that a food security issue could arise there.

4 Colombia

4.1 The influence of oil palm expansion on economic development and land-use change

While the African oil palm was introduced to Colombia in 1932, it was only in the late 1940s and early 1950s that it began to be commercialized, initially through the United Fruit Company,[72] then through a few local growers (Fedepalma 2001 *in* Aguilera 2002). Tenera seeds were cultivated for the first time in 1958. Fedepalma, the National Federation of Oil Palm Growers (representing the interests of 80% of the large plantations), was founded in 1962 and has been instrumental in organizing growers and attempting to ensure the progress of the industry. By 1967, with 18,000 ha of mature palms, Fedepalma announced its strategy of import substitution through oil palm. However, increases in area under production were gradual, from 54,000 ha in 1986 to 103,000 ha in 1991. High quality seeds were produced at Hacienda Las Flores (in Codazzi, northern zone) and the Colombian Agricultural Institute (Tumaco, southwestern zone). Growth was slow through the 1990s, largely due to a lack of government support to the industry and imports of cheaper vegetable oils (Marin-Burgos 2014, 60) but finally reached 135,000 ha in 2000 (Fedepalma 2001, *in* Aguilera 2002).

The Colombian Institute of Land Reform set up an experimental plantation of 600 ha for smallholders in Aracataca (northern zone) during the late 1960s (Aguilera 2002). Before the introduction of the 'Strategic and Productive Alliances'[73] between 1998 and 2000, the first Palm Oil Census in 1997 indicated that 1281 farmers had less than 5 ha, a further 360 had between 5 and 20 ha. They made up only 4% of the total area, with 5500 ha. At the opposite end of the scale, properties with more than 2000 ha constituted 33% of the total, but there were only 13 in the whole country, occupying 48,500 ha. A further 13 cultivated between 1000 and 2000 ha of oil palm, so that the 'large growers' altogether had 66,759 ha or 45% of the area[74]. Even the 'big' estates were in fact quite small properties (the two in the northern zone each having 5000 ha, Indupalma in the central zone, 10,000 ha), while growers with 50 to 999 ha accounted for almost 50% of the area cultivated. Colombia's largest plantations are still small by Indonesian or Malaysian standards.

4.1.1 Recent growth of the industry

More recent figures, as shown in Table 5, used somewhat different categories, so cannot be directly compared. What is notable is that the

72 The company was beginning to phase out bananas and experiment with oil palm (Goebertus 2008).

73 Strategic and Productive Alliances are a form of contract farming between associations of small landholders ('supply allies') and a source of funding, especially large oil palm estates or mills ('anchor companies'). Additional outside funding is supplied by the government and agencies such as USAID. While the alliances may involve commodities other than oil palm e.g. cocoa, coffee, milk, mangoes – (*Alianza para los Negocios Inclusivos* 2008) the palm oil alliances were originally developed by Carlos Murgos in 1998–99, following a visit to Malaysia when he was Minister of Agriculture in the Pastrana government (1998–2002).

In the northern zone, Maria La Baja's Alliance (associated with the Murgos-Oleoflores group) began in August 1998; that associated with Palmera de Puerto Wilches (central zone) also in 1998; in Tumaco (southwest zone), the alliance Cordagropaz 1998–2000; the alliances associated with Indupalma (central zone) 2000–2002.

74 Fedepalma (1997). Another census was taken in 2010–11, but no figures have been generally released.

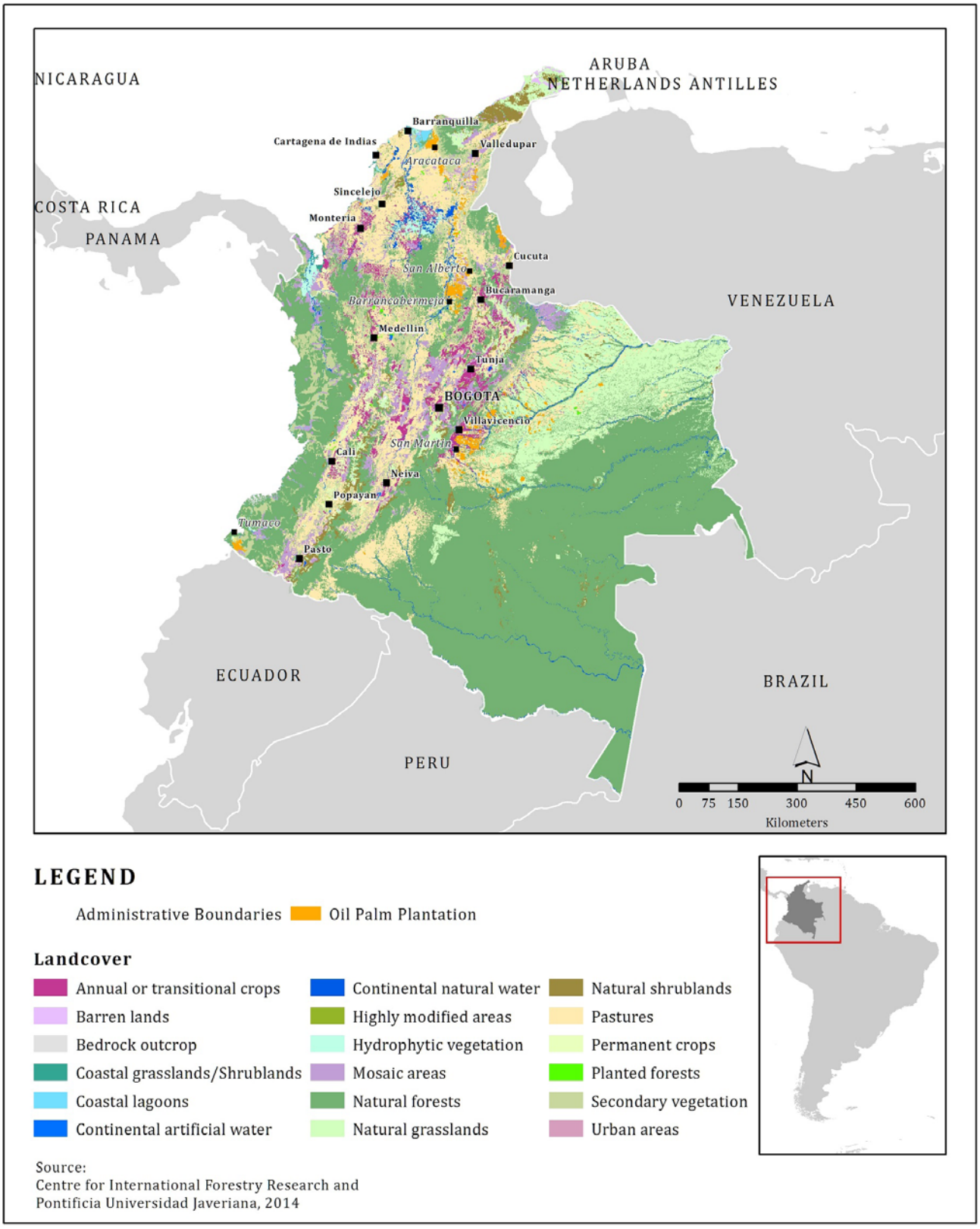

Figure 4. Colombia: Land Cover, indicating main oil palm areas.

Table 5. Oil palm planted areas by landholding size, selected years.[a]

Size range (ha)	Planted area (ha) 1999/2000	Planted area (ha) 2008	Planted area (ha) 2009	Planted area (ha) 2010	% of total 1999/2000	% of total 2008	% of total 2009	% of total 2010
Alliances	645/2,110	59,315	62,914	64,023	0.4/1.3	17.6	17.4	15.9
0–<20	4,908/5,067	2,649	2,882	11,319	3.3/3.2	0.8	0.8	2.8
20–<200	19,366/19,994	45,012	48,970	52,089	12.9/12.8	13.4	13.6	13.0
200–<1000	57,454/59,319	102,771	107,458	132,029	38.4/38.0	30.5	29.8	32.8
Over 1000	67,391/69,579	127,310	138,396	142,553	45.0/44.6	37.8	38.4	35.5
Total	**149,764/156,069**	**337,057**	**360,620**	**402,013**	**100/99.9[b]**	**100.1[b]**	**100.0**	**100.0**

a These tables of planted areas by landholding sizes have not been published since 2010.

b Errors due to rounding.

Source: Based on figures released by SISPA (2008-2010, with a backward look at 1999-2000). SISPA (Sistem de Informacion Estadistica del Sector Palmero) is Fedepalma's statistical section.

alliances, while experiencing their main period of expansion between 2000 and 2008, then stabilized to occupy a slowly declining proportion of the sown area.[75] Constain (2014) has suggested that the 116 alliances in existence in 2013 had 71,000 planted hectares with 5900 small or medium cultivators as members. These figures would maintain the average holding size of around 12 ha,[76] with alliances occupying 14.9% of the 2013 sown area of 477,000 ha.

Tables 6 and 7 illustrate the growth of the industry since 2008 by zones, using area in production (rather than sown area) together with total production of CPO and yields in tonne per hectare. It is notable in tables 6 and 7 that since 2010, the eastern zone, largely part of the extensive *llanos*, the Orinoco savannas, has gradually asserted its dominance over the northern zone (the Caribbean coast), being responsible for 38% of both the area under the crop and the production of CPO. The northern zone has 31% of crop area and 32% of production, the central zone 28% of both; the southwest has just 2% of area planted and 1% of production (Fedepalma 2014a). The industry virtually collapsed in the southwest zone, the heavily forested Pacific coast area of Tumaco, as a result of the bud rot disease, with the loss of thousands of jobs. It is now beginning slowly to recover, as a proportion of the diseased trees have been replaced by more resistant hybrids that are gradually coming into production. In 2012, it was reported that renovation with hybrid materials was successful for 40% of the crop (Cordeagropaz 2012).

While there was rejoicing that total production of CPO had exceeded 1 million t for the first time in 2013 (Table 7), yields were disappointingly low, an effect partly blamed on a wave of cool temperatures, replanting of older trees (mainly in the north), and the lingering effects of the bud rot crisis, which also hit the central zone, especially in the areas of Puerto Wilches and Cantagallo.[77]

75 About 25% of the 'new oil palm' planted between 2000 and 2010 was in the form of "productive alliances". The area under oil palm almost tripled over that period and the number of municipalities with oil palm plantations rose from 47 in 1999 to 106 in 2010 (Marin-Burgos 2014, 38, 83).

76 An average size of 12.6 ha was discovered in the original survey of alliances published in 2010 (based on 2009 data), which included some medium growers (up to 200 ha) as well as smallholders (Fedepalma 2010 with SNV-CECODES, USAID Programa MIDAS; SNV et al. 2009).

77 In Puerto Wilches, it was estimated that by January 2014, 80% of the 35,000 ha cultivated had been lost, together with more than 8700 jobs (Ministerio de Agricultura, ICA y Fedepalma 2014). In January 2014, Puerto Wilches was described as "a gigantic cemetery of dead and dry plants" (vanguardia.com 2014, eltiempo.com 2013). The social impact, with loss of income of small and large producers alike, was immense. One estate, *Oleaginosas Las Brisas*, went into liquidation in 2013, a result of the bud rot crisis, together with strikes and other labor problems in the Puerto Wilches area, as estates dismantled many agreements with workers (eltiempo.com 2013; Mesa-Dishington 2014).

Table 6. Area of oil palm in production by zones, 2008–2013.

Year	Eastern		Northern		Central		Southwest		Total	
	'000 ha	%	'000 ha	%	'000 ha	%	'000 ha	%	'000 ha	%
2008	73.2	33.1	76.3	34.5	53.6	24.2	18.1	8.2	221.3	100
2009	85.0	36.0	85.8	36.4	57.5	24.4	7.6	3.2	235.9	100
2010	90.5	36.1	87.4	34.9	67.8	27.1	5.0	2.0	250.7	100
2011	100.6	37.7	92.1	34.5	71.2	26.7	3.0	1.1	266.9	100
2012	113.8	37.9	100.3	33.4	81.6	27.2	4.2	1.4	299.9	100
2013	127.6	38.1	104.6	31.3	95.0	28.4	7.2	2.2	334.5	100

Source: SISPA (2013) for 2008–2012, Fedepalma (2014a) for 2013

Table 7. Production and yield of crude palm oil (CPO) by zones, 2008–2013.

	Zones	2008	2009	2010	2011	2012	2013
Production of CPO (000 t)	East	226.6	261.2	245.8	356.6	354.3	398.0
	North	243.9	252.9	250.0	305.7	343.3	332.8
	Central	266.7	272.0	246.2	273.7	265.8	294.7
	Southwest	40.3	18.8	11.1	8.9	10.3	14.3
	Total	777.5	804.8	753.0	945.0	973.8	1,039.8
Yield of CPO, t per hectare	East	2.67	3.07	2.72	3.55	3.11	3.12
	North	3.20	2.95	2.86	3.32	3.42	3.18
	Central	4.98	4.73	3.63	3.84	3.26	3.10
	Southwest	2.22	2.45	2.24	2.96	2.44	1.97
	Total	3.51	3.41	3.00	3.54	3.25	3.11

Source: SISPA 2013 for 2008–12 and FEDEPALMA (2014a) for 2013.

Industrial disputes and blockades, which occurred mainly in the Central Zone, especially at Catatumbo (near the Venezuelan border) and in Puerto Wilches also inhibited production (Fedepalma 2014a, 2014b).

A study of the domestic costs of production between 2003 and 2012 revealed that costs were lowest in the Northern Zone, where productivity was also greatest, and highest in the Central Zone, with the Southwest Zone being omitted (Guterman 2014). In international terms, Colombia's yields were well below those of Malaysia and Indonesia, while its costs of production were much higher (Fedepalma 2014a). Guterman's seven-country study of costs saw Colombia in fifth position, below Nigeria and Brazil, but well above Thailand, PNG, Malaysia and Indonesia (Guterman 2014).

4.1.2 Modelling palm oil expansion

The Alexander von Humboldt Institute in its publication *Los Biocombustibles en Colombia; uno Reto para el Desarrollo Sostenible* (Carillo 2010) drew on a series of maps earlier produced at the 1:500,000 scale which identified suitable zones for oil palm cultivation.[78] While the institute's main aim was ecological, examining the impacts on biodiversity conservation (species and ecosystems), the protection of water, soils and land and the levels of GHG emissions, the socioeconomic dimension was not overlooked. Social criteria of sustainability included such aspects as respect for human rights, work and well-being, food security, economic viability, social, local and regional

78 These original maps were produced by CENIPALMA-CORPOICA 1999 and IDEAM-IGAC 2009

development, together with public participation and transparent decision-making.

A resulting table indicated that 72% of the country was not suitable for oil palm. Suitable zones were classified as "apt" (2.34%); "apt with moderate limitations" (5.92%); and "apt with severe limitations" (19.92%). The net result was that up to 5 million ha of land could be put under oil palm if biophysical and social limitations, at times severe, were ignored; 1 million ha could be planted on land with moderate limitations, while really suitable land was just 400,000 ha (less than the present cultivated area). The most suitable area was the Department of Meta in the Eastern region, with Caqueta and Guaviare, further south toward the Amazon, also being suitable. The current main producing areas in the Central and Northern regions were mainly classified as having "severe restrictions". This last point led to the rejection of this study by Castiblanco et al. (2013), who criticized the coarse scale of the maps and their non-correspondence with the realities of current production.

In 2000, Fedepalma had suggested a target of 3.5m t of oil palm to be achieved by the year 2020 (*El Palmicultor* 2000). This figure, as part of Colombia's 'Vision 2020', was seen as a challenge to growers to defeat the violence and insecurity that beset the industry at the time, urging them to become more united, serious and organized. It was before the question of biodiesel arose but about the time that the Colombian Government and USAID began their strong support of the industry. This production figure was adopted as a firm target by one of the two most important recent studies of oil palm's projected expansion in Colombia (Garcia-Ulloa et al. 2012). Since 2000, the "3.5 million t by 2020" figure has not been much discussed. In a newspaper interview in early 2012, Fedepalma's Mesa-Dishington predicted that with its current expansion (including increased production from new plantings) the annual output of CPO would rise above 1.6 million t in "three to four years" (*Dow Jones Newswires* 2012). In 2013, with a sown area of 477,000 ha, 44 % of the production of 1,039,800 t was used to supply the biodiesel market. In November 2013 the main blend continued to be B10, with several of the more remote departments still using B5 or B2 (Fedebiocombustibles 2013).

Garcia-Ulloa et al.'s 2012 paper *Lowering environmental costs of oil palm expansion in Colombia* attempts to replicate a study carried out for Indonesia by Koh and Ghazoul (2010b) using a GIS analysis to build up layers representing such variables as 'land use and land cover', 'crop yield potentials' 'land profitability', together with specific geographical facts, such as elevation, proximity to road networks etc. The model simulates oil palm expansion by progressively converting the land cover polygons into oil palm to meet the (presumed) production target of 3.5 million t of CPO by 2020. Five scenarios were examined, oriented towards: the most productive lands for oil palm; agroindustrial development; ecosystem protection; carbon conservation and finally a hybrid of the first four, resulting in "a mix of moderate environmental and agroeconomic impacts" (p. 371). It was noted that impacts on food production would be appreciable, but buffered by the existence of extensive unproductive pastureland (a buffer which did not exist in the Indonesian counterpart study). However, the main caveats to adoption of this strategy were political factors, which could direct the expansion into specific areas, together with possibly high economic prices of pastureland.

According to the second important study (Castiblanco et al. 2013), to reach the 3.5 million t by 2020 target would require an additional 930,000 ha to be planted with oil palm by that year, an area which they argue will not be reached. A further target (also mentioned in connection with 2020) has been expressed in terms of area to be planted: 3.5 million ha. According to the Ministry of Agriculture and Rural Development (MADR), that is the total of the potential areas of oil palm that could be planted in each zone (Bochno 2008[79]).

79 This total originated in an earlier study (Corpoica-Cenicana 1999), which has been adopted by the Ministry of Agriculture. It is not clear why that figure should be associated with the year 2020. The Ministry of Commerce, which operates the Productive Transformation Programme, has a goal for oil palm of 1.6 million ha by 2032. At present it is the third largest 'permanent' crop in Colombia, with coffee (950,000 ha) the leader and 'fruits' running second (664,459 ha). Oil palm (476,782 ha) has just edged out bananas (438,158 ha). Maize and rice, called 'transitory' crops, are also ahead of oilpalm. In 2013 oil palm accounted for 9% of the total sown area of 5.3 million ha and 13% of the area under 'permanent' crops (Ministerio de Agricultura, ICA y Fedepalma 2014).

The Castiblanco et al. paper models the future expansion of oil palm beyond the existing locations mapped accurately in 2008, using an econometric model which includes the impact of government policies in support of the biofuel sector, together with expected increases in crop productivity. The gradual increase in blends to 20% was estimated by the Department of Mines and Energy to require an additional 600,000 ha. These variables were incorporated into a Time Series Intervention Model. Four comparative projections were arrived at, using scenarios suggesting a simple linear trend from the 1967–2002 period; the impact of government policy intervention since 2002; the additional impact of blending targets; and the Ministry of Agriculture's 3.5 million ha, which when plotted is far above the other trend lines. A set of map grids of biophysical and socioeconomic variables representing suitability factors for oil palm expansion (using GIS as in the previous study) was used to construct a probability map of oil palm presence and project the likely impact on land cover/land use. The model predicted an additional growth of 650,000 ha of oil palm by 2020 (giving a total around 1.1 million ha). This is not far from Fedepalma's prediction of 743,000 ha but still not close to the extra 930,000 ha needed to meet the expected demand for B20 biofuel, which the authors conclude does not appear feasible, though further government intervention could possibly change the picture.

While around 50% of the growth would replace current pasture areas, 19% would replace agricultural areas and 13% natural vegetation, mainly in the eastern zone. The most important growth areas lie there and in the central zone. Two important agricultural areas which presently have no plantations (Tolima and Uraba) were considered highly likely to have oil palm by 2020, while another expansion zone is predicted south of the savannas, into the forest "in the colonization front of the Northern Amazon region" (p. 179), which is somewhat alarming. In conclusion it was suggested that "It is necessary to refine the spatial scale of analysis and incorporate detailed regional information to determine local impacts on strategic regional ecosystems, food systems and water resources" (p. 182).

4.1.3 The socioeconomic impact of oil palm expansion

In a further paper examining the expansion of oil palm across Colombia, Castiblanco et al. (2015) conducted a statistical analysis of a number of indicators across the 'oil palm' and 'non oil palm' munciipalities to test the socioeconomic impacts of oil palm's presence or absence. The analyses were done mainly over 3 years: 2000, 2005, 2009. Two variables tested, the General Unmet Basic Needs Index and the Municipal Income Index showed significantly positive results in favor of oil palm, especially in later years when government subsidies and tax exemptions were active. On the other hand, Land Concentration and Violence indexes were higher in the oil palm areas, especially in some production zones and over specific time periods. General levels of poverty also remained high. Castiblanco et al's conclusion was that, "a better income for oil palm producers does not guarantee an increased equity in the distribution of regional incomes, and a reduction of rural and urban poverty. It seems that high levels of land concentration and violence obstruct the possibility of an equitable development in palm producer regions". This is an important finding, and the authors extend their analysis to other palm producing areas and the so-called 'staple thesis', arguing that "it is important that the agroindustry generates sustained positive economic linkages with other land uses and economic activities, in order to a contribute to a regional productive transformation and diversification" (Castiblanco et al. 2015).

4.1.4 Environmental questions

Despite the claim that oil palm has so far mainly expanded into grazing lands, the further extension of the oil palm frontier and the opening of new land for cultivation could have undesirable environmental impacts. A study commissioned by Fedepalma in 2004 (not generally available) showed that 17.5% of land now under oil palm was previously under natural ecosystems (Rodriquez and van Hoof 2004 *in* Llaguno et al. 2010). Expansion into the north and east zones is considered as posing the greatest threat to important natural areas, such as remnant dry forests in the north and wetlands in the east, with the latter area also possessing a great richness of species, many of them endangered. Research in the eastern department of Meta (on the llanos) revealed that 25% of newly planted areas

previously contained native forests or waterbodies (MAVDT 2008 *in* Llaguno et al. 2010). Romero-Ruiz et al. (2012, 773), in their analysis of land use change in the llanos from 1987 to 2007, noted the "astonishing doubling in area of oil palm plantations"[80] between 2000 and 2007, mainly in the south of Meta and Casanare states and the high savannas of the central part of Meta. In this transition "flooded and high savannas were converted for plantation purposes".

4.2 The role of policies and corporate strategies in shaping oil palm development

Colombia has been called "a difficult country to govern" (Isaacson and Poe 2009). There is a very unequal distribution of both land and population. More than half of farms (52%) are owned by just 1.15% of landholders, while land reform projects attempted in the past were described as "timid" (*Economist* 2012).[81] From the 1960s, the unresolved agrarian issues led to the formation of guerrilla groups and violent armed conflict, partly fuelled by the trade in illicit crops, notably coca. With left-wing guerrillas battling right-wing paramilitaries (and both involved in coca trafficking), there were large numbers of killings, especially between the late 1990s and early 2000s (including many civilian deaths) and huge displacement of people from their lands.

In its attempts to restore peace to the countryside and provide alternative crops to coca, the Uribe government decided that oil palm would be a suitable candidate among a number of other possible choices.[82] From 2002, the US-financed Plan Colombia authorized USD 75 million a year for "alternative development" (AD) programs, including oil palm, administered through the USAID office in Bogota (Ballvé 2009).[83]

The Uribe government was enthusiastic in its support for oil palm. In 2005, the president was quoted as saying: "Colombia could have, without major improvements in infrastructure, 3 million ha of oil palm; with some work to adapt land, around 6 million ha of African palm. When the government began, we had 175,000 ha, this year we ended with almost 300,000. We have made progress, but we need much more speed" (Mingorance 2006, 56). During President Uribe's two terms in office (2002–2010), the palm oil industry prospered.

Marin-Burgos (2014, 115) has outlined the way in which the palm oil industry received an unbalanced allocation of government support through the Rural Capital Incentive (ICR) compared to other agricultural commodities. That assistance, together with tax exemptions, helped the industry to progress and favored large- and medium-scale growers. The large firms also received subsidies for irrigation and drainage and for technical assistance. A number of experts who had worked for the government moved across to employment with Fedepalma and its scientific research wing, Cenipalma, as the links between industry and government remained close. The prominent estate owners, such as former Agriculture Minister Carlos Murgos (the Oleoflores group) and Davila Abondano (the Daabon group) supported Uribe's political campaigns and received large sums from the ICR (Velez-Torres, 2008, 34; Seeboldt and Salinas 2010, 33; Marin-Burgos 2014, 129). "The Uribe government… espouses a rural development model based on large scale agribusiness with heavy foreign investment"(Isacson and Poe 2009, 36).

4.2.1 Oil palm: "Accumulation by dispossession and assimilation" 1998–2006

With generous government subsidies and assistance from the World Bank and USAID, oil palm cultivation increased rapidly. Velez-Torres (2008, 29) suggested an annual increase of 11.47% per year between 2002 and 2006. This expansion of the oil palm frontier was largely made possible by an increase in the amount of land that became available to the large plantations, either directly or through the medium of the alliances. Many of the land dealings which took place in the countryside during this period have been described as "accumulation by dispossession", which took a number of forms (Marin-Burgos 2014, 93). These were:

- oil palm cultivation in connection with displacement operated by illegal armed groups;

80 From 77 km^2 to 162 km^2

81 See also Grajales (2011) for a description of the previous battles for and against land reform.

82 Others were cacao, coffee, rubber and commercial tree plantations.

83 See the Peru report for similar programs there.

- take-over of land left by internally displaced people;
- actual or attempted occupation of lands under contested ownership rights;
- occupation of public lands;
- land-use change;
- land concentration.

An example of the first type of displacement was in Choco and other Pacific coast areas, such as Tumaco, where fictitious 'community associations'[84] were used to legalise land grabbing. In Choco, these incursions happened soon after the Afro-Colombian communities were given communal titles to their lands in the Curvarado and Jiguamiando valleys in 2000. It was alleged that 46,084 ha in the Curvarado Valley and 53,973 ha in the Jiguamiando Valley were illegally occupied by paramilitaries and planted to oil palm (*El Espectador* 2010). The nature and extent of the 're-colonization' of the lands by paramilitaries and the establishment of oil palm plantations was not revealed until February 2007 when 23 palm growers were investigated and the newspaper *El Espectador* in January 2008 revealed the public scandal known as the 'Palm Grower Dossier' (*Velez Torres* 2008, 35).[85] These revelations brought international condemnation (e.g. *Times online* 3.6.07, Zimbalist 2007, Monahan 2008), but the legal processes against the perpetrators were only slowly set in motion, with court hearings in 2010 and 2012.[86]

The displacement of small farmers and landless peasants in the northern 'Zona Bananera' (Magdalena department) took a somewhat different path. Banana prices had fallen and cultivation was decreasing; by 2000 there were 42,817 ha of oil palm. By 2006, the planted area of oil palm had doubled, but the number of displaced persons had reached 12,202. Oil palm required fewer workers than bananas (only one worker per 10 ha compared to 1.5 workers per ha for bananas) and the expansion of the monoculture meant a reduction in food security in the region, as the small banana farms with mixed cultivation were being replaced. The generous government subsidies for oil palm encouraged both the established large proprietors and newcomers to look for more land. They were helped in this by an armed struggle in the area between FARC guerrillas and paramilitaries over control of the narco traffic from coca producers in the nearby mountains. Guerrillas and paramilitaries both practised extortion from the local population, who often fled in fear, abandoning their land (Goebertus 2008).

Obviously there are mixed cases where more than one category is involved, as in the study of the Zona Bananera above. The occupation by oil palm interests of public lands, where landless peasants depended on access to such lands, seems to have been a common practice, especially in the central zone. For example in Simiti-Bolivar, "public communal savannahs and marchlands used by landless people for fishing or growing short cycle crops were unlawfully taken over by oil palm growers" (Marin-Burgos 2014, 94). Tenants and sharecroppers may be dispossessed when landowners changed the use of their land e.g. from bananas or rice to oil palm, as their services were no longer needed. In the Eastern Zone and in Tibu, Central Zone, several plantations were under investigation for unlawfully "accumulating" land previously awarded by the state to beneficiaries of land reform[87] (Marin-Burgos 2014, 228; Oxfam 2013).

Oil palm's expansion has not always been associated with high levels of violence and displacement, though this was common between 1998 and 2006 (Marin-Burgos 2014; map p. 82). Most of the municipalities with high levels of displacement in the northern or central zones also possessed oil palm plantations with alliances, while those with low levels of displacement did not.

84 The Uropalma company, seeking a grant from USAID for its illegal palm plantation on lands seized from Afro-Colombian farmers in Choco, was one of the first to attempt to use a (fraudulent) 'strategic alliance' in support of its claim.

85 The 23 palm oil growers were brought to court in July 2010 charged with the forced displacement of 5000 small farmers and invasion of 100,000 ha of land, the collective property of Afro-Colombian communities in Choco (*El Espectador* 2010; Restrepo 2010).

86 In 2012 it was noted that 19 palm oil businesses would be charged with forced displacement in the Curvarado region of Choco. The companies allegedly met with paramilitaries and arranged for residents in the western department of Choco to be violently displaced from their land (Kinosian 2012).

87 Such lands, known as 'baldios' or wastelands, have a legal restriction on the size permitted to a single owner (Oxfam 2013).

The legal protection of their lands provided to people under risk of displacement meant that established oil palm producers could not acquire such lands. However local landholders could be persuaded to enter into "productive alliances" with the plantations and thus expand the oil palm frontier. This happened especially in the municipality of Tibu (Catatumbo), where the Murgos group Oleoflores established large areas of productive alliances from 2003, providing the group with control over considerably enhanced supplies of FFB (Marin-Burgos 2014, 85).

Instead of '"accumulaton by dispossession", Marin-Burgos called this process of alliance-building, "assimilation". Such a process also applied where displaced small farmers were allocated land by the government, provided they planted it with oil palm. Some small farmers entered an alliance under these terms because it seemed to be the only means of keeping their land. Others perceived the alliance as potentially profitable, so did not feel disadvantaged. The same applied to many of those who had formerly been cultivating illicit crops such as coca (Marin-Burgos 2014, 87, 100). In the Zona Bananera, some townspeople and landowners joined alliances in an attempt to extract rents from the land (Perez Castro 2012 *in* Marin-Burgos 2014, 87).

However, an alternative to the plantation/alliance duo had emerged in the central zone, through the Program for Development and Peace of the Magdalena Medio (PDPMM), run by the Jesuits through the Parish of Barrancabermeja. In 2007, 117 displaced families in the region of Sabana de Torres were allocated land by the government at a property called La Pampa, very close to a new mill built by the large plantation company, Indupalma. They formed themselves into a group called ASOBENPRO in order to work the land and Indupalma was selected to provide them with technical support. However, when the farmers realized that they were to be incorporated into an alliance, would lose control over the land and have to move into the town of Sabana de Torres, they rejected Indupalma's offer. In the campesino tradition they wanted to grow food around their houses and also keep cattle, activities not permitted on the plantation. Luckily, they were assisted by a group with a different model for growing oil palm in the form of mixed cultivation –Fundepalma or 'Finca campesina con Palma'. This organization, which helped several other peasant groups interested in oil palm but unhappy with the monoculture model, was sponsored by the PDPMM and attracted local and international funding (Bravo 2009, 130; *Vanguardia* 2009; Marin-Burgos 2014, 162)[88]. In 2010, Seeboldt reported that 5000 ha of oil palm were planted as part of Fundepalma (Seeboldt and Salinas 2010, 22).

4.2.2 Oil palm and biodiesel

One method of further encouraging the production of palm oil was to establish compulsory blending of palm oil-based biodiesel with imported diesel fuel for use in buses, trucks and other heavy vehicles. The Uribe government began with a law (No. 693) promoting the use of sugarcane-based ethanol in 2001 and this was followed in 2004 by Law 939 on "biofuels of plant or animal origin", which in Colombia meant palm oil. The same law laid out tax exemptions for biodiesel. Production is subsidized, as it is generally more economic for producers to export their CPO directly to the international market, especially to the EU.[89] A detailed economic analysis of Colombia's biodiesel industry carried out for the World Bank (Johnson and Franco 2009, 45) concluded that "it has never been attractive to produce biodiesel from a strictly economic perspective"…and that "it will always be necessary to subsidize the production of biodiesel". Despite these findings, a compulsory blend of 5% biodiesel (B5) was introduced in 2008 and increased to B10 by 2010, though more remote areas were permitted to continue with B5 (or even B2).

4.2.3 Recent increases in biodiesel

While internal demand has been growing for edible oils and fats (now absorbing 40% of production), the predominant local use of Colombian palm oil is for biodiesel (Mesa-Dishington 2012b). Exports of CPO, which represented more than 30% of production in 2008, (before the biodiesel industry had begun its operations) now stand at 16%, mainly to the Netherlands, Mexico and Brazil. Nine biodiesel plants have been constructed in

88 Funding has come from Ecopetrol (the Colombian State Petroleum Company), enabling the PDPMM to establish a biodiesel plant, the World Bank, the US government's MIDAS programme, the UNDP and the EU.

89 See earlier discussion on the comparable situation in Indonesia and Malaysia.

various zones of the country[90] (Reina et al. 2011, 29). Most recent blend mandates have remained at 10% (B10), although more remote areas still only blend between B2 and B8 (Fedebiocombustibles 2013; Gilbert and Pinzon 2013). Gilbert and Pinzon argue that the recent increases in palm oil production can easily sustain a rise in mandated blend levels.[91] This may occur in 2015 (a rise to B15) as one plant is being expanded and a new one is under construction.

The Colombian Ministry of Energy and the Inter-American Development Bank have jointly produced research revealing that palm-based biodiesel can reduce Colombia's GHG emissions by 83%. They argue that expanding palm oil production will have negligible impacts on either the environment or food security (Gilbert and Pinzon 2013).

Given that the most favored areas for oil palm expansion are on underutilized cattle pastures (Castiblanco et al. 2013 predict 50% to take place there, notably on the plains of the llanos), there is some truth in this statement. However, the prediction also suggests 19% will occur on agricultural land and 13% on areas currently under natural vegetation. These areas together constitute 1/3 of the total, which is not "negligible". There is also the suggestion that expansion will move to the southeast, to the Amazon forest frontier, which is certainly likely to have environmental consequences.

The Central Zone is identified by Castiblanco et al. (2013) as another area of likely future oil palm expansion. The original land classification in that area prior to the growth of oil palm between 2000 and 2010 was: cattle ranching, 50.7%; natural vegetation, 17.3%; heterogeneous agricultural areas and mosaics of crops, pastures and natural areas 20%; smallholdings of cocoa, coffee and sugarcane, 6.2%. The last two categories were identified as the lands of small farmers. Marin-Burgos (2014, 148) suggests that not only were the 26% of small farmer lands and livelihoods likely to have been affected by oil palm, but the pasture lands were not 'empty'; they were partly occupied by sharecroppers and small-scale graziers. The section of the central zone known as the Magdalena Medio (including Puerto Wilches) has a difficult recent history of peasant displacement, labor conflicts and bud rot disease. The impacts of further oil palm expansion in such an area, if attempted, are unlikely to be 'negligible'.

One study suggested that the national policies promoting biofuels favored access to the plantations and exacerbated the 'negative effects of the agrarian structure for peasants, indigenous and Afro-Colombians' (Marin et al. 2011). An attempt was made to refute such criticisms of the biofuel expansion in Barbosa 2011. Selecting an especially good plantation (Unipalma in Meta Department, part of the Llanos) Barbosa emphasises the importance of the industry for local employment, providing an alternative to coca. He also notes the plantation's plant breeding program, producing disease resistant hybrids and "strains of palm which suit Colombia's soils and are rich in the oils needed for biodiesel" (*Cleantech Magazine* 3, 2011).

4.2.4 Other Santos government initiatives

Following its election in 2010, the Santos government continued some support for oil palm, though Juan Camilo Restrepo, the Minister for Agriculture from 2010 to 2013 made some changes to the subsidies that had sustained the industry in the Uribe years. A replacement for the ICR, called equitable rural development (DRE), will only allow subsidies to be paid to plantation owners if they have an alliance with small-scale growers and the government will no longer provide subsidies for irrigation and drainage (Marin-Burgos 2014, 216).

Restrepo resigned in May 2013; his successor Francisco Estupinan lasted only 3 months, a casualty of a wave of protests by small-scale farmers seeking improvement to rural livelihoods and more trade protection, which placed the government in "crisis mode" (Gilbert 2013). The new appointment as Minister for Agriculture, Ruben Dario Lizarralde, was previously Chief Executive

90 Three of these are in the Eastern Zone, five in the north and one in the central area, but only four are large. Their total capacity is 581,000 t, with 439,000 t being used for biodiesel in 2012 (Fedebiocombustibles 2013).

91 An earlier study suggested that mandated levels would rise to B20 by 2012, but this has not happened, and it would need a much larger palm oil output before it is feasible (*Inter-American Development Bank, Ministry of Mines and Energy* 2010, 52). The proposed timetable for B20 levels is now 2020, but a recent paper suggests that even that date is too optimistic (Castiblanco et al. 2013).

Officer of Plantation Indupalma. In a GAIN report on the situation, it was suggested that President Santos wanted leaders "who understand how to transform rural livelihoods" (Gilbert 2013). Gilbert explained that Lizarralde had been prominent in developing the oil palm alliances, suggesting that "this model has often been highlighted as a private sector-led successful approach to improving livelihoods for small-scale farmers in conflict and former conflict zones". However, he suggested that the problems with Colombian agriculture would not be fixed quickly, emphasising the need for "deep structural changes" (Gilbert 2013).

Santos's aims for restitution of property to those displaced in the early 2000s, together with his protracted negotiations with the FARC guerrillas, have made him unpopular with the large plantation owners, who supported his ultra right-wing opponent (and Uribe favorite), Oscar Ivan Zuluaga in the June 2014 election won by Santos (*Associated Press* 2014). One casualty of the election was Lizarralde, who has been replaced as Minister of Agriculture by lawyer Aurelio Iragorri Valencia, former Minister of the Interior. The new Minister of the Interior, Juan Fernando Cristo, was an architect of the Victims Land Restitution Law, so he will be a key figure in the new government, with its aims to build "peace, education and equality" (Hinchliffe 2014).

4.3 Socioeconomic outcomes from disparate business models in oil palm development

4.3.1 Evaluating the alliances: The 2009 study

An evaluation of 22 palm companies and 91 associated organizations with 3958 smallholder families was carried out between June and December 2009 (Fedepalma et al. 2010).[92] Among the group studied, 56% of the smallholder cultivated area was in the Central Zone and 34% in the Northern Zone (p24). There were only three alliances at the time in the Eastern Zone, and those in the Southwestern zone (Tumaco) had been hit hard by bud rot disease. Overall, 52% had experienced problems of disease, either bud rot or *marchitez letal* (lethal wilt). The average holding size per family was 12.6 ha, but this included some "medium-scale" enterprises. Between 2001 and 2009, 66 projects were assisted with credit from the Rural Capitalization Incentive (ICR) to the tune of USD 37,436 million; the Fund for Investment in Peace provided USD 21,395 million; the MIDAS program of USAID gave USD 19.7 million; and the Ministry of Agriculture gave seed funding of USD 2597 million (Fedepalma et al. 2010, 4).

The study identified the fact that the most favorable scheme, called Typology 1, was a direct relationship between a mill and an organization of producers who were tied to supplying it with fruits (61% of cases).[93] Typology 2 was an organization of producers without a direct tie to a mill (35% of cases),[94] while Typology 3 represented individual producers with direct commercial relationships or other services from mills (4% of cases).

In 2008, the combination of alliances and their associated companies (in the 22 cases studied) was responsible for 31% of the sown area of palm, 15% owned by the alliances and 16% by their companies. Production was skewed, with only 9% of the total production resulting from the alliances and 16% from the companies. The main motivation for companies to engage in alliances was to gain access to the ICR funds, as well as utilize the full capacity of their mills. In the Central Zone, this resulted in an increase of 29% in mill utilization (from 57% to 86%) (Fedepalma et al. 2010, 15). The companies provided technical advice and agreed to purchase the harvest at a defined price. Most of the companies also supplied high quality seed, for which the farmers eventually paid from their harvest. Smallholders had to promise to comply with the technical recommendations of the company, to sell their entire crop to the company's mill and to repay the cost of the various services provided. During the first 3 or 4 years after planting, the alliance members could grow other crops, such as banana,

92 This detailed study does provide a useful analysis of a large sample of the alliances. Its main points are presented here in some detail, including their benefits and limitations. Other versions of the report have appeared in booklet form (Alianza SNV–Cecodes 2010, with some recommendations for the major stakeholders) and as a PowerPoint presentation (SNV et al. 2009). Castro presented a partly updated version in 2012 (Castro Forero 2012).

93 Perhaps akin to an Indonesian '*plasma*' scheme.

94 This arrangement appears to resemble Indonesian 'independent' smallholders.

maize and cassava, but this ended when the trees became productive.[95] The majority owned their farms individually, with 13% having communal ownership. The ownership included 73% male and 27% female household heads (p. 18).

Productivity during 2008 was generally below expected levels, with the Northern Zone scoring highest, followed by the Eastern and Central Zones. Yields tended to be much higher under Typology 1, where the company could more easily assist, but 38% of farms were said to require monitoring to ensure reasonable yields. Members of the alliances paid inadequate attention to technical matters, although technical assistance was indispensable for a productive outcome.

They also needed a plan of environmental management. It was noted that the alliances assisted by the USAID/MIDAS program were more advanced in environmental matters than others. An environmental guide to the cultivation and processing of oil palm supplied by Fedepalma could be used by the companies but not by the smallholders, as its language was not adapted to their understanding. The estates could transfer suitable environmental practices to their smallholders, a process more valid when global certification was the key to market entry. However, with one exception, the smallholders were perceived to be very far from such processes of certification (p. 33).

Commercial agreements were complied with by 70% of the allliances, although in the case of arrangements that the parties might want to modify, the biggest area of disagreement lay in the definition of the purchase price in case of liquidation through the commercial noncompliance of some producers. This comment referred mainly to the former *Zona Bananera* and the Aracataca area in the north, where there were many mills in close proximity to each other, leading to breaches of the agreement by the producers to meet their credit liabilities. The costs of credit repayment were considered to be too high, so they simply took their fruit to another mill, which then destabilized their alliance (p. 34 and personal communication from Maria Clara Rodriguez, 2014). Reflecting on the commercial dimension, the authors recommended the utmost clarity by the estates in divulging calculations of the costs of transport, technical assistance and any other factors affecting the final price paid for fruit. Producers should also be informed of the negative consequences for all parties if repayment agreements were breached (p. 36).

Of the credit received from various sources, 52% had to be repaid to the companies and banks, while 48% was not repayable (including 19% from the ICR). Around 40% of the sampled smallholders complained of the delays in receiving their repayable credit, so that the companies had to provide bridging funds.

A comparison was made of the annual income available to a family with two members employed. The hypothetical family had either 10 ha in full production of palm, 10 ha of rice or employment as estate laborers, both formal and informal. According to the figures presented, the palm smallholder would receive USD 16,200, the rice grower USD 11,760, a 'formal sector' estate worker USD 6480 and an 'informal sector' estate worker USD 5184[96]. So in effect, the palm grower would receive three times the salary of the informal worker (pp. 38–9). Comparing the numbers of plantation laborers (estimated at over 115,000 in 2009, of whom 80% were 'informal'[97]) with the 5000–6000 families engaged in alliances, it is obvious that the alliance smallholders, if they receive this level of income, should be a

95 As part of a continuing discussion on declining food security in the alliance areas, a number of observers have suggested that alliance members did not grow food once their oil palm seedlings were established (e.g. Velez Torres 2009, 36; Perez Rincon 2010; Rivera 2011).

96 On the oil palm estates most workers are hired for specific tasks (such as harvesting, fertilizing and planting out) from a 'pool' organised by a cooperative. This makes for maximum flexibility of the workforce but keeps wages low – a system very favorable to employers. 'Formal' employees, with generally higher levels of education, are permanently attached to the estate and mainly include those working in the mill or in positions of supervision in the field. In a detailed study of the conditions of employment of plantation workers on five estates in the Magdalena Medio (Central Zone) and Meta (Eastern Zone), Vargas (2012) found that 80% of workers were subcontracted, with wages below the legal minimum, barely enough to cover the basic needs of a family, and insufficient to secure their children's education. The CTA (*Cooperativa de Trabajo Asociado*) were banned under the Santos government (Law 1429 of 2010) but this did not deter the plantation owners, who turned to other organizations where wages were even lower (Vargas 2012, 113).

97 Vargas (2012, 113)

privileged group, even though in 2008 many were experiencing problems with productivity and technical aspects of production.

The alliance members perceived an improvement in housing, education, options for saving and to a lesser extent, health, though in general such services were better on the estates. The factors deemed most important for success on the part of the alliances were an assured market, access to credit and the experience of the 'anchor estate', while main difficulties were crop disease, a deterioration of public order, high fertilizer costs and volatility in international prices (p. 50–51). High debt levels also rated a mention in a third of cases.[98]

4.3.2 Case studies of specific alliances 1: Maria La Baja and its Asopalma associations (northern zone)

Maria La Baja was described as "the best example of an alliance" by one of the major initiators of the schemes (personal communication from Maria Clara Rodriguez, 2011). It lies south of the city of Cartagena and close to the Montes de Maria, an area of particularly severe violence between campesino organizations and paramilitaries, especially from 2000–2002, as paramilitaries sought to claim back land won by campesinos during the 1960s land reform. Part of the district was originally a fertile irrigated rice growing area, in which small farmers had been allocated 10 ha each by the Land Reform. However, by 1998 many rice growers were almost bankrupt, the result of a combination of cheaper rice imports, problems with bank credit and high debts, poor administration and declining yields (Gomez Lopez 2010, fieldwork May 2011). To emphasise their plight, one farmer said: ''Rice prices were very low and the harvests failed. There was violence and displacement – the zone was in bad shape, with lots of emigration. Everybody had left: there were not even snakes here!" ('pioneer'farmer, May 2011). Another said "Because of the violence it was impossible to work in the fields".

Maria La Baja began experimenting with oil palm and the alliance model at the instigation of wealthy businessman Carlos Murgos, who laid out a few demonstration plots, then built a mill in the region. He began encouraging the inhabitants to move from rice to oil palm, which they gradually did. Rangel et al. (2008, 38) suggested that 4000 ha were planted to oil palm, about 25% of the area's total farmland, with the main establishment of cultivation occurring between 2002 and 2006. About 600 families were involved, around 3500 people altogether, including landless laborers who assisted with various aspects of the cultivation and transport of the crop. However, as with the 'Zona Bananera', only 1/10 of the people were needed compared with the labor force on the former rice fields. Food security was affected as prices for local produce rose strongly (Gomez Lopez 2010). Vargas (2012) wrote of massive land sales and forced displacement of farmers during that period,[99] while an unnamed author in *Cien Dias* (2012) described a 'company push' (*empuje empresarial*). The latter article presented a counter story to that in a press release, which indicated very favorable conditions in Maria la Baja (Ortegon 2012).

Farmers interviewed in a field visit by the author in May 2011 were happy with the change to oil palm as their incomes had increased. Most did not have more than 5–7 ha of oil palm and were also either growing food crops or tending cattle, suggesting that food security problems may not have been as severe as claimed (Rivera 2011) and that there was some scope to adopt the "*Finca campesina*" model. One farmer explained that there were 11 in his family. They grew rice and had resisted joining the project because they argued that they could always eat the rice and couldn't eat oil palm. But they never had any surplus to improve their lives. After watching the position of their neighbors gradually get better, they began to plant palm. Another said that he had been a cattle farmer for 40 years and had been in the project for 4 years. He found the work lighter than cattle farming and argued that with oil palm it was possible to also be involved in other activities. A third farmer indicated that

98 Seeboldt (2010, 30) presents a much bleaker picture of the income of alliance members, suggesting that many did not earn the minimum wage and had trouble meeting their debt repayments, with children having to work on the allotment to help struggling parents.

99 Displacement certainly occurred, especially during the most violent times of 2000 to 2002, when many people fled to Venezuela. They gradually drifted back, but how many were able then to reclaim their lands is not known. Most of these farmers are Afro-Colombian, with large families who were disrupted during the period of displacement (fieldwork May 2011).

his mother actually owned the land, but she had given him 3 ha and he was now growing palm. The quality of the planting materials was very good, the trees grew quickly and yielded very well.[100] Previously he had grown rice and corn and had also tried cattle, but these were stolen in the times of violence.

Yields of FFB were surprisingly high (22–30 t/ha), but some disease problems (bud rot) were still a concern at that time. One young man had been very affected by bud rot, was having to replant in the spaces where his trees had died; there were no hybrid trees in this area.[101] The high humidity was generally blamed for the bud rot. One observer attributed the bud rot to the tendency of some women to grow corn and beans with the young palms, as they tried to maintain a mixed cultivation. Another farmer explained that he was originally displaced from Maria La Baja but had found new land outside the irrigation area. He joined the project and was the first to plant on hilly land. He made his own drainage system, his yields were very high and his palm had no bud rot. Only one farmer had apparently failed and left the project, but informants stressed that he was not part of the local community.

Sixty smallholders had shares in the mill (unusual for alliance members) that provided them with a further source of income, even though the mill was not working to full capacity, processing 20 t per hour instead of 30. The female head of one of the associations said that the industry had made a huge positive impact on the area, while one man described the project as "a miracle". A social worker who was employed to assist the group was more down to earth. She said that services were still very poor; this was considered a zone of rehabilitation after the violence and economic problems. Many families had become separated during the times of violence, leading to instances of family breakdown and some continuing trauma. Potable water and health conditions remained inadequate, although education had improved. While the irrigation system could be useful in dry periods, it was not well maintained and floods were common, affecting the palms. However, farmers had access to services they had never had before, such as TV, and some had money to spend in Cartagena. One looming problem was that many of the original farmers were now in their 60s and there was uncertainty whether their children would want to continue with oil palm.

4.3.3 Case studies of specific alliances -2: Hacienda La Cabana and Asopai (Eastern Zone)

Another example of a good alliance (at least one that is socially responsible) is the one operated by plantation Hacienda La Cabana on the llanos. This small alliance consists entirely of displaced people, 26 families coming from different areas of the country, including the Pacific Coast, the Amazon and another section of Meta which was heavily conflicted. They had a low level of experience in farming and a general background of poverty and unemployment. They were a difficult group to instruct in the technical aspects of growing oil palm, but Carmilo Colmenares (the plantation manager) saw the most important challenge as attending to social and community needs, thus eventually managing to inspire confidence, optimism and hope. "The easiest thing is sowing the palm". An agronomist was hired to live with them initially and found the early years very hard – she had to be encouraging them all the time, cajoling them to work (the cooperative began in 2000). Relations between men and women were often stormy, with some of the men drinking away the household's income. One woman, a recent arrival with six children, described how she had been displaced twice because of violence, but she was lucky to be given some land and a house by the government. She had 12 ha, 10 ha for palm, 1 ha for citrus and 1 ha for food. After the demobilization of the paramilitaries who had been in the district (2006) she and her family at last felt safe. At the time of the interview she had not yet planted anything but worked in the nursery and cleaned around the trees.

The members do what they are able to do, with some work done communally, some on their own land; they are paid by their cooperative on an

100 Murgos has a seed farm and experiments with the best varieties on his plantation at Codazzi. The alliance now has three nurseries of its own.

101 The risk from bud rot recently decreased in the Northern Zone, from an incidence above 5% between February and August 2011 to around 1% in December 2013. The reasons given were not only a sequence of dry months, but also a campaign of careful checking and some eradication of infected trees in the focal zones of the disease, which included Maria la Baca (Fedepalma 2014a, 60).

Bullocks are used on the savannas (llanos) to transport an Alliance farmer's fruit to the plantation mill. Near Hacienda La Cabana estate, Cumaral, Meta department. (Photo by Lesley Potter)

incentive basis, while the cooperative manages the supply of fruit to La Cabana's factory. Yields of FFB initially were only 6 t/ha, but in 2011 they were expecting 11–12 t/ha and had hopes of eventually reaching 20. The plantation provided credit and technical assistance.

One former leader of the group complained that some members prefer to work with a local petroleum company and pay others to manage their palm trees. Wages are higher with the petroleum company and the work is lighter, but it only lasts for a few months at a time. He saw oil palm as having better prospects for the future. Disease has continued to be a further difficulty; on the llanos *marchitez letal* is a problem disease, which is spread by a small insect from the cattle pastures and can quickly kill the trees. Three families out of the 26 had given up and left, selling their land to other members, who do not want any more families to be admitted. With some struggle and a desire for improvement, they have managed to be moderately successful (Colmenares 2012 and fieldwork, May 2011).

Despite their flaws, the alliances were not a bad model for smallholder participation, though they form a much smaller component of the industry than for example in Indonesia.[102] Little information is forthcoming on the formation of new alliances beyond 2008, and the particular model has been somewhat downplayed as the biodiesel rush has taken hold.[103] There continue to be few alliances on the Llanos, the area expected to be most prominent in future expansion of oil palm.

4.4 Initiatives towards more sustainable and inclusive oil palm production

An application was made to the UNDP–Global Environment Facility (GEF) for funding to overcome problems of loss of biodiversity likely to be associated with the expansion of oil palm, with

102 Mesa Dishington (2009) claims that the proportion of 'smallholders' (i.e. those with 50 ha or less) in Colombia is 30%, which presumably also includes private growers not affiliated with a plantation-based alliance, such as those working with Fundepalma.

103 There were to be two stages in formation of alliances, the first between 2002 and 2007, followed by a second, with new funding, between 2008 and 2011. The second stage should have established 300 new alliances with 25,300 families in all. The extent to which it was achieved is not clear, but from the figures in Table 5, it seems unlikely that much happened.

a focus on the northern and eastern zones. With Fedepalma, Cenipalma, WWF and the Alexander von Humboldt Institute as the implementing agencies, the project, worth USD 18.3 m was set to run between April 2012 and December 2016, but only had its first full year in 2013 (Mesa Dishington 2014b). This initiative is in association with a desire by Fedepalma to implement the Principles and Criteria of the RSPO and gradually prepare members of the alliances for accreditation.

Some of the major environmental weaknesses identified as needing attention, especially in relation to oil palm plantations and protection of biodiversity, were listed as part of the GEF application:

1. Ignorance about conservation tools and appropriate environmental management of oil palm ecosystems, especially identification of high conservation value areas (HCVA). Within the design of new plantations there is a lack of knowledge of conservation criteria regarding, for example, protection of natural systems that lie within the plantation.
2. Colombia has a national standard based on the principles and criteria of the RSPO, but its implementation is still incipient due to the technical weakness of oil palm growers and environmental authorities to support producers in meeting these requirements. Such certification is likely to become very important at the international level[104].
3. Undervaluation of the economic benefits of environmental services for oil palm activities: e.g. phytosanitary barriers, pollination and erosion control (Llaguno et al. 2010).

At a more general level, there is limited institutional capacity to incorporate biodiversity into regional and local planning processes (Llaguno et al. 2010).[105]

The system known as 'UAATAS' – 'Unidades de Asistencia y Auditoria Tecnica, Ambiental y Social' (*Revista Palmas* 2009) will work at the level of the plantation company for adoption of ecological practices, conservation of HCVA and capacity building for insertion into differentiated markets. Landscape ecology aspects at regional level, with identification of HCVA, suitable areas for palm, ecological structures and conservation corridors will complement the other activities. Fedepalma's scientific arm, Cenipalma is also involved, especially in stepping up efforts to control diseases such as bud rot, which have recently created such havoc in the central zone. They are also attempting to reduce the gap in yields between the large producers and their alliances, by concentrating on best practice in agronomic techniques (Cenipalma 2014).

Fedepalma has recently been promoting a palm 'cluster' scheme similar to that in Malaysia between growers and their mills, with the mill acting as 'anchor company', with its own plantations and fruit suppliers. These units will be used for technology transfer, technical assistance, marketing, environmental and social support. The possibility of RSPO certification for alliance smallholders is the goal, once the environmental message has been understand and good management practices implemented (Castro Forero 2012). A group of Murgos-initiated alliances in Catatumbo (in the central zone) were said to be the closest to being RSPO compliant[106] and hoped to be 100% compliant by 2014 (Brounen 2013).

104 The RSPO's principles and criteria were revised in 2013, leading to a revision of Colombia's National Interpretation (NI), which is ongoing.

105 A recent thesis by Hortua-Romero 2014 uses Critical Discourse Analysis of the two leading newspapers, *ElTiempo* and *El Espectador* through the period of 2002 to 2012. It notes the frequency of political/economic themes which basically supported the expansion of oil palm on the grounds of 'development' and 'progress', while the rural population were perceived as passive; any negative aspects such as dispossession were legalised and therefore 'neutralised'. The 'ecosystemic' dimension was also neutralised, with the environmental impacts of oil palm being hidden and scarcely noticed.

106 These alliances, incorporating "680 growers, 7500 ha, with a production of 24.5 t/ha/yr, 30% ex-coca growers" received direct financial assistance from the Netherlands Government.

The process of drawing up Colombia's National Interpretation (NI) of the RSPO Principles and Criteria in 2008 was led by Fedepalma. The limited involvement of representatives of civil society in that process was criticized by outside observer Oxfam-Novib, especially the lack of consultation among environmental, ethnic, indigenous and labor organizations. Colombian civil society organizations claimed that the NI process, 'was viewed as an opportunity to clean up the industry's reputation without this necessarily implying substantial change in its practices' (Seeboldt and Salinas 2010, 33). Given the power structure of Colombian society, with the oil palm elite operating in the same "closed space" as the political and economic elite, they questioned whether the RSPO process was feasible (Seeboldt and Salinas 2010, 38).

The intervention of Oxfam-Novib, a member of the RSPO Executive Board, delayed the acceptance of the NI, as it commissioned an evaluation of the process. The evaluation concluded that "procedural power" in the hands of Fedepalma undermined the effective participation by local actors opposed to oil palm expansion, through the number, location and duration of the workshops (Marin-Burgos et al. 2014).

Following the revision and upgrading of the RSPO international standard in 2013, the National Interpretation also had to be revised. This time the process in Colombia is being led by the Daabon Group rather than Fedepalma, and includes more organizations representing environmental and social interests, such as the NGO *Indepaz*, which had been very critical of the original NI process (Marin-Burgos 2014, 218). Other additions are prominent international organizations such as Conservation International and Solidaridad (RSPO 2014). However, the suggestion (Seeboldt and Salinas 2010, 39) that local ethnic and labor organizations also be included has not been adopted. The Smallholders Association of Tibu (Catatumbo), though invited, was replaced by two executives from the Oleoflores group (RSPO, 2014). The committee is, however, taking more time to complete its work, with the period of public comment just finished (Fedepalma 2014c). It is to be hoped that the expanded membership of the committee and the more open process of consultation within the regions will produce a more credible National Interpretation. However, with still only a handful of growers[107] and a few palm oil processors plus Fedepalma as members of the RSPO, much work still needs to be done.

Since President Santos assumed office in August 2010, he has attempted to initiate moves toward restitution of lands to their former owners, where such ownership can be proved. The Victims and Land Restitution Law was passed in June 2011, to general approbation. However, one result has been the formation (in the Departments of Cesar, Cordoba, Magdalena and Narino) of a new right-wing paramilitary group, the "Army against the Restitution of Land" with 6000 members, thus increasing the threat to those attempting to return to their lands (ABColombia 2012, 2).[108] In a comprehensive examination of "gaps and shortcomings" of the law, Tenthoff and Eventon (2013) see its aim as further to consolidate the neoliberal approach of the government in encouraging agro-industry, notably biodiesel, as well as large scale mining projects. "There is a high likelihood the law will operate as a means of stabilising property titles whilst transferring land from peasants – unable to sustain their livelihoods as traditional farmers – to large businesses possessing the necessary capital to exploit the land" (p. 10). If communities return to their land and find it has been put to productive use, the new occupiers retain the right to continue operating and just have to pay "rent" to the victims. The latter may be given "right to the surface", which allows ownership of land to be separated from its use. It thus allows "newly established agro-industry to continue to operate on potentially stolen land without interruption" (p. 11). An example of this process has been illustrated by the community of

107 The most recent being Indupalma: Colombia has 20 members of the RSPO.

108 In August 2011, before the land restitution policy went officially into force in January 2012, the Santos government had already redistributed 361,000 ha. However paramilitaries were at work in the Jiguamiando and Curvarado valleys (Choco) planting coca on land collectively owned by black communities. If coca is grown in an area, the communities lose their right to the territory (Vieira 2011).

Las Pavas, being asked to lend their land to the oil palm estate that had taken it over.[109]

The ASOCAB group from Las Pavas were offered incorporation in an alliance on the disputed territory. Their response was negative, as they also perceived that the palm company would damage the wetlands environment of the area. In the words of an ASOCAB representative "… we are not asking for more than a small parcel to produce food and that they do not damage the environment and the wetlands with the palm. If we were after the money we would have accepted the alliances that we have been offered…"[110]

It is obviously critical for other kinds of initiatives to be examined. The FARC, in their negotiations with the government, have suggested the establishment of a large number of Peasant Reserve Zones, where peoples' land rights would be respected and traditional agriculture could persist, even the growing of coca, which could be phased out slowly.[111] In 2013, the Catatumbo area was involved in conflict, with former coca growers blocking roads and demanding a Peasant Reserve Zone for their district, free of army harassment (Rincon 2013; 'Pablo Catatumbo' 2013; Whitney 2013). This road blocking impeded the activities of the oil palm growers in the district, including the alliances at Tibu and was commented on by Mesa-Dishington, who deplored the disruption caused to the industry by these kinds of activities (Mesa-Dishington 2012, 2013).

The Fundepalma group continues to operate, offering an alternative to the alliances, which is more acceptable to many small farmers. Yields of FFB under that system compare favorably with local allliances and reach the national average productivity as defined by Cenipalma: 12 t FFB/ha for the fifth year and 20 t FFB/ha for the seventh year (Fundepalma 2011, quoted by Marin-Burgos 2014, 165). This model, which is confined to the central zone, offers more opportunity for self-management and independence by its participants. Third parties such as the courts, the National Ombudsman and national and international NGOs have also assisted in cases where rural people wish to retain access to their lands without being forced into oil palm cultivation (Clancy et al. 2013).

4.5 Conclusion

The issues in Colombia that have been given the greatest attention recently have been the performance of the Santos government and his narrow reelection for a second term, without the support of the large plantation owners. Colombia remains a seriously conflicted country, although there are some signs of improvement. President Santos told the Congress of Oil Palm Growers in May 2014 that he would not put brakes on the expansion of the industry, which he saw as the "key to the economy" (Santos 2014).[112] The government is beginning to distance itself somewhat from the cosy relationship with the palm oil industry that characterised the Uribe years (as analysed in the thesis of Marin-Burgos, 2014) and this means fewer opportunities for corruption.

Following his reelection, Santos has promised a Colombia with more justice and equality and the end of violence (*Associated Press* 2014). Such aims will not easily be met. He has inherited considerable dissatisfaction with his government's performance in his first term, especially with conditions in the rural areas, and his planned restitution of "stolen lands" is still far from a reality. A low level of violence is certainly continuing,

109 This was a conflict over land between two of the Daabon company's estates and a displaced peasant cooperative, ASOCAB, whose lands had been invaded by the plantation (which had been sold the land by the government's land agency, INCODER). The peasants have been fighting to get their land returned, having been evicted again by the police in 2009 after the plantation company bought 1800 ha of it. *The Report of the Independent Commission Land Conflict – Las Pavas-Bolivar, Colombia (*Vargas et al. 2010*)* is very detailed but provides an excellent picture of the complex nature of land tenure in Colombia. Eventually in May 2011 the people were told their lands would be returned, but they were asked to *lend* their lands to the palm company (ABColombia 2011).

110 Translation by Marin-Burgos from an interview by a representative of ASOCAB with a journalist: Marin-Burgos 2014, 154 quoting Kienyke 2011 (Spanish version also supplied).

111 The FARC has called for 9 million ha to be included in peasant reserve zones, which should have a legal status similar to indigenous reserves and Afro-Colombian collective titles. The sizes of land holdings are limited within the zones and the government is required to provide assistance with their development (Ballve 2013).

112 Rival right-wing candidate Zuluaga also addressed the Congress with a popular speech about the advantages of *Fuelcultivo de palma* (Zuluaga 2014).

most of it not directed specifically at the palm oil industry, although small outbreaks still occur.

However, they are marginal compared to the situation in the past and marginal as a problem confronting the industry, where the wreckage of livelihoods in Tumaco and Puerto Wilches through bud rot disease has far greater social and economic consequences. Considerable research is being directed at the disease problem, which is much worse in Colombia than in the other countries studied in this review and a timely reminder of the dangers of monoculture.

It may be the case that large-scale replanting with hybrid trees is the only sustainable solution to bud rot, although the replacement of all infected trees will take time and money. One advantage of the hybrid is the high quality of its oil, with a different composition of its fatty acids to the normal teneras, so that it has been called tropical olive oil with a high potential for increased market demand as a specialised boutique type (Mesa-Dishington 2014 b).

In the public policy debate there has been considerable study of oil palm's likely expansion, using various scenarios and sophisticated techniques, with the emphasis continuing to be on extensification rather than intensification. Some attention is however being given to the yield discrepancies between the large plantations and the smallholders. The development and then revision of Colombia's National Interpretation of the RSPO's principles and criteria caused some interest, specifically in the process and associated personnel, with Fedepalma now attempting to move on towards certifying smallholders as compliant with RSPO standards. That process will take some time to resolve. Although oil palm's costs of production are high in Colombia, so that it is not competitive on the world market and its biodiesel production continues to be subsidised, many in the the industry seem confident of the future and are keen to promote continuing expansion.

Among unsolved issues there is still much scope for improvement of conditions of workers on the plantations and for more attention to be given to problems of food insecurity in the plantation areas. An extension of the ideas behind the mixed cultivation in the 'Finca campesina' model to areas outside the central zone would be a useful beginning.

The recent paper by Castiblanco et al. (2014) on socioeconomic indicators surrounding oil palm expansion basically rejects the current model as being incapable of reducing rural poverty and inequality, even though incomes of some growers have improved. The background of violence and land consolidation, as discussed in depth by Marin-Burgos, remains a factor and is one of the reasons why the model has failed.

Castiblanco et al. (2014) noted that statistical information on several socioeconomic indicators is not available, while other details, such as the most recent census of the palm oil industry, remain slow to be released. This inadequacy of current statistical material may impede the conduct of important research into relevant aspects of rthe industry.

5 Peru

5.1 The influence of oil palm expansion on economic development and land-use change

The Plan Nacional de Promocion de la Palma Aceitera PERU 2000–2010 (Ministerio de Agricultura 2000) provides some background history of the industry in Peru. Oil palm was first planted at Tochache in the Department of San Martin in the Peruvian Amazon in 1973, following a 1969 French study commissioned by the government, which suggested that San Martin had suitable agroclimatic conditions for the crop. By 1980 the state-owned "pilot plantation" EMDEPALMA, planted at Tonanta in Tochache had grown from the original 200 ha to 5273 ha; its factory was successfully producing more than 5000 t of CPO. But by the mid-1980s it entered a period of crisis, with rising labor and administrative costs, followed by problems of narcotrafficking and terrorism. In 1993, EMDEPALMA suspended its operations, following the passage of a law to privatize state firms. Under the terms of its liquidation, the local workers union, ACEPAT was handed 2809 cultivated hectares, together with houses, machinery and tools; a further 1233 ha was sold to small private firms and the remaining 1397 ha which could not be sold was transferred to the Ministry of Agriculture and subsequently abandoned. A second government owned plantation was planned for the huge Department of Loreto, with 10,600 ha earmarked as suitable land in the Rio Maniti-Quebrada de Paparo area. However, that estate had barely begun, with just 702 ha, before it was overtaken by the country's privatization process and liquidated.

Observing EMDEPALMA's good results in its first years of operation, the Grupo Romero, one of Peru's leading firms, also invested in oil palm, locating its cultivation further south in the Uchiza district of Tochache in 1979 and establishing 6400 ha, together with a modern processing plant.

An international initiative funded by the United Nations to establish alternative crops for coca selected oil palm as one of the suitable crops. In 1991, in the Campo Verde district near the city of Pucallpa in Ucayali, a group of 300 farmers was organized into a cooperative - COCEPU (Comite Central de Palmicultores de Ucayali) - with 5 ha of oil palm per family. A small extraction plant, OLAMSA, owned by the cooperative was set up in 1996 in Neshuya.

In 2000, a similar cooperative, ASHPASH was tried in the Shambillo Valley, Aguaytia, a strong coca growing area, with 1000 ha for 400 smallholders. In 2004 a second small extraction plant (6 t of FFB/hour) called OLPASA, was established to serve those farmers. The main zones and producers of palm oil in Ucayali today lie along the major highway (Federico Basadre, the road to Lima) between Campo Verde and Aguaytia; OLPASA is 178 km from Pucallpa (*Dirección Regional Sectorial Agricultura Ucayali*).

By 2000, out of 14,667 ha which had at any time been planted with oil palm, 51% were in production, 30% had been abandoned, and the balance consisted of new plantings, still immature. In San Martin the presence of the Grupo Romero's estate, Palmas del Espino, made that department the leading area. Among the smallholders in both San Martin and Ucayali there was considerable abandonment (up to 42% in Ucayali), due to crop disease and the poor state of feeder roads, which made it hard for some farmers to reach the factories. Farmers were also undercapitalized and could not succeed financially until their oil palm trees became productive. It was argued that both national and international assistance would be required to ensure the

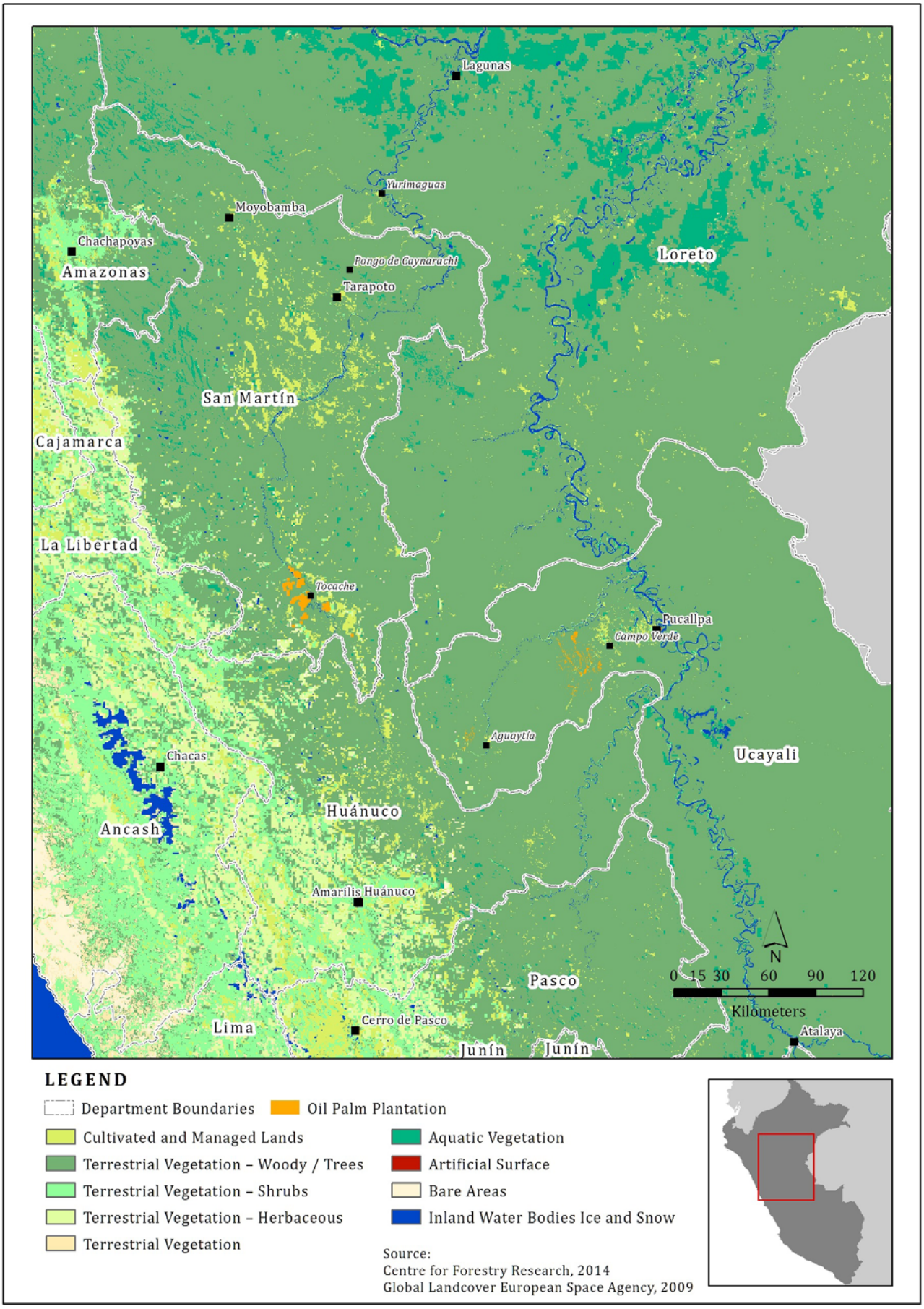

Figure 5. Peru: Map of Vegetation and land cover in a section of the Peruvian Amazon. Main oil palm areas are in Departments of San Martin, Ucayali and Loreto

sustainability of the various projects.[113] While the factory and refinery at Industrias del Espino in San Martin were working at full capacity, Olamsa, the factory in Neshuya, was only managing 25% of its installed capacity due to a lack of supplies of FFB from the surrounding smallholder growers (*Plan Nacional*, 24).

It was a shaky start to the industry, but it was recognized that there was a good market for locally produced palm oil. Remission of taxes was announced for investments in planting oil palm, and in May 2000 the government proclaimed (Supreme Decree 01 5-2000-AG) that it was *in the national Interest*[114] to set up oil palm plantations "to promote alternative rural development and augment… the national supply of vegetable oils" *(Plan Nacional*, 8).

A national plan for 2010 was drawn up by the Ministry of Agriculture, with the aim of increasing the area to 50,000 ha of investments in large estates and 20,000 ha of smallholdings, ecologically zoning the Amazon to permit oil palm development, rehabilitating the abandoned areas, assisting smallholder organizations and generally improving both production and infrastructure *(Plan Nacional*, 44). The expansion envisioned 10,000 ha in both Ucayali and San Martin, 15,000 ha in Loreto and a further 15,000 ha along the right bank of the Amazon (*Plan Nacional*: 45). It was suggested that eventually there was scope to develop 1.4 million ha (*Plan Nacional* 18).

Two companion references from the Peruvian Ministry of Agriculture, both dated 2012, cover the modern palm oil industry. They are *Palma Aceitera: Principales Aspectos de la Cadena Agroproductiva* (Ministerio de Agricultura 2012a) and *Estudio sobre la potencialidad de la palma aceitera para reducer la dependencia de oleaginosas importadas en el Peru* (Ministerio de Agricultura 2012b). Although there is considerable overlap between the two, the first supplies figures for area cultivated (both producing and immature) and current production. The area cultivated in 2012 stood at 57,752 ha, of which 33,567 ha were mature; production of CPO was 119,189 t. Some of the aims of the 2000 Plan had been achieved, even though Peru has remained a very small player, in both Latin America and globally.

While 49% of the total planted area in 2012 was in San Martin, 26% in Ucayali, 23% in Loreto and just 2% in Huanoco, more than 70% of the producing area and 78% of the production remained in San Martin. It was dominated by the Romero Group's plantation (Palmawasi) in the district of Uchiza, Tochache. Palmawasi remains Peru's largest oil palm plantation, with 12,293 ha in production. A third processing plant, OLPESA to handle smallholder production around the area of ACEPAT and the original plantation, EMDEPALMA was established in Tochache in 2009.

A further development by the group consisted of three estates straddling the border between San Martin and Loreto, with Palmas del Shanusi (2006) lying in Loreto, the adjoining estates – Palmas del Oriente (2010) and Palmas del Caynarachi – in San Martin. That project was denounced for deforestation and criticized for the low prices the company paid for the land. There were disputes with local people – in Yurimaguas over the Shanusi lands (WRM, 2006) and in the Barranquita district of San Martin over lands in the other two estates. The latter dispute led the Romero Group to decide not to go ahead with the Caynarachi property (which had not been cleared and was experiencing local invasions). From satellite imagery (Butler 2013a), Palmas del Oriente (designed specifically for biodiesel) had been partially planted by 2011 but was having serious problems (Dammert et al. 2012, 66). A new factory was opened near Palmas del Shanusi in 2011 (*Grupo Palmas* 2013). A fourth smallholder extraction plant, INDUPALSA had already been established at Pongo Caynarachi in 2005 to service the needs of the many smallholders who had established a cooperative, Jarpal in the border area between San Martin and Loreto (UNODC 2014).

The government publications provide little information about the ecological impacts of oil palm on the Amazon forests. This gap is increasingly being filled by studies by academic researchers and NGOs. In the work by Guitierrez-Velez et al. (2011), the authors demonstrated that high yield oil palm (generally found on private

113 It was been suggested that the main reason for the abandonment was the surge of coca growing during the 1990s, which at that time was more profitable than oil palm. The latter was later to return (personal communication from Miguel Pinedo-Vasquez, 2014)

114 Emphasis mine.

plantations) was more likely to expand into forests, with 72% of new plantations expanding into forest areas between 2000 and 2010 (mainly post-2006). The low yield smallholders, many in cooperatives and occupying 50% of the oil palm area,[115] expanded by 80% between 2000 and 2010, but only 30% of that was at the expense of forests.[116] In order to include the Romero Group's plantations in San Martin and Loreto, there were two scales of analysis – the entire Peruvian Amazon and a smaller area focused on Pucallpa City, Ucayali.[117] In the latter area, the private estates were also considered, two of which were of medium size.[118] The conclusion comes in the final sentence "… incentives for expanding cultivation outside of the forest are essential to achieve simultaneous goals of agricultural production and forest conservation" (Gutierrez-Velez et al. 2011, 4). A companion paper (Guiterrez-Velez and DeFries 2013), focused more on the remote sensing techniques needed to detect and quantify land cover changes associated with oil palm development, again using the same dual scales and research areas, but going further, estimating the ages of the oil palm in 2010 and the non-oil palm land covers for each year between 2001 and 2010. The authors suggested that the earlier result, listing the contribution of high yield oil palm expansion as responsible for 72% of deforestation 'may be conservative' (Guiterrez-Velez and DeFries 2013, 163).

These studies are backed up by other work, notably the expansion of Grupo Romero's Palmas de Shanusi and Palmas del Oriente, which probably deforested 7000 ha, as illustrated by detailed maps reproduced in Butler (2013a), charting the changes in the forest within those plantation areas between 1998 and 2011. Subsequently there are several indications that more large plantations are planned for Loreto, with the Grupo Romero initiating a policy of expansion into several areas: Tierra Blanca, Santa Catalina, Santa Cecilia and Maniti (about 34,000 ha). The Forestry Law[119] insists that 30% be given up to make two forest reserves, one near each group of estates. According to environmental impact assessments, two-thirds of the area is primary forest. The Tierra Blanca case has been examined by Dammert et al. (2012), who found that there was already a group of smallholders, or potential smallholders, waiting to welcome the company. However, a road would be needed to connect the locality with the Shanusi factory in Yurimaguas, and such a road could create many problems for the intervening forest, such as land trafficking along the route.[120] While the Grupo Romero denies that it would cut primary forest, maps of the proposed areas indicate that primary forest is the dominant vegetation (IDL 2013, *Actualidad Ambiental* 2013b, Luna Amancio 2013).

The second group to contemplate rapid deforestation in Loreto is associated with Singapore-based American Dennis Melka, who has bought up 13 separate parcels of land in Peru to grow oil palm (*Actualidad Ambiental* 2013b). Melka, whose Sarawak plantation Asian Agri (renamed Pacific Agri Capital) was listed on the Malaysian Stock Exchange, praised the opportunities available in Peru. His manager told the Malaysian press that they were interested in providing coca growing farmers with sustainable incomes (Ismail 2011), and some smallholdings have recently been opened in association with Melka's estates in Ucayali (personal communication from Ayme Muzo, 2014). Melka, together with two Peruvian associates, is seeking an allocation of 100,000 ha in Loreto. Local people in Iquitos were shocked when a newly cleared area was discovered by accident in Tamshiyacu, quite close to the city. This was one of Melka's properties (for cocoa), but he had not received permission to deforest, as reported by the local paper (*La Región* 2013a). *La Región* followed this report with two more studies of the impending deforestation, described as

115 (Ministerio de Agricultura 2012a, 14)

116 As the smallholder farms were experiencing a substitution of oil palm for coca at the time, they were less likely to be actively deforesting.

117 The highest rates of forest disturbance between 1999 and 2001 were found to be 'around the Ucayali logging centre of Pucallpa and along the road network that emanates from it' (Oliveira et al. 2007, 1234).

118 Probably Biodiesel Ucayali SRL – 3000 ha (belonging to the Grupo Romero) and Plantaciones Ucayali SAC- 4400 ha (belonging to Melka and associates – see later discussion).

119 The former Forestry Law (No. 27308) is still in existence until the regulations of the new law, passed in 2011 (No. 29763) are finally implemented. They were being circulated for comment early in 2014. (AIDESEP 2014; Forest Peoples Programme 2014)

120 An earlier study of the forest situation in Peru concluded that the presence of roads had a huge impact on forest disturbance, even in the most remote areas (Oliveira et al. 2007, 1234).

"deplorable", "fatal" and "irrecoverable" (*La Region* 2013 b,c), and echoed in Pickett (2013) and Dammert (2013).[121]

The regional chairman of Ucayali noted that Melka had also invested in that department, with 5000 ha to be planted to oil palm and plans for a factory once the crop was ready. However, more detailed studies have revealed that Melka's group had already deforested 10,926 ha of 'primary forest' in the district of Nueva Requena between October 2011 and November 2013 (Pautrat 2013b). That clearing known as 'Plantaciones Ucayali SAC' and 'Plantaciones Ucallpa' is in two lots of around 5000 ha each according to the maps (see also 'IDL-reporteros' 2013, *Actualidad Ambiental* 2013c, Servindi 2014) and is strictly illegal if indeed it is cleared from primary forest.[122]

The new plantations have invaded 827 ha of lands in three villages belonging to a union of small farmers and graziers called CONVEAGRO – Ucayali. The plantation management is accused of bringing heavy machinery into the area, threatening the farmers with armed security personnel and obstructing the flow of the River Aguaytia with fallen trees (Pautrat 2013b). Various legal entities have inspected the property, including representatives of the Minister for the Environment, the Forestry Department and the National Police. Melka and an offsider were charged in July 2013 before the Provincial Prosecutor. Despite these actions, the displaced farmers had not had their lands returned and conducted demonstrations and protests in November 2013 (Pautrat 2013b). The *malayo-peruano* group were declared an "untouchable mafia" *(mafia intocable)* by representatives of Servindi after a public meeting in Pucallpa on November 22. At that meeting, a functionary from the Ministry of Agriculture and a member of the regional government of Ucayali, together with members of the denounced plantation, reiterated their interest in promoting the cultivation of oil palm (Servindi, 2014). Farmers from the village of San Juan de Tahuapoa, already recruited to work on the plantation, were also strongly supporting oil palm (personal communication from Ayme Muzo, 2014).

According to a presentation by Melka, the plan is to plant 5050 ha of oil palm over the 4 years from 2013 to 2016, an activity which would involve 720 families (Melka 2013). Some of the land will be worked with smallholders, initially from two communities. One of these is the village of San Juan de Tahuapoa, in which 160 ha of oil palm was planted by 22 farmers in May 2014, giving them around 7 ha each. The plantation will provide technical and financial support for a fertilized program for the first 3 years, then transport and purchase the FFB. Each farmer member must pay 70% of the cost, and the enterprise must pay 30%. Two more communities will later be included, one of which, Bajo Royal, was the group making the initial complaint about farmer displacement. A further group, formed by indigenous people, rather than 'colonists', will have 120 ha of palm to be worked communally (personal communication from Ayme Muzo, 2014).[123]

Pautrat (2013a) has suggested that all of these applications for new oil palm clearing are being filed with regional governments for soil reclassification: from land suitable for forest production to land suitable for single crop agriculture. While such reclassification is permitted under the new Forest Law, which will soon be implemented, the Ministry of Agriculture has not yet established guidelines for the regional governments 'to safeguard forest land'. Pautrat argues that the Supreme Decree promulgated back in 2000, declaring the setting up of oil palm plantations to be 'in the national interest' has been the basis for granting large tracts of land for farming in the Amazon, risking the reclassification of permanent production forests.[124]

121 Melka has now sold his Sarawak oil palm plantation to FELDA and is keen to expand his activities in Peru, including 4000 ha of cocoa, where his company, called 'United Cocoa', is planting a disease-resistant variety. He aims to produce 9,000 t by 2020 (Terazono 2014).

122 One independent researcher, noting the types of timber stacked from that clearing, has suggested that it was more likely secondary forest (personal communication from Ayme Muzo, 2014)

123 It is a bit hard to work out what is actually happening here, as the NGO group, represented by Servindi and Pautrat, is totally opposed to oil palm. Melka and his Peruvian allies seem to be ignoring Peruvian law in their approaches, which could be genuine, but it will be important to monitor the progress of these developments.

124 This reclassification was already suggested under DL1090 and DL1064 two of the most controversial decrees issued by former President Garcia in 2008 and revoked in 2009 (see later discussion).

5.2 The role of policies and corporate strategies in shaping oil palm development

State policies have varied somewhat over the past 12 years, depending on the president in power and the accompanying stance of his government, though generally the large oil palm companies have been favored. President Alejandro Toledo (2001–5) negotiated a Free Trade Agreement with the United States, which passed under his successor, despite opposition from small farmers. Though he secured funding from President Bush to support alternative crop development in coca producing areas, Toledo's philosophy was neo-liberal, so he directly supported the large private oil palm plantations by initiating an interest in biofuels through the passage of Law 28054 and the establishment of targets in 2005 for mixing gasoline and diesel with biofuels. The Grupo Romero quickly became a leader in biofuel production, producing ethanol from a sugar estate in Piura on the north coast and biodiesel based on oil palm from its factory in San Martin. In 2007 a timetable was established for implementing biofuels targets, which for biodiesel involved 2% mixing by 2009 (B2) and 5% by 2011 (B5).

Peru has long been short of edible oils, much of the local demand being met by fish oil and imported soy[125]. The improvement in the security situation (from Shining Path guerrillas) meant greater possibilities for palm oil, though the new focus on biodiesel was almost entirely artificial, as local production was far below what was needed to implement the targets. Although production of both CPO and biodiesel increased sharply from 2007, the demand for biodiesel has been met largely from cheaper imports of soy. These came initially from the United States, but following the imposition of duties on US imports, Argentina has taken over as the main source of supply, probably reaching 167,000 t in 2011 and 230,000 t in 2012 (*Oxford Analytica* 2011). Refined palm oil has also been imported, mainly from Malaysia.

Government incentives for growing oil palm have included tax free status and continuing assertions (emanating from the National Plan)[126] that growing the crop is in the national interest.

President Toledo's successor, Alan Garcia (2006–11), though coming from a background in which his party was regarded as 'centre-left', in his second term as president was concerned to remove any impediments to expansion of economic activities in the Amazon by large-scale business models. Garcia made a speech in 2007 proposing that 63 million ha be parceled out into properties of "5000, 10,000 or 20,000 ha, since in less land there is no formal investment long term and high technology". He added that one should not "deliver small lots of land to poor families that do not have a penny to invest" (Zibechi 2009). That signalled his contempt not only for the communal tenure under which lands were held by the indigenous inhabitants of the Amazon, but also for the work of UNODC in attempting to improve the conditions of poor communities by substituting oil palm for coca. It was suggested that officials in Lima "never deeply cared" about the coca trade as it was conducted in remote areas far from the seat of political power in Lima (Paul Gootenburg *in* Epstein 2013).

The passage of 99 Legislative Decrees following the ratification of the Free Trade Agreement in 2007 aimed at opening the land market in the Amazon to establish biofuel monocultures, as well as mining and oil exploration on indigenous lands (Pautrat and Segura 2010). The more extreme of those decrees (especially 1090 and 1064[127]) were rejected by the population, leading to huge social conflict, especially at Bagua (Amazonas) on June 5 2009, when several people died in confrontations between indigenous groups and the military. Both bills were revoked on June 19 2009, but the ideas behind them still linger.

In the debate over a new forest bill during 2010, one of the communications received was from CONAPAL, the National Federation of Oil Palm Producers and Companies of Peru, membership of which includes all the large producers. The

125 In 2010-11, Peru was ranked 17th out of 24 countries in the Americas in its annual consumption of fats and oils (kg/yr) (Ministerio de Agricultura 2012a, 28).

126 (*Plan Nacional*, p8)

127 Decree No DL 1090 limited the definition of a 'forest resource' to protected forests only, leaving 45m ha of production forests (60% of Peru's total forests) as part of 'the agrarian scheme' whose priority was not forestry but agriculture. DL 1064 made it possible to re-classify state forest lands as private agricultural lands.

suggestion was made that oil palm should be considered as a "forest plantation", equal to native wild species in the tropical forests. According to Pautrat and Segura (2010) "this would promote the opening of the primary forest areas and land trafficking for the purpose of installing plantations of agro-industrial and biofuel monocultures".[128]

In 2009 Dourojeani et al. produced a controversial report on the situation of the Amazon by 2021. In it they summarized all the information available about the large variety of projects in the area and predicted what might happen if all the plans for future development came into effect. In addition to hydropower, mining, forestry and transport, they examined the projections for biofuel plantations. The future cultivated area of oil palm arrived at was 483,581 ha, the largest areas and numbers of projects being in Ucayali (20 projects, 204,681 ha) and San Martin (16 projects, 160,000 ha). Loreto, the more recent focus, at the time had just 4 projects, with 89,500 ha. While the projects in San Martin and Ucayali averaged only around 10,000 ha each, those planned for Loreto were twice the size. The authors suggested that the figures, though only estimates, provided some indication of the 'explosion of interest' in producing biofuels in Peru (Dourojeani et al. 2009:51-52)[129]. They commented that while it was good that the new plantations could reuse semi-abandoned lands and degraded pastures by applying inputs such as fertilizer, that advantage would be nullified if they destroyed natural forests directly or indirectly. They also warned of the impacts of overuse of chemicals, not only fertilizer but also herbicides and pesticides (p72). They raised questions of food security, displacement of communities and the environmental impacts on fragile ecosystems (pp. 104–105), as well as challenging the idea that biofuel crops were efficient in reducing GHG (p. 74).

The Ministry of Agriculture provided a much lower total of 171,000 ha which they believed would be planted in oil palm by 2021. Later they also published a table of land suitability for oil palm, breaking that down into forested and non-forested areas and lands highly and moderately adaptable. Total lands suitable in non-forested areas came to 510,080 ha, the leading Departments again being Ucayali and San Martin. Loreto had by far the largest area of suitable land for oil palm from the point of view of its soil (2,045,489 ha) but it was forested (MInisterio de Agricultura 2012b).

Since the government of more left-wing President Ollanta Humala came to power in 2011 the emphasis has changed somewhat, with the free, prior and informed consent of indigenous people now compulsory where concessions are granted on community or indigenous lands (*Oxford Analytica*, 2011). However, the many applications for new clearing of forest for oil palm have raised doubts as to whether the 'political and commercial alliance' noted above has been much affected. In 2012 the Malaysian press reported that the Peruvian government had offered 70,000 ha to Sime Darby to set up plantations in Peru, to draw more attention to oil palm as a lucrative substitute crop for coca (*Palm Oil HQ* 2012, Wong 2012)[130]. Most recently AIDESEP [131] has criticized the proposed Regulations of the new Forests and Wild Life Law (No 29763) as being too biased towards the promotion of plantations: 'the "national interest" being provided for big businessmen, but only "controlled access "for the communities' (AIDESEP 2014).

5.3 Socioeconomic outcomes from disparate business models in oil palm development

Smallholders are especially prominent in Ucayali, where large private estates do not dominate, although there are at least two moderately sized private properties and a few smaller ones (*Dirección Regional Sectorial Agricultura Ucayali* 2012, Dammert 2013, Pautrat 2013b). The balance of Ucayali's 18,000 ha of oil palm comes from the members of four major associations and an unaffiliated group of smaller, more scattered

128 English version, p2

129 Dourojeanni et al. qualified their figures by noting that they represented 'declaration of intentions' by companies in 2008: while some projects were already in place, the viability of others was still being verified and might depend on improved transport or their aggressive promotion by regional governments.

130 This offer does not appear to have secured any response from Sime Darby.

131 The Interethnic Peoples Organization for Development of the Peruvian Amazon.

players[132]. The largest association, COCEPU, has been in existence for 12 years, has 657 members in nine branches and 5,632 ha planted to oil palm of which 4,372 ha are in production, giving an average of 6.6ha of mature oil palms per member[133] (*Dirección Regional Sectorial Agricultura Ucayali* 2012, Ruiz 2012). This group, mainly located in the Neshuya district and along the road between Neshuya and Curimana, (about 60km-100km from the main city of Pucallpa), was assisted in the early 1990s by the UNOPS/UNODC[134] 'alternative crops' project, with farmers being provided with 5 hectares of oil palm to substitute for coca. As described in section 1, production almost collapsed during the difficult 1990s period, but later was resumed. The factory – Olamsa - with an original capacity of 6 million t of FFB/hr has been expanded to 24 million t of FFB/hr and operates at 83% capacity, despite the fact that there have been problems of accessibility to this mill especially in the rainy season[135]. It also pays the highest price for FFB of the five factories existing in the area (*Direccion Regional Sectorial Agricultura Ucayali* 2012:35).

The most important source of income of the association members identified in Ucayali was oil palm, an average of 36% overall. Yuca (cassava) was the crop with the second highest score (30%) in Campo Verde, the region closest to Pucallpa, while for more distant and hilly Aguaytia, and for Neshuya, bananas scored second with 25% and 20% respectively of total incomes. Almost all farmers noted animal husbandry as a further income source, many with cattle and pigs or chickens.

It is not possible to deduce from the statistics presented to what extent these farmers in fact practise mixed cultivation, although several different crops are mentioned. In Campo Verde the main sources of income listed are oil palm, cassava and sugarcane, but in another table, 60% of farmers in that area are described as practicsing monoculture. Fewer farmers were resident on their holdings in the periurban Campo Verde (around 65%), as compared with Aguaytia (79%). The Aguaytia zone is described as the place for the most important agriculture, with bananas, oil palm, cocoa, coffee and papaya, but to what extent these crops might be combined is not made clear. Their palm oil factory was only operating at 52% of its capacity after being enlarged, an indication that oil palm is not as important there. In another table farmers are shown to prefer bananas. The Aguaytia farmers have rather smaller holdings (averaging 15ha) and only 3% have title to their lands, unlike the majority in Neshuya (63%). The lack of tenure may be explained by the rather recent migration status of many farmers, who have mainly come from Huanuco with a strong coca growing tradition. A USAID study noted in 2010 that many Aguaytia farmers had returned to growing coca, as there seemed to be few sanctions on producing the crop and prices were high. Small areas of coca were seen as useful to both palm oil and cocoa growers as a means of providing income when 'licit' crops were still immature. Other coca growers lived in regions remote from roads and were looking for short-term cash before returning to homes in the mountains (USAID, 2010:53).

In Neshuya the average farm size was around 31ha and that area was also singled out as having the most interest in cattle-raising. The earlier ASB Report (White et al. 2005), showed oil palm growers with holdings of about 30 ha on which they combined oil palm and other perennial crops with small areas of annual food crops. At that time they still retained over 50% of their land in forest and fallow and were basically still making swiddens, but with a 'diversified production strategy' (White et al. 2005, 20). While perennial crop production was highest for oil palm farmers, fallow land comprised around 25% of all land holdings. At that time yields of FFB were only 6 t/ha. High costs and low incomes for the first 5 years were seen as strong deterrents for potential oil palm growers (White et al. 2005, 76). The changes over time seem to indicate the reduction in forest on many holdings in Neshyua in favor of pasture though some may have been able to increase their oil palm area.

132 The detailed data presented here for the smallholder groups seem to refer to 2011 and some to 2012 (the reference is dated 2012).

133 This is the largest average area per member, as befits a long established association; by way of contrast those smallholders as yet unaffiliated had an average of only 3ha and may well be just beginning.

134 UNOPS is the United Nations Office for Project Services, while UNODC is the United Nations Office on Drugs and Crime

135 Both the OLAMSA plant and that belonging to the private estate Biodiesel Ucayali have been accused of polluting the Neshuya River (Fumachi Inuma 2013).

Horse transport used by oil palm smallholder, Curimana, Ucayali Region. (Photo by Ayme Muzo)

The more recent studies show that almost all the farmers received assistance from extension officers, though far smaller proportions actually used inputs. Campo Verde farmers were again different, with 53% using no inputs (fertilizer, pesticide) compared with 21% of 'no input' farmers in Neshuya and 19% in Aguaytia (*Direccion Regional Sectorial Agricultura Ucayali* 2012, 32). Perhaps not surprisingly, yields of Campo Verde farmers were lowest, with 1233 kg of FFB per month compared with 1716 in Neshuya and 1641 in Aguaytia (*Dirección Regional Sectorial Agricultura Ucayali* 2012, 30).

The cooperative mills were doing well, however, with sales from OLAMSA especially good at almost USD 16 million and 13,300 t of CPO for 2011 (a far cry from the USD 315,000 value of sales in 1997). Even INDUPALSA, the least profitable, managed sales worth more then USD 5 million in 2011 (Mirella 2012).

The study by Ruiz, also for 2012, suggested that oil palm was one of the alternative crops in Ucayali which improved the quality of life of the poorest villagers, who were able to obtain a net monthly income af about 1000 to 2500 soles (USD 360–900) with 5 ha in production. He indicated, however, that about 80% of the farmed areas had been contaminated by the indiscriminate use of chemical fertilizers, which had impoverished the soil. He was recommending the use of organic fertilizers from empty fruit bunches and other materials, which were readily available from the five mills operating in the area, and not utilised (Ruiz, 2012). This was interesting, as an earlier (undated) paper from the DPCA (Direccion de Promocion y Competitividad Agraria) had argued that the poor state of many of the associations apart from COCEPU was a result of the very acid and infertile soils (DPCA n.d., 14).

The limits for participation in San Martin were 3–5 ha, and the original allocation in Ucayali was 5 ha, while in Caynarachi it started at 2.5 ha, but this was added to by the Loreto Regional Government, so that most farmers now have around 4 ha. The Ministerio de Agricultura (2012b, 77) noted that the majority of small growers with less than 3 ha, whether organised or not, achieved low productivity, with average to poor quality of the harvest and low incomes. The

reasons were mainly a lack of technical assistance, financial problems resulting from poor access to credit and often no title to their property. What was worrying was the claim that projects carried out by aid agencies under 'social inclusion' policies were not comprehensive as participants were only given seedlings and payments for one year. Small producers also struggled to have their fruits accepted by the large processors as there was dumping of cheap imported CPO on the market and they couldn't compete.

The Department of San Martin now boasts a "miracle" change in its economy with the agricultural sector growing 80% between 2001 and 2010, much higher than neighboring regions[136]. According to Villaran de la Puente et al. (2012), who provided a rosy picture of San Martin, the explanation lies in the process of Alternative Development (AD), which has been largely adopted there with the assistance of UNODC, USAID, PRODATU (Germany) and DEVIDA (Peru's national drug council). This basically means coca substitution and farmer organization into cooperatives, as already described, but San Martin has also the advantage of the large estates of the Grupo Romero, the more southerly of which, Palmawasi, has actively assisted smallholders (see next section).

Four value chains are recognised – cocoa, coffee, oil palm and palmetto – each with three phases: production, industrialization and commercialization. While coffee and cocoa and to some extent palmetto are traded internationally, all oil palm products target the national market, given Peru's shortage of edible oils. The San Martin regional government has also been very supportive, being especially involved in infrastructure and social projects, while it has been recognised that good prices for the four main products on international markets have been helpful[137]. Between 2003 and 2011, USD 2094 million were invested in the region: 79% of this was from the government, 20% from the private sector and 1% from international aid. Pinedo-Vasquez (personal communication. 2014) has another explanation for the "San Martin miracle", suggesting that it is not connected to oil palm but due to high levels of remittances which have been locally invested from relatives working in the cities.

5.4 Initiatives towards more sustainable and inclusive oil palm production

While President Humala aims to promote "social inclusion", this is still no easy matter for small-scale growers of oil palm. Critics of Alternative Development, such as Cabieses (2010, 2) have slammed that model as not being ecologically sustainable and to some extent glossing over the serious problems that still affect San Martin. He has pointed out that "83% of those dedicated to agricultural activity are unskilled laborers whose daily wage is between USD 2 and 3". He added that San Martin lacked both qualified agricultural producers and infrastructure, such as electricity and good roads. While he does not deny the benefits that have been introduced through the coca substitution program, he suggests that the 'beneficiaries' have included only about a quarter of the region's producers and that the strategy of mono-crop production in a zone of diversity is flawed, dependent on international demand and prices (p. 4). He claims that even the processing plants, which supposedly add value, don't operate for lack of management. While this comment presumably does not apply to the larger oil palm processors, some problems obviously remain.

An exception to the above negative analysis is the Romero Company's estate Palmawashi. A group of smallholders is associated with this plantation and its factory, described as an island in the middle of a remote district, a "pole of development" in a difficult area with continuing problems of narcotrafficking and violence, at the end of a terrible road, made worse in the rainy season. The existence of the company has offered the nearby population of Santa Lucia assistance with schools, health centres and a market for their farm products. In a gesture of 'social inclusion', the company even arranged legal tenure for coca growers who had established their farms on company land before it was planted with palm. Those farmers have now happily switched their cultivation and received credit to become oil palm smallholders (Dammert et al. 2012, 64, 66). In

136 The transformation has been called 'The San Martin miracle'. Hurtado (2011) also reported favorably on the situation in San Martin.

137 In the case of oil palm, higher international prices did influence the prices obtained on the local market for farmers.

Ucayali the farmers may have managed to mix their cultivation on relatively large holdings,[138] but their yields appear less than optimal and lack of credit appears to be serious, though not covered in the detailed study (*Dirección Regional Sectorial Agricultura Ucayali* 2012). While the Ucayali growers at least appear to be still producing their own food, very small producers of oil palm seem to be excluded.

It is unclear to what extent the newer private plantations to be established in Loreto and Ucayali are planning to include smallholders. Melka and his associates provide a timetable of hectares of oil palm to be planted, but there is no indication what proportion of these lands will finally be devoted to smallholders (Melka 2013). In general the large producers seem mainly keen to obtain forested lands, like their counterparts in Indonesia, while the cooperatives of smallholders are spread over the already opened and deforested areas.

5.5 Conclusion

The greatest attention has been given to the level of forest destruction in Peru by large companies, ostensibly to plant oil palm, though some of the logging may simply be illegal. Most of the information is coming from NGOs, who are very critical of the role of local and even national authorities in allowing the deforestation to go unchecked. There appears to be a strong 'pro oil palm' stance among regional governments, especially in Loreto and Ucayali, with some suggestion that bribes may have been used to sway decisions. Regional governments now have considerable power to influence land use decisions and all responsibility for environmental management. So far there are worrying signs that the larger players are not too concerned with issues of conservation as they pursue an economic imperative. As in Indonesia, the felling of forests may be seen as a useful step in funding subsequent plantations, or it may just be a way to secure acess to timber outside concessions. Illegal logging outside the concessions is apparently widespread (ACA, ACCA and CIEL 2014). Critics of the new Forests and Wildlife Law have suggested that there is 'an excessive bias towards the promotion of large scale logging and plantations' (Forest Peoples' Programme 2014), with the suggestion from AIDESEP that indigenous peoples' customary lands could also be at risk.

The ability of the regions to discharge their environmental responsibilities has been questioned as being "based on local politics, without central supervision" (*Neotropical Primate Conservation,* 2014). The author goes on to describe "rapid changes in personnel, under-trained functionaries… unpaid staff… inadequate funding, equipment and transport" (*Neotropical Primate Conservation* 2014). While these comments refer specifically to hunting and trafficking of wildlife, they can also apply more broadly. The social impact of large plantations on villagers has so far been hardly studied, but it is beginning to surface in the activities of both the Romero group and of Melka and his associates, as evidenced in the recent Ucayali case.

The smallholders in cooperatives and other associations, while doing better than a few years ago, still face problems in obtaining credit and securing reasonable incomes while their yields remain low. The use of coca to finance oil palm planting remains an option, especially in Aguaytia.

Peru's oil palm crop is still small. It is important that sufficient accountability develops for it to become a sustainable and well-managed entity, in which the needs of both the environment and the local populations are adequately taken into account. Although there has been some movement, sponsored by the Peruvian branch of the WWF, towards adopting RSPO international standards on palm oil, with a first interpretation of the relevant Peruvian legislation in 2013, there is still a long way to go before sustainable production may be ensured (McDougall 2013).

Tha main knowledge gaps, from a research and policy viewpoint, relate to 1) what is actually happening in parts of the forest, with a degree of secrecy about the activities of some of the major players; and 2) the nature of the value chain linking local CPO production with biodiesel and food processing firms. Some updating of the major government publications providing statistics of the industry is also overdue.

138 The evidence is not clear on this.

6 Brazil

6.1 The influence of oil palm expansion on economic development and land-use change

As in Peru, the oil palm industry in Brazil is still quite small (only 0.6% of world production),[139] but with the potential for considerable growth[140]. Its recent expansion is largely the result of a government decision to add this oil crop to the country's existing sources of biodiesel, although soybean remains by far the leading feedstock.[141]

Brazil has long been known for its promotion of sugarcane based ethanol, but government interest in developing biodiesel only really began in 2003, following the election of President Lula (Andrade and Miccolis 2010, 7). The National Biodiesel Production and Use Program (PNPB) (which set up the regulatory network, chain of production, funding and technology) was launched in 2004 and the Biodiesel Law, permitting specified mixtures of biodiesel to be inserted into petro-diesel, was passed in 2005. During 2008, first a B2, then a B3 mix were mandated, rising to B4 in 2009 and B5 in 2010, where it has remained (Andrade and Miccolis 2010; Wilkinson and Herrera 2010, 757).

The preferred feedstock was to vary by region: oil palm in the north, castor bean in the northeast, soybean and other oil crops in the rest of the country (Wilkinson and Herrera, 2010: 757). In 2005 the Agropalma plantation group opened the first palm oil–based biodiesel plant in Belém, in the northern state of Para. This plant was unique, in that it used the residue from the palm oil refining process. A "mini-mill", its production was a mere 8 million litres, compared with most biodiesel plants of 100 million litres or more (Magalhaes and Drouvot 2009, 7)

Biodiesel was perceived as an avenue for social inclusion of "family farms".[142] The Agrarian Development Ministry included a *Social Fuel Stamp,* which provided tax cuts for biodiesel sales, provided that a minimum percentage of the feedstock was purchased from family farmers. In the north this was initially 10%, rising to 15% after the 2010–11season (Wilkinson and Herrera 2010, 757). In addition, the biodiesel company had to agree to sign contracts with family farmers and guarantee technical assistance and training (Biondi et al. 2008).

Agropalma already had a 'family farm' project, the 'Dende Family Agriculture Project'. This had been developed in 2002 in the municipality of Moju for 185 families, with 35 families on 6 ha lots, the remainder on 10 ha each, a joint initiative of the Moju municipal council and Agropalma, with funding from the Amazonia Bank for the first 3 years (Fischer et al. 2006). The plan of Agropalma management was to take advantage of the social fuel stamp as well as encourage more smallholder planting of oil palm in Pará. Agropalma uses its palm oil mainly for the international and Brazilian food and cosmetics markets, rather than for biodiesel (Gomes et al. 2009).

---

139 Oil World Annual 2013

140 From 2000 to 2010 Brazil's rate of growth in oil palm harvested area was more rapid than that in either Colombia or Ecuador (Pacheco 2012, 17).

141 Soybean constitutes 73% of the total Brazilian feedstock for biodiesel, with tallow 20%, cottonseed oil 3% and 'others' (including palm oil) 4% (Barros 2013).

142 A family farmer has been defined as follows: uses family-based labor with temporary helpers and a maximum of two full-time employees; works or owns a plot of land smaller than for 'fiscal modules' (each module about 76ha in the Amazon); resides on the property or in a nearby rural town; receives 80% of income from farming, fishing or extractive activities (Andrade and Miccolis 2010, 15). The size of such farms is obviously very variable. Another study, quoted by Da Rocha and De Castro (2012, 78), suggested an area between 20 and 100 ha.

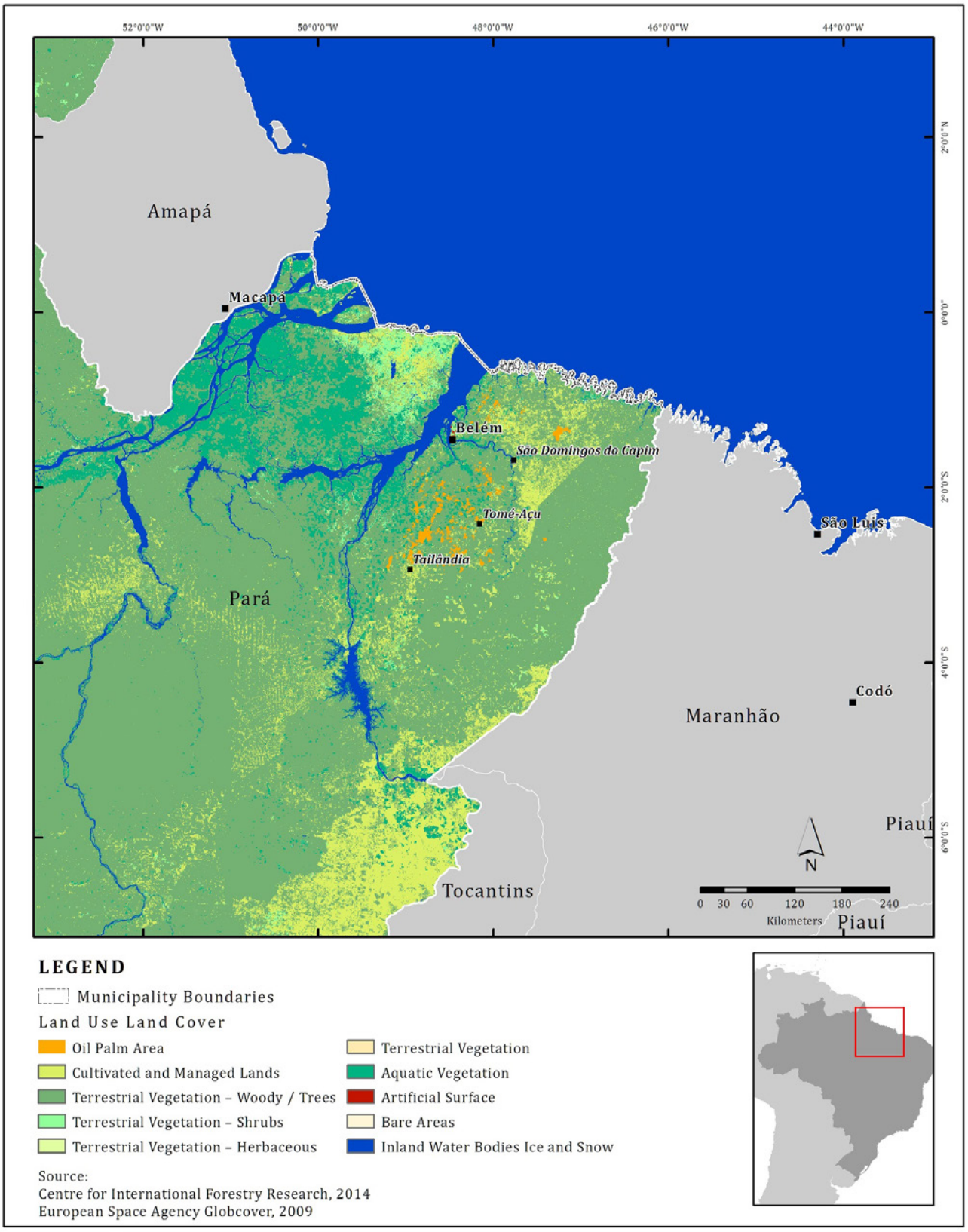

Figure 6. Brazil: Map of the northern part of Pará State showing location of oil palm areas.

6.1.1 Background to the development of oil palm in Pará.

South of Salvador in coastal Bahia state, traditional groves of *Elaeis guineensis* have existed since the sixteenth century.[143] The first introduction of the African palm to Pará state in 1942 used seedlings from Bahia. Following trials at a local research station and some inputs from French scientists from CIRAD, it was realized that the introduced species would grow well (Rebello 2012, 224).

However, it was 1974 before the first private commercial oil palm property, Denpasa, was set up near Belém. That company erected a processing plant in 1976 and began exporting CPO in 1980 (Rebello 2012, 225). The Agropalma company arrived in 1982, first named CRAI (Compania Real Industrial) with 5000 ha in Tailandia (about 182 km south of Belém). In 1986, Agromendes (5300 ha) was added. From 1992 to 1999 a further 6570 were planted and in 2000 the company bought Coacará (4152 ha). Since 2000 several former cattle properties have been purchased to give Agropalma its present area of 39,391 ha.[144] By 1995, the state of Pará already included 85% of the oil palm area in the Legal Amazon.[145] Moju and Tailandia, the leading locations, represented 43% of the total area (38,000 ha) and 50% of the state's production (66,000 t) (Dos Santos et al. 1998, 19).

6.1.2 Developments post 2005

In 2007, Brazil had an estimated 67,453 ha of oil palm, consisting of 59,543 in Pará, 1400 ha in Bahia and 6510 ha in Amazonas (Villela 2009). In 2008, a joint operation was organized between the Brazilian company Braspalma and Malaysian Felda Global Ventures[146] to take over 20,000 ha of abandoned oil palm plantation land in Tefe, Amazonas (525 km from Manaus) occupied by small farmers. However, the deal broke down as the terms offered by Felda were socially and environmentally unacceptable.[147]

The further extension of oil palm into the Legal Amazon was slow, as noted by observers. "Oil palm has recently expanded more in government discourses than in plantations" (Gomes et al. 2009, 39). In 2008, less than 1% of biodiesel was coming from oil palm, as soybean and animal fats (from the huge cattle industry) were accommodating most of the production (Wilkinson and Herrera 2010, 757). Other problems, as identified by Da Rocha and De Castro (2012) were inadequacies of transport, plus the difficulties experienced by large companies in acquiring lands not legally encumbered and contiguous, while maintaining a forest reserve of 80%, as mandated by the Forest Code.

Disease was also seen as a serious risk, with 5 million ha earlier being decimated by fatal yellowing (*Amarelecimento Fatal*) on three estates, in Pará (Denpasa),[148] Amazonas (Emade, Tefe) and Amapa.

In addition the 'social inclusion' aim was falling short, as incorporation of more family farms was becoming difficult (Wilkinson and Herrera 2010, 758). As De Smet found in Bahia, farmers realized that once they entered into contracts with the plantations they lost the power to make decisions over their land. The targets (designed to reach the obligatory mix of biodiesel [149] were set too high and took too many of their resources away from food crops, so they preferred to exclude themselves (De Smet 2010 *in* Schrijver 2012, 18). De Smet's research was mainly among castor bean farmers,

143 Originally introduced from Africa by Portuguese interests, cultivated by slaves and now semi-spontaneous. See discussion of Bahia at the end of this chapter.

144 Details of the Agropalma purchases were supplied by Joel Buecke, the Agricultural Director of Agropalma.

145 The Legal Amazon includes the states of Acre, Amapa, Amazonas, Mato Grosso, Pará, Roraima, Tocantins, part of Maranhao and five municipalities of Goias.

146 Described by Drouvot and Drouvot 2011 as "an agency of the Malaysian Government".

147 Small farmers were to be treated simply as laborers, with no land rights and no opportunity to continue with food production. Considerable deforestation was considered likely. The plantation would take over all water sources and privatise the port of Tefe, closing access roads. The two land grants were too large for the state to authorise and would have to be approved by Brazilian Congress. The Malaysian Government and Felda subsequently denied that there were any plans to develop oil palm in the Amazon (Gomes et al. 2009; Rainforest Rescue 2009).

148 See Venturieri et al. 2013 on the use of interspecific hybrids between the African oil palm (*E. guineensis*) and the South American type (*E. oleifera*) which are resistant to AF or fatal yellowing.

149 The target was B4 in 2009, i.e. a 4% biodiesel mix with petro-diesel, which equates to 1.8 billion litres/year (Andrade and Miccolis 2011, 6).

a crop which was not productive enough to obtain the high yields demanded by the Petrobras Company. Nevertheless there was considerable anxiety among family farmers in Pará when they were first introduced to oil palm, even though this was a much more productive crop (Osava 2010a, b) (see Section 3).

In May 2010 President Lula visited Tome-Acu in Pará to launch a new Oil Palm Sustainable Production Program, the aim being to increase palm oil production "under the banner of sustainability" (Miotto 2010). There were three initiatives:

- publication of the Palm Oil Agro-ecological Zoning;
- a congressional bill to regulate environmental aspects of palm plantations;
- the launching of a program of incentives (up to USD 60 million) for palm production.

The 2010 Palm Oil Agro-ecological Zoning (ZAE) in partnership with Embrapa[150] identified suitable areas for planting oil palm on deforested or degraded land, a total of 31.8 million ha, 28.9 million of which was in the Legal Amazon[151] (Ramalho-Filho and da Motta 2010). The zoning was largely on the basis of soil, slope and climate, though economic factors such as accessibility to the market and the type of farming system were considered. Zones were characterised as "preferential", "regular", "marginal" and "unsuitable" (*inapta*).

As the plan was to include family farms as well as large estates, two levels of management were built in: level B was to include a modest application of capital and largely animal traction as befitted a family farm; level C was seen as incorporating the higher technological standard of a large plantation, with a more intense application of capital and mechanization wherever possible (Ramalho-Filho and da Motta 2010, 11). In the Legal Amazon, 28.9 km^2 was classified as suitable for oil palm under level C management, 29.7 km^2 under level B (Ramalho-Filho and da Motta 2010, 38). Among the individual states, Pará, with 12.3m km^2 available under level C management and 12.8 km^2 under level B had by far the largest area of land in the top two suitability categories (Ramalho-Filho and da Motta 2010, 36). However the government declared that a maximum of 4.3 million ha would be permitted, mostly in Pará (Osava 2010c).

The area zoned for oil palm in the northeast of Pará covers 44 municipalities, but especially the region called 'Guajarina' along the Moju-Tailandia valley – Tailandia, Moju, Tome Acu, Acara, Igarape-Miri, Concordia do Pará and Bujaru – south of the Belém metropolitan area (Drouvot and Drouvot 2012, 3). A second nucleus is located close to Belém city, in Santa Isabel do Pará, Santa Barbara do Pará and Castanhal, while a third is in the Lower Tocantins, including the municipalities of Mocajuba and Cameta (Monteiro 2013, 61). Although there is some commercial oil palm in Amazonas and Bahia, it is in Pará that the greatest impact has been felt.

The expansion of oil palm production is restricted to areas already affected by human activity before July 2008.[152] Areas of intact native vegetation, conservation areas and reserves set aside for quilombolas[153] and indigenous groups have been excluded (Andrade and Miccolis 2011, 13; Nahum 2011, 2013). The forest reserve of 80% of the land farmed must, however, be maintained. Earlier attempts by an agricultural lobby group in the National Congress to have the Forest Code changed would have allowed oil palm plantations to count towards the reserve. After much debate and several amendments by the President, the revised Forest Code was finally approved in October 2012, retaining the 80% legal reserve in the Amazon, but exempting family farmers, except for a restoration of 5 m of degraded woods beyond their boundaries (*Instituto Peabiru* 2013). Landowners are now permitted to cultivate riverbanks and hillsides (previously restricted) but must restore up to 30 m of previously deforested areas and join the Rural Environmental Registry

150 Embrapa (*Empresa Brasileira de Pesquisa Agropecuaria*) is the Agriculture and Livestock Breeding Research Agency, which has branches in 17 states.

151 The potentially suitable area is more than three times Indonesia's current area of oil palm (10 million ha).

152 Environmentalists have argued that this very recent date has created amnesties for illegal loggers.

153 Quilombolas are descendants of former escaped slaves or maroons, who have settled along rivers in the interior and lead a communal lifestyle. Some of their settlements are close to the major oil palm municipalities, such as Tome-Acu (Nahum 2011).

(CAR), which will be used to monitor illegal deforestation via satellites.[154]

The Environmental Council of Pará State in May 2013 was still debating the new Forest Code, suggesting that oil palm, as a "low impact crop" might offer a sustainable option for restoring permanently protected areas (APPs). Officials from the local museum in Belém objected. Quoting Fitzherbert et al. (2008), they noted that oil palms require considerable chemical inputs and host few native species. "Oil palm plantations must not be allowed to displace natural forest vegetation and should not count as a component of the legally required forest reserves on private land" (Lees and Vieira 2013).

The first detailed analysis of the likely actual land use impacts of oil palm expansion in the Amazon was published by Yui and Yeh (2013). Using lands classified as "suitable" for oil palm, in terms of climate, soils and slope, together with proximity to roads, other agriculture and savannah, they applied three scenarios: no enforcement; some enforcement; and strict enforcement of the regulations. The regulations restrict oil palm planting to deforested land with minimal use of forest and no use at all of conservation units, indigenous lands or wetlands. The results revealed striking differences, between the "no enforcement" and "strict enforcement" scenarios, from 62% to 22% of forest converted. Conversely, only 29% of the area used had been previously deforested under scenario 1, compared with 78% under scenario 3, when the regulations were strictly complied with (Yui and Yeh 2013, 6).

In terms of carbon emissions, the important conclusion of Yui and Yeh (2013) is that for palm oil based biodiesel the "total life cycle intensity including direct land use emissions plus production and use will greatly exceed that of petroleum diesel in scenarios 1 and 2". Although they concede that their study is preliminary, the question of relative carbon emissions from petroleum diesel and palm oil-based biodiesel has not previously been scientifically analysed in Brazil and makes the adoption of scenario 3, with strict regulation, even more critical.

Biovale,[155] Petrobras-Galp , and the American firm Archer Daniels Midland (ADM), have recently established oil palm holdings in Para. The planted area increased from 109,000 ha in 2010 to 140,000 ha in 2012 and is expected to reach 329,000 ha by 2020, with Pará responsible for 90% of the country's production (Gomes and Glass 2013; Oliveira et al. 2013). New foreign interests have also been appearing. A Chinese group (Guanfeng from Shandong) acquired land in 2010 along highway 150 in Moju. They were initially planting 600 ha for the food industry, but planning to expand to 250,000 ha in the next few years in the municipalities of Moju, Tailandia, Acara and Concordia (Nahum 2012; Monteiro 2013, 117). Recently, representatives from Malaysian Felda Global Ventures have been making enquiries in Belém about forming a partnership with the Pará state government to plant oil palm, produce biodiesel and restore degraded soils (*Agência Pará de Notícias* 2014).

The most recent figures suggest a total area of 166,000 ha of planted oil palm, about 140,000 ha by large and medium estates and 26,000 ha by family farmers, from Agropalma, Biovale, ADM, Belém Bioenergia Brasil (Petrobras-Galp) and four smaller companies (Table 8). Three of the 'top four' have expansion plans, which will include much larger numbers of family farms. Agropalma's plans are more modest as it is already well developed, controlling all sectors of the supply chain. It does not plan to produce much biodiesel, instead consolidating its wide interests in food and cosmetics. Its family farms also include several independent growers of intermediate size.[156]

154 Constitutional challenges to 39 provisions of the amended Forest Code are expected to be heard in 2014. Meanwhile, satellite imagery from INPE (National Institute of Remote Sensing Research) noted an increase in Amazonian deforestation of 28% from August 2012 to July 2013. This finding came after after many years of decline and was confirmed by the Environment Ministry in November 2013. Observers have questioned whether the changes to the Forest Code may be partly responsible (Butler 2013; WWF 2013; Haley 2014).

155 The Brazilian mining giant Vale bought out the Canadian company Biopalma in 2011 after forming a partnership with the latter company in 2009. The company has six oil palm plantations in Pará (Butler 2011b, 95).

156 In October 2014, Agropalma had 44 independent farmers with areas from 50 to 2000 ha drawn from a radius of about 70 km around the plantation; there were 192 family farmers, most with 10 ha. The family farmers contributed only 4% of the entire production, the independents 13% (Interview with Joel Buecke, Agropalma 1 October 2014).

Table 8. Area of oil palm, estates and family farms and direct employment, Pará 2013.

Estate name	Estate area (ha)	Family farm area (ha)	Number of farm families	Installed capacity t/hour	Direct employees	Expansion plans (ha) by 2015
Agropalma	45,000	10,924	234	201	5,314	50,000
Biovale	42,000	2,800	280	40	2,618	80,000
P'bras/Galp/BBB	4,000	850	85	-	119	75,000
ADM	3,000	1,102	146	-	172	50,000
Yossan	16,000	-	-	-	-	20,000
Denpasa	6,000	3,558	53	12	290	10,000
Marborges	5,000	240	24	20	1,120	10,000
Dentaua	4,000	3,211	27	39	941	6,000
Palmasa	3,000	3,353	40	28	340	8,000
Others	12,000	-	-	-	-	20,000
Total	**140,000**	**26,038**	**889**	**340**	**10,914**	**329,000**

Source: Nunes (SAGRI) 2013

Expanding oil palm in the Amazon has been controversial, both nationally and internationally. Butler and Lawrance (2009) were widely quoted when they suggested that Brazilian oil palm could well be the next threat to the Amazon. They came to this conclusion before the latest government effort to expand palm oil production, citing Malaysian and Indonesian experience that companies preferred to open forest when establishing plantations.

Butler (2011b) has now suggested the opposite: palm oil plantations could actually help save the Amazon rain forest. "Planted on the degraded pasture land that abounds in the Brazilian Amazon, oil palm could generate more jobs and higher incomes for locals than the dominant form of land use in the region: low intensity cattle ranching." He also noted the environmental benefits of palm trees as compared with pastures for sequestering carbon, and suggested that sustainable production of palm oil by Brazil might put pressure on Indonesia and Malaysia "to clean up their acts".

However, the work of Yui and Yeh (2013) warns against easy optimism, as does the conclusion of Andrade and Micholis (2011, 33) that although guidelines and best practices may be established, "monitoring and enforcing these practices on the ground is a huge challenge in light of the weak governance structures in most of the Brazilian Amazon".

6.2 The role of state policies and corporate strategies in shaping oil palm development

State strategies toward the extension of oil palm in conjunction with biodiesel policy seemed rather ambivalent in the early years following the announcement of the PNPB in 2004 and the passage of Law No. 11.097/2005. The emphasis was rather directed towards small farmers in the semi-arid regions of the northeast and the cultivation of products such as castor bean (*mamona*) and *Jatropha curcas* (*pinhao manso*), though without much success (Drouvot and Drouvot 2011). Both crops have subsequently been seen as responsible for further deforestation by replacing land previously under food crops, while their failure hindered the functioning of the government's Social Fuel Stamp programme (Andrade and Miccolis 2011).

The Agropalma company largely used its palm oil to serve international clients, such

as Danone and Oreal for food and cosmetics, as well as the local market.[157] It had also been equivocal about placing much emphasis on palm biodiesel, despite being the first to erect a small plant in Belém in 2005. Although the company used its biodiesel to run its own vehicles, further investments were not considered to be cost-effective, largely due to the high price of palm oil on the international market at the time, which made it more expensive than diesel oil (Biondi et al. 2008; Andrade and Miccolis 2010). Agropalma "temporarily" stopped producing biodiesel in August 2010 because its prices were not competitive (Osava 2010c).

Agropalma was also very concerned about the maintenance of its own image, and that of oil palm, against the prevailing views of many international NGOs and their media supporters (Drouvot and Drouvot 2011, 419). As "the leading producer of palm oil in Latin America" the company's sustainability director (Marcello Brito) was anxious to "push the Brazilian Government and Brazilian NGOs to get interested in palm oil sustainability issues" (Brito 2010). He further commented that the local government did not comply with its responsibilities, leaving surrounding communities without basic services such as education, a good water supply and security.

Brito noted that "Brazil has very few producers of palm oil and very few stakeholders interested in this activity", which was hard for stakeholders involved with palm oil production in Southeast Asia to understand, including RSPO members. This had made certification by the RSPO more difficult. They were surprised, for example, that not one NGO attended the public consultation process on local interpretation of the RSPO principles and criteria (Brito 2010). The company helped organize the second RSPO regional meeting in Latin America in Belém in 2010.[158] It also supported Belém's RSPO Roadshow (May 2013), aimed at training lead auditors for certification. The comment from the organizers (Proforest) was that most Brazilian plantations were ineligible for certification "mainly because they are very recent developments and the market is only now starting to be aware of specific RSPO requirements for new plantings, or biofuels". There was also a lack of understanding of the HCV concept and a need for tools and training especially adapted for smallholders (Proforest 2013).

A national estimation of the impacts of the 5% biodiesel blend on the probable increase in land under various crops suggested that oil palm might grow by 308,000 ha, compared with a likely 3.4 million ha increase in the area under soybean, 4.4 million ha in cotton, 3.1 million ha in sunflower, 2.4 million ha in castor bean. Given that soybean already occupied 18.5 million ha and was overwhelmingly the leading crop, it was obvious that "soybeans are bound to remain the dominant force in biodiesel production" (Souza 2009 *in* Andrade and Miccolis 2010, 19). De Smet (2010) had also suggested that the soybean group had strong lobbying power and preferred to shut out other sources of biodiesel.

In the Amazon, a soybean moratorium has thwarted the expansion of that crop into intact forests, but policymakers, research institutes and the private sector have been examining a number of possibilities, including wild endemic palms such as *babassu* (*Attalea speciosa*) and *macauba* (*Acrocomea aculeate*) the products from which may be extracted without causing deforestation. The Brazilian Agricultural Research Corporation (Embrapa) has led this work, but has placed special emphasis on oil palm.

Within Pará state, the key players are seen to be Embrapa, the state Agricultural department, SAGRI, the Federal University of Pará (UFPA)[159] and Agropalma (Andrade and Miccolis 2010, 23). According to a 2013 report, local studies in Belém showed that in 2012 67% of the production from the 140,000 ha of plantation oil palm went to the food and cosmetics industries and 33% to biodiesel. The prediction was that in 2015, 47% of the output of 329,000 ha would go to biodiesel, while the government of Pará suggested that by 2022, 700,000 ha of oil palm would be used for biodiesel, involving 700 farm families

157 Agropalma is building a new multi-oil refinery near Sao Paulo to further cater for the food and cosmetics industry (BiodieselBR.com 2013).

158 Benedita Nascimento, a successful woman "family farmer" from the Agropalma group, was a featured speaker at the RSPO meeting in Belem (2010) (Osava 2010a).

159 UFPA has initiated many research projects into the impacts of oil palm in Para

(Frayssinet 2013a; SAGRI 2013). Such figures indicate confidence by the state government in the future importance of the oil palm industry in Pará, though two of the big companies were already planning to exceed that target, both for output of biodiesel and for numbers of family farms.

Rebello (2012, 245), visualized recent 'events' in Pará as geopolitical, representing power struggles over the use of territory, with the state supporting leading economic groups in consolidating their position and stimulating their expansion. On the other side were groups of environmentalists and traditional communities who were arguing about the environmental and social impacts of these activities, so Brito's wish that local environmentalists become interested in the sustainability of oil palm seems to have been fulfilled.

Accompanying the national government's announcement in 2010 of the Program for Sustainable Production of Palm Oil to dramatically expand palm oil production in the Amazon, large and well-resourced companies such as Biopalma-Vale and Petrobras-Galp were already developing their own strategies for large-scale production of palm-based biodiesel.

Vale, the world's biggest producer and exporter of iron ore, was the most rapid and strategic in its plans, as it had decided to save USD 115 million (and reduce its carbon emissions) by placing its mining machinery, its ports and large fleet of locomotives in Pará state on to a 20% biodiesel mix by 2015 (Butler 2011b). Under its new company, Biovale, in November 2013 it had 60,000 ha under oil palm in six different areas and had contracted 350 families, with plans to incorporate an additional 1650 by 2015 on 20,000 ha (Frayssinet 2013a). The first of two mills for processing of FFB was built in Moju in 2012, and a biodiesel plant would be built in 2015 at a cost of USD 500 million (Rebello 2012, 252).

Brazil's state run oil company, Petrobras, has an oil palm subsidiary Petrobras Biocombustivel (PBIO) or Biodiesel Pará which will be primarily concerned in making biodiesel for the needs of the market in northern Brazil. Its source of supply will be from municipalities in the lower Tocantins – Cameta, Mocajuba, Balao and Igarape-Miri – where 3338 families (including independent growers) have been registered. As a government company, Petrobras is seeking to prioritise "social inclusion", using family farmers to produce half the raw material on this project (Osava 2010c). According to Miccolis and Andrade (2012, 11), Petrobras "has focused on buying up existing companies and partnering with family farmers" instead of seeking new lands for its own plantations. It even attempted (unsuccessfully) to buy Agropalma.

The second project, Belém Bioenergia Brazil (BBB) is a joint venture between Petrobras and the Portuguese company GALP. It will make "green diesel" (from mixed vegetable oils[160]) for the Iberian market, especially Portugal, which already has a B10 biodiesel requirement. The Belém project will produce 250,000 t of biodiesel in Portugal, "part of Petrobras' strategy to enter the European fuel market" (Green Car Congress 2010).

The palm oil will be grown on BBB's estates, eventually totaling 50,000 ha and will contract 1000 families, mainly from Tome-Acu and Tailandia, who will be responsible for producing 20% of the total CPO (Osava 2010c). The combined needs of the two biodiesel plants, one in Pará, the other in Portugal will require 335,000 t of palm oil per year. Planting of a million seedlings was planned to begin in 2014, 3 years later than originally planned (Rebello 2012, 252). In August 2012, Vale and Petrobras agreed on a strategy to combine some of their activities aimed at biodiesel production in Pará and are studying construction of a joint factory (*Automotive Business* 2012).

American firm Archer Daniels Midland (ADM) is one of the world's major agricultural processors, being involved in Brazil since 1997 with soybean, now also cocoa, wheat, fertilizers, animal feeds and chemicals. ADM began to plant oil palm in Pará in 2011, together with a group of family farmers

160 Petrobras also contracts small farmers in the North-East to produce sunflower oil.

and independent growers.[161] The requirements for keeping 80% of land under forest and severe restrictions on foreign ownership have meant that the company had problems in finding available land for a plantation. It has had to engage in partnerships with some of the larger growers, the result being that its activities are considerably decentralised away from its office in the town of Sao Domingos do Capim, 170 km from Belém. In 2014 the company had 267 smallholders occupying 2030 ha, but none were yet producing . There are 21 big farms growing oil palm for ADM in the northeast of Pará, totalling 5500 ha. The mill which is under construction was 60 km away from some of the smallholder properties, but they had been assured that collecting points would be established near their farms.[162] Like Agropalma and the group of smaller companies in Pará, ADM will concentrate on the food industry rather than biodiesel (Jaccoud and Villela 2013, 3).

One possible limitation to these expansion strategies is a likely shortage of suitable seed. Agropalma has solved the problem of fatal yellowing in Moju by using hybrid seed, mixtures of *Elaeis guineensis* and the local palm *Elaeis oleifera* (BRS Manicore and OxG) which are resistant to the disease. Embrapa has an experimental station in Amazonas near Manaus, producing the local hybrid BRS Manicore. *Eleais oleifera* can be found growing along the Amazon and several tributaries in that area, but there is not enough seed to meet demand. There have also been problems with pollination of that hybrid and somewhat lower yields than the best teneras.

Large imports of the OxG hybrids are sourced mainly from Colombia (Hacienda La Cabana and Indupalma), while tenera crosses such as Deli-Ghana and Deli-Nigeria come predominantly from the ASD seed station in Costa Rica. Fortunately, not all of Pará seems to be susceptible to fatal yellowing, but the big expansion plans of Biopalma between 2015 and 2018 will require 14.3 million new seeds; Petrobras will need 10 million. Such demands will certainly test seed availability and will need careful planning (Monteiro 2013, 178).

6.3 Socioeconomic outcomes from disparate business models in oil palm production

Monteiro (2013, 64) has described the northeast of Parástate as possessing a "peculiar productive dynamism", with mineral extraction, planted pastures for beef cattle, the substitution of mechanised production for family farming (through expansion of soybean) and most recently, tapping the market for palm oil. Pará has the largest deforested area of the Legal Amazon; as much as 75% of the forest in this ecologically sensitive zone (the Belém endemism area) had been lost by 2008 (Dias and Brito 2012). It was also an area of considerable poverty, with low scores on the municipal Human Development Index of the 33 oil palm producing municipalities (Jaccoud and Vilella 2013, 2).

Researchers studying the livelihoods most likely to have been affected by the expansion of oil palm have especially focused on pastoral activities (Villela 2009, 107; Monteiro 2013, 1245). There was a big growth in cattle herding in the Legal Amazon between 1990 and 2003, from 26.6 million to 64 million head. It was stated that 70% of the deforestation of the Amazon was the result of this spread of low productivity pastures, with the best 20% supporting 1.38 head/ha, the rest, only 0.5 head or 300–600 ha per *vaqueiro* (Villela 2009, 135). Before the moratorium on buying soybean from newly deforested areas in the Amazon, soybean production was another factor pushing the expansion of the agricultural frontier, with an increase in the area under the crop from 16,000 km^2 to 70,000 km^2 between 1990 and 2007 – 33% of Brazil's total.[163] The soybean sector

161 The original plan was to control 12,000 ha, of which half was to be planted in 600 family farms, each with 10 ha (ADM 2011). This has been scaled back, partly because of the difficulties of the farmers in obtaining bank loans as most did not have legal documents for their land (field work 2014). It was still hoped to increase the numbers involved, but low prices for palm oil in 2013 and 2014 as against higher prices for alternatives such as cattle have reduced enthusiasm among potential smallholders (personal communication from Pieter Soebrandij, 2014).

162 Presentation by Leonardo Dutra 'Palma de Oleo: Agricultura Familiar'and discussions with staff and farmers, Sao Domingos do Capim and surrounding districts 3 October 2014 (translation by Leandro Silveira).

163 The soybean moratorium, introduced in 2006, has been renewed several times, most recently to the end of 2014, which reportedly was its last year. A new mechanism to replace it will probably be based on the rural environmental registry system, which is slowly being implemented (Miccolis et al 2014:38).

was more capital intensive and mechanized than that under oil palm, needing only four employees to 200 ha (Villela 2009, 137), whereas oil palm employed one worker per 10 ha on an established property such as that of Agropalma.

Forest activities of small farmers were based on cutting swiddens to plant cassava (*mandioca*) (*Manihot esculenta*),[164] sometimes accompanied by logging and charcoal burning in secondary forest or extracting wild palm products such as acai[165] (Villela 2009, 134). In 2008, the presence of large numbers of both illegal sawmills and charcoal kilns along state highway 150 in Tailandia made that town the target of operation *Arco de Fogo* (Arc of Fire) by the Federal Police and IBAMA, the Institute for the Environment. The destruction of many of the forest-based facilities caused an unemployment crisis in the town, which was partly alleviated by Agropalma's hiring of more workers (Biondi et al. 2008, 14).

Focussing on the impact of palm oil culture on the micro-region of Tome-Acu, Nahum and Malcher described the local people as "river folks, quilombolas, family farmers, rural workers to whom the land is the structural nucleus of the communities… with low use of modern techniques, low productivity and precarious integration with the market" (Nahum and Malcher 2012, 7) Yet, they also emphasized the huge range and diversity of traditional food sources, including many edible forest products and river fish.

Most of those who took up land in "family farms" were migrants from the northeast (Rebello 2012). Bearing in mind the possible transience of the labor force, Embrapa has described oil palm as a crop that "will fix people on their farms". "On average, each ten hectares of *dende*[166] will provide enough work for a family for 25 years. Because of those characteristics dendeculture represents an excellent example of an anchoring activity in programmes of sedentarization, agrarian reform, colonization, cooperatives and other models of rural development, providing economic, ecological and social benefits" (Barcelos 2002 *in* Drouvot and Drouvot 2011, 373).

6.3.1 The family farm model in Pará: Agropalma and Biovale

This section will discuss the question of smallholder oil palm, specifically the viability of the "family farm" model, as originally developed from 2002 to 2006 by Agropalma and the Moju Municipal council, with funding from the Banco da Amazonia. This model was subsequently adopted from 2010 by several other companies in Pará, notably Biovale, BBB and ADM, although the aim of the first two was to produce biodiesel, and rapidly, unlike Agropalma, with its steady commitments to the food and cosmetics markets and its slow uptake of family farmers.

The new cohort of family farmers also comes under the *'Pronaf Eco-Dende'* financing scheme, which has a limit of USD 80,000 per farmer and the need for each family to acquire a Certificate of Eligibility for Pronaf (DAP). Possessing a DAP is the main prerequisite for obtaining credit from the Banco da Amazonia, which basically excludes those with unpaid debts or unclear land ownership. By August 2012, the bank had 644 assisted families, with the numbers growing fastest during 2012 (see Table 8), with only 84 and 87 respectively in the two previous years (Banco Amazonia 2012).

As the Agropalma model is the only one with some years of experience, all researchers have examined it. Considering the 10-year period from 2002 to 2011, Rebello attempted a balanced assessment, noting that before working with oil palm, most families earned a monthly income of half the minimum wage of around BRL 300, cultivating corn, rice, beans and cassava, with the possible addition of black pepper or illegal logging. Their level of education was very low. The cultivation of oil palm gave them a secure means of production, technical assistance, a guaranteed market, an increase in income and improvement in their living conditions. He asserted that, "a good number of these farmers today have motor cycles and a few have cars" (Rebello 2012, 263).

---

164 It was estimated that 20–45 ha would be needed per family, on a rotation of 2 years cultivation and 17 years fallow, but a more intensive form has been evolving, with only 0.5ha-1 ha now required per family member (Villela 2009:134).

165 The acai palm (*Euterpe oleracea*) grows wild in the Amazon estuarine forests near Belem. Originally cultivated for palm heart, marketing the fruit and juice have become a major industry and many farmers grow a few trees themselves. The resurgence of forests in the estuary has been partly explained by decreasing economic return from manioc-based annual agriculture and cattle ranching (Brondizio et al. 2014).

166 The Brazilian word for oil palm.

Figures provided by Agropalma showed an average gross income of BRL 4427.73 per month in 2011 for the 43 families in the first project, Soledade,[167] which began in 2002. With production from the palms gradually increasing after they began bearing at year 3, this represented the most productive period in their 25-year cycle.[168] But, as might be expected, the returns were not even. The best farm, with 307 t of FFB per year returned a gross income of BRL 6019.90 per month; the worst, with only 97 t of FFB, returned BRL 1827.30. As 25% of the return went to the company to cover expenses and inputs and a further 25% to the bank, the net returns were halved (Rebello 2012, 263). The price of CPO (on which the payment for FFB was calculated[169]) was high in 2011, so these kinds of returns represented a "best case scenario" for the group.

In a more in-depth exploration of the variability in output from the Soledade farmers, Rebello focussed on the 36 (out of 43) who had actually received 10 ha of land. With an average productivity of 21.25 t FFB/ha, the best farmer scored 27.9 t, the worst only half that, at 13.8 t. The families could be divided neatly into three groups – 8 with high productivity, 20 with medium productivity and 8 with low productivity. Rebello explained the differences by the number of family members actually assisting in growing oil palm, as well as the ability of the farmer and his or her[170] dedication to the project, which depended on the land, the availability of inputs, equipment, information and technical assistance, which in theory were distributed equally. He suggested that the selection criteria for participating families perhaps deserved more attention (Rebello 2012, 264).

Agropalma's project 4, Calmaria II, established in 2006 was different from the first three in that the recipients received only 6 ha of oil palm from the Ministry of Agrarian Development, after criticisms were raised about food security, given the fact that Agropalma refused to allow intercropping of young palm with food crops in their first 3 years (Biondi et al. 2008). After a visit to Calmaria II, Rebello was more convinced that the human factor had a strong role in explaining the variability in productivity and the level of success of the families. Instead of working in oil palm, some of these settlers invested their time in fishing, raising small animals or engaging in commerce, scared of the amount of work which oil palm entailed (Rebello 2012, 264). Biondi et al. (2008) suggested that at that time (before production began) 13% of the land in the settlement was occupied by oil palm, 7% by food crops and the rest was the legal forest reserve.

As was pointed out by members of the NGO Reporter Brazil, many farmers had extra expenses in producing the crop, especially in hiring labor to assist with particular operations, and in some cases hiring tractors (Glass 2013, 8). Obviously, working expenses would depend on the family's position and labor supply. Individual case studies told different stories, some successful, others more problematic, with a 10% failure rate (Osava 2010a; Gomes and Glass 2012). The heavy workload on the oil palm plots, most difficult in the early establishment years, declined as the trees matured (Osava 2010a).

Tables in Homma et al. 2014, a detailed recent analysis of Agropalma's Arauai community (which included previous researchers such as Rebello and Monteiro), provided evidence on the questions of hiring extra labor (Table 12 p. 26) (very common for clearing, fertilizing and harvesting) as well as the continuation of growing food crops for the household (Table 11 pp. 24–5). The latter showed clearly that most farmers were continuing to produce their own food. While the emphasis on mandioca had decreased from 84% before oil palm to 71% after, corn (68%) and rice (65%) remained the same and a number of other food crops such as beans, bananas and squash had actually increased. The report of Homma et al. 2014 was

167 Rebello has the name wrong for this first project, which other researchers such as Monteiro, Homma et al. 2014 and the auditors visiting Agropalma for RSPO certification have called Arauai. It seems that Soledade was the second project, begun in 2004.

168 Vilella (2009:80), quoting figures from Agrianual 2008, compiled a table of the expected yield of palms by age, with a maximum of 25.2 t FFB/ha at years 7 to 9.

169 10–12% of the CPO price at Rotterdam

170 20% of the Agropalma plots were owned by women (Osava 2010a).

very positive about the experience of those family farmers, especially the assistance they received from Agropalma.[171]

Between 2010 and 2012, 581 new families in Pará had become involved, mainly with Biovale, all with 10 ha, while for the 2012–2013 crop, the plan was for a further 1610 to enter. The rapid contracting of so many new families was seen to be a worrying sign. Agropalma's environmental manager suggested that if they had not worked closely with the families under their schemes, the failure rate would have been 30%, not the 10% which occurred: "If management is poor, output will be lower and final production costs will be higher. That means … a much higher risk of failure of the project" (Tulio Dias *in* Gomes and Glass 2012, 22).

The mainly negative case studies recorded in Reporter Brazil's 2012 publication were almost all from farmers working with Biovale. The only positive report was of a farmer with considerable resources – 125 ha, with pepper, annatto and many fruit crops apart from oil palm (Gomes and Glass 2012, 21). Another commentator found a successful farmer with a range of commercial crops, described by Biovale as "a small businessman" (Frayssinet 2013b). Osava (2010b) found a similar case among Agropalma farmers – an individual who already owned several plots of land and a small business had bought a block from one of the failed smallholders. Social stratification would appear to be evolving in the usual way in Para; the wealthier farmers are doing fine but many with few resources are suffering "adverse incorporation". Some are being forced by debts to sell their land and ending up as plantation laborers.

"Since late 2010, but especially in 2011, vast swaths of land have been purchased by Biovale" Miccolis and Andrade (2012, 11). The rapid turnover of land in Tomé-Açu to Biovale was also reported by Nahum and Malcher (2012). In particular they noted "the formation of the land market", with the company sending agents into the villages and buying land cheaply. Nahum (2013) quoted from a local paper *(Jornal Diario do Para*) about one person's resistance to the oil palm monoculture, which had produced a shortage of *farinha* (manioc flour) as "…70% of the producers have sold their land. Most people have abandoned the planting of cassava".

Even lands belonging to quilombolas were being sold to Biovale (Biondi et al. 2008, 13: Nahum 2011), though the company stated that the boundaries of their reservations were often unclear. Nahum (2011, 19) was particularly concerned about how the quilombola communities in Tome-Acu (and equally in other impacted areas such as Acará, Moju and Concórdia do Pará) would be able to continue their traditional way of life following the expansion of oil palm.

Following field research in 2010–11, Miccolis and Andrade (2012, 12) reported the reactions of farmers' groups in Tome-Acu to this rapid acquisition of land by large companies. While there were short-term, positive economic impacts in terms of temporary jobs, these were believed to be outweighed by many negative aspects including displacement of smallholders (some of whom were pressured heavily to sell their lands) with soaring land prices and increased land concentration. People also complained of environmental problems, such as pollution of streams by chemicals and deforestation, sometimes in protected areas (Miccolis and Andrade 2012, 12; Gomes and Glass 2013, 12). This was despite Biovale's claim that their plantations involved "100% recovery of degraded areas" (Vale Newsroom 2012).

171 Interviews with a small number of family farmers with 6 ha and 10 ha of oil palm were undertaken by the author in October 2014. Recent RSPO certification means smallholders must maintain high standards, with burning strictly forbidden. Technical support people from the estate were also watchful about application of chemicals but the farmers reported that they only used fertilizers, being frightened of harming the environment, while some claimed they used no chemicals. All the farmers belonged to associations that owned the land, so individuals were not free to sell it. While some preferred to use only family labor to work their plots, commenting that it was too expensive to hire helpers (even if this meant that women must help carry the heavy bunches), others felt they had no option, and must seek work outside so they could buy in extra labor, especially for harvesting. Farmers were shocked by recent low prices for FFB, but said they could still make money. All said they preferred oil palm to their former concentration on mandioca, although several among the 10 ha group were still growing enough food for household use. Some of those with only 6 ha were keen to extend their oil palm up to the 10 ha limit but did not want to cut their acai trees. One problem that had not been mentioned in the literature was the incidence of red ring disease, caused by a nematode (*Bursaphelenchus cocophilus*) which had infected some of the smallholders' trees and was now being addressed.

Many farmers were now refusing to join the integration agreements, arguing that most of the land and labor would be taken up by oil palm, to the detriment of food crops. Some were also worried by market fluctuations and the likelihood of disease. All agreed that they would be happier if they could intercrop the oil palm with staples such as cassava and beans and cash crops such as cocoa and acai. While Biovale stated that they preferred family farmers to continue working part of their land on food crops, they admitted that often this portion was small (Frayssinet 2013a). Petrobras also commented on the question of food security for its family farmers, noting that the company "has sought primarily to establish partnerships with farmers who undertake not to abandon their food crops", but the spokesman for the company admitted that this objective was not spelled out in the contract (Gomes and Glass 2013, 9).

6.4 Initiatives towards more sustainable and inclusive oil palm production

6.4.1 Adapting oil palm cultivation to family farming through intercropping in agroforestry systems

Two models emerge from the literature on oil palm in Brazil, which, while still contributing to the use of palm oil for biodiesel or other commercial purposes, do so in an environmentally sustainable and socially more "smallholder friendly" manner. They are the CAMTA project in Tomé-Açu (Pará) and the traditional oil palm systems in operation in coastal Bahia.

Research on mixing commercial oil palm plantations with agroforestry systems is quite new and was described as "fledgling" in 2010 when first mentioned by Andrade and Miccolis (2010, 35). They described the beginnings of a pioneering research study *Projeto Dendê: Agroforestry Systems and Family Farming* funded by NATURA,[172] partnered with a farmers' cooperative, CAMTA[173] in Tomé-Açu and supported by Embrapa and the Federal Rural University of Amazonia. The CAMTA cooperative members are mainly Japanese Brazilians, descendants of a former colony founded in 1929, who introduced agroforestry systems to Tome Acu at that time (Monteiro 2013). Beginning in 2007, three demonstration plots, each of 6 ha of degraded land, were planted with oil palm and combinations of up to 17 species. The project demonstrated that not only could short-cycle species be intercropped with oil palm during the first few years, but also with perennial species such as banana, cocoa, acai and black pepper, while leguminous ground cover restored fertility (Castellani et al. 2009; Andrade and Miccolis 2010, 36; Kato et al. 2011).

A further report was made by Miccolis and Andrade (2012) following a meeting in Belém in November 2011 of the Brazilian Congress of Agroforestry Systems, at which a number of papers were presented on aspects of the project. All indicated that oil palm yields were equivalent to or greater than a mono-crop system, although the number of oil palm trees was smaller. There were also improvements in biodiversity.

Most of the 133 CAMTA members were rather wealthy, owning at least 60 ha. Oil palm was cultivated on 15 properties, 40% of it planted in 2011. Some of these farmers have signed integration agreements with Agropalma or Biovale. However, it was suggested by farmers' organizations in the area that there would be both available land and interest outside CAMTA if farmers were permitted to plant with other food crops, especially cassava and fruit. It was stated that farmers rejected the "monoculture" model of oil palm, while recognising the crop's economic promise. The scientists suggested that there was a huge potential for expanding oil palm coupled with agroforestry systems in the region, "which the companies will need to do if they want to meet their expansion targets" (Miccolis and Andrade 2012, 17).

Other small farmers would happily intercrop on a smaller scale (perhaps 5 to 6 ha) once they could secure funding and extension (they would need training in the new system). One of the problems with funding was the high rates of default in Tomé-Açu, most previous debts having been incurred in earlier projects for planting black pepper and cattle ranching. Many farmers have not yet acquired their DAP, which would allow borrowing from the bank.

172 A Brazilian cosmetics company which uses palm oil in its products.

173 CAMTA - *Cooperativa Agricola Mista de Tome-Acu*

The oil palm agroforestry project run by Japanese Brazilians in Tomé-Açu, Pará state. (Photo by Lesley Potter)

The conclusion is far-reaching:

> the expansion of oil palm solely in conventional large-scale monocultures entails grave socio-environmental risks. Despite the laudable efforts made by the federal government in establishing policies and guidelines to ensure the sustainability of this expansion… it is extremely difficult to monitor compliance at the local level due to poor governance structures. As the major industry players are forced to rethink their expansion strategy among family farmers in the light of these hurdles, the possibility of coupling oil palm with Agroforestry Systems emerges as arguably the most promising path for mitigating these socio-environmental risks and, ultimately, for increasing the overall sustainability of oil palm in the context of the Brazilian Amazon (Miccolis and Andrade 2012, 17).

Miccolis has recently presented updated information on the progress of the CAMTA system showing average palm yields of more than 7 t/ha compared to 5 t in mono-crop oil palm of the same age. The high yields were assisted by heavy mulching with the Mexican sunflower, which proved to be an excellent organic fertilizer. The systems are still young, but results are considered very promising (Langford 2014).[174] While Embrapa is supporting these trials, it now needs a company such as Agropalma, with its organic certification, to adopt these practices and give them more status.[175]

174 A visit to the CAMTA project in October 2014 revealed that one of the three farmers involved in the experimental plots was less certain whether the experiment should continue after its closing date of 2016. He said that most members of his cooperative were interested in implementing a system of 10 ha only and would need to harvest a range of other crops, not just oil palm. Securing a large supply of organic matter to maintain the good growth of the oil palm was hard work, as was the original control of weeds. Nevertheless, he was expecting a yield of 14 t FFB/ha, which was excellent in 6-year-old trees. As this area also had low rainfall, the variety used was Deli La Me, a drought–resistant species originally from the Ivory Coast. The system was impressive, with the participating crops carefully arranged in rows and growing well (Interview with Claudio Sugaya).

175 It is interesting that those conducting the RSPO certification audit on the Agropalma plantations found considerable biodiversity within the plantations, possibly because they are surrounded by a carefully preserved forest, in which no human activity is permitted (Baldoni et al. 2011, 39)

Monteiro (2013) examined the CAMTA system along with those of other independent smallholders, in her comparison of the compliance of the three oil palm production systems that she found in Pará with 24 socio-environmental indicators. These were agro-industrial systems; independent smallholders and family farms. This is important work, as the existence of a group of independent smallholders, some of whom were producing a variety of crops as well as oil palm, makes comparisons easier between the range of approaches to the industry in Brazil and in other countries, such as Indonesia.

In both the family farm and independent systems, Monteiro found economic and social indicators to be largely positive, especially those relating to income generation, income sources diversification and training. Environmental indicators were more negative, particularly the use of chemical inputs, energy use and lack of environmental restoration. The CAMTA system, still experimental, would indicate a way of reversing those negative indicators, which could be applicable also to the plantations (not exempt from overuse of chemicals).

6.4.2 The Costa do Dendê, Bahia: "An agroforestry system led by oil palm" (Semedo 2006, 50)[176] .

The Costa do Dendê (oil palm coast) in the State of Bahia, lies between the towns of Valenca and Ilheus, with its major focus between Valenca and Camamu (270 to 358 km south of Salvador), especially the hamlets of Taperoa, Nilo Pecanha and Valenca. In that area, the sub-spontaneous groves of palms (largely low-yielding *dura* species) have been integrated into a number of mixed farming systems as described by Watkins: "Dispersed through the sub-spontaneous groves are a variety of livestock and subsistence and commercial crops including cattle, goats, donkeys, manioc, guarana, bananas, clove, chillies, black pepper and another perennial with commercial applications, the piassava palm" (Watkins 2011, 22). Between Camamu and Ilheus and further south again to Uno, the location of the CEPLAC[177] experimental station, the emphasis turns mainly to cocoa and rubber although oil palm groves are still present. The oil palm, always a tree of secondary forests in Africa, has become part of the "native" vegetation on the oil palm coast, propagated by vultures (Biondi et al. 2008, 19).

In his paper, Watkins provides evidence of the transfer of the palm oil technology from West Africa by the Portuguese from the sixteenth century, largely to provide food for the African slaves, especially Yoruba speakers from Nigeria who were transported to the sugar estates of Bahia. It is not yet known when the oil palm culture became adopted in the new environment by the slaves, but it certainly was present at the time of emancipation in 1888 and spread along the coast, where climatic and soil conditions were very favorable, although production was seasonal, peaking between April and June. The culture based on oil palm has remained strong among the Afro-Brazilians and others who now inhabit the area, through both cuisine (combinations of African and Latin American foods such as okra, black-eyed peas and cassava with oil palm) and the *candomble* religion, centered on the city of Salvador.

While Watkins suggests the systems practised provide a "baseline model of sustainable agroecology" (Watkins 2011, 15), he does not include much detail of the individual farm arrangements. Semedo (2006) interviewed more than 50 farm families in Valenca and Taperoa and identified 14 separate systems, of which six were described as only marginally diversified, while the rest were highly diversified. Most interesting is his attempt to place them in historical sequence, suggesting that while the oil palm fruits had long been utilized locally, the trees were not planted before the 1960s. In the early twentieth century, rice, mandioca and sugarcane were widely grown, together with cocoa (under shade) and bananas. Palm kernels were cracked manually with stones, as in Nigeria in the past. Semedo stated that it was the arrival of Japanese immigrants during the 1960s, with their agroforestry cultures of black

176 Translation by author

177 CEPLAC *Comissao executive do plano da laboura cacaueira* is the national government's cocoa planning committee, but it also looks after oil palm in the area and runs the Lemos Maia Experimental Station near Uno, conducting improvements in oil palm germplasm and pollination and disease prevention in all tree crops.

pepper, pimento, cloves and annatto, foreign fruits such as jackfruit, mangosteen and rambutan together with the local guarana and cocoa, which encouraged high diversification. By the 1980s, the black pepper cycle had diminished and witches broom disease was affecting the cocoa, but was brought under control by 2000. Cocoa now continues to be a prominent part of the mix.

In his research in 2006, Semedo found 17 different crops on family farms, apart from oil palm, though most farms had around 5 or 6 and some up to 10. An interesting question was the extent to which the other crops or animals were "integrated" with the oil palm. One system which was described as "well integrated" had cloves, guarana and annatto growing together, and use of the heat from the artisanal mill to dry those crops, as well as produce palm oil and kernel oil, while chickens scavenged in the effluent. An example of a non integrated system was one with no mill; the dende was growing in a pasture but there were no cows; the cocoa and cloves were growing separately as were the birds in the yard. Large animals such as pigs and cows he suggested were recent additions to the mix (generally only seen on bigger properties), although chickens and other farmyard birds had always been there, cleaning up around the mill. In 8 of the 14 systems, farmers had their own mills, which varied from artisanal, often animal-driven systems to more complex and efficient structures. There were around 300 mills on the Dende coast, most producing quite small amounts of palm oil and palm kernel oil.

The largest commercial mill is at the Opalma plantation, which was established in 1962 in Taperoa, now with 3270 ha of *tenera*. This was the first large palm oil mill in Brazil. It was initially government-owned, and started distributing tenera seed in the district. It would also send a boat across to the nearby island of Boipeba, to collect palm fruit from farmers there. That ceased when the property was privatized. Oil palm activities are now quite minimal on the island, with just one artisanal mill, which operates at the height of the season (April to June). People on Boipeba have had to become more oriented to tourism and fishing.

While many farmers are now introducing tenera seedlings, the result of a program by Petrobras to expand the output of biodiesel from the coast,[178] they continue to include at least some dura trees; they like to produce palm kernel oil and the kernels in dura fruits are larger (discussion with workers, mechanical mill Taperoa 27 September 2014).[179] Current yields are dura: 3–4 t/ha, tenera: 5–12 t/ha, depending on the age of the tree, fertilizer levels and location. Some of the tenera trees, like their dura counterparts, are already very old.

One aim of Semedo's thesis (2006) was to suggest that reorienting their diverse agricultural systems to produce biodiesel was not a good option for the farmers of the Dende coast. He demonstrated that they could earn more from their farms by retaining that diversity, which in many cases also produced mandioca/farinha and other products to feed the household. Watkins (2011, 23) also expressed concern that some farmers were being pressured to sell their land, as more capitalistic enterprises were poised to enter. Current thinking seems to focus more on rehabilitating the system, at least to improve yields, as production is insufficient to meet demand and Bahia must import from Pará (*Imprensa Seagri* 2012). As one mill worker observed, "the traditional system will not die". There is too much culture and history behind it and tourists continue to be attracted to the area

178 Petrobras has a biodiesel factory 60 km north of Salvador (mainly for castor bean) and had distributed 70,000 tenera seedlings to a group in Camamu ([EBDA] *Empresa Baiana de Desenvolvimento Agricola*), which was responsible for providing seeds and technical assistance to farmers, assisting them to obtain their DAP to access a bank loan, encouraging them to continue their agroforestry systems and rehabilitating old groves (ImprensaSeagri 2012). A similar attempt at distribution of 80,000 seedlings from the CEPLAC Experimental Station in Uno had failed, as farmers did not collect the seedlings and they would eventually be burned. CEPLAC officials stated this was due to a lack of credit, but the State Agriculture Department believed transportation to be the problem (Interview, Bahia State Agriculture Department, Family Farming Section, Salvador, 30 September 2014).

179 The family owning this quite large private mill was originally from Portugal, the owner's grandfather having bought the land (80 ha). He was in the process of expanding the 15-year-old mill, which handled 14,000 t/ day, compared to Opalma's capacity of 30,000 to 40,000 t. Most of his oil goes to Salvador, where he sells at the largest street market. The Afro-Brazilian owner of a small traditional mill, also in Taperoa, had 8 ha, producing cocoa, guarana and dende. He would process 5 t of FFB per month in the high season, 2 t in the low season. His mill had water access, so farmers could bring their fruit by boat. He sells his red oil directly to families.

because of the combination of the traditional system and the glorious beaches.

While oil palm is rejected as a means of regenerating protected areas in the Amazon (e.g. in Para) because the commercial plantations would extend an "unnatural", chemical-dependent monoculture into the forest, the traditional groves in Bahia present a different picture. Invasive oil palms permeate the severely damaged Atlantic forest and are present in secondary regrowth (Biondi 2008). They could both conserve and expand the forest while also helping to alleviate rural poverty.

6.5 Conclusion

The recent expansion of oil palm plantations in the Amazon is presented by the Brazilian Government as a carefully controlled development using predominantly degraded lands in restricted areas. It obviously provides an economic improvement to the previously run-down pastures the plantations have replaced and foreshadows a possible environmental gain in reduced GHG emissions, though the work of Yui and Yeh (2013) casts doubt on the latter. Most commentators also warn that weak governance can easily undermine the system. The current development in limited areas of Pará, together with some needed improvement in yields from the traditional palm groves of Bahia is not yet of an uncontrollable size, even with the growth plans of the bigger companies. However, other states of the Legal Amazon are waiting to participate, so authorities must be careful about the directions and limits of future expansion and cognizant of its risks, while assessing its opportunities.

The present social and economic experiment in Pará, in which the spread of oil palm depends to a great extent on the compliance of largely poor and unskilled family farmers, is having mixed results. Although farmers with more resources are doing very well, the progress of many others is less certain. The process is still quite new and not yet fully and objectively researched. The next 5 years are likely to be critical for this experiment, as major upheavals will be anticipated until the two big biofuel companies and others reach their proposed extension targets. The struggle for media attention between environmental groups, academics, government authorities and plantations is also likely to continue, especially over issues of food security and land concentration.

To cover still unresolved issues and main knowledge gaps, Joccoud and Villela (2013, 2) suggest a number of important research topics to be undertaken which may include "permanent improvement actions" in such areas as: (1) the viability and costs of production of the different production systems; (2) the environmental, social and economic impacts of oil palm expansion; (3) the impacts of current and new technologies appropriate for the Amazon; (4) the management of natural and agroforestry sites for economic and social benefits; and (5) impacts on GHG emissions.

Brazil has many environmental safeguards surrounding its venture into producing oil palm in the Amazon, but fewer social safety nets. It is critical that these receive equal attention, both there and in Bahia.

7 Nigeria

7.1 The influence of oil palm expansion on economic development and land-use change

7.1.1 Background and a brief history

The African oil palm *Elaeis guineensis* is endemic to Nigeria, the wild palms being restricted largely to village groves and open patches of secondary regrowth forest across a swathe of land in the southernmost part of the country. The historical association between oil palm and human habitation in Nigeria goes back several hundred years and predates some modern forests, earlier misclassified as "primary rain forests" (White and Oates 1999).[180] The present oil palm belt is largely found in the southern coastal and riverine areas of the South South, South East and South West zones, extending inland for about 1000 km along the Niger and Benue rivers. During colonial times the areas specializing most in palm oil lay in the southeast, to the east and north of Port Harcourt, east to Calabar and north to Enugu in the current states of Rivers, Imo, Abia, Anambra, Enugu and Akwa Ibom[181]. Until the 1960s the far eastern state of Cross River, now the leader in oil palm cultivation, was only lightly populated and heavily forested, the only remaining areas of long fallow shifting cultivation in Southern Nigeria being identified there in the late 1950s (Morgan 1959,140).

The major palm oil and palm kernel areas in traditional groves were described by Morgan as "the eastern yam-cassava region", with high yam yields due to "careful cultivation techniques" and oil palms both within the farmland and in dense groves around the settlements (Morgan 1959, 145). The population density map at the 2006 census shows the variation among the southeastern states, from 70 to 100 per km^2 in Cross River to 800 to 2000 in Anambra. Korieh suggests large populations already existed in the sixteenth century, when agriculture had developed well beyond the subsistence level (Korieh 2010, 32). In 1929, shortages of land were noted in relation to the population; by the 1940s densities of 1000 or more per km were recorded; in the 1960s, densities were four times the Nigerian average (Korieh 2010, 34).

Korieh's book '*The land has changed*' (2010) follows the fortunes of the dominant ethnic group, the Igbo, who occupy "a little over half the land area of southeastern Nigeria but comprise over 60 per cent of the population" (Korieh 2010, 33). A high population density led to agricultural intensification focussed on root crops, especially yam and cocoyam, later cassava, together with palm groves and gradual elimination of the original forest. "Food production, especially the production of yams, may account for the unusually high concentration of population in central Igboland…" (Korieh 2010,34).

The development of the palm oil trade from Nigeria to Britain during the nineteenth century followed the abolition of the Atlantic slave trade. It was used particularly for soap and candles, for tin plating, margarine and chocolate, and its glycerine was used

180 A layer of charcoal, identified as burnt fragments of oil palm nuts, together with pottery shards at depths between 25 and 34 cm in the Okomu Forest Reserve (Edo State), has been dated at around 1300 *a.d.* and suggests a period of intense human habitation at that time, though the sequence was subsequently broken, allowing today's dense secondary forest to develop. Similar sequences have been found over a vast area, including northern Congo, SE Cameroon and SW Central African Republic. The valuable mahogany forests have grown subsequent to this period (Fay 1997 *in* White and Oates 1999, 358).

181 There have been several changes in Nigerian state boundaries since independence in 1960.

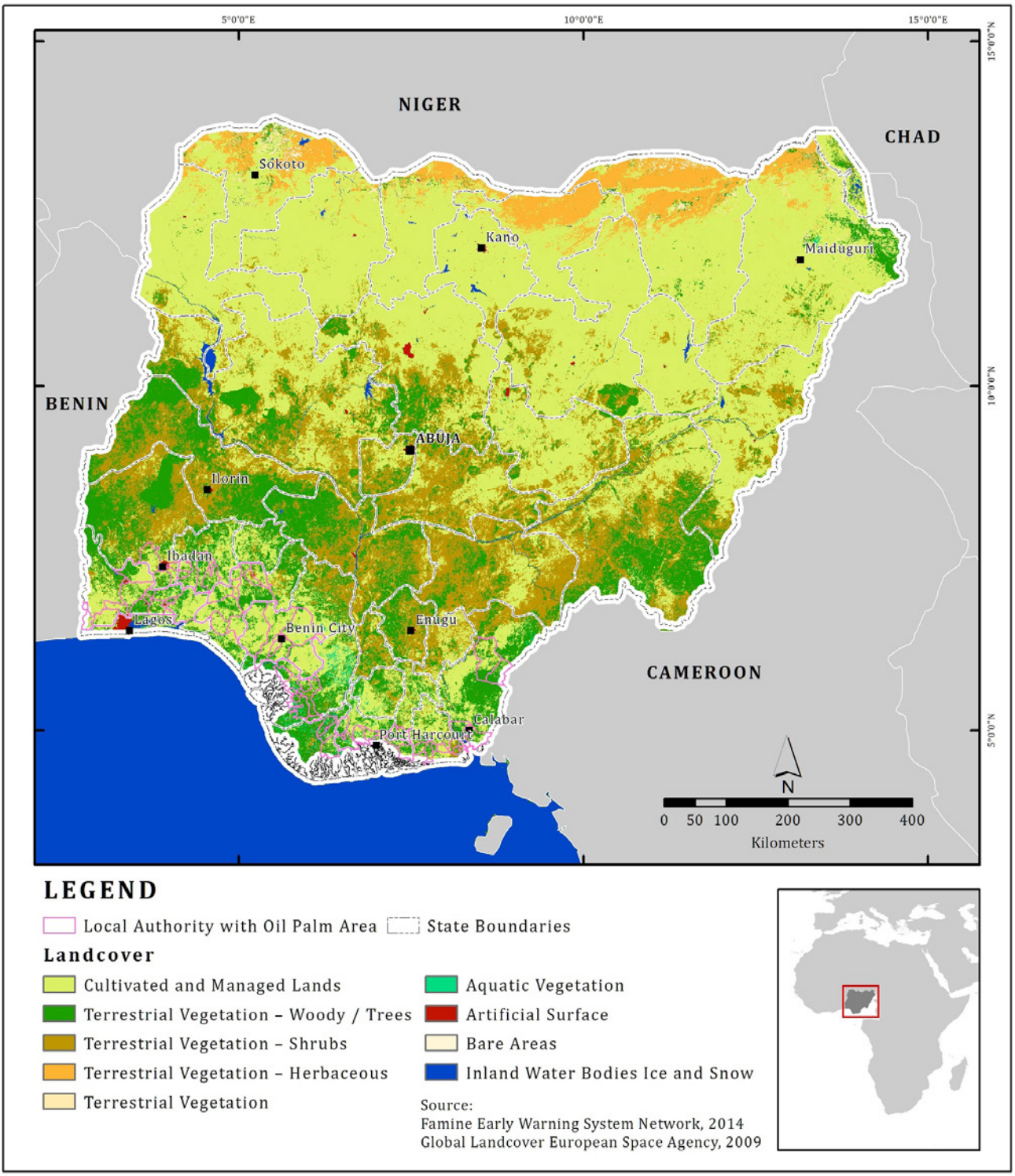

Figure 7. Nigeria: indicating main oil palm areas in the south and around the Niger Delta.

for explosives.[182] The expansion of oil palm was "at the core of colonial economic policy" for the palm oil belt following the arrival of colonialism in the area in 1900 (Korieh 2010, 60). This expansion was to be based on small-scale producers, with local labor and resources being redirected to meet the demands of European markets for both palm oil and palm kernels, the production of which steadily increased. It was an example of the famous dual mandate, in which Britain followed a policy of indirect rule, protecting local institutions and practices while promoting peasant-based production for export and taxing that production (Schoneveld 2014, 148).

Techniques were simple and labor-intensive, especially hand cracking of palm kernels by women and children, with palm kernel oil being more lucrative than palm oil.[183] However, the increases in quantities traded were accompanied by a change and later a decline in food production, with yams, the dominant male-produced food, being replaced in the 1920s in parts of the area by female-managed crops such as cocoyam and cassava, more tolerant of declining soil fertility (Korieh 2010, 87). In some districts, people no longer grew their own food, being reliant on cassava brought in from other parts of the country and a variety of imported foods. Their vulnerability to international price changes increased, as became evident during the 1930s Great Depression and the disruptions to trading patterns during the Second World War (Korieh 2010).

Attempts in 1907, 1920 and 1925 by William Lever to establish oil palm plantations were rejected, partly because of the high population density and the communal land tenure system.[184] To prevent exploitation by foreign capitalists, no non-native was to be allowed to hold freehold land. However, two leasehold oil palm plantations were permitted in the 1930s on the edge of the high population belt, in Delta State and near Calabar in Cross River State (Udo 1965, 362; Kilby 1967, 178; Korieh 2010, 80, 86).[185] The latter was owned by the United Africa Company or UAC (formerly Lever Brothers, now Unilever).

The decision by the Eastern region in 1952 to reverse the colonial anti-plantation policy was a critical turning point in the subsequent development of the industry and a precursor to the important changes that have taken place over the past 60 years in the oil palm landscapes of Nigeria. The intervening period is examined in more detail in the next section. An overview of the modern scene follows below.

7.1.2 The modern palm oil industry

In the early 1960s, Nigeria was the world's leading exporter of palm oil and palm kernels, with 45% of global exports (Hartley 1977, 18).[186] According to the *Oil World Annual* (2013), Nigeria now has a mere 1.75% of world production (and negligible exports), although this excludes the production from the "wild groves", which should perhaps double the production figure. Although domestic (commercial) production was estimated at 940,000 t in 2012,[187] imports, largely from Malaysia and neighboring African countries such as Ivory Coast, Ghana, Togo and Benin were estimated to have reached 870,000 t to meet a growing demand. They have risen from 700,000 t in 2008 (*Oil World Annual* 2013). Imports of CPO include a 35% duty to protect local suppliers, to which is added a number of fees and taxes, bringing it up to 50% or more (Nzeka 2014, 5). Nigerian CPO is more expensive to produce than that from Indonesia or Malaysia and is not competitive in global

182 *The Times of London*, reviewing the history of Price's Patent Candle Company in 1905 observed "Price's demand for palm oil was so great that West African chiefs found it more profitable to collect palm oil than to sell them [their fellow Africans] into slavery" (Henderson and Osborne 2000, 65).

183 Figures in Hartley (1977) for the period from 1909–13 show exports of palm oil from Nigeria at 82,000 t (67% of world total) and of palm kernels, 122,000 t (54% of world total).

184 Land was divided among families and subdivided to family members according to need. As population increased, so did fragmentation and land disputes.

185 Any encouragement by colonial authorities towards establishment of even locally owned plantations was met with suspicion. However, such plantations slowly increased, from just 21 acres and 6 owners in 1928 to 8730 acres and 4667 owners a decade later. The area owned per farmer was small (Udo 1965, 363).

186 Zaire (now the Democratic Republic of Congo), Malaysia and Indonesia were beginning to catch up by 1965, though Nigeria was still leader in palm kernels with three times its exports of palm oil.

187 The USDA's GAIN report suggests a rather lower figure, with 930,000 t in 2013, up from 910,000 t in 2012–13, and a forecast 940,000 t in 2014/2015 (Nzeka 2014)

markets.[188] The potential area available for oil palm is estimated at 24 million ha; from that area, 2.3 million ha are under natural groves and 430,440 ha are in plantations of various sizes (PIND 2012).

Studies by the Foundation for Partnerships in the Niger Delta (PIND) in 2011 and 2012 present a broad picture of the present position of oil palm in the nine states now recognized as constituting the Niger Delta, which are responsible for 57% of current production. They omit some of the populous central Igbo states such as Anambra (which was credited with 8.6% of total area under oil palm in 2004) and the states of the southwest such as Osun and Oyo which have many palm groves, but lack large oil palm plantations (the southwest specializing more in rubber).[189] The Niger Delta region, the heart of the palm oil belt, has abundant wild groves (74% of the total area, 50% of production); small-medium private plantations (19% of the area, 34% of production) and large, corporate estates (7% of the area, 25% of production) (PIND 2011, x). All three types of production (examined in more detail in the third section) have low yields, ranging from an average of 1.5 t FFB/ha/year in the "wild groves" through 3 t FFB/ha/yr for smallholders to 5 t FFB/ha/yr in both smaller and larger plantations. The best plantations, such as Presco, manage yields of around 22 t FFB/ha.

While the low yields are largely the result of the age (30 years and above) and variety of the palms (*dura* rather than *tenera*), together with general lack of fertilizers and maintenance, the natural environment is also partly responsible. A 1989 World Bank report pointed out that rainfall conditions in Nigeria's oil palm belt are not as conducive to high yields as in Malaysia or Indonesia. Rainfall is monsoonal, with even the wettest areas of the South (the delta) experiencing two dry months, increasing to five months further north. "The oil palm belt thus experiences water deficits in the range of 200 to 400 mm, which translates to a maximum potential yield of 16 and 10 t FFB/ha respectively for the better soil types" (*World Bank* 1989, 7). The authors compare these yields to those of Malaysia at the end of the 1980s, above 25 t FFB/ha, with a more evenly distributed rainfall, longer sunlight hours and better soils, without the potassium deficiency common in Nigeria. Shorter sunlight hours can delay fruit ripening and reduce oil content, while potassium is essential for good fruiting.

It is difficult to obtain up-to-date information about areas under oil palm by state under the differing systems of production. The figures in Table 9 are for 2009, a combination of fieldwork by the PIND team and available statistics, and cover only the 9 Niger Delta states.

It is notable from this table that although Cross River had the largest total area under oil palm in 2009, Edo State had a bigger area devoted to plantations. This position has recently changed, with the Wilmar group acquiring more than 45,000 ha of mainly defunct oil palm plantation land in Cross River State in 2011–12, and an additional 10,000 ha in 2013 (for rubber plantations) (Schoneveld 2014). While it will be a few years before that land is producing, the replacing of old *dura* trees by new, high yielding seedlings is ongoing.

The milled product is divided according to its levels of free fatty acids (FFA) into technical palm oil (TPO) (more than 5% FFA), and special palm oil (SPO) (less than 5% FFA). Technical palm oil largely comes from the traditional sector and is used for household consumption, while special palm oil, which can be fractionated, is used to meet the needs of downstream industrial producers.[190] The processing is also divided into: Channel 1: Traditional TPO; Channel 2: Medium Technology TPO; Channel 3: Medium Technology SPO; and Channel 4: Integrated. The researchers found a move away from the Channel 1, traditional systems operated manually by women to Channel 2, employing small, locally made machines operated by men. Channel 3, producing SPO, included most of the smaller estates with mini mills (able

188 It has been alleged that large volumes of cheap imported CPO avoid the duty and enter Nigeria via neighboring African states, such as Benin, which are part of a free-trade area with Nigeria (ECOWAS Trade Liberalisation Scheme)(Osagie 2013b). Local plantation owners are increasingly concerned that the food industries which use this imported oil are bypassing local producers (Osagie 2013a).

189 Raw Materials Research and Development Council (RMRDC) (2004) *in* ONF International (2012).

190 Good examples of traditional processing in Akwa Ibom and Oyo States, largely carried out by older women, are found in WRM (2010a,2010b) and Akangbe et al. (2011). The economics of male small-scale semi-mechanised processing in Rivers State were analysed in Ekine and Onu (2008).

Table 9. Estimated area under oil palm by production system and state in the Niger Delta.

State	Wild groves	Medium & smallholders	Plantations	Total area
Cross River	240,000	29,577	26,207	295,784
Akwa-Ibom	240,000	32,277	3,095	275,372
Abia	150,000	29,765	4,589	183,354
Imo	106,690	67,690	3,410	177,790
Rivers	91,655	57,000	16,300	164,955
Ondo	85,000	10,143	16,169	111,312
Edo	50,000	24,542	28,147	102,689
Delta	60,000	13,730	6,246	79,976
Bayelsa	39,000	2,459	1,212	42,671
Total	**1,062,345**	**267,182**	**105,375**	**1,434,902**

Source: Foundation for Partnerships in the Niger Delta [PIND] 2011.

to process 10–20 t of FFB/day), and was growing due to high demand, though not yet providing sufficient product for the end market users, who met the gap through imports.[191] The expensive integrated systems (Channel 4) are used only by a few top plantations (PIND 2011, 2012).

The PIND studies made a comment about environmental questions, noting that "Cognizance must be taken over the environmental concerns regarding the conversion of rain forest into palm oil plantations and PIND should use its influence to ensure that any new plantation development is conducted in an environmentally sound and sustainable manner" (PIND 2012, 12).

Such a statement glosses over the reality that many plantation developments, as illustrated in Schoneveld's map of Cross River State have taken place in areas of reserved forest. In Cross River State this has included parts of the Oban Group, which in 1991 became the Cross River National Park (Schoneveld 2014).[192] The reserved forests, dating from the colonial period, were viewed as "available" land, with fewer claims and were more accessible to newcomers (von Hellermann 2007, 382). The 1978 Land Use Decree, transferring all land to state and district governments, provides a lower level of protection to small landholders and was mainly intended to assist plantation development (Kajisa et al. 1997). Schoneveld argues that "a resurgent plantation economy" which has been emerging since 1999 is likely to put pressure not only on the forests but also on traditional production systems in an "ever-expanding agricultural frontier" (Schoneveld 2014, 148). The arrival in Cross River in 2011 of the Singaporean group Wilmar International and its subsequent purchase of numbers of defunct estates, some within the national park and several with resident populations of "illegal" migrant farmers, has exacerbated those fears.

7.2 The role of policies and corporate strategies in shaping oil palm development

In this section, I will trace the impact on the oil palm industry of federal government and state policies during the critical years from the early 1950s to the present. This includes: independence and the boom years of the early 1960s; the discovery of oil and development of the petroleum industry; the Civil War and the

191 Several palm oil refineries are operating at less than 25% of installed capacity due to an inadequate supply of SPO (PIND 2012, 17). This problem is not new. In 2008 Eshalomi listed 11 refineries that had either gone out of production or were operating at less than 25% capacity (Eshalomi 2008).

192 The Cross River National Park, which joins the Korup National Park in Cameroon, is "one of Africa's most important biotic reserves" (Schoneveld 2014, 148)

decline of agriculture; the ensuing series of military governments; the implementation of Structural Adjustment Policies and the eventual restoration of democracy in 1999. Corporate and public/private strategies will also be examined as these became more important towards the end of the period.

7.2.1 Plantations, innovations and settlements, 1950s to mid-1960s

In 1952, following the devolution of economic planning to the regional governments of the Eastern, Northern and Western regions, the first indigenous cabinet in the Eastern region reversed the colonial anti-plantation policy. This was followed by a decade of rapid plantation establishment in various commodities, especially cocoa, rubber and oil palm (Udo 1965, 356). Alarm had been raised by potential competition from oil palm plantation developments in Sumatra and Malaya. It was realised that plantation mills could extract up to 95% of the oil content of the fruit, compared to only 50% by traditional techniques and that the seeds used by plantation palms were more productive.

Given the already dense population across much of the oil palm area, parts of Cross River state were one of the few localities with sufficient land available for plantation establishment. From 1952–62, 36 plantations were established, in cocoa as well as oil palm, including Kwa Falls in Cross River, which was taken over in 1955 as the first plantation of the Eastern Nigerian Development Corporation (ENDC) (Kilby 1967, 180).[193] The ENDC and Eastern Regional Development Board (ERDB) assisted the Government's efforts to accelerate improvements in the oil palm industry (including small farmer production), as the Board would no longer accept low-grade oil. Palm grove rehabilitation was attempted, with farmers being paid a subsidy, together with seedlings and fertilizer, but late payment of the subsidy and inadequate extension limited its success (Kilby 1967:181).

"Pioneer" mills were expanded, using a simple process to mill ¾ of a ton of fruit per hour (Kilby 1967, 184; Korieh 2010, 199). The mills had originally been developed in the 1930s by the UAC as "a small-scale power unit which would fall midway between the screw press and the large-scale plantation mills". The UAC argued that the Pioneer mill, which was only partly mechanized therefore still labor absorbing, was the ideal machine for Nigerian conditions "bearing in mind that Nigeria is in the main committed… to peasant development by non-plantation methods" (United Africa Company 1951 *in* Kilby 1967, 185). The government agreed and by 1962, 200 mills had been set up, able to produce 'special palm oil' (Korieh 2010, 198).

After independence in 1960 these agricultural initiatives continued, with an "agricultural revolution" declared by Dr. Michael Okpara, the first premier of the Eastern region. The ENDC had established five plantations by 1964, with 47,000 planted ha (Kilby 1967, 180) and 60,000 ha in 1966 (Schoneveld 2014, 149). Most of this land (80%) was in Cross River State. Though European firms had originally been interested in setting up oil palm plantations, their interest had waned due to the low prices available from the marketing boards through which the produce had to be sold. Foreign firms moved instead to invest in rubber, which had no marketing board (Udo 1965, 364). After independence, the few European estates established in oil palm were run by the UAC and the Commonwealth Development Corporation (CDC).

The "most elaborate" of the government's programs in support of agriculture was the establishment of farm settlements in a scheme known as "pragmatic African socialism", supposedly a model for the peasants to emulate. The settlements were established in various parts of Igboland and one, Boki, in Cross River. Most were expected to focus on oil palm, in combination with either citrus or rubber, together with food crops (Korieh 2010, 207). Korieh claimed that these settlements amounted to "forced villageization" with a regimented lifestyle alien to indigenous ways. All settlements produced export crops but few in fact grew food. Although there was progress in the cash crop sector, "Officials ignored indigenous knowledge and failed to recognize that peasants had other interests and motivations that often did not fit into the official concept of development" (Korieh 2010, 209).

193 The Kwa Falls plantation was part of an abortive attempt to resettle people from overcrowded parts of eastern Nigeria. It was started in 1948 with 200 farming families, but failed, with poor production levels and a "lack of settler enthusiasm" (Udo 1965, 364).

These settlements criticized so heavily by Korieh (and based on an Israeli model), bore some resemblance to the Malaysian 'FELDA' schemes; they were organized by the government, with strong discipline at their core. Bringing the farmers together made it easier to supply them with training and to overcome the problems of farmer dispersion, with village farmers preferring to mill their own fruits on-site using traditional techniques, rather than transport them to a mill. Kajisa saw farmer dispersion as a disadvantage of the Nigerian traditional systems, with "high transaction and transportation costs" in conveying harvested fruits to a mill, when compared with the systems of "managed" smallholder settlers in Malaysia (Kajisa et al. 1997).

7.2.2 War, petroleum and military rule; World Bank interventions and structural adjustment 1967–1999

The oil palm boom of the early 1960s was disrupted by the trauma of the Nigerian Civil War from 1967 to 1970[194] which was partly caused by the discovery of petroleum in the southeast.[195] Palm oil and palm kernel exports collapsed as a result of the war, which also "marked the downfall of the fledgling plantation economy" in Cross River State, as all private plantations except those of UAC were abandoned (Schoneveld 2014, 149). Schoneveld has outlined the transfer of authority over the Cross River plantations, as the ENDC was dissolved in 1976. Its functions were taken over by the Agricultural Development Corporation until 1982, when it too was dismantled. The rubber estates were allocated to a joint state and federal government corporation, Cross River Estates Limited (CREL) and the oil palm and cocoa plantations to a private company, Nigerian Joint Agency Limited (NIJAL). Following revelations of significant mismanagement, all estates were repossessed by the state government and fell into neglect (Schoneveld 2014, 149).

The greater emphasis on petroleum and a build-up of urban-based industries led to a diminution of interest in agriculture from the early 1970s. The trade in edible fats (mainly palm oil and palm kernels) went rapidly from surplus to deficit between 1974 and 1976. While agriculture had constituted around 50% of GDP during the 1960s, during the 1970s it fell to 26% (*World Bank* 1978). It rose again to around 40% in the 1990s, as conditions for growing food marginally improved during the period of the Structural Adjustment Programme from 1986 (Anyanwu et al. 2011).

From 1970 to 1999, the country was mainly under a series of military governments.[196] From time to time, attempts were made to improve the position of agriculture, especially as imports of food continued to climb. The focus was initially on federal and state government involvement in organizing agricultural activities such as new oil palm plantations, with funding from the World Bank and for a short period, the European Union. At the same time, the federal government passed the Land Use Decree (1978) which transferred all land to state ownership "with the aim of allocating all unused or under-used land to large scale enterprises" (Kajisa et al. 1997, 6). After the implementation of Structural Adjustment, government involvement was gradually reduced as it shifted to public/private partnerships[197] and eventually full privatization of plantations, once suitable investors could be found. At state level the privatization process was slower; it was 2002 before it began in Cross River (Schoneveld 2014, 151).

The Structural Adjustment Programme (SAP) implemented from 1986–93, which devalued the Naira by 80%, devastated urban salary levels but allowed agricultural prices to rise (the Palm Oil Marketing Board was abolished in 1986). Import bans were placed on many agricultural commodities, providing some stimulus for small

194 During the Nigerian Civil War (the Biafran War) the Igbos were starved into submission as supplies of food from outside were blockaded; more than 1 million people died.

195 Interethnic rivalries and concerns about the distribution of oil wealth if Biafra were allowed to secede were some of the causes of this conflict (Watts 2001, 202).

196 Except for the period from 1979–83, when Alhaji Shehu Shagari was president. That proved a difficult time, as corruption was rampant, petroleum prices dropped and the economy began a long period of decline. Food shortages, which had started in the 1970s, remained serious.

197 The first example of a public/private partnership was the Okomu estate, a government entity which received advice on technical management and accountability from Belgian company SOCFINCO between its inception in 1976 and its eventual privatisation to SOCFIN in 1990. It managed to prosper when other estates were becoming bankrupt (Dada 2007, 27).

farmers, including those managing traditional palm groves. The World Bank noted that "increased population pressure and the resulting emphasis on food production have reduced wild palm densities as farmers severely prune palms". Farmers intercropped with cassava for at least 4 years after the palms were planted, a practice that inhibited noxious weeds but reduced yields (*World Bank* 1989, 7).

Von Hellermann, working in the Okomu Forest Reserve in Edo State between 2001 and 2003 could still observe the impacts of the SAP:

> Due to the country's worsening economy and the Structural Adjustment Programmes implemented in the 1990s, food prices have been rising steadily, making food crop agriculture a profitable enterprise again, even for relatively well off people…Ex-military men, for instance, or their wives, have taken up farming in the form of medium scale oil palm plantations or cassava farms. At the lower end of the social scale, rising food prices and declining opportunities in the cities have forced many to go back into farming 'for survival'…. virtually all current rubber and palm oil plantation workers, including those living inside the plantations, supplement their wages by farming (von Hellerman 2007, 382).

Parts of the forest reserve were made available in small lots to settlers by foresters and local chiefs (for a fee) after the original *taungya* tree replanting programmes of *Gmelina arborea* (for a failed pulp and paper industry)[198] were discontinued and government control lapsed.[199] Unlike Oates, who considered that *taungya* had failed as a forestry technique and quoted the State Forestry Department as suggesting that it "would eventually liquidate the forest reserves" (Oates 1995, 117), von Hellermann saw these more recent developments as positive. While land was still being given out in a formal manner by forestry personnel, no tree seedlings were distributed. The lands were limited to those previously farmed, close to villages in the northern part of the reserve.[200] They were being worked for food crops on a 3–5 year rotation with less forest encroachment than before, while village lands outside the reserve could be rested for longer periods. Women and migrants were more easily accommodated, although traditional owners could still make claims. A large number of "strangers" (i.e. migrants) who came to work on the oil palm and rubber plantations were also accommodated with land for farming in what she described as a "shifting hybrid system" (von Hellermann 2007, 389).

7.2.3 Civil government, 1999 to the present

Following the return to civil government after 1999, the strategy of privatization of state-owned assets was continued, with the national Obasanjo government (1999–2007), emphasizing strategic roles for the private sector in agriculture (Iwuchukwu and Igbokwe 2012; Gourichon 2013). The civilian administration from 1999–2007 "anchored its poverty alleviation agenda on reviving the agricultural sector", attempting to restore agriculture to the preeminence it once had (before the petroleum boom)and to boost national food security (Anyanwu et al. 2011).

The Presidential Initiatives on Agriculture relied on public/private sector partnership, with the Vegetable Oil Development Programme (VODEP), one of the four areas of concentration. While vegetable oil production increased by 177% between 2002 and 2007, this was still below the target to meet demand. Nonetheless, there were major investments in oil palm plantations (an increase of 30,000 ha) and 65% of abandoned large mills were rehabilitated. The target had been the development of 1 million ha of oil palm plantations with a yield of 15 million t of FFB. Although VODEP was conceived of as largely private sector-driven, government support funds were only 0.3% of what was required. The government put in place several incentives,

198 Three plants were set up, in Ogun State (bond paper), Kwara State (kraft paper) and Akwa-Ibom State (newsprint) but all became insolvent during the 1990s. The ONF international study (2012) identified the Gmelina plantations as serving no economic purpose and "the most likely area to convert to other plantation crops (e.g. rubber and oil palm)" (ONF International 2012, 4)

199 A similar situation prevailed in Cross River forest reserves, where *taungya* plantations for *Gmelina* had been shelved but lands continued to be allocated to farmers by the Forestry Commission as a source of income, shared with traditional landlords (Schoneveld 2014, 154).

200 This area had only been added to the reserve in 1935, had been repeatedly logged and was described as "secondary regrowth less than sixty years old" (von Hellermann 2007, 384).

such as a ban on importation of oils and fats, a subsidy on the import price of critical inputs such as fertilizer and a 10-year tax holiday on agricultural investments. Some of the challenges to the program, apart from the inadequate funding, were identified as inefficient and ageing processing machinery, fluctuating electricity supply and poor road networks (Anyanwu et al. 2011).

Meanwhile, the privatization programme was rolled out in the states. All the rubber estates in Cross River State were privatized by 2003 (Schoneveld 2014, 152). It was initially decided not to privatize Cross River's oil palm and cocoa estates as these were suitable for smallholder production. This was tried in three separate initiatives – CR SEED I (2004–08); CR SEED II (2009–12) and the Cross River Agriculture and Rural Empowerment Scheme (CARES) (2008–10). The schemes were generally regarded as not meeting expectations and their full privatization was recommended in June 2010. The "commercially-oriented smallholders", who under the CARES scheme were provided with 10–20 ha of cleared land on parts of the government estates, together with improved seedlings and a rent-free lease, by 2010 had planted only 452 ha of oil palm out of 4120 ha allocated. The program was considered unproductive, with government officials suggesting that smallholders "lacked the will and technical expertise to properly manage and maintain their allocated plots". A further problem was corruption, with smallholder plots not allocated according to need, but "on the basis of patronage… to customary elites, particularly chiefs, local businessmen, and officials within the state administration" (Schoneveld 2014, 152)[201].

A second privatization exercise, with a concentration on large foreign investers, led to the arrival of Wilmar International in Cross River in 2011 and the corporation's acquisition of three former government oil palm estates totaling 19,713 ha, to be followed in 2012 by four privately owned estates, a further 26,017 ha (Schoneveld 2014, 152).

The present federal government is now trying to resuscitate the industry, largely through private sector participation under the Agricultural Transformation Agenda (ATA). In August 2012, the 18 commercial plantations[202] were provided with improved planting materials (estimated to yield 21 t FFB/ha/year), which should establish 60,000 ha of new trees. Smallholder farmers were also promised the necessary income to allow them to replant with improved seeds (Minister of Agriculture and Rural Development, *AllAfrica* 2012). The GAIN Report (Nzeka 2014, 5) has noted some increases in production from this initiative.

The nature of the land tenure system has, however, been described as 'limiting'. The 1978 Land Use Act vested the power to alienate land to the governor of the state in which the land was situated. This system, although providing uniformity of land legislation across the country, nevertheless gave state governors excessive power (which was often abused) and resulted in long delays before transactions were finalised (Ayodele 2010, 8; El Rufai 2012). In addition, the customary tenure system meant that multiple claimants needed to be paid out whenever there was a change of ownership. The federal government is now planning a new land registration system, which would enable farmers to use land as collateral to secure loans from banks and would resolve land disputes. This will be a huge challenge as so far, only 3% of Nigeria's land is registered and mapped (*The Citizen* 2013).

Officials at both the federal and state levels in Nigeria are in favor of increasing oil palm production. There is a feeling of shame that CPO must be imported, especially from Malaysia, a country which (it is said) originally sent agriculturalists to the Nigerian Institute for Oil Palm Research (NIFOR) to learn how to grow oil palm (Osagie 2013b). There is also concern about the continued importation of CPO by the food

201 One old oil palm estate which Wilmar was offered and subsequently bought in 2013 (originally privatized to SIAT, but then cancelled due to lack of payment) had earlier been involved in fighting over CARES, which meant the sudden removal of the estate from the care of "youths and peasant farmers" to the "political class" who shared it out, not only among themselves but the party faithful in neighboring local government areas (Onah 2008).

202 The estates are listed on the website of POFON, the Plantation Owners Forum of Nigeria. The SIAT group (Presco Plc) has 15,000 ha of planted oil palm and is at present the only fully integrated oil palm plantation until Wilmar can supply CPO to its PZ Cussons refinery, which has begun importing Malaysian CPO.

processing companies, which the plantation owners view as undermining the expansion efforts of the local industry (POFON 2013a). Some noodle companies are considering setting up their own plantations to overcome the shortage of palm oil ('backward integration').

The corporate strategy of the largest companies (Presco and Okomu) is to rapidly expand their production. Both have recently increased the capacity of their mills to 60 t FFB/day and they are seeking more land (Okomu Plc 2013; POFON 2013b; Presco Plc 2013). Presco is partially controlled by SIAT (60% of shares) and Okomu by SOCFINAF (58% of shares), in public/private partnerships with Edo State. Both are listed on the Nigeria Stock Exchange.

7.3 Socioeconomic outcomes from disparate business models in oil palm development

7.3.1 The 'business models'

Traditional groves

Two types of 'traditional' landscape are recognised: 'Integrated farming'- palm trees well spaced to allow for other agricultural products (specifically cassava, plantain, cocoyam and yam but also fruit trees) and 'Agroforests' - community or family palm stands in a multistoried agroforest, combined with timber species, medicinal trees and shrubs and fruit trees (e.g. mango) (Merem 2005; PIND 2011; Merem 2012). Other aspects of the traditional agroforest landscapes include the diversity of macrofungi (Osemwegie and Okhuoya 2009) and the specific use of the fruit tree *Dacryodes edulis* or 'bush butter' (Aiyelaagbe et al. 1998). The palm nuts are gathered from wild groves of the *dura* variety,[203] which are very old and have low yields. As the person harvesting the trees is usually not the owner[204], fertilization and tree care are rudimentary (PIND 2011, 15).[205] Bush fallow systems continue to be used wherever population pressure permits, with the woody weed *Chromolaena odorata* increasing nutrient levels in soils, enabling fallow periods to be shortened to as little as 1–2 years (de Foresta and Schwartz 1991; Amiolemen et al. 2012).

Smallholders

Small-scale farmers own 1–10 ha of *tenera*, generally younger trees from plantings in the early 2000s (under schemes run by the various states as part of a national initiative e.g SEED). They are properly spaced but poorly maintained (pruned, weeded) or fertilized. Medium scale farmers are similar, with 10–25 ha. These small and medium farms are often intercropped with food crops and sometimes other cash crops (PIND 2011).

Larger scale farmers and estates

Larger scale farmers have 25–100 ha, with small amounts of mechanisation and some application of herbicides. A second group, with 100–1000 ha are considered small estates, sometimes owned by cooperatives. Medium (1000–5000 ha) and large estates (greater than 5000 ha) have attached mills, while some of the bigger plantations are integrated into large-scale processing. POFON, the Plantation Owners Forum of Nigeria, has around 18 members with large or medium-sized estates. Aside from the leaders, Presco and Okomu (both from Edo State), most of the other large estates encountered in the PIND survey had trees about 30 years old which were not being properly maintained (PIND 2011, 24).

203 An FAO report explained that farmers did not embrace the *tenera* variety as it is solid rather than liquid at ambient temperatures and did not have the "right" taste. *Tenera* should have been positioned as "a high-yielding industrial purpose oil", not an oil for home cooking. "The negative perception of *tenera* led to its slow adoption and the failure of Africa to maintain its lead in palm oil production" (Poku 2002).

204 More nuanced accounts are from Aweto's studies in Delta State and Chima's comment from Abia State. Aweto writes: "Farmers protect palms growing on their farms but such palms are communally owned and exploited. The community regulates when palms can be exploited and how many bunches of palm fruits can be harvested by each male farmer" (Aweto 2002); Chima writes: "In view of any developmental project, the head of the village or community places a ban on individual harvesting of oil palm fruits for a specified period. When it is time for harvesting, individual members… are mandated to pay a specified amount of money to qualify them to partake in the harvest which takes place collectively on an agreed date" (Chima 2010).

205 The effluent produced in traditional processing rarely undergoes treatment and is usually discharged into the surrounding environment (Awotoye et al. 2011).

The PIND analysis recommended increasing investments in replanting and upgrading the palm varieties to secure a larger oil content and this is happening in a number of cases, partly through direct federal government interventions such as the Agricultural Transformation Agenda. Another path is via public/private partnerships, agreements between individual states, international firms and defunct state-owned companies e.g. Imo State: ADA Palm plantation (originally Ohaji Farm Settlement, 4300 ha) now taken over by Roche company (Ireland) and being rehabilitated (Uzoma 2013).

7.3.2 The precursors: Attempts to develop large plantations in the 1970s and 1980s: the World Bank and the EU

In 1975 the military government of General Obasanjo attempted to revive oil palm production through a program sponsored by the World Bank, to be implemented through the state governments. New oil palm plantations, designed as "nucleus estate and smallholder" projects were to link the plantation sector with smallholders, to "maximise economies of scale and scope, provide new employment opportunities and offer facilities for fruit collection and processing" (Dada 2007, 6). Farmers with 1–10 ha of land under oil palm would receive free *tenera* seedlings, fertilizers and chemicals (up to USD 400 per ha), and credit in cash (up to USD 462 per ha) for payment of labor (*World Bank* 1978, 13). The materials and credit would be supplied through a Smallholder Management Unit within each state's Ministry of Agriculture direct to farmers via their cooperatives. Farmers would contribute labor and tools, were supposed to repay their credit over 13 years at 9.5% interest and sell their FFB to the nucleus plantation mill (*World Bank* 1978, 12). Notwithstanding the passage of the Land Use Decree (1978), difficulties in land acquisition were seen as slowing implementation of the projects (*World Bank* 1978, 30), while wage escalation and other financial constraints impeded state governments from distributing the free seedlings and fertilizers (Dada 2007, 6).

Although almost all those World Bank sponsored projects failed (with the exception of Okomu), the new plantations established from 1975 (and from a further set of projects in 1989[206]) remained in the landscape, gradually falling into disrepair. However, they began to be privatized from the early 1990s, some in public/private partnerships, and they have since been gradually rehabilitated and extended (Dada 2007, 7; Anyanwu et al. 2011). They include Ayip-Eku (Cross River State, recently bought by Wilmar), Risonpalm (Rivers State, now owned by SIAT) and Obaretin (Edo State, part of Presco, owned by SIAT).

Risonpalm, Okomu and four other estates were also involved in an abortive EU-funded project between 1988 and 1995 (EU 1990). While the other estates were to be rehabilitated and extended, Risonpalm, with then Belgian partner Socfinco, had plans to convert to oil palm 78,700 ha of rain forest in the Yenagoa Delta Development program by constructing extensive dikes and drainage channels. This area included the Upper Orashi Forest Reserve, home to two protected species of monkey and the African Grey Parrot (Douglas 1995; Ogunkoya 2007). No environmental impact assessment had been carried out before the project began construction of an 82 km-long dike and limited clearing. The lowland oil palm project, know as LOPPY, was opposed by local people in the area, who had not been consulted about its implementation. It was viewed as damaging local fishing, rice farming and forest products collection (Douglas 1995). The EU withdrew its aid from Nigeria in 1995[207] and the project lapsed. By December 2005, 1000 ha had been planted to oil palm (Okidim and Albert 2012). Ogunkoya pressed to have the area declared a RAMSAR site and was worried that LOPPY might be resurrected in plans to improve social and economic development in the delta (Ogunkoya 2007).

The EU withdrawal also affected the Cross River National Park, the master plan for which had proposed a variety of alternative economic activities for the inhabitants of 39 villages in the park's support zone in exchange for their withdrawal from their previous forest-based activities of hunting and collecting non-timber forest products (NTFPs). However, the funding was stopped

206 The World Bank Nigeria: Tree Crops Project, 1989

207 This followed the execution by Sani Abacha's military government of Ken Saro-Wiwa and other Ogoni activists protesting human rights violations against the Ogoni people in the Delta.

before that work was undertaken, leaving the communities deprived of forest resources and resentful of the park (Schoneveld 2014, 151).

Before they were rehabilitated, the former plantations were not empty. After their employment with the estates had ceased, former workers, many of whom were migrants from other districts, simply continued to live on the plantations and engage in small-scale cultivation of food crops. In some cases such migrants were permitted by caretakers to cultivate food crops between the palms, for a fee (Schoneveld 2014, 154). Schoneveld calculated that the rehabilitation of four of the defunct Cross River estates (including Wilmar's Ibiae) would involve the displacement of between 5200 and 7800 households (Schoneveld 2014, 156). In Cross River, most of the migrants came from the neighboring heavily populated state of Akwa Ibom. As they had been living in Cross River for many years, returning 'home' was not an easy option, nor was it easy for them to obtain land in nearby villages.

7.3.3 Privatisation and the large estates

In this section, I will examine the activities of Nigeria's four largest oil palm estates: Wilmar, Presco, Okomu and Risonpalm. The newest and potentially the biggest is Wilmar, whose plantations are not yet much beyond the nursery stage, as it goes through the complex process of acquiring the 'social licence to operate' in Cross River State (Schoneveld 2014, 154).

The corporate business model proposed by Wilmar, integrating all levels of the supply chain through its partnership with P.Z. Cussons (which has built a large factory near Lagos to handle the refining and further processing of the products) is on a bigger scale than had previously been tried in Nigeria. In its 2012 *Annual Report*, Wilmar management stated: "The Group's vision is to revive the palm oil industry in Nigeria and restore its past glory by investing in the entire palm oil value chain, including plantations, mills, refineries and production of packaged edible oil. Establishing such a value chain would increase the country's oil production to satisfy increasing local demand and export while at the same time, minimize foreign exchange exposure and create jobs" (Wilmar 2012, 10). While this was a rather overblown claim, it did demonstrate that the company was serious in its intentions.

There seemed to be no objection to the refinery[208], but by 2012 the company had acquired around 45,000 ha of land in three government and four private plantations in Cross River State (Schoneveld 2014, 153). While most of these were previously abandoned properties with old oil palm, one of the plantations, Ibiae, had only had about one-third planted to oil palm (Schoneveld 2014, Table 1, p. 152). Migrants living in estate housing and people from surrounding villages were farming much of the remainder, including a group of smallholders under the CARES leasehold scheme organised by the state government. As Wilmar now wanted to cover the entire estate with oil palm, the company's obligation as a member of the RSPO was to submit Ibiae to that organization for approval under the RSPO's New Planting Procedure. Comments were invited from interested or affected persons.

A complaint was received from a local NGO, the Calabar-based Rainforest Resource and Development Centre. The complaint dealt mainly with the lack of transparency regarding the environmental impact assessment (EIA) for the Ibiae plantation and whether the interests of all stakeholders had been properly covered by the company (including all landlord communities, CARES smallholders and migrant and "illegal settlers" living within the estate) (Oyama [RRDC] to Rasikon [RSPO] 10/11/12). Wilmar management's response (Lee to Rasikon, 08/12/12) covered all the points raised by the complainant, including the fact that 45 CARES settlers had been paid for their land. Mr Lee noted that the company had no responsibility for the previous plantation workers (mainly migrants) who had been given 'gratuities' by the state government and had left the plantation.

The first petition from Oyama was followed by a second, relating to a different group of plantations bought by Wilmar: the infamous Obasanjo farms, two properties acquired in 2002 without local consultation by former President Obasanjo, to

208 Although there was some disquiet from the Plantation Owners Forum when Cussons began importing CPO from Malaysia and Indonesia. However, it was realized that the large investment in planting by Wilmar would eventually provide the necessary raw materials.

which in 2003 he had added a third, Kwa Falls, which had long been government land. It was claimed that those lands encroached on part of the Cross River National Park and the Ekinta Forest Reserve, the lands of which had not been 'dereserved' so the estates were illegal (Oyama [RRDC] to Rasikon [RSPO] 06/02/13). This caused some surprise at the RSPO, as it had nothing to do with the 'New Planting Procedure', which was the point of the first complaint regarding Ibiae. The response from Wilmar explained that the properties were far apart (a map was appended); if the second complaint was to be considered, Wilmar requested that it be taken separately from Ibiae (Siburat to Krishnan 18/02/13).

Siburat's letter also contained an attachment of a meeting of the local Privatisation Committee (15/01/13) attended by Oyama in which his petition was ridiculed by the members, including representatives from the landlord communities near the estate. Copies of the original call for tenders for the estate, the deed of conveyance and receipts for payments from the four nearby landlord communities were also attached. Schoneveld noted that the Cross River government had earlier invited all thirteen councils of chiefs to consider the privatization of the various estates to Wilmar. The company had assured them that it would provide access to clean water and electricity and contribute to schools and hospitals, which overcame their initial doubts (Schoneveld 2014, 156).

As far as the RSPO was concerned, the only plantation which was a new development and on which stakeholders were invited to submit comments (under the RSPO procedures for new plantings) was the balance of the Ibiae Estate that had not previously been planted with oil palm. Biase Plantations Ltd[209] had to provide a summary report of planning and management (RSPO 2012a), a summary report of assessments (RSPO 2012b) and an audit confirming that the social impact assessment (SIA) and high conservation value (HCV) reports had been carried out in compliance with the RSPO rules for new planting (SGS 2012). The assessments made to the RSPO by Proforest, the group responsible, were comprehensive in their physical coverage of the area (HCV)[210] and their attempts to interview a large number of stakeholders (SIA) to address the question of "free, prior and informed consent". Local people did voice fears about the arrival of the plantation, with its likely impacts on biodiversity, forest products collection and water supply. However, they were also pleased that employment would probably be available and asked that local people, not outsiders, be employed. The lack of attention by Proforest to the fate of those outsiders – the migrant population resident on the estate – was one shortcoming of the analysis.

After receiving extensive documentation, the RSPO gave Wilmar a mild rebuke over the transparency issue and asked it to provide a Nigerian lawyer to check that the environmental regulations were legally complied with. The company was instructed to cease work until those requirements were met (Krishnan to Siburat 14/05/13). An impartial lawyer was duly selected and the legal opinion received by the RSPO on 27/08/13 was in Wilmar's favor, including the interim EIA and their relations with the local landlord communities. They were therefore permitted to resume work on the Ibiae estate from October 2013 and the case was closed.[211]

Schoneveld suggested possible cooptation of state government officers by Wilmar (some officials were employed by the company as 'consultants'); cooptation and perhaps intimidation of the local chiefs by the Cross River authorities and a generally uncritical attitude of the latter towards the company (Schoneveld 2014, 157). The political background was obviously important: the Cross River State had suffered economically from the loss of many of its crude oil resources when the Bakassi Peninsula was transferred to Cameroon in 2008, and further loss of oil wells to the next state, Akwa Ibom, in 2012. Unemployment was high and the arrival of Wilmar was welcomed with enthusiasm, as it meant jobs (Okwe 2012). The President, Goodluck Jonathan inaugurated the project in November 2012, describing it as "Nigeria's great leap into return to oil palm production and processing" (Osagie 2013a). While international

209 Wilmar's name for this new subsidiary

210 It was noted that a wooded area indicated on the Ibiae plantation plan should be left as forest to protect local water supplies (RSPO 2012b)

211 The second complaint was not addressed as it did not fall under the 'new planting' regulations.

NGOs such as the Forest Peoples Programme, Friends of the Earth and the World Rainforest Movement have run articles in support of the RRDC and its complaints against Wilmar,[212] the local press has been much more favorable to the company, including stories of employment of local women in the Ibiae oil palm nurseries (Osagie 2013a) and the progress of the Calaro Estate, with employment of 740 young people and production to begin in 2016 (*Daily Independent* 2014).

The second complaint had incited protests from the German NGO Save Wildlife, operating across the border in Cameroon in the Korup National Park (*Save Wildlife* 2013). From Schoneveld's map it seems clear that one of the Obasanjo properties (now called Oban) is indeed inside the national park, while another (Ibad) is part of the forest reserve.

Wilmar's declaration on 5 December 2013 of "no deforestation, no peat, no exploitation" has been taken up by local people in the Ekinta Forest Reserve, who are asking for the return of their 10,000 ha of land, which they say they had given to the government for conservation purposes, only to see it handed over to President Obasanjo for an oil palm estate (without consultation and in secrecy) and subsequently bought by Wilmar. The villagers, assisted by the RRDC, are asking for some kind of partnership with Wilmar, but they want it to be their plantation, and they need the government to provide them with an area of equal size where they can farm (GRAIN 2013). It is clear that RRDC's second complaint about Wilmar's activities has not gone away.

In a report in August 2013, the general manager of 'PZ Wilmar Joint Venture' discussed a plan for smallholder outgrowers which the estate is keen to implement "to enhance local capacity through the transfer of world class technical skills to local farmers" (Kandi 2013). They wish to promote a smallholder project under the existing Cross River Agriculture and Rural Empowerment Scheme (CARES). No details have so far been provided as to how those smallholders would be funded and whether they would also receive leases. Given the Cross River government's negative attitude to their previous CARES project (which could hardly be considered successful), there could be some problems there. Wilmar was advised by the Plantation Owners' Forum to begin "accelerated small farmer schemes in the short to medium term" (POFON 2013a) but this will need careful organization.

The Presco plantation has operated an outgrowers' scheme since 2007 in collaboration with the Edo State government. The smallholders prepare their land, while Presco supplies planting materials (*tenera* seedlings), farm inputs such as fertilizer and cover crops, together with technical assistance, using a subsidy from the Edo State government (*Presco News* 2008, 2014; *AllAfrica* 2013). The FFB harvest is sold to Presco as inputs for its milling and refining processes. One commentator noted that the outgrower scheme had brought "a harmonious relationship between Presco and its host community in contrast to its peer Okomu Oil which has experienced leakages due to theft, in addition to significant frictions with its host community"(ARM 2012).[213]

One problem with the management of the Okomu Oil Palm plantation had been the installation of contractors to manage the casual "day laborers", which reduced their wages and relieved the management of any responsibilities toward their health care or social security. General relationships with the workers were therefore strained and there was no attempt to involve locals as smallholders, although the plantation was doing well economically (von Hellermann 2010, 273).[214] Subsequently there were allegations that the company was operating illegally, owed tax to Edo State and dividends to shareholders and had subjected host communities and workers to intimidation. These allegations were denied by the chairman of the board of directors, who admitted that there had been kidnap attempts and robberies from the estate. He saw lack of land as hindering

212 Forest Peoples Programme 2012, GRAIN 2013, Milieudefensie 2013, WRM 2014, Friends of the Earth International 2014

213 Von Hellermann, who lived in Udo town near the Okomu plantation in 2001–3 and again in 2006, found that the expatriate management of the estate had become very involved in local politics. After 2006, when the 'youth', especially Ijaw elements became dominant in the town there were attempted kidnappings of expatriate staff, leading to the stationing of soldiers on the plantation.

214 According to Dada (2007, 27) Okumu once had a smallholder programme, but this has apparently been discontinued.

the future development of the plantation and remarked that the land was held in small portions by the different communities. He observed: "We need to aggregate those lands and increase the size of the estate" (nigeriadailynews.com 2011). This statement appeared to have been followed by more direct action, with two complaints in March and April 2014, claiming encroachment on community land, outright destruction of three villages by heavy machinery from the plantation and threatened destruction of a fourth (; WRM Bulletin 199 2014).

Community relationships on Risonpalm estate seemed to be equally difficult. There had been a few attempts to rehabilitate this large plantation, which had 3000 workers in 1975. It had been abandoned in 1999 due to a crisis between the management and workers over welfare. Subsequently it became overgrown by weeds and much fruit was stolen "by some youths in the host community" and sold to local palm mill owners (nigeriabusinessguide 2013). In 2003, action was taken to repair the damage, to restore both production and payment of salaries and to improve community relationships (Yornamue 2003). But again there seemed to be problems, resulting in a further abandonment in 2009.

SIAT finally took over the management in 2011, leasing the estate in a public/private partnership with the Rivers State government. Strengthening the relationship with the 20 host communities, repairing roads and providing employment were obvious priorities, as well as quickly restoring the mill which had been broken down (*Presco News* 2013). Plans were also in train to set up an outgrowers scheme similar to that at Presco (thetidenewsonline.com 2014b).

Yet under the new management, some former workers were "retrenched" and have subsequently been demanding "back pay" of 40 years' worth of salaries and gratuities from the Rivers State government and from SIAT. The Rivers State Commissioner for Agriculture, noting that they had been paid 17 months' salary, was scathing: "We do not owe anybody, what we suppose to give them? Today, people are protesting and agitating for entitlements even when they knew there were no workers at the company when we met it…they all abandoned the company…"(nigeriabusinessguide 2014). However, more protests were held in April (Azubuike 2014) and in June the former workers were threatening to take over the estate, accusing the state government of not honouring promises made to them 3 years earlier (thetidenewsonline.com 2014a).

Given these precedents, a company such as Wilmar will need to tread carefully as it moves to work on its new investments. Wilmar has so far felled all the old and unproductive palms on its new properties and has transplanted thousands of high quality seedlings to replace them, which the company claims should provide yields of up to 21 t of FFB in contrast to the 5 t which the old palms were yielding. A training school in plantation management, a clinic and public primary school have been established, with the focus mainly on the Calaro Estate, where the company is planting out 1400 ha (*Daily Independent* 2014). They have also employed many locals and claim they are working hard to protect the interest of the host communities (Kandi 2013). However, the presence of the company and its technology will have a large impact on Cross River State and the company is likely to experience unforeseen problems.

7.4 Initiatives towards more sustainable and inclusive oil palm production

At the beginning of the current administration of President Jonathan, agriculture was decentralised to the states. This was seen as a logical move, given that the states also controlled access to land and were more able to plan for the latest government program, the Agricultural Transformation Agenda (ATA). At the 19th Nigerian Economic Summit (September 2013), five state governors reported progress, among them Governor Imoke of Cross River State. He stated that Cross River was transforming agriculture "from a plantation economy to a complete agricultural value chain" ([NESG] [FMARD] [NPC] 2013, 58).

This attitude of the governor was reinforced back in his home state at a ceremony he attended where an aspiring oil palm company (Dansa) distributed 80,000 improved oil palm seedlings to local communities. "I am here because Dansa has demonstrated a commitment to backward integration and holistic development of the environment and economy of the community

where it is operating. If it was just about plantation, I would not have come.' The 10,000 ha development (due to employ 11,000 people when it is fully operational) will not only have its own mill, but also ecotourist facilities and a flora and fauna management regime "that equates with global environmental best practices" (Lydia 2014). Given its location within the Cross River National Park, this is a sensible arrangement and one which may enable more protection of the endangered wildlife in the area. Elizabeth Greengrass, in her survey of chimpanzees in Southwest Nigeria, recommended more tourist facilities for the Okomu National Park, noting that "the popularity of a protected area is often enough to strengthen the morale and organizational ability of the law enforcement team" with revenue from tourism partly earmarked for conservation activities (Greengrass 2006, 47).

Also in Edo State, the Ologbo Forest Reserve has partly been taken over for oil palm development by the Presco Plantation Company, but part remains in what has been termed "a sustainable integrated project for conservation and oil palm production". In this new plan, termed 'Green Ologbo', 61% pf the 11,467 ha will be planted to oil palm, the remaining 39% will be conserved as 'biodiversity plots' in accordance with RSPO principles on HCV forests (*prosharing.com* 2014). Greengrass noted that if protected, "Ologbo might represent the only sizeable area of swamp and swamp forest under effective protection in southwestern Nigeria" (Greengrass 2006, 47).

In planning for Ologbo, much detailed information had to be collected before decisions were made concerning the boundaries of the two zones, the 'legitimacy' and eligibility of surrounding villagers for compensation or outgrower contracts (about 800), who might be eligible for employment (about 1500 jobs) and which groups would have to vacate the lands (notably taungya farmers, among others). In March 2013 the Edo State council passed a resolution to urgently re-locate the 'tungya farmers', as they were supposed to leave a few months later after harvesting their crops and all had farming permits (*edostate.gov.ng* 2013). Lopez, who completed a thesis for CIRAD on the impact of the plantation, estimated the extremely mixed surrounding population to number around 10,000 (Lopez 2005). She suggested that Presco must be very prudent in its actions as the chances of conflict were high. It was a situation similar to that of the Okomu forest reserve and Okumu estate and Wilmar with its Ibiae plantation, a further example of the almost intractable problem remarked on by Schoneveld (2014, 148) when plantations were established in an area with both conservation needs and a large migrant population. At least Presco took time to commission various studies of the area and hold meetings with the communities concerned. It has partnered with the Netherlands DOEN Foundation to co-fund the project. The deliberate decision to conserve and protect a section of the company's legal concession has come as a new initiative for Nigeria.

Presco seems to be positioning itself as a 'model' company, at least in terms of sustainability. All organic waste from its mill is recycled as fertilizer or as fuel to power the turbines (75% green power). It tries to eliminate the use of pesticides by constant supervision and pre-emptive reaction, "conserving the natural predator-prey cycle". Effluents are digested in retention ponds and eventually returned to the plantation as fertilizer. The company sees the Green Ologbo project as having two complementary lines: "Issues related to new development; and issues relating to sustainable management of existing plantations" (*presco-plc.com/environment* n.d.).

The fact that Presco's decision relating to Green Ologbo was taken in recognition of RSPO principles and criteria is also new. Presco's parent company, SIAT, is a longstanding member of the RSPO, but until the arrival of Wilmar, Nigeria had no local members. However, in recognition of the fact that from 2015 companies like Unilever have threatened not to handle palm oil from suppliers not RSPO-certified, a committee to work on the National Interpretation of RSPO Principles and Criteria was recently formed, with Presco as chair and PZ Cussons (Wilmar's partner) vice-chair (*Agronigeria*, 2014), co-ordinated by the Plantation Owners' Forum of Nigeria (POFON). Proforest (UK) and Solidaridad (West Africa) have been assisting, with their 'RSPO Africa Roadshow', to explain the aims of the RSPO and make people aware of international best practice, particularly in relation to no clearing of primary forests or HCV areas, minimising the environmental footprints of plantations and respecting the basic rights of all elements of the communities (*Businessday* 2013).

Announcing the inauguration of Wilmar's oil palm plantations, Cross River State. (Photo by George Schoneveld)

This may seem premature for Nigeria, given its present shortage of CPO, the high cost of local production, and the continuing predominance of palm oil sourced from 'wild groves'. The government's aim appears to be to move as quickly as possible to a position of sufficiency and then begin to export. A representative from the Ministry of Agriculture noted at the inauguration meeting that "the entire RSPO process is in consonance with the Agricultural Transformation Agenda of the Jonathan administration". He said that the Government was keen on the issue of certification of agricultural commodities, so would be very supportive (Lydia 2014). These comments show a lack of appreciation of the difficulties which lie ahead.

The present strategy seems to be mainly to distribute *tenera* seeds, both to plantations and small growers. That is only a first step, however, especially for the smallholders. Provided that they have the land, they will need financing until the trees are bearing (at least 3 years); they will also need technical advice and extension. Presumably the hope is that such services will be supplied by the more prosperous estates, but these are so far few in number. In 2003 the Tenth Nigerian Economic Summit advocated the adoption of a Nucleus Estate Initiative, which was visualised as "weaving small farmers around big industrial firms/farmers, which provide (a) market for their produce at agreed/market prices and enhance their access to input(s), technology and market(s), as well as other monetized and non-monetized incentives" (Ijewere 2004). Advantages included reduction of rural-urban migration, employment generation and poverty reduction, as well as making farming and agribusiness more attractive to youth. Although existing outgrower schemes were listed in industries such as rubber, cocoa and cotton, only two oil palm growers were mentioned: Presco and Risonpalm (Ijewere 2004). Ten years later, they remain the only two currently providing facilities for oil palm outgrowers.

Given the large local market for 'red palm oil' sourced via the traditional groves, it is probably sensible (though not particularly 'inclusive') to begin with the estates and small farmers outside the traditional system and build back the industry from that point. The estates are small

in size,[215] which is not a bad thing, given the competition for land among the very large rural population. Whatever strategies are attempted, the transformation of the industry and the implementation of RSPO principles are likely to be slow and difficult.

7.5 Conclusion

In this chapter, I have outlined the irregular progress of oil palm development in Nigeria. This has been necessary in order to understand the present scene, as Nigeria's present oil palm landscapes are still very much reflective of past traumas. Land still seems to lie at the core of the present problems, a major conclusion of the 2013 Nigerian Economic Summit being that "it is imperative to review the land tenure system to enhance land availability for agriculture". Yet the mechanics of such a review appear almost impossible to contemplate. The attempts to transform the system using a "value chain" approach, considering the processing as well as the production of the crop is obviously essential, given the different and very large demands of both the traditional and commercial systems, as well as the high levels of poverty among rural dwellers. Many government programs have been attempted over the years and most have failed, but there is progress, despite the impatience of youth and the continuing threats of violence.

Apart from the historical record, there is more empirical information in the PIND reports, the detailed analyses of Schoneveld for the Cross River estates and the correspondence between the RSPO, Wilmar and the RRDC. Other cases, such as the Okomu Estate, were eventually discovered after some more research, as the author attempted to construct a more balanced picture, which was not limited to Cross River and placed Wilmar in a wider perspective. The result has been a longer than usual country study.

The public policy debate has placed much attention on the current inadequate production levels and the difficulties caused by the imports of cheap CPO to service the existing food industries. The need for the plantations to include smallholders has been emphasised by both government and the plantation companies, together with the desirability of companies thinking toward a future in which Nigeria would be a palm oil exporter, thus seriously considering sustainability issues and the RSPO's principles and criteria. However, the country is still poverty stricken, with much catching up to do in terms of infrastructure and the backward conditions afflicting much of the industry.

The main knowledge gaps lie in up-to-date figures for production and areas at state level. It would also be useful to commission an in-depth study of the nonindustrial section of the industry, similar to that carried out for Cameroon (Nkongho et al. 2014a, b).

215 Gbenga Oyebode (the chairman of Okumu Oil Palm Plc.) has compared the optimum size of oil palm plantations in neighboring countries: 250,000 ha in Ivory Coast, 100,000 ha in Cameroon, but the biggest plantation in Nigeria, just 30,000 ha. He was complaining that state governments had not created land banks for investors, 'constraining the expansion of the existing plantations' ([NESG] [FMARD] [NPC] 2013, 69)

8 Cameroon

8.1 The influence of oil palm expansion on economic development and land-use change

The oil palm (*Elaeis guineensis* Jacq.) is endemic to Cameroon as well as Nigeria. The area naturally suited to the tree (in which it may be found growing wild in secondary forests) occupies 53% of the country, mainly in the higher rainfall provinces of the Southwest, Littoral and South. Although 7.2 million ha is cultivable, only 26% of that is actually cultivated (Bakoume and Abdullah 2005). Most of the existing industrial palm oil mills are located close to the coast, which is the highest rainfall area, although, as in Nigeria, a marked dry season still exists. The seasonality of the climate affects palm production, with highest yields at the end of the dry season. This phenomenon is apparently because pollination can be disturbed by the heavy rains at the height of the wet season, while maturation of the fresh fruit bunches (FFB) (5.5 to 6.5 months after pollination) is stimulated by lighter rains as the dry season ends (Rafflegeau 2008, 18). Globally, the best oil palm yields occur when an annual average rainfall of at least 1800 mm is well distributed through the year; the longer and more marked the dry season, the more the yield declines.[216]

While Cameroon's current production puts it closer to meeting local demand than Nigeria, there is still some reliance on imports.[217] Figures from the Ministry of Agriculture and Rural Development (MINADER) suggest that total production may have reached 265,000 t in 2013[218] and they predict 300,000 t by 2015 and 450,000 t by 2020. However in 2013, there was still a deficit of around 85,000 t (Ngom *in* Nfor 2013). Overall yields have historically been low and seem to be decreasing, from 2.79 t CPO/ha in 2000 to 1.98 t CPO/ha in 2012 (*Oil World* 2013). Hoyle and Levang (2012) point out that proposed gains in production will focus mainly on increases in area, rather than yields, though replanting of aged trees, on the agenda of the industrial estates, will certainly help in yield restoration.

There is no definitive figure for the total area of oil palm in Cameroon, as the area under "village groves" or "non-industrial holdings" is only a rough estimate. Agro-industrial estate figures are more reliable and according to MINADER, increased from 58,860 ha in 2010 to 70,000 ha in 2013. Over the same period, the area of village groves is said to have risen from 135,000 ha to 140,000 ha. An overall estimate for 2013 is thus 210,000 ha (Hoyle and Levang 2012; Ngom 2013 *in* Ndjogui et al. 2014).

8.1.1 Brief historical background to the establishment of commercial oil palm estates

The German colonial authorities who occupied Cameroon between 1884 and 1916 were determined to exploit the range of tropical products available, including palm oil. They began by allocating large concessions to two companies to purchase commodities from local villagers. When such collection was slow to yield results, plantations were established in two favorable localities – the rich volcanic soils on the lower slopes of Mount Cameroon in the southwest and

216 A similar effect has been noted for Nigeria, with maximum possible yields in these countries lower than in Malaysia or Indonesia.

217 Cameroon also exports CPO to some neighbors, including Nigeria.

218 *Oil World* figures are more cautious, with an estimate of 255,000 t (*Oil World* 2013).

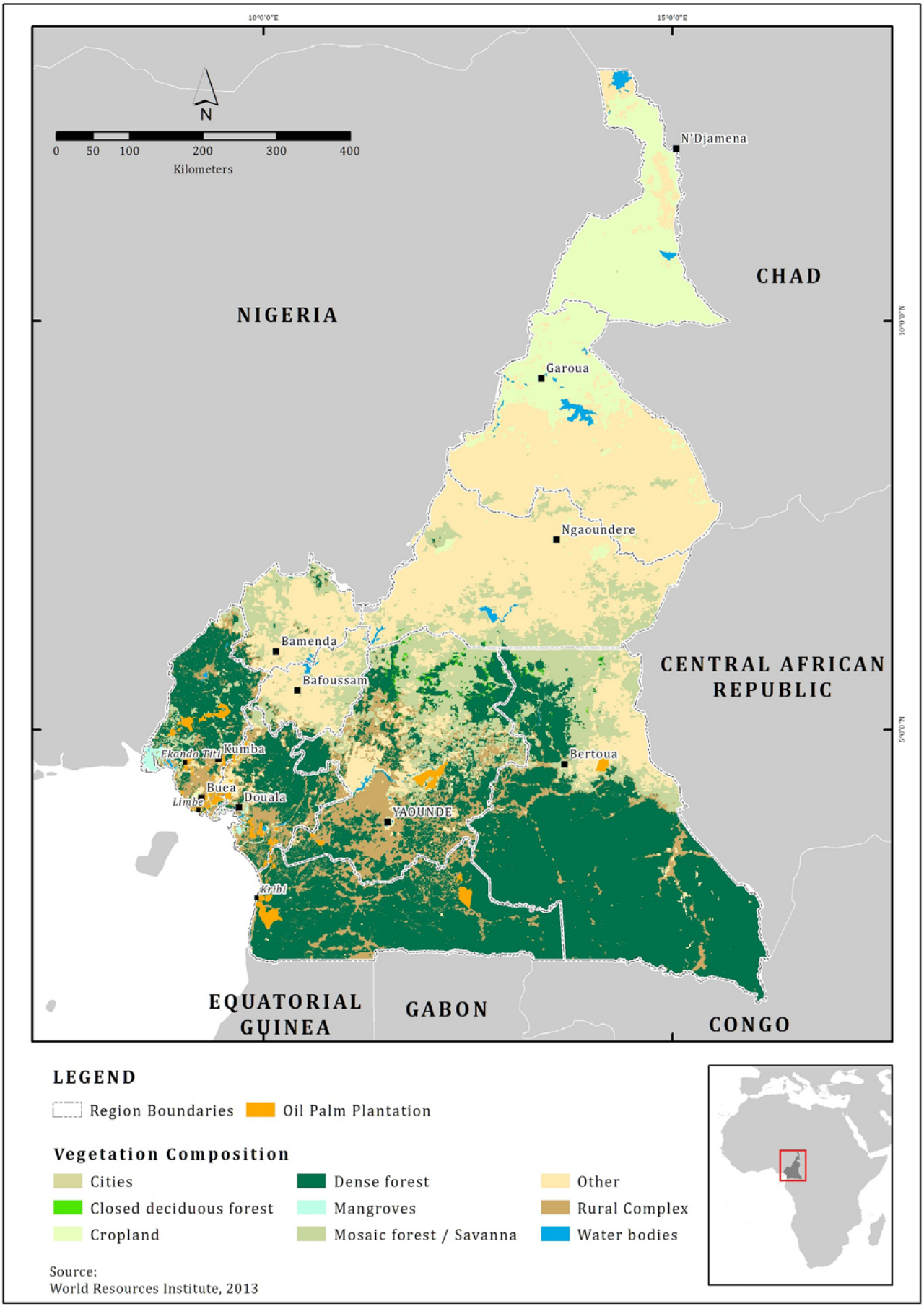

Figure 8. Cameroon: vegetation cover and oil palm plantation areas in the south of the country.

in the valley of the lower Sanaga near the south coast, not far from the port of Douala. The Mount Cameroon plantations began with local rubbers (substituted by *Hevea brasiliensis* in 1906) but also produced palm oil and cocoa (Rudin 1938; Gerber 2008). The first oil palm estate was said to have been established at Edea (lower Sanaga) in 1907 (Sokoudjou 1999),[219] but the large enterprise (Debundcha) near Mount Cameroon at Victoria/Limbe (now one of the CDC plantations) preceded it; it was established in 1898 and became productive in 1904 (Ndjogui et al. 2014, 14). As in Nigeria, palm kernel oil was historically a more important export commodity than palm oil (Ndjogui et al. 2014, 15 after Etoga 1971).

After the end of World War I, as Germany was stripped of her colonial possessions, Britain and France secured a joint mandate over Cameroon, with Britain administering the western section and France the larger eastern section. The plantations around Mount Cameroon were reoccupied by their German owners as the British sought to sell them, but other buyers were scarce. Four were, however, sold at auction in 1927 and were acquired by Unilever: these are known as Pamol[220] and are now government-owned. After the outbreak of World War II, the remaining German plantations were again confiscated. They were formed into a government company in 1947, the Cameroon Development Corporation (CDC) with 100,000 ha of "the best soil in the country" (Konings 1993).[221]

Meanwhile in francophone Cameroon, the German oil palm estates were sold to French interests during the 1920s. Most plantation development was in the vicinity of Edea and Moungo (Dibombari) but the old estate SPFS (established by the Germans in 1907) was also functioning. All suffered during the 1930s depression, although production from village groves continued, accounting for 65% of the total in 1935 (Ndjogui et al. 2014, 17). However, by the 1950s, the trees were becoming old and in need of replanting. Between 1951 and 1953, a new oil mill at Dibombari was constructed by the French Government. This region (the lower Moungo) was already well developed in artisanal oil palm and a system of "family plantations of selected palms", was introduced, both to counter the aging of the plantations and to push the local farmers to feed the new mill and contribute to increasing the export of palm oil. From 1952 to 1962, a colonial government organization, *Le Secteur de Modernisation des Palmeraies* (SMP), built a seed lot of improved varieties for village use and conducted demonstrations on growing oil palms on its own small estates. SMP also looked after preparation and planting of the new varieties on village lands and absorbed costs for the first 5 years until the plants were bearing fruit. Between 1952 and 1962, 1191 ha were developed, but unfortunately the production was still insufficient to keep the mill operating and it closed in 1963 (Elong 2003).

After a series of riots and assassinations between 1956 and 1960, in 1961 francophone Cameroon was granted independence under a leader favored by France (Amadou Ahidjo) and in 1972 the English speaking part voted to join it.[222] A rubber growing estate, Dizangue, was in 1962 transformed to a property known as SAFACAM, planting oil palm and rubber.

Soon after Cameroon's independence, it became clear that the Government of President Ahidjo[223] was keen to promote large-scale industrial plantations, to establish a few protected capital-intensive firms to propel the economy into the international arena.[224] Under the Green Revolution policy between 1971 and 1981, and with World Bank assistance, 60% of funds reserved for agriculture were devoted to developing a new

219 This old plantation is now part of the modern estate *Societe des Palmeraies de la Ferme Suisse* (SPFS). Bakoume and Abdullah give its foundation date as 1910 (Bakoume and Abdullah 2005).

220 Originally linked to Pamol in Calabar,Nigeria. Of the two Pamol plantations growing oil palm in SW Cameroon, Ndian was developed during the 1930s, but Lobe was a banana property until the 1950s. There is also one rubber estate (Ndjogui et al. 2014, 16, Pamol Plantations Plc n.d.).

221 A potential smallholder arrangement in 1946–7, which would have included the original landholders, the Bakweri, was rejected by the latter, who wanted all the land returned (Ndjogui et al. 2014, 17).

222 The anglophone part of Cameroon (9% of the area and 25% of the population) has always felt it has been given unequal status by the francophone government in Yaounde, partly because some of the anglophone politicians originally voted to join Nigeria (Konings and Nyamnjoh 1997).

223 President Ahidjo from 1960-1982, President Biya from 1982 to the present.

224 Konings (1993) stated that the Cameroonian elite "positively favors capitalist farming" and considered traditional agriculture to be "backward".

government entity, Socapalm with five plantations[225] and revitalizing the multiproduct CDC. Pamol, the third large entity, was not included, being privately owned by Unilever and more remote. According to Konings (1998) Pamol was the "lifeline" of the far southwest, promoting the development of that region. In the wet season when the roads became impassable, Pamol would export its CPO to Nigeria by sea. Unilever began experimenting with high quality *tenera* seedlings in the 1960s and introduced a unique smallholder scheme, based largely on cooperatives of retired employees and local elites (Konings 1997; 1998; fieldwork, February 2011).

In the next section, I will discuss in more detail the smallholder development projects of 1977–91, which were overtaken by a financial crisis and the failure of the financing agency, FONADER. The Structural Adjustment policy that followed produced a devaluation of the currency and a rise palm oil prices, tempting more middle-class urban dwellers and elites into the industry. Equally important was the spread of small processing plants, so that farmers had an alternative to the estate mills.

8.1.2 Recent events

The rise in palm oil prices from about 2006 prompted the plantations to plan expansions and in the case of Socapalm, to begin secretly making biodiesel for export.[226] All the plantation companies had land banks that had remained undeveloped, though in most cases, the lands were occupied by settlers. Socapalm began expanding in its already developed areas, Mbambou, Dibombari and Kienke, to the consternation of existing villagers. In Mbambou, an extension of 7500 ha, together with a new mill brought many complaints, while in Dibombari chiefs asked unsuccessfully for small areas to be exempted and demanded compensation for lost lands (Matho 2012). Both the CDC and Pamol planned to move some of their oil palm activities further west, CDC to the Boa Plain and Pamol to the Bakassi Peninsula, the latter area having been handed over reluctantly to Cameroon by Nigeria in 2008.[227] One survey suggested that almost all of the population of the Boa Plain was living on CDC land, prompting CDC to offer a smallholder program to all 13 villages (Binde 2009). CDC suggested that the new planting on the Boa Plain, together with replanting of older areas, would lift its yields of FFB from 7 t/ha to 15–20 t/ha (Cameroon Development Corporation 2012).

The Bakassi Peninsula remained insecure for Cameroonians until 2013, but now the government is pushing to establish a Cameroonian presence there, despite continuing difficulties with lack of fresh water, inadequate electricity supply and a difficult road connection with Mundemba (Biy Nifor 2014).[228] Pamol has been provided with FCFA 1 Billion to establish oil palm in Bakassi, suggesting that the industry would employ 5,000 workers (Biy Nifor 2014). Pamol is also looking at other locations within its land bank of 30,000 ha in the Mundemba–Ekondo Titi region, while CDC has identified a quite distant area in the northwest, Donga Mantung northeast of Bamenda, as a possible site for an oil mill. This area is on the northern boundary of land suitable for oil palm (*Cameroon Tribune* 2012).

As these developments were taking place in the industrial sector, various projects, usually with international assistance, were aimed at improvements to the non-industrial sector. These included Pepipalm (provision of more nurseries of improved varieties) supported by the EU (2000–03); PACA the World Bank's USD 60m "agricultural competitiveness" project in which oil palm was one of the six targeted areas for intervention (launched 2009 in the francophone area); and Poverty Reduction through Productive Activities supported by UNIDO (launched 2010 in Nigeria and Cameroon). This last project included four distribution centres for improved seeds, including one in the east, which had previously lacked access to such materials.

225 The final Socapalm plantation to be developed, Kienke, near Kribi, lay much further south than the others, in an area with an equatorial climate and a double rainfall maximum, although even there some moisture deficits could occur for oil palm in the driest months (World Bank 1982). This plantation was also supposed to have smallholders, but has resisted, even though local Bantu villagers would have liked to receive some assistance from the plantation, which is gradually squeezing them off their land as it expands (Gerber 2008).

226 This was not popular, especially as the increased international production of palm oil to meet demands for biodiesel was blamed for the rise in food prices in 2008. Cameroon experienced serious food riots, with many deaths during that year.

227 A main reason for the move to more isolated areas has been the high levels of theft from the more accessible plantations.

228 Having at last secured some government money, Pamol management is also planning to replant its old trees, which were yielding as little as 1 t FFB/ha, not having been fertilized since 1986 (fieldwork 2011; Pamol Plantations Plc n.d.).

8.2 The role of policies and corporate strategies in shaping oil palm development

Konings (1993) suggested that under pressure from the World Bank and other international financiers, in 1977/78 the government *ordered* the two parastatal agro-industrial companies (Socapalm and CDC) to each develop 2000 ha of smallholder oil palm and rubber, while a further request was made of the rubber estate Hevecam in 1979 to develop trials of 250 ha of smallholder rubber. The government had previously devoted little attention to setting up such schemes, due to "the political elite's persistent anti-peasant bias and its vested interests in plantation production" Konings (1993, 218).

The development of "tied" village smallholdings of the first Palm Oil Plan (1977–91) was designed to provide more fruit for estate mills and to introduce farmers in selected villages to improved seeds. The estate/smallholder arrangements, different for each company, were funded by the rural bank known as FONADER, but credit repayment was a problem.[229] FONADER was considered very inefficient by the World Bank, which approved the handling of loan repayments directly by the plantations. Credit recovery by Socapalm averaged over 70%, but for the CDC it was less than 50%, largely due to wide dispersal of smallholders on physically unsuitable land, together with some 'wilful delinquency' (World Bank 1991, 7). The doubtful value of these smallholdings was emphasised by Elong (2003)[230] and Konings (1986, 1993). Some smallholding villages remain, in Dibombari and Eseka (Socapalm)[231] and in Pamol's grower cooperatives. All now have a majority of elite growers.

From 1986 to 1994, Cameroon was in financial crisis, largely because of the high value of the local currency compared with the US dollar. Oil palm production had increased very markedly, especially from the state-subsidized parastatals, Socapalm and CDC, exceeding domestic demand by 40%. This resulted in considerable competition among the agro-industrial firms, which were forced to attempt to sell their expensive product on the world market, leading to losses against cheaper Malaysian oil (Konings 1998). FONADER closed in 1991, removing the sources of credit; with few options, farmers sought cheaper, poor quality seeds. The IMF intervened in 1994, the currency was devalued and oil palm prices rose. The IMF recommended that the palm oil estates be privatized and this was attempted. Pamol was in liquidation from 1987, but continued to operate under an administrator. It was eventually bought by creditors in 1996, becoming partly owned by the state (54%), with Unilever until recently retaining 10%. CDC, a huge enterprise, produced tea, rubber and bananas as well as palm oil. While the tea estates were sold and the government began joint production of bananas with American firm Del Monte, the rubber and oil palm plantations remained in government hands. Socapalm was bought in 2000 by the French firm Bolloré and that company also acquired the small private estates Safacam and Swiss Farm (SPFS).

The rise in oil palm prices spawned a new independent middle class of smallholders. Some were local elites, others were urban in origin, with no oil palm experience, but they bought their own small mills and began acquiring land, often in the estate villages (Hirsch 2000). Estate trees tended to be old and there was little incentive for the companies to replant. By 2002 smallholder

229 Ndjogui et al. 2014: 29–32 provide a more detailed discussion of Fonader and its role. They mention that smallholders could have their lands seized if they did not comply with all the regulations imposed by their 27-year contracts. However, there was no sanction applied if the plantations did not keep to their side of the bargain.

230 Elong wrote of "palm oil wars" in the francophone villages such as Dibombari and there were also problems at CDC, as related by Konings (1993). The main difficulties seemed to be the small amount of remuneration received by farmers and delays by the companies in paying for farmers' fruit. The World Bank, discussing the CDC (Camdev II) project, stated that 'Accounts are badly kept and it is at present difficult to trace the amounts of loans due to the farmers' (World Bank 1982, 9).

231 The Eseka Plantation (2600 ha; 900 farmers) was given up to the farmers by Socapalm after privatisation when they continually failed to repay their credit, though the company retained the mill to receive their fruit. The trees by this time were very old, averaging 32 years, although such an age structure was not uncommon among the Socapalm estates (PACA 2009, 54). These farmers are now gradually replanting, funded by a German bank (LeMaitre 2007), but up to 90% of holdings have been bought by elites (Ndjogui et al. 2014 quoting Mbouhnoum 2009; fieldwork 2011).

Cooking oil palm fruit at a traditional mill, Sanaga Maritime, Littoral Division. (Photo by Lesley Potter)

production was almost twice that of the estates (Cheyns and Rafflegeau 2005), but the total now could not meet demand, as both population and consumption had increased. It was expected that any increased production would come from smallholders (Bakoume and Abdullah 2005).

A second oil palm project was started by MINADER (Ministry of Agriculture and Rural Development) in 2001, aiming to increase the planted area by at least 5000 ha per year, to reach a production level of 250,000 t by 2010. There were new contracts for village farmers and more nurseries of selected seedlings, assisted by CIRAD (Montfort 2005) and the EU.

In 2009, the government announced Cameroon Vision 2035, a plan to make Cameroon a middle-income country over the next generation, alleviating poverty, promoting industrialization and national unity. In agriculture, the plan envisaged increased productivity through intensification and 'the dominance of large and medium-scale undertakings' (*Republic of Cameroon* 2009, x).

In the same year the attempts at 'land grabbing' began, tempting MINADER to welcome these wealthy corporations, but the Ministry has been slow to develop a clear policy for controlling or benefitting from their activities. Hoyle and Levang noted the interest of investors, especially from Asia, in trying to secure forested land in the oil palm zone.[232] They drew attention to the contract signed with one new company (left unidentified) in which

232 They listed: Sithe Global, owned by New York-based Herakles Farms; Malaysian Sime Darby; the Indian-owned Siva Group/Biopalm Energy and Singaporean Good Hope Asia Holdings as all planning to develop large land areas in Cameroon. Sime Darby, once said to be interested in 600,000 ha, has now withdrawn, citing problems with their Liberia holdings (Feintrenie 2014, 1584). The Siva Group/Biopalm Energy, planning to set up on a greenfield site of 200,000 ha in the Ocean Department of the South has brought unfavorable comment, especially for its likely impact on Bagyeli (indigenous pygmy) villages (Forest Peoples' Programme 2011; Freudenthal et al. 2012). Two other possible introductions were noted by Hoyle and Levang (2012): they were Malaysian companies PALMCO (100,000ha) and Smart Holding (25,000ha). These companies were mentioned during a workshop in February 2014 as being 'under negotiation'. However, at the same meeting a representative of the Agriculture Ministry affirmed (p16) that no future agro-industrial development should be larger than 20,000ha and it would have to develop a 'partnership' arrangement with small farmers (WWF, MINADER and Proforest 2014).

the state was set to receive very low amounts of land tax compared to other activities, such as forestry[233].

The most developed of the new 'land grabbing' attempts is the American-owned Herakles Farms project, which will be examined as a case study to exemplify government inadequacy in dealing with this new challenge.

8.2.1 Herakles Farms - Sithe Global Sustainable Oils (Cameroon) Limited

The project, located in the South West Region between a number of important protected areas, including the richly biodiverse Korup National Park straddling the Nigerian border, has been heavily criticized from many sources, both local and international. In February 2012 the company, then a member of the RSPO, submitted an application to that agency under the New Planting Procedures (NPP), which was open to comment for 30 days. Many comments followed, from WWF Cameroon, SAVE Wildlife Conservation Fund, GIZ, the Centre for Environment and Development (CED) in Yaounde, Greenpeace and universities in Europe and the USA. The critics alleged that the development was in breach of national laws and regulations; that it was in a biodiversity hotspot and surrounded by protected forest; that clearing could disrupt migration routes of protected species; and that clearing could result in loss of water resources and farm lands of local communities. There was no suggestion that smallholder oil palm might be established or that compensation would be paid to villagers who lost land to the plantation.

In August 2012, Herakles Farms withdrew from the RSPO, claiming that the grievance process was holding back its operations (RSPO 2012c). However, the critiques have kept coming, with the topics now alleging bribery of local chiefs; misinformation about potential benefits; poor treatment of workers and failure to secure "free, prior and informed consent" (FPIC) from the communities. Evidence of a serious impact on local food production and available agricultural income is very clear from the work of Njonga et al. (2012). As the authors of the Forest Peoples' Programme (FPP) study concluded: "*There is a potential human rights and livelihood disaster in the making if these plans proceed*" (Nelson and Lomax 2013, 20). A subset of these critiques in chronological order run from September 2011 to June 2014: (Butler and Hance 2011; Nguiffo and Schwartz 2012; Greenpeace 2012; Ntungwe Ngalame (Reuters Special Report 2012); Oakland Institute and Greenpeace 2012; Robinson (National Geographic) 2012; Greenpeace 2013a; Oakland Institute and Greenpeace 2013; Nelson and Lomax 2013; Agence Ecofin 2013b; Cultural Survival 2013; Achobang 2013a, b; Ndi 2014; Business in Cameroon 2013; Greenpeace 2014; GRAIN/Oakland Institute/World Rainforest Movement 2014; Ntungwe Ngalame (Reuters 2013).

Newspaper articles concerning the project were published in 2013 on 23 May, 26 May, 6 June, 8 June, 21 June, 9 July, 10 July as the company was alternately asked by the Cameroonian Government to halt its operations; to resume its operations; to downsize to 20,000 ha. In September 2013, it was hinted that Herakles Farms might sell off its nursery beds to Pamol, but this was denied (*Cultural Survival* 2013). Finally in November 2013, the company was awarded a "temporal concession" of 19,843 ha for 3 years by President Biya (Achobang 2013b). The original contract had been signed by the Minister of Economic Planning and Regional Development on 17 September 2009. It was discussed in detail and roundly castigated in Nguiffo and Schwartz (2012), but it seems it was not until June 2013 that the Minister of Agriculture and the Minister of Forests and Wildlife actually saw it and challenged some aspects. The Minister of Forests and Wildlife queried the clause stating that any timber cut on the property belonged to the company (legally it belongs to the government). He asked the company to stop cutting, then was apparently "leaned on" by somebody more senior, following pressure by the company on "high officials" (*Agence Ecofin* 2013b). Almost a year later Sithe Global was accused of setting up a 'shell' company ('Uniprovince') which was awarded a *vente de coupe* (sale of standing volume) to remove timber from the area. This violates Cameroonian timber regulations, which state that a *vente de coupe* must be awarded by competitive public auction. It appears that the Department of Forests and Wildlife

233 Nguiffo and Schwartz (2012) also make a detailed study of this contract (with Herakles Farms): they demonstrate that villages would receive very little of the available rents, according to the country's normal rent sharing arrangements – much less than a farmer makes per year from cultivating 1 ha of land.

colluded with Sithe Global to allow this timber to be sold (Greenpeace 2014).

It seems that the government now wants to nullify the original contract. 'If Herakles Farms does not agree to changes in the contract, the Government of Cameroon would have to prove either that the company is violating the terms of the contract or that the contract involved corruption – a potentially long and extremely costly process' (Agence Ecofin 2013b).

Schwartz et al. have suggested that there is much room for improvement of systems of managing resources, as there are multiple permit overlaps between forestry, mining and agriculture, with the needs of local people routinely ignored.[234] Government departments do not appear to share information about concessions, nor do they enter concession boundaries into the National Land Cadaster. All land concessions for agro-industrial plantations of more than 50 ha are supposed to be granted by presidential decree, not ministerial negotiation. Yet such concessions "are currently being granted by at least three different ministries using three different procedures" (Schwartz et al. 2012, 14).[235]

The authors observe that, "There appears to exist a profound naivety on the part of the Cameroonian Government regarding the international protection of investments, the contents of bilateral investment treaties and the resulting possibilities of expensive litigation, arbitration and settlements". They argue that land use planning is one of the most important policy issues facing the government "as it strives towards the goal of economic prominence by 2035" (Schwartz et al. 2012, 1415).

Hoyle and Levang (2012, 14) suggested that the development of palm oil investments should be halted until a "road map" leading to a new government policy on the expansion of oil palm production was agreed. The Ministry of Agriculture has announced that it will develop a plan for a sustainable, national oil palm development strategy, to be completed in 2014 (Gwinner, 2013)[236].

8.3 Socioeconomic outcomes from disparate business models in oil palm development

One of the government's anti-poverty strategies in its future planning continues to be a focus on large-scale farming in various regions "to achieve economies of scale and a substantial growth in production" (IFAD 2012). Despite the government's emphasis on large commercial enterprises, analyses undertaken in 2008–9 (with assistance from the World Bank and ILO) of the oil palm value chain threw up some interesting comparisons between the various business models, which were identified as

1. family farms (traditional groves);
2. larger commercial farms (the post-1994 "second generation smallholders");
3. large-scale industrial estates or agribusinesses, which may have some 'tied' smallholders.

Family farms (FAM) were characterized as yielding 8 t FFB/ha/yr in year 12. They grew mainly low-yielding *dura* trees, with some mulch but otherwise low inputs, low tree maintenance and predominantly family labor (130 days). They used small local processors, avoiding the high cost of transport to an industrial mill.

Commercial farms (COM) were larger, with more capital invested. Some used *tenera* seeds but others had trouble obtaining them; their average yields were 12 FFB/ha/yr. They used some fertilizer and mulch, no herbicides and mainly hired labor (145 days). Some used transport to get to an industrial mill, others preferred local processors. The study observed that the method of delivering FFB to an industrial mill had an important impact on

234 Herakles, for example (called SGSOC) overlaps both a mining and a forest concession (Schwartz et al. 2012, 8)

235 The Ministry of State Property, Surveys and Land Tenure [MINDCAF]; of Agriculture and Rural Development [MINADER]; of Economics, Planning and Regional Development [MINEPAT]

236 The Ministry of Agriculture, with WWF and Proforest organised a two-day workshop in February 2014, where delegates discussed the possibilities of improved partnerships between oil palm smallholders and agro-industrial firms as a means of securing sustainable development of the palm oil sector. One of the main problems identified was a lack of trust between smallholders and the agro-industrial estates. This workshop was followed by studies such as Hakizumwami (2014) on models for smallholder development. Deliberations are continuing.

profitability. The high cost of roadside transport leads independent farmers (COM) to deliver to a local mill, where the extraction rate is only 10–14% compared to 20–24% at an industrial mill, a significant drop in returns (World Bank 2008, 49).

Agribusinesses were divided into high or low, depending on their yields: AGI low-13t FFB/ha/yr or AGI high – 19t FFB/ha/yr. Both had industrial-type management, good quality *tenera* seeds, with tree maintenance and nearby access to an industrial mill. The low yielding businesses only used fertilizer on establishment, no herbicide and 150 days hired labor. High yielding businesses used correct fertilizer and herbicide and needed 130 days hired labor; the addition of herbicides was seen as a labor-saving technology.

Labor accounted for the majority of production costs in all systems and made the low-yield industrial estates (AGI-low) the most costly of the four systems per tonne of FFB. Family farms (FAM) were the least costly, especially as they used mainly family labor (their farms came in at half the cost of the AGI-low). In the high yield industrial estates (AGI-high), fertilizer and chemicals were also a large component of costs. The 2008 study observed:

> The data clearly show that FAM and COM farmers have an important strategic role to play as a source of competitiveness for Cameroon's palm oil sector. Investments that specifically help these farmers to improve their production and /or establish closer ties with a well-functioning industrial mill should therefore be accorded high priority in future development policy (World Bank 2008, 49).

It was also suggested that low yielding industrial estates[237] could be helped to high input production. "Investments that help struggling AGIs currently trapped at the low input level because of accumulated debt and /or other management problems should be a priority for the oil palm sector" (World Bank 2008, 50).

The ILO study provided more comparative data on these business models. While the industrial plantations need a labor force of 1 person per 4.5ha, village farms can employ 1 person per 1.5 ha (Lebailly and Tentchou 2009, 73). Although smallholder yields were low, there was some noticeable variability across the country. In the Southwest and Littoral Zones, yields reached 10–14 t FFB/ha, compared to the South and the Central Zones, which were below 6 t/ha. While the rainfall conditions were more favorable in the SW, the reasons for the low yields were seen to be more a result of the use of poor quality seeds and other inputs (inability to access or pay for *tenera*) and higher poverty levels among the people.

The *Cameroon Economic Update* (World Bank 2013) indicated that overall poverty in Cameroon (about 40%) has not changed much over the past decade, though there have been declines in urban areas. Poverty is more widespread in rural areas, especially in the dry, northern regions. The southern oil palm belt is relatively better off, partly because the two major cities (Yaounde and Douala) are also located in that region. The oil palm belt is quite dynamic, with a wide range of employment possibilities.

The ILO study on the employment value chain for palm oil describes the small-scale milling industry, with which there is "a veritable infatuation (*engouement*) in Cameroon, so that one can count hundreds of manual and motorized mills spread through the production zone" (LeBailly and Tentchou 2009, 11). The tendency of even middle-level operators to use the small mills has meant that some industrial mills are working well below capacity. In Dibombari, for example, fieldwork revealed that the plantation mill was only heavily used at the height of the season (February to April), when even the multitude of small mills could not cope with the harvest. The Pamol mill at Mundemba hardly worked between November and January, with much more fruit going to the artisanal mills.

New research has focused on the "nonindustrial palm oil sector", with fieldwork undertaken during 2011–2012 in four of the seven palm oil production basins originally carved out during FONADER-sponsored smallholder schemes, each basin lying within 30km of a large-scale industrial

237 Most recent figures for average yields of FFB per hectare among the large agro-industrial estates are as follows: private estates (SOCAPALM/SPFS/SAFACAM) 13.4t; government estates (CDC/PAMOL) 6.6t. While all yields are very low, the private estates owned by Bolloré have yields twice as high as the state-owned properties. It is concerning that these yields appear to have declined since the World Bank study published in 2008. (Source of figures: re-worked from Ngom et al 2014 in Hakizumwami 2014:9).

mill. The basins studied with their mills were Eseka (Socapalm), Dibombari (Socapalm), Muyuka (CDC) and Lobe/Mundemba (Pamol) (Nkongho et al. 2014a, 2014b).

The research provided statistics of the farmers involved and their methods of processing their FFB, sampling 131 artisanal mills and 200 individuals. The first of the studies (Nkongho et al. 2014a) concentrated on the milling process, to answer the question: Why do oil palm smallholders prefer to mill their own FFB irrespective of the low extraction rates of these artisanal mills? While six different mill types were identified, the most frequently used were the three cheapest and the least efficient.

Most important was the distinction between the prices and incomes received in the peak and low seasons by smallholders in the four sampled zones. It was clear that smallholders doing their own milling (or even using middlemen[238]) were much better off in the low season than if they used the estate mills (which had fixed prices), and even somewhat better off in the peak season. The incomes varied between the districts, being lower in the more remote areas of Eseka and Lobe and higher in the more central areas of Dibombari and Muyuka. The mills were often unhygienic and generally needed improvement, but their economic advantages were clear. Smallholders would generally mix their product, still sending some to the plantation mills, but only in the peak season when prices were at their lowest.

The second paper (Nkongho et al. 2014b) provides more information from the same survey, presenting data on first a typology of palm oil producers, distinguishing local villagers from migrants and identifying company workers and elites as separate groups. It was found that most palm oil producers were aged over 60, the highest number being former company workers. As might be expected, the elites recorded the highest education levels and the largest cultivated areas under palm, while the villagers scored lowest on both those measures. Fertilizer was applied irregularly at best, with the majority of growers outside the elite group not using any fertilizer. It was explained that inputs such as fertilizer and fungicides must be imported and are therefore expensive: there is no government subsidy. It is therefore not surprising that fungal diseases such as Ganoderma are common in some areas while overall yields tend to be low, varying from 7.0 to 8.4 t of FFB/ha/year. In general, the industrial sector provides little assistance to smallholders in the established areas as most of the latter have withdrawn from anything but seasonal use of estate mills. This kind of break between the two systems is largely a result of the alternative milling processes available. These were developed as a direct result of the unfortunate historical experiences of non-industrial producers during the difficult times of the 1980s and 1990s. As many village growers now use better quality seedlings (the highest cost of establishing a hectare of oil palm according to the survey), government encouragement of local fertilizer factories would also help in improving yields. The advanced age of most farmers (over 60) was identified as a problem, indicating the need for the establishment of an agricultural credit bank to make the industry more accessible to younger aspirants.

One of the problems with employment and the insecurity which accompanies the industry is its short term nature. In most of the village plantations, workers are paid by the task and seasonally (Le Bailly and Tentchou 2009, 75). The industrial estates tend to have few permanent employees with large numbers sub-contracted, for whom the estates take no responsibility, beyond providing minimal facilities. Socapalm's Kienke estate has been castigated for the extremely bad treatment of its labor force, many of who are migrants from poorer regions in the north (Ricq 2009; Ricq and Gerber 2010; Sherpa et al. 2010).[239]

238 The 'middlemen' are predominantly women

239 In 2010 the NGOs Sherpa, CED, FOCARFE and MISEREOR alleged that the French, Belgian, and Luxembourgian holding companies – Bolloré, Financière du Champ de Mars, SOCFINAL and Intercultures - which jointly control Socapalm's operations in Cameroon had breached OECD Guidelines by failing to take action to prevent SOCAPALM's negative impact on the environment, local communities and workers. They took four separate cases to the French NCP (National Contact Point), which were upheld. After 2 years Bolloré agreed to put pressure on Socapalm through an action plan to cover community dialogue, reduction of environmental nuisances (pollution), public services, local development, workers' rights and conditions, transparency and compensation of local communities for their loss of resources and lands. The action plan was to be adopted before September 2013. (Also see Agence Ecofin 2013). By March 2014, an independent body had been selected by Bolloré and Sherpa to monitor implementation of the action plan and to issue annual progress reports (Communiqué du Point de contact national Français 2014).

Echoing one suggestion prominent among observers of the Indonesian industry, Hoyle and Levang (2012, 12) argued that new plantations should be on land already deforested or degraded. However, that idea was criticized by local NGO activist, Samuel Nguiffo. 'Degraded natural forests are located next to villages, and are considered as traditional land and 'reserve' for the future expansion of communities' farmland' (*The Ecologist* 25th March 2011). Nguiffo went on to say "… we need to give the priority to regaining our food sovereignty over promoting land concessions to foreign companies". His words are echoed in March 2012 with an analysis by Adam Sneyd in *Africa Portal*, suggesting that while it is understandable to hone in on the threat posed by these investments to high conservation value forests and the shrinking of the permanent forest estate, "This focus should not overshadow the equally legitimate concerns about the possible impacts of new investments on the availability, accessibility and adequacy of food" (Sneyd 2012).

8.4 Initiatives towards more sustainable and inclusive oil palm production

The "family farms", often lying outside the collection zone of the large mills, have been shown as being low cost producers and high labor absorbers and may provide a more sustainable and inclusive model than either the "tied" smallholders or the big estates. On those farms, which were studied by Cheyns and Rafflegeau (2005) and Rodrigues et al. (2009), the focus is on diversification and reduced input costs. While the yield from the palm trees may be reduced, the emphasis is on the productivity of the farm as a whole and minimization of risks. Juvenile palms are intercropped with food crops such as plantain, cocoyam, peanut or cassava. Cassava is especially important near cities, where there is a ready urban market.[240] Farmers will sell some of their FFB to small-scale processors, use it when processed for their own consumption, or fell some of the palms for palm wine, the last strategy enabling young farmers without capital to get started.

A sophisticated analysis of 38 plots in traditional agroforestry systems within the rainforest zone of the southwest described the roughly 1 ha plots as permanently occupied (no fallow) in which three main perennials – cocoa, rubber or oil palm – were integrated with food crops and native trees. Of interest was the extremely packed nature of the immature plots, which continued, though somewhat reduced, when cocoa and oil palm trees were producing. Rubber trees tolerated much less competition at the producing stage. Oil palm plots had the lowest income when in the immature stage, but highest once they were producing. The main expenditure on inputs was purchase of *tenera* seedlings. The oil palm plots also had the highest proportion of income as self-consumption while the crop was immature, reiterating the importance of the associated food crops in sustaining the household during that period. The authors concluded that the farming systems could still be improved with the addition of nitrogen-fixing legumes, although the high density of plants kept weeds under control (Rodrigues et al. 2009).

These examples show ways in which oil palm may be combined with food production in a sustainable manner. They would fit the model of "agroecology" espoused by the UN Special Rapporteur on the right to food, Olivier De Schutter (2010) in his address to the Human Rights Council of the UN General Assembly.

While the RSPO initiatives promoting sustainable palm oil are just beginning in Cameroon, the organisers of a "roadshow" aimed at capacity building and awareness raising (Proforest 2013) were informed that the large companies were not engaged in implementing the RSPOs principles and criteria. The companies considered that there was no added value in certification because their markets were not demanding certified products.

The Chair of UNEXPALM (The Union of Smallholder Oil Palm Growers) explained that certification for small growers was not possible "mainly because palm growers are not getting any support, while their capacities are very limited" (Proforest 2013). Some of the recommendations

240 In our field studies (Mbongo 2011) we saw cassava being planted between the rows of palm (which were further apart than recommended to accommodate the intercropping) and were informed that the cultivation belonged to the farmer's wife, who also planted vegetables and maize. Almost all of these crops were consumed by the household, with only small amounts being sold. Bamenda people from the northwest who were hired as workers were also permitted to plant between the rows; in this case, the worker's wife had planted peanuts.

from the final plenary session of the "roadshow" were in support of smallholders. "Appropriate planning for lands suitable for oil palm plantations and limit or stop allotment of large concessions in favor of promotion of small growers". "Creation by the government of the enabling conditions for the establishment of effective partnership between small growers and large-scale companies; need to mobilize necessary financial and human resources to support small growers".

8.5 Conclusion

Cameroon possesses good environmental resources and a resourceful population. To date, it has been able to develop its palm oil industry to a reasonable level, largely led by smallholders. The government's desire to improve global competitiveness by concentrating on large or medium industrial enterprises and encouraging foreign corporations may lead to unbalanced and unsustainable outcomes if care is not taken to involve local communities and maintain food production.

Such issues continue to surface and were especially prominent in the debate over Herakles Farms, with large numbers of comments continuing to be published (mainly criticizing the project) between 2011 and the present. That issue was certainly prominent in the public policy debate and to some extent is still unresolved, as Herakles Farms is still present, despite having its workable area considerably reduced. It continues to cause problems, the most recent being the formation of a 'shell' company to remove and sell the timber from the estate.

In examining the pros and cons of oil palm expansion in Cameroon, Hoyle and Levang (2012) admit advantages, such as employment, revenue to the State, expansion of infrastructure, and under the right conditions, a "smallholder friendly" crop. However, they place more emphasis on the likely disadvantages, particularly environmental and social costs and the loss of state revenue for alternative developments.

As recommended by researchers, a detailed study of land use to prevent overlapping claims and a realistic appraisal of the options for increases in yields, rather than area, in the palm oil industry, needs to be undertaken urgently.

While it seems likely that oil palm production will continue to increase, its impacts on food security need to be constantly monitored. Given the high costs of production, there is little point in attempting to sell Cameroon's CPO on the global market. A niche in the African market is a reasonable aim, once local demand has been fully satisfied. This strategy does not negate the need for sustainability principles to be implemented by all segments of the industry, with environmental and social questions needing more attention, especially as the big companies seek to expand, yet still appear to lack corporate social responsibility towards community needs.

9 Overview

9.1 What major themes have emerged from the literature on the seven countries to address the four questions?

9.1.1 The influence of oil palm expansion on economic development and land-use change

The first theme that emerges here is oil palm expansion, its rates and directions. The variations in international prices have certainly played a role. In five of the seven countries, oil palm has experienced rapid expansion since prices began rising in 2006–7 as a result of the "biofuel boom". The hiatus in 2009 brought about by the global financial crisis did not slow growth for very long and prices in 2010–11 reached exceptional highs. Brazil and Peru were encouraged to promote their existing small industries and in those states and especially in Colombia, incentives have been provided to encourage oil palm production. Even in the African states of Nigeria and Cameroon, where low productivity of both the existing estate sector and traditional groves meant an inability to meet local demand, the governments have sought to lift production, not just from existing estates but by encouraging foreign corporations to locate in the country. This strategy appears to have worked so far with Wilmar in Nigeria, but has caused ongoing problems with Herakles Farms in Cameroon.

The 'giants' of the industry, Indonesia and Malaysia, have rather different expansion strategies. Malaysia, now experiencing a shortage of suitable land in most locations apart from Sarawak, is predominantly focused on yield improvement; Indonesia is still expanding its area. Its incentives have been access to land and (until recently) very cheap labor. With the moratorium on further incursions into peat swamps and some lowland forests, together with pressure from certifying bodies and downstream suppliers to appear more "sustainable", there is a gradual realization that the industry should also be engaged in yield improvement. This is happening for plantations and "plasma" smallholders, but only marginally for independent smallholders, whose numbers are increasing.

All of the countries studied have attempted to link the expansion of oil palm with economic development, reductions in poverty and targetted improvements in welfare. There is no doubt that the large corporations in Indonesia and Malaysia have made profits for their shareholders. While some small farmers have been able to improve their houses and acquire desirable goods (such as motorcycles), such improvements have been patchy and are subject to the fluctuating price of CPO and conditions in the field. Others have lost land but also missed out on any benefits.

It is also worth noting the statement from CLUA with reference to Indonesia that, "the industrial crops sector contributed just 2% of GDP in 2011 despite massive investment and public policy support… Just under half of the population continues to live on less than USD 2 a day… There is rising consumption inequality, with more and more wealth accruing to the top 20%" (CLUA 2014).

A second big theme in the literature for both Indonesia and Sarawak remains the destruction of forest and wildlife habitat, especially incursions of oil palm onto peat soils with concomitant burning. Several important studies with an environmental focus have been carried out since 2008, exploring oil palm's impact on biodiversity and attempting to quantify rates of deforestation associated with plantation expansion (Fitzherbert et al. 2008; Koh and Wilcove 2008; Foster et al. 2011; Miettinen

et al. 2011; Carlson et al. 2012a; Gunarso et al. 2013). Some studies have focused particularly on peatlands, as the newer plantations, especially in Riau (Sumatra), Kalimantan and Sarawak, have moved rapidly to colonize that more difficult environment (Wetlands International 2010; Sarvision 2011; Carlson et al. 2012b; Miettinen et al. 2012; Agus et al. 2013). More recent research has achieved greater sophistication, handling larger data sets and striving for increased accuracy, while recognising the uncertainties involved in analysis of emissions from peatlands.

Another group of studies, accepting the inevitability of palm oil expansion, have considered a number of future scenarios to indicate the best ways forward. Koh and Ghazoul (2010) initiated this type of analysis for Indonesia and it has recently been replicated for Colombia by a group which included the above two authors (Garcia-Ulloa et al. 2012), using a GIS analysis to identify areas most suitable for oil palm. The authors pointed out that deforestation issues were not as critical in Colombia as in Indonesia, given the large areas of poorly performing cattle ranches that could be converted to oil palm, especially on the eastern savannas, the most promising area for future development. A wider study, spanning Indonesia, Malaysia and Papua New Guinea and carrying the 'future' not just to 2020 but 2050, with the presumption that the current area of oil palm would double by that date, has recently been completed (Harris et al. 2013). While the scenarios of the earlier group attempted to balance a variety of demands, including that of local food security, the Harris et al. (2013) scenarios focused almost entirely on emissions. They visualise a possible movement from scenario 1 'Business as usual' to scenario 2, a moratorium on peat, with yield improvements and a shift to mineral soils. Finally, scenario 3, rewetting and restoration of the peat areas with further yield improvements on the plantations (all on mineral soils) is predicted to lead to "annual emissions near zero for a mature stable oil palm sector covering approximately 21 million ha of plantations" (Harris et al. 2013, 89). Harris et al.'s work provides a vision of the future with a stable, rather than constantly expanding, plantation sector, with no emissions and no further peat problems, but it is curiously empty of smallholders, who are omitted from the discussion.

Putting the smallholders back and continuing the deforestation theme is the question of the role of large plantations in deforestation, as compared with smallholders. Studies in Peru (Guitierrez-Velez et al. 2011; Guitierrez-Velez and DeFries 2013), using remote sensing, showed that it was the larger firms which opened forest, while smallholder groups, in areas of secondary forest or pastures, tended to substitute oil palm for illicit crops, such as coca.[241] Lee et al. (2013) arrived at a similar conclusion with regard to deforestation in Riau, Sumatra. They conducted a GIS analysis of land cover change and found large plantations were mainly the ones involved in deforestation, especially in the peat swamps, which smallholders found too difficult to work.[242]

Other aspects of deforestation were more subtle, such as the lobbying by the oil palm producers association in Peru to have the African palm declared a "forest plantation" tree, rather than an agro-industrial crop, so that the companies might expand their holdings into the forest (Pautrat and Segura 2011). Similar ruses were noted in the Brazilian Amazon by Butler and Lawrance (2009), where plantation owners wanted to count oil palm as part of their legal reserve of forest (80% of the land), while more recently in Brazil, the idea was floated that oil palm as a "low impact crop", could be used to reforest protected areas (Lees and Vieira 2013).

While many of the environmentally oriented studies used the latest satellite technology and complex analyses, they have not been carried out so far in either Nigeria or Cameroon. However, curiously in Nigeria, the reserved forests, demarcated in colonial times, are now seen as "available land" and have been used for plantation development and settlement of nearby populations (von Hellermann 2007; Schoneveld 2014). In Cameroon, the commentators have mainly criticised the location of Herakles Farms, surrounded by reserved forest, while the plantation

241 Coca was shown to return when prices were right, or as a temporary income earner before the oil palm was mature.

242 However, district authorities may actively support smallholder deforestation of peat swamps by subsidizing the construction of drainage canals, as described in Cacho et al 2014.

company has been accused of violating forest laws in removing timber from the land. Overlapping leases have been common in forest areas (Schwartz et al. 2012).

9.1.2 The role of policies and corporate strategies in shaping oil palm development

The major theme here is the manner in which all governments, either directly or indirectly, have assisted the establishment of oil palm. In Indonesia, the most recent strategies have tended to be indirect, in the form of enabling legislation supporting the industry and giving the plantations greater power (Gillespie 2011). A further indirect strategy has been the institution of compulsory blend levels to encourage the local manufacture of biodiesel. This has especially been the case in Peru and Colombia,[243] though increasing now in Indonesia and Malaysia, with incentives also for oleo-chemicals and other downstream products. In Brazil the "social fuel seal" was available to estates that incorporated "family farmers"; similarly in Colombia, access to funds from the lucrative Rural Capitalization Incentive was available to plantations, especially when they initiated smallholder alliances. Even in Nigeria, the government, anxious to increase oil palm production has provided the estates with improved seedlings, in what is called the Agricultural Transformation Agenda.

A further theme here has uncovered the effects of a strong plantation lobby influencing government decisions pro-oil palm, especially in Colombia (Marin-Burgos 2014) and Indonesia (Accenture 2012) while in Malaysia, the government has part ownership in very large plantation companies such as Sime Darby (Varkey 2012). There is also a lobby protecting the interests of Malaysian plantations in Jakarta (Varkey 2014).

9.1.3 Socioeconomic outcomes from disparate business models in oil palm development

While the business models concentrate on plantations and types of smallholder contract farmers or outgrowers, the themes that arise are primarily concerned with land and the way in which it is handled. Who gets access to land and who is excluded? What are the benefits provided and restrictions imposed on smallholder participation? And what are the limitations on independent smallholder involvement? The changes in Indonesian plantation/smallholder arrangements are important here, as gradually reducing smallholder benefit, especially through the latest 80/20 schemes, while in East Malaysia native customary land is taken over in a series of schemes (Cramb 2011, 2013; Majid Cooke 2011, 2012) which are hardly profitable to the landholder.

Independent smallholders in Indonesia have been found to suffer from serious problems of access to inputs such as quality planting materials, fertilizer and loans (aidenvironment 2013; Molenaar et al. 2013; Lee et al. 2013a). Lee et al. 2013a have noted the increasing stratification among Indonesian smallholders, while McCarthy (2010) has characterized oil palm as "a rich man's crop", with would-be participants often suffering from "adverse incorporation". Similar differentials have been observed in Brazil, with wealthier farmers succeeding where others struggle (Gomes and Glass 2012). The social ramifications of land-use change from peasant farming to oil palm have impacted strongly on *campesino* farmers who resist joining alliances in Colombia (Marin-Burgos 2014).

A further theme is food security, especially under discussion for Colombia (Rivera 2011) and Brazil, but also in Indonesia. A final important area is the question of labor, particularly the conditions under which workers are hired on the estates. The use of indirect or casualised labor occurs in Nigeria (von Hellermann 2007), is common in Colombia (Vargas 2012) and Indonesia (Sinaga 2013). In Malaysia, discriminatory practices occur such as withholding migrant workers' passports (Pye et al. 2012).

9.1.4 Initiatives towards more sustainable and inclusive oil palm production

The big questions among oil palm plantations in Indonesia and Malaysia relate to certification, either by the RSPO or perhaps the newer in-country schemes, the ISPO and MSPO. Among the countries studied, only Indonesia and Malaysia have made much progress towards certifying

243 Castiblanco et al. 2012 have modelled the future expansion of biodiesel in Colombia against a target required if blend levels were to reach B20 by 2020. The conclusion was that this target could not be attained.

smallholders. For example, at the meeting of the RSPO in November 2013, great fanfare was made over two groups of smallholders who had succeeded in this process, one each from Malaysia and Indonesia. One group of smallholders (the first in Latin America) was recently certified in Brazil (personal communication from Marcello Brito, August 2014). In Colombia, Fedepalma has been working with alliance groups using a model, developed by Malaysia, of smallholder "clusters" grouped around estates who receive training in agronomic and environmental practices. In Malaysia, this scheme is run by the MPOB, with NGO assistance, using government funding to replant aged trees.

However, such appears to be the difficulty and expense of implementing smallholder certification that one wonders if the model is not flawed, and needs to be replaced by a more diverse, more organic model which is more suited to smallholders. There are many examples, already noted, of oil palm agroforests, which have been developed by smallholders, both in Nigeria (Merem et al. 2012) and Cameroon (Cheyns and Rafflegeau 2005) and in Brazil (Semedo 2006; Watkins 2011; Miccolis and Andrade 2012).

Whenever smallholders are given the option of working with oil palm, they tend to look for ways of inserting this crop into a more diverse agriculture. Cramb and Sujang (2011) and Cramb (2013) discovered this among independent smallholders in Sarawak and it is also true of Dayak smallholders in Kalimantan (Potter 2014) and *campesinos* in Colombia, through Fundepalma (Marin-Burgos 2014). While yields may not be as high (though the CAMTA system in Tome Acu, Brazil refutes this),[244] such cropping is risk averse (usually favored by small farmers) and as multicropping usually includes one or more food staples, food security is not compromised. Smallholders generally use little inorganic fertilizer but can utilize organic waste from the palm in the form of empty fruit bunches and palm fronds. The possibilities of a boutique, organic palm oil need further exploration and could be marketed along Fair Trade or similar channels.

However, such is the ubiquity of the plantation/smallholder model with its focus on international trade and certification (a model also emphasised strongly by the downstream processors and retailers of palm oil products) that practitioners find difficulty in conceiving alternatives. This applies universally; although the small and medium farmers had the upper hand in Cameroon, the government still firmly held to a desire for larger scale activity and was naively keen to welcome "land grabbers" so that eventually the country's production would be high enough to join the group of CPO exporters.

The global reach of the RSPO is very clear, even though the decisions by Indonesia and Malaysia to 'go it alone' may have undermined it somewhat. The compulsory and rival ISPO in Indonesia has been rather slow to be implemented, which is not surprising. It is a huge job, but potentially could have a major positive impact throughout the industry (Gillespie and Haryanthi 2012). That initiative, together with the proclamation by both GAR and WILMAR for a new approach with "no deforestation, no peat, no exploitation" and the "Sustainable Palm Oil Manifesto" of Sime Darby and others signals some major changes over the next few years.

Indonesia, as the most important oil palm producing and trading country, must take the lead in implementing change. It is hoped that the new administration will offer support to moves such as the proposed amendments to the Revised Plantations Bill, which would place restrictions on foreign investment, restrictions needed to reduce the influence of Malaysian corporations and help prevent unjust land distribution.[245]

244 Bhagwat and Willis (2008, 1369) deny that mixed plantations would reduce oil palm yields and suggest that "management of oil-palm plantations as agroforestry systems is a promising solution to ensure that oil-palm agriculture also supports biodiversity conservation". They argue that prehistoric systems in West–Central Africa maintained oil palm groves with other secondary forest species; they maintain that a return to growing oil palm as part of an agroforestry system can both conserve other species and allow movement of animals

245 A Member of House Commission II, proposing this bill quoted figures from the National Land Agency that 56% of national asssets – 80% of which was land – was controlled by only 0.2% of the population.

References

ABColombia. 2012. *Colombia, the current panorama: Victims and land restitution law 1448*. CAFOD, Christian Aid, Oxfam GB, SCIAF, Trocaire.

ABColombia. 2011. *Returning land to Colombia's victims.* CAFOD, Christian Aid, Oxfam GB, SCIAF, Trocaire.

[ACA] Amazon Conservation Association, [ACCA] Conservación Amazónica and [CIEL] Center for International Environmental Law. 2014. Logging concessions enable illegal logging crisis in the Peruvian Amazon. *Upside Down World.* http://upsidedownworld.org/main/news-briefs-archives-68/4800-logging-concessions-enable-illegal-logging-crisis-in-the-peruvian-amazon

Accenture. 2012. Exploitative labor practices in the global palm oil industry. Accessed 9 April 2013. humanityunited.org/pdfs/Modern_Slavery_in_the_Palm_Oil_Industry.pdf

Achobang, Fon C. 2013a. Herakles Farms: Major plantation downsize in the works? *Palm Watch –Africa*

Achobang, Fon C. 2013b. Cameroon president authorizes Herakles Farms to destroy forests. *Palm Watch-Africa.*

Actualidad Ambiental. 2013a. *Loreto: Fiscalía denuncia a empresa del Grupo Romero por deforestación de 500 hectáreas.*

Actualidad Ambiental. 2013b. *Denuncian que Grupo Romero pretende deforestar 23 mil hectáreas de bosque para sembrar palma aceitera.*

Actualidad Ambiental. 2013c. *Denuncian que empresas de palma aceitera han deforestado mas de 13 mil hectáreas de bosques primarios.*

ADM News Release. 2011. *ADM to invest in sustainable palm production in Brazil.* 9 February 2011. (also in Portuguese).

Adnan H. 2014. *Malaysia to quit roundtable on sustainable palm oil grouping? The Star*. 26 *February 2014.*

Agence Ecofin. 2013a. *Cameroun: Bolloré promet de faire pression sur Socapalm à propos de l'environnement.*

Agence Ecofin. 2013b. *Le Cameroun annule la première convention signée avec Herakles Farms.* 21 June 2013.

*Agência Pará de Notícia*s. 2014. Pará e Malaysia firmam parcerîa para extração e produção de oleo de palma. 27 March 2014.

Agrofarm. 2014. *Perusahaan kurang siap, susah memperoleh ISPO*. 27 March 2014.

Agronigeria. 2014. *Finally RSPO Nigeria inaugurates National Interpretation Working Group.* 24 April 2014.

Aguilera Diaz M. 2002. *Palma Africana en la costa caribe: Un semillero de empresas solidarias. Centro de estudios económicos regionales No. 30, Banco de la República, Cartagena de Indias.*

Agus F, Gunarso P, Suhardjo B, Harris N, van Noordwijk M and Killeen T. 2013. Historical CO_2 emissions from land use and land use change from the oil palm industry in Indonesia, Malaysia and Papua New Guinea. *In* Killeen T and Goon J, eds. *Reports from the Technical Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil (RSPO)* Kuala Lumpur, Malaysia.

Aidenvironment. 2014. *Fair company-community partnerships in palm oil development.* Oxfam Discussion Papers, published by Oxfam GB for Oxfam International

Aidenvironment, [GSA] Global Sustainability Associates and Triodas Facet. 2013. *Diagnostic survey of oil palm smallholders in Indonesia: Presentation of results and recommendations.* Jakarta, Indonesia.

Aidenvironment. 2010. *Analysis of the agronomic and institutional constraints to smallholder yield improvement in Indonesia.* Oxfam Novib and the Prince's Rainforest, Aidenvironment and Global Sustainability Associates

Aiyelaagbe IOO., Adeola AO, Popoola, L, and Obisesan KO. 1998. Agroforestry potential of *Dacryodes edulis* in the oil palm-cassava belt of southeastern Nigeria. *Agroforestry Systems* 40:263-274

[AIDESEP] *Asociacion Interetnica de Desarrollo en la Selva Peruana*. 2014. *Reglamento de Ley Forestal Avances, Problemas y Correctivos.* 22 January 2014.

Akangbe J, Adestiji G, Fakayode S and Aderibigbe Y. 2011. Towards palm oil self-sufficiency in Nigeria: Constraints and training needs nexus of palm oil extractors. *Journal of Human Ecology* 33(2):139–45.

Aliansi Serikat Buruh Indonesia [SERBUNDO]. 2013. Statement: Indonesian Trade Unions Alliance Stop Exploitation of Plantation and Industrial Labor Stop a Large-scale Plantation Expansion

Alianza para los Negocios Inclusivos. 2008. *Los negocios inclusivos en Colombia* [SNV] [CECODES] (Netherlands Development Agency and Colombian Business Council for Sustainable Development).

Alianza para los Negocios Inclusivos, Fedepalma, USAID, Program Midas. 2009. *Presentación de los resultados del estudio de evaluación de los proyectos de alianzas productivas constituidas en Colombia en el cultivo de la palma de aceite.* [SNV][CECODES] (Netherlands Development Agency and Colombian Business Council for Sustainable Development).

Alianza SNV–Cecodes. 2010. *Las Alianzas Productivas Estrategicas en palma de aceite* SNV, Fedepalma, USAID.

AllAfrica. 2013. *Nigeria: As Presco, PzWilmar, Okomu battle to dominate vegetable oil market.* 1 September 2013.

AllAfrica. 2012. *Nigeria: FG targets US $8 billion dollars from palm oil export. AllAfrica* Vanguard. 31 August 2012.

Amiolemen SA, Iwara O, Ndakara T and Deekor AI. 2012. Assessment of the nutrient status of soil under *Chromolaena odorata* L. (Siam weed) fallow in Moniya, Oyo State, Southwestern Nigeria. *Ethiopian Journal of Environmental Studies and Management* 5(3):252–9.

Andrade RMT and Miccolis A. 2011. *Policies and institutional and legal frameworks in the expansion of Brazilian biofuels*. Working Paper No. 71. Bogor, Indonesia: CIFOR.

Andrade RMT and Miccolis A. 2010. *Biodiesel in the Amazon.* World Agroforestry Centre. Working Paper No. 113, Nairobi, Kenya.

Anyanwu C, Amoo B, Odey L and Adebayo O. 2011. *An Assessment of the operations of the presidential initiatives on agriculture in Nigeria: 2001–7*. Central Bank of Nigeria. Occasional Paper No. 40.

[APROBI] Asosiasi Produsen Biofuel Indonesia 2014. List of biodiesel plants in Indonesia. http://www.infosawit.com/index.php/pages/page/industry-biodiesel/

Asian Indigenous Peoples' Pact 2012. Malaysia: Orang Asli go to court to state their land rights against national park and palm oil plantation. 28 March 2012.

Associated Press. 2014. Juan Manuel Santos convincingly wins Colombia presidential election. 15 June 2014.

Aweto A 2002 Agriculture in Urhoboland of Nigeria's Niger Delta www.waado.org/Geography/Agriculture/Agruclture-Aweto.html

Awotoye O, Dada A and Arawomo G. 2011. Impact of palm oil processing effluent discharge on the quality of receiving soil and rivers in South Western Nigeria. *Journal of Applied Sciences Research* 7(2):111–8.

Ayodele T. 2010. *African case study: palm oil and economic development in Nigeria and Ghana. Recommendations for the World Bank's 2010 palm oil strategy.* Lagos: Initiative for Public Policy Analysis (IPPA)

Azmi R and Nagiah C. 2012 *A Review of Smallholder Oil Palm Production*. Kuala Lumpur: Wild Asia Malaysia.

Azubuike V. 2014. Rivers: Disengaged workers protest in Port Harcourt. *Daily Post Nigeria.* 23 April 2014.

Bahroeny J. 2009. *Palm oil as an economic pillar of Indonesia. The Jakarta Post.* 2 December 2009.

Bakoume C and Abdullah MB. 2005. Potentialities of the Oil Palm Industry in Cameroon. *The Planter* 81(953):483–91.

Baldoni CFM, Chiarini L, Renner RM, Alves SAO. 2011. IBD Certifications RSPO Certification Audit Principles and Criteria Agropalma Group Brazil. 14th to 18th February 2011.

Ballve T. 2013. Colombia's peace talks: Independent republics or peasant territories? *Territorial Masquerades*. 19 March 2013.

Ballvé T. 2009. The dark side of Plan Colombia. *The Nation.* 15 June 2009.

Banco Amazônia 2012 Dados referentes as empresas que atuam com Eco-Dendê. Programa PRONAF

Barros S. 2013 *Brazil Biofuels Annual: Annual Report 2013.* GAIN Report No. BR13005. USDA, Foreign Agricultural Service.

Bernard S and Bissonnette JF. 2011. 'Oil palm plantations in Sabah: Agricultural expansion for whom? *In* de Koninck R, Bernard S and Bissonnette JF, eds. *Borneo Transformed: Agricultural Expansion on the Southeast Asian Frontier*. Singapore: NUS Press. pp120–51.

Bhagwat SA and Willis KJ. 2008. Agroforestry as a solution to the oil-palm debate. *Conservation Biology* 22(6):1368–9.

Binde N. 2009. CDC oil palm, rubber projects firmly on course. Accessed 23 November 2009. http://the-news-from-cameroon.com/article.php?article_id=1147

BiodieselBR.com 2013 Agropalma construira refinaria de oleos vegetais em Limeira. 4 Fev 2013

Biondi A, Filho MM and Glass V. 2008. Brazil of biofuels: Palms, cotton, corn and jatropha. NGO Reporter Brazil: Biofuel Watch Center www.agrocombustiveis.org.br

Bitchoka JP. 2013. Herakles Farms in Cameroon: Agribusiness is the problem, not the solution. 10 July 2013. Accessed 26 August 2013. www.foodfirst.org/en/Herakles+Farm+Cameroon

Biy Nifor V. 2014. Interview: Pamol's expansion will help populate Bakassi. 14 aout 2014

Bochno E. 2008. *Biocombustibles: Visión del sector agropecuario.* Segundo Seminario Biocombustibles Colombia, Bogota 9 de octobre 2008.

Borneo Post 2012. *PKR Sabah demands return of 306,000 acres from FELDA.* 13 February 2012

Borneo Post 2014. *SOPPOA committed to MSPO standard for palm oil industry.* 24 April 2014.

Bravo A. 2009. *En Medio del Magdalena Medio*, CINEP, Bogota.

Brito M. 2010 Annual Report of the Agropalma group to the RSPO. www.rspo.org

Brondizio ES, Siqueira AD and Vogt N. 2014. Forest resources, city services: globalization, household networks and urbanization in the Amazon Estuary *In* Hecht SB, Morrison KD and Padoch C, eds. *The Social Lives of Forests: past, present and future of woodlands resurgence*. Chicago and London: University of Chicago Press.

Brookfield H, Potter L and Byron Y. 1995. *In Place of the Forest: Environmental and Socioeconomic Transformation in Borneo and the Eastern Malay Peninsula.* Tokyo, New York, Paris: United Nations University Press.

Brounen J. 2013. *Building the first RSPO certified value chain in Colombia: Transcript of Sustainable Palm Oil Partnership – Catatumbo región – Colombia* 20/05/13 Holland House, Colombia.

Businessday 2013 Oil palm sector braces up for global market competition. F.Afolabi, September 18 2013

Business in Cameroon. 2013. *Herakles Farms will invest CFAF300 billion in Cameroon.* 20 March 2013. http://www.businessincameroon.com/investment/2003-3986-herakles-farm-will-invest-cfaf-300-billion-in-cameroon

Business Monitor International. 2013. *Indonesia: Agribusiness Report Q3 2013.* www.businessmonitor.com

Butler R. 2014a. *Rainforest conversion for oil palm in Malaysian Borneo. Wilmar's full statement to Mongabay*. mongabay.com 17 February 2014.

Butler R. 2014b. *New forest map for Sarawak reveals large scale deforestation, encroachment on indigenous territories*. mongabay.com 24 February 2014.

Butler R. 2014c *Malaysia at risk of falling behind in push for more sustainable palm oil* mongabay.com April 17 2014

Butler R. 2013a. *Palm oil company destroys 7,000 ha of Amazon rainforest in Peru.* 4 March 2013. http://news.mongabay.com/2013/0304-palm-oil-peru.html

Butler R. 2013b. *80% of forests in Malaysian Borneo logged* mongabay .com July 17 2013

Butler R. 2011a. *Brazilian mining giant buys Amazon palm oil company*. mongabay.com February 2 2011

Butler R. 2011b. *Could Palm Oil Help Save the Amazon?* mongabay.com 15 June 2011

Byerlee D, Kyaw D, Thein S and Kham LS. 2014. *Agribusiness models for inclusive growth in Myanmar: Diagnosis and ways forward.* Paper prepared for presentation at the 2014 World Bank Conference on Land and Poverty. The World Bank, Washington, DC, 24–27 March 2014.

Cabieses H. 2010. *The 'miracle of San Martin' and symptoms of 'alternative*

development' in Peru. Transnational Institute: Drug Policy Briefing No. 34

Cacho O, S. Milne, R. Gonzalez, L.Tacconi 2014 Benefits and costs of deforestation by smallholders: Implications for forest conservation and climate policy *Ecological Economics* 107(2014) 321-332.

Cameroon Development Corporation 2012. *Cameroon Development Corporation moving on.* 15 June 2012.

Cameroon Tribune. 2012. *Njalla Quan's legacy at CDC.* 13 December 2012.

Cargill 2013. Cargill launches innovative oil palm smallholders sustainability program in Malaysia. www.cargill.com/news/releases/2013/NA3075382.jsp

Carlson KM, Curran LM, Ratnasari D, Pittman AM, Soares-Filho BS, Asner GP, Trigg SH, Gaveau DA, Lawrence D and Rodrigues HO. 2012a. Committed carbon emissions, deforestation, and community land conversion from oil palm plantation expansion in West Kalimantan, Indonesia. *Proceedings of the National Academy of Sciences of the United States of America* 109(19):7559–64.

Carlson KM, Curran LM, Asner GP, McDonald Pittman A, Trigg SN and Adeney JM. 2012b. Carbon emissions from forest conversion by Kalimantan oil palm plantations. *Nature Climate Change Letters*, published online 7 October 2012, 5 pp.

Carrasco RT. 2012. *Analisis del desempeño financiero del sector palmero y de los sectores industriales vinculados. Presentation to the XL Congreso Nacional de Cultivadores de Palma de Aceite*, Fedepalma, in Bucaramanga, May 2012.

Carrillo R. 2010. *Los Biocombustibles en Colombia; uno reto para el desarrollo sostenible.* Instituto de Investigacion de Recursos Biologicos Alexander von Humboldt.

Casson A. 2002. The political economy of Indonesia's oil palm subsector. *In* Colfer C and Resosudarmo IAP, eds. *Which Way Forward? People, Forests and Policy-making in Indonesia.* Singapore: Institute of Southeast Asian Studies (IAP). pp221–45.

Casson A. 2000. *The hesitant boom: Indonesia's oil palm subsector in an era of economic crisis and political change*. Occasional Paper No. 29. Bogor, Indonesia: CIFOR.

Castellani D, Monteiro R, Takamatsu J, Kato O, Rodrigues M, Miccolis A, Costa M and Casara J. 2009. Estudo de sistemas agrosilviculturais para produção de dendê (*Elaeis guineensis*) em propriedades rurais de Tomé-Açu (Pa). *VIII Congresso Brasileiro de Sistemas Agroflorestais, Brasilia.*

Castro Forero A. 2012. *Alianzas público-privadas y proyectos estratégicos para el desarrollo rural.* Conversatorio para la construcción de rutas para la associatividad rural en Colombia, Septiembre 2012.

Castiblanco C, Etter A and Aide T. 2013. Oil palm plantations in Colombia: A model of future expansion. *Environmental Science and Policy* 27:172–83.

Castiblanco C, Etter A and Ramirez A. 2015. Impacts of oil palm crop expansion in Colombia: What do socioeconomic indicators tell?' *Land Use Policy* 44 31-43.

[Cenipalma] Centro de Investigaciones en Palma de Aceite. 2014. *Informe de gestión 2014: Incrementar la productividad.*

Cien Dias 2012. *La otra cara de la palma en Maria la Baja*. Sep-Nov 2012. Por equipo Tierras y Victimas del CINEP/Programa Por la Paz.

Chandran M. 2014. *Sustainability in the Malaysian palm oil industry – M.R. Chandran*. 5 March 2014. Accessed 10 April 2014. http://www.themalaysianinsider.com/sideviews/article/sustainability-in-the-malaysian-palm-oil-industry-m.r.-chandran

Cheyns E and Rafflegeau S. 2005. Family agriculture and the sustainable development issue: Possible approaches from the African oil palm sector. The example of Ivory Coast and Cameroon. *Oléagineux, Corps Gras, Lipides* 12(2):111–20.

Chima U. 2010 comment on 'Oil Palm in Africa' a work in progress for the WRM. 12 August 2010.

Choo YM. 2012. *Malaysia: economic transformation advances oil palm industry.* Accessed 5 July 2013. www.aocs.org

Choo YM and Ismail A. 2013. *Pointers: The importance of labor in the supply and demand of palm oil in Malaysia.* [MPOC] Malaysian Palm Oil Council.

Cochard B, Amblard P and Durand-Gasselin T. 2005. Oil palm genetic improvement and sustainable development. *Oleagineux, Corps Gras, Lipides* 12(2):141-7.

Colchester M, Jalong T and Wong MC. 2012. *Sarawak: IOI-Pelita and the Community of Long Teran Kanan.*

Colchester M, Jiwan N and Kleden E. 2014. *Independent review of the Social Impacts of*

Golden Agri Resources' Forest Conservation Policy in Kapuas Hulu District, West Kalimantan. Forest Peoples Programme, Tuk Indonesia,

Colmenares C. 2012. *Alianza Productiva Hacienda La Cabana – Comunidad de Guarupay, Cabuyaro – Meta*. Presentation to the *XL Congreso Nacional de Cultivadores de Palma de Aceite*, Bucaramanga. 30 May 2012.

Commission of the European Communities. 1990. *Nigeria and the European Community*. Brussels October 1990.

Communiqué du Point de contact national français. 2014. *SOCAPALM: un plan d'action concerté visant l'amélioration des conditions de vie et de travail des employés de la plantation et des populations locales.* 17 mars 2014

Constain F. 2014. *Formación de Clusters y Competitividad en la Agroindustria de la Palma de Aceite.* Presentation to the *XLII Congreso Nacional de Cultivadores de Palma de Aceite, Santiago de Cali 4 de junio de 2014.*

Cordeagropaz 2012. *Experiencia de Cordeagropaz en al desarrollo de las alianzas estratégicas productivas en palma de aceite con pequeños agricultores de Tumaco (N).* Presentation to the *XL Congreso Nacional de Cultivadores de Palma de Aceite, Bucaramanga, Mayo 30 de 2012.*

Cramb R. 2013. Palmed off: Incentive problems with joint-venture schemes for oil palm development on customary land. *World Development* 43:84–99.

Cramb R and Sujang P. 2013. The mouse-deer and the crocodile: Oil palm smallholders and livelihood strategies in Sarawak, Malaysia. *Journal of Peasant Studies* 40(1):129–54.

Cramb R and Ferraro D. 2012. Custom and capital: a financial appraisal of alternative arrangements for large-scale oil palm development on customary land in Sarawak, Malaysia. *Malaysian Journal of Economic Studies* 49:49–69.

Cramb R. 2011. Re-inventing dualism: Narratives and modes of oil palm expansion in Sarawak, Malaysia. *Journal of Development Studies* 47(2):274–93.

Cramb R and Sujang P. 2011."Shifting ground": Renegotiating land rights and rural livelihoods in Sarawak, Malaysia. *Asia Pacific Viewpoint* 52(2):136-47.

Cultural Survival. 2013. Campaign update: Herakles Farms to sell off plantation. 24 September 2013

Dada L. 2007. *The African Export industry: What happened and how can it be revived? Case study on the Nigerian oil palm industry*, FAO, Agricultural Management Marketing and Finance, Working Document 17. Rome: FAO.

Daily Independent (Lagos) 2014. Nigeria: Wilmar Calaro Estate to start production in 2016. 8 June 2014.

Dammert J. 2013. *Expansión de palma aceitera en la Amazonia: en las puertas del escándalo.* Servicios en Comunicación Intercultural Servindi

Dammert J, Cardenas C and Canziani E. 2012. *Potenciales Impactos Ambientales y Sociales del Establecimiento de Cultivos de Palma Aceitera en el Departamento de Loreto*. Sociedad Peruana de Derecho Ambiental (SPDA) Cuaderno de Investigación No. 8.

Da Rocha MG and De Castro AMG. 2012. *Fatores limitantes à expansão dos sistemas produtivos de palma na Amazônia.* Texto para Discussão 43, Embrapa, Brasilia 2012.

Darussamin A. 2013. *RSPO certification for independent smallholders*. RSPO presentation to IFC workshop, 6 September 2013.

De Foresta H and Schwartz D. 1991. *Chromolaena odorata* and disturbance of natural succession after shifting cultivation: an example from Mayombe, Congo, Central Africa *In* Nuniappau R and Ferrar E, eds. *Ecology and Management of Chromolaena odorata*. Special Publication No. 44. Bogor, Indonesia: BIOTROP. 23-42.

De Lavigne C. 2013. Influence of Bio-diesel on palm oil pricing: Is the game now changing? *Malaysian Oil Science and Technology* 22(1):15–21.

De Schutter O. 2010. *Report submitted by the Special Rapporteur on the right to food*. United Nations General Assembly, Human Rights Council.

[DPCA] Direccion de promoción y competitividad agraria. *Diagnóstico: número de planes de negocio de las cadenas productivas de la DPCA* De Cruz Rodriguez W. Ucayali 2012

Dimelu MU and Anyaiwe V. 2011. Priorities of smallholder oil palm producers in Ika local government area of Delta State: Implication for agricultural extension service in Nigeria. *World Journal of Agricultural Sciences* 7(2):117–23.

Dias T and Brito M. 2012. Agropalma Forest Patrol Programme: Conservation of Forest

Integrity and biodiversity protection. http://www.sustainablepalmoil.org/growers-millers/growers/case-studies/forest-patrol-programme-conservation-of-forest-integrity-and-biodiversity-protection/

Direccion Regional Sectorial Agricultura Ucayali 2012. *Cadena productiva de palma aceitera en la region Ucayali.*

Direktorat Jenderal Perkebunan 2013. *2012–2014 Kelapa Sawit Palm Oil Statistik Perkebunan Indonesia Tree Crop Estate Statistics of Indonesia*

Djalal DP and Steer A. 2013. *Making the right choice on Indonesia's forest moratorium. The Jakarta Post.* 2 June 2013.

Dollars and Sense: Real World Economics. 2007. *Oil palm plantations on Afro-Colombian lands: An exchange.* November/December 2007.

Dos Santos EA. 2010. *Caracterização de Dendezeiros Subespontâneos com Base na Produção de Frutos e Cachos.* Mestre em Produção Vegetal, Universidade Estadual de Santa Cruz, Ilhéus 2010

Dos Santos MAS, D'Avila JL, Da Costa RMQ, Rebello FK, Lopes MLB. 1998. *O Comportamento do Mercado do Oleo de Palma no Brasil e na Amazônia.* Estúdios Setoriais 11, Banco da Amazônia S.A. Consultoria Técnica (COTEC) Coordenadoria de Estudos Especiais (COSEP)

Douglas O. 1995. *Nigeria: using a variety of advocacy tools in the Niger Delta* Environmental Rights Action. Friends of the Earth Nigeria

Douglas O. 2004. *EU sponsors wholesale environmental destruction*. http://blackperspective.co.uk/display_content.php?show=stories&id=7

Dourojeanni M, Barandiaran A and Dourojeanni D. 2009 *Amazonia Peruana en 2021 Explotación de recursos naturales e infraestructura: Qué está pasando? Que es lo que significa para el futuro?* http://www.spda.org.pe/wpfb-file/20120216164858_amazonia-peru accessed May 2 2012

Dow Jones Newswires 2012. *Interview: Colombia CPO output to hit 1 Mln-ton milestone in 2012, expanding aggressively*. Susabhi Sahu and Sameer Mihindru. 2 November 2012.

Drouvot CM and Drouvot H. 2011. *O Programa de Produção Sustentável do Dendê na Amazônia: a mobilização dos grupos de interesse no reflorestamento das áreas degradadas*. 6 Congresso de Instituto Franco-Brasileiro de Administração de Empresas (IFBAE)

Drouvet H and Drouvet C. 2012. *O Programa Federal de Produção Sustentável de Oleo de Palma : a Questão da Participação dos Atores Locais em favor do Desenvolvimento Territorial*. IX Simposio de Excelencia em Gestão e Tecnología (SEGeT)

[DTE] *Down to Earth*. 2013. A turning point for Indonesia's indigenous peoples. DTE Update 7 June 2013.

Ebegbulem S. 2013. Oil palm processing: PIND/NIFOR partnership raises hope of revival *Vanguard* 31 July 2013

Eco-Business 2013a. *RSPO fires back at Greenpeace, calls report baseless.* www.eco-business.com 6 September 2013.

Eco-Business 2013b. *Wilmar commits to zero deforestation after year of intense pressure.* www.eco-business.com 6 December 2013

Economic Transformation Programme (ETP) *ETP Annual report 2013* Government of Malaysia 2013

Economic Transformation Programme (ETP) *ETP Annual Report 2012* Government of Malaysia 2012

Economic Transformation Programme *ETP Handbook* 2010 Chapter 9 'Deepening Malaysia's oil palm advantage' Government of Malaysia 2010 http://etp.pemandu.gov.my/Download_Centre

Edo State. 2013. EDS No 1644 of 08/03/13 *EDHA passes resolution for relocation of Ologbo tunya farmers*.www.edostate.gov.ng

Ekadinata S, van Noordwijk M, Budidarsono S and Dewi S. 2013 *Hot spots in Riau, haze in Singapore: The June 2013 event analysed*. ASB Policybrief No 33, Nairobi: ASB Partnership for the Forest Margins.

Ekine D and Onu M. 2008. Economics of small scale palm oil processing in Ikwerre and Etche local government areas of Rivers State, Nigeria. *Journal of Agriculture and Social Research* 8(2):150–8.

El Espectador 2010. *El 'dossier' de los palmeros.* 21 mayo 2010 El Espectador.com

Elong J. 2003. *Les plantations villageoises de palmier à huile de la Socapalm dans le bas-Moungo (Cameroun): un projet mal intégré aux préoccupations des paysans. Les Cahiers d'Outre-Mer* 224:401–18.

El Palmicultor 2000. *La visión 2020 de la palmicultura colombiana.* FEDEPALMA.

El Rufai N. 2012. Why Nigeria must revisit land reforms. *Sahara Reporters.* 20 December 2012.

Elson D. 2014. *Interpreting the rural economy in Indonesia: trends, policies and performance.* Climate and Land Use Alliance (CLUA), Singapore.

El Tiempo 2013. *Hongo amenaza cultivos de palma en Puerto Wilches.* 19 April 2013. http://www.eltiempo.com/archivo/documento/CMS-12750115

Embas Uggah AD. 2013. Speech by YB Datuk Amar Douglas Uggah Embas to PORAM annual dinner (Palm Oil Refiners Association of Malaysia), Selangor.

Embas Uggah AD. 2014. Speech by YB Datuk Amar Douglas Uggah Embas to Lab on strengthening oil palm industry performance, Westin Hotel KL.

Environment News Service 2013. Malaysia to increase palm oil component of biodiesel. 28 October 2013.

Environmental Investigation Agency. 2011. Box II: Peru's New Forestry and Wildlife Law. 22 July 2011.

Epstein, E. 2013. How Peru is dethroning Colombia as cocaine king. *Inter-American Security Watch* September 7 2013 news.msn.com

Eshalomi M. 2008. The mirage of palm oil availability. *Nigerian Muse* 19 August 2008.

[EU] Commission of the European Communities 1990 *Nigeria and the European Community*, Brussels October 1990

[FedeBiocombustibles] *Federación Nacional de Biocombustibles de Colombia.* 2013. *Citras Informativas del sector biocombustibles: biodiesel de palma de aceite.* Noviembre de 2013.

Fedepalma. 2014a. *Informe de Gestión Fedepalma 2013*

Fedepalma. 2014b. *Fedepalma reitera llamado al Gobierno Nacional para mejorar seguridad en la actividad agropecuaria.*

Fedepalma. 2014c. *Version 2014 de la Interpretación Nacional para Colombia del estandar RSPO*. XLII Congreso Nacional de Cultivadores Palma de Aceite, June 3-6 2014

Fedepalma. 2013. *Minianuario Estadistico 2013. Principales cifras de la agroindustria de la palma de aceite en Colombia.*

Fedepalma. 2010. *Informe final: Evaluación del modelo de Alianzas Productivas en Palma de Aceite* (with SNV, Consejo Empresarial Colombiano para el Desarrollo Sostenible, USAID, Programa MIDAS)

Fedepalma. 2009. *Unidades de Asistencia y Auditoría Técnica, Ambiental y Social (UAATAS): una estrategia para el manejo sanitario y para incrementar la productividad y competitividad palmera. PALMAS* 30(3).

Fedepalma. 2001. *La Palma Africana en Colombia-Apuntes y Memorias*, *In* Aguilera Diaz M. 2002 *Palma Africana en el Costa Caribe: un semillero de empresas solidarias.* Centro de estudios económicos regionales. No. 30. Banco de la República, Cartagena de Indias.

Fedepalma. 1997. *Censo Nacional de palma de aceite, Colombia 1997. In* Aguilera Diaz M. 2002 *Palma Africana en la costa Caribe: un semillero de empresas solidarias.* Centro de estudios económicos regionales. No. 30. Banco de la República, Cartagena de Indias.

Feintrenie L, Chong WK and Levang P. 2010. Why do farmers prefer oil palm? Lessons learnt from Bungo district, Indonesia. *Small-Scale Forestry* 9:379–96.

Feintrenie L. 2014. Agro-industrial plantations in Central Africa, risks and opportunities. *Biodiversity Conservation* 23:1577–89.

Fischer R, Bose M and da Rocha Borba P. 2006. Dende oil family agriculture project. *Revista, Harvard Review of Latin American Studies* Fall 2006:16–19.

Fitzherbert EB, Struebig M, Morel A, Danielsen F, Bruehl C, Donald PF et al. 2008. How will oil palm expansion affect biodiversity?' *Trends in Ecology and Evolution* 23:538–45.

Flach B, Bendz K and Lieberz S. 2014. *EU biofuels annual 2014.* GAIN Report No. NL4025. USDA, Foreign Agricultural Service.

Forest People's Programme. 2014. *AIDESEP calls for modification of Peruvian forestry law which threatens indigenous peoples' lands and rights.*

Forest People's Programme. 2012. *Nigerian CSOs challenge Wilmar's palm oil expansion plans in Cross River State.*

Forest People's Programme. 2011. *BioPalm plantation will lead to destruction of Bagyeli communities in Cameroon.* 7 October 2011

Fortin CJ. 2011. *The biofuel boom and Indonesia's oil palm industry: the twin processes of peasant dispossession and adverse incorporation in West Kalimantan.* Paper presented at the International Conference on Global Land Grabbing, 6–8 April 2011, Institute of Development Studies, University of Sussex, UK

Foster W, Snaddon J, Turner E, Fayle T, Cockerill T, Ellwood MDF, Broad G, Chung AYC, Eggleton P, Khen CV and Yusah KM. 2011. Establishing the evidence base for maintaining biodiversity and ecosystem function in the

oil palm landscapes of South East Asia. *Philosophical Transactions of the Royal Society B* (Life Sciences) 366:3277–91.

Frayssinet F. 2013a. *Para, a nova terra onde cresce a palma*. *Inter Press Service News Agency*. 12 November 2013.

Frayssinet F. 2013b. *Oil palm changes rural culture in Brazilian Amazon*. *Inter Press Service News Agency*. 20 November 2013.

Freudenthal E, Lomax T and Messe V. 2012. *The BioPalm oil palm project: A case study in the Departement of Ocean, Cameroon*. Forest Peoples' Programme.

Friends of the Earth International. 2014. *Tell Wilmar: Only action, not words, will save forests*. 29 January 2014.

Fumachi Inuma J. 2013. *Los efectos de las abusivas adjudicaciones de tierras en Ucayali. Alturas de la Amazonia.* 30 de mayo 2013.

Garcia-Ulloa J, Sloan S, Pacheco P, Ghazoul J and Koh LP. 2012. Lowering environmental costs of oil palm expansion in Colombia. *Conservation Letters* 5:366–75.

Gaveau D and Agus Salim M. 2013a. New data on June fires generate important insights. *CIFOR Forests News blog*. 2 July 2013.

Gaveau D and Agus Salim M. 2012b. Research: Nearly a quarter of June fires in Indonesia occurred in industrial plantations. *CIFOR Forests News blog*. 30 July 2013.

Gerber JF. 2008. *Résistances contre deux géants industriels en forêt tropicale. Populations locales versus plantations commerciales d'hévéas et de palmiers à huile dans le Sud-Cameroun.* Montevideo (Uruguay): Mouvement Mondial pour les Forêts Tropicales, SSNC et Oxfam-Novib.

Gerritsma W and Wessel M. 1997. Oil palm: Domestication achieved? *Netherlands Journal of Agricultural Science* 45:463–75

Ghazoul J, Koh LP and Levang P. 2010. Checking the reality check. *Trends in Ecology and Evolution.* 25(1):8–9.

Gilbert A and Pinzon L. 2013. *Colombia Biofuels Annual* 2013. USDA GAIN Report.

Gilbert A. 2013. *Agricultural Sector protests put Santos Government in crisis mode*. 6 September 2013. GAIN Report.

Gillespie P. 2010. *Politics, power and participation: a political economy of oil palm in the Sanggau District of West Kalimantan, Indonesia* PhD thesis, Australian National University

Gillespie P. 2011. How does legislation affect oil palm smallholders in the Sanggau district of Kalimantan, Indonesia? *Australasian Journal of Natural Resources Law and Policy* 14(1):1–37.

Gillespie P and Harjanthi R. 2012. *ISPO, RSPO: Two sides of the same coin? The Jakarta Post*. 2 November 2012.

Glass V. 2012. *Expansion of palm oil in the Brazilian Amazon: Elements for an analysis of impacts on family farmers in north-eastern Para.* NGO Reporter Brazil's Biofuel Watch Center, Sao Paolo. Accessed 15 July 2013. www.agrocombustiveis.org.br

Global Witness 2012. *Taib family business expose by Global Witness.* Press statement 20 March 2012, PKR Sarawak

Goebertus J. 2008. Palma de Aceite y Desplazamiento Forzado en Zona Bananera: "trayectorias" entre Recursos Naturales y Conflicto. *Colombia Internacional* 67:152–75.

Golden Agri Resources (GAR). 2014. *Sustainability Report 2013*

Golden Agri Resources (GAR). 2012 *Sustainability Report 2011*

Golden Agri Resources and SMART 2012. *High Carbon Stock Forest Study Report* (with The Forest Trust and Greenpeace) Golden Agri Resources Limited, Singapore

Gomes MA, Biondi A, Brianezi T and Glass V. 2009. *Brazil of biofuels animal fat, palm oil, cotton, Jatropha, sunflower and rapeseed: Impacts of crops on land, environment and society.* NGO Reporter Brazil, Biofuel Watch Center, Sao Paolo. 33–4.

Gomes M and Glass V. 2013 *Expansion of palm oil in the Brazilian Amazon: an analysis of impacts on family farms in north-eastern Para* Reporter Brazil Biofuel Watch Center

Gomes M and Glass V. 2012. *New partnerships: Promise or poison to small farmers? Palm oil biofuel production in the Amazon*. Case study 4 *In Biofuel Partnerships: From Battleground to Common Ground.* CORDAID and partners.

Gomez Lopez A. 2010. *Palma de aceite y desarrollo local: Implicaciones en un territorio complejo.* MC Planificación y administración del desarrollo regional. Universidad de los Andes, Bogotá, enero de 2010.

Gourichon H. 2013. *Analysis of incentives and disincentives for oil palm in Nigeria.* Technical notes series, MAFAP, FAO Rome.

GRAIN 2013. *Stolen land: Nigerian villagers want their land back from Wilmar.*

GRAIN/Oakland Institute/World Rainforest Movement. 2014. *Environmentalist faces trial, while charges against his attackers mysteriously "disappear".*

Grajales J. 2011. The rifle and the title: paramilitary violence, land grab and land control in Colombia. *Journal of Peasant Studies* 38 (4):771-792

Green Car Congress. 2010. *Petrobras Launches Two Palm Oil Projects; Biodiesel in State of Pará, Renewable Diesel with Galp in Portugal*. 6 May 2010.

Greengrass E. 2006. *A survey of chimpanzees in southwestern Nigeria.* NCF WCS Biodiversity Research Programme.

Greenpeace 2014. *Licence to launder: How Herakles Farms illegal timber trade threatens Cameroon's forests and VPA.* Greenpeace International, Amsterdam, the Netherlands

Greenpeace. 2013 *Herakles Farms in Cameroon: A showcase in bad palm oil production*. Greenpeace, Washington, DC.

Greenpeace. 2013. *Certifying destruction: Why consumer companies need to go beyond the RSPO to stop forest destruction.* September 2013 Greenpeace International, Amsterdam, the Netherlands.

Greenpeace. 2012. *Palm oil's new frontier: How industrial expansion threatens Africa's rainforests*. Greenpeace International, Amsterdam, the Netherlands.

Greenpeace. 2009. *Illegal forest clearance and RSPO Greenwash: Case studies of Sinar Mas.* Accessed 10 January 2010. http://www.greenpeace.org.uk

Grupo Palmas. 2013. *Comprometidos con la Amazonica: Reporte de Sostenibilidad Palmas 2012.*

Gunarso P, Hartoyo M, Agus F and Killeen T. 2013. Oil palm and Land Use Change in Indonesia, Malaysia and Papua New Guinea *In* Killeen T and Goon J, eds. *Reports from the Technical Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil (RSPO)* Kuala Lumpur: RSPO. 29–64.

Guterman L. 2014. *Medicion de costos de producción e indicadores de productividad laboral en la agroindustria de la palma de aceite en Colombia 2011–2012.* Presentation to XLII meeting of oil palm growers, Cali 3 junio 2014

Gutierrez-Velez VH, DeFries R, Pinedo-Vasquez M, Uriarte M, Padoch C, Baethgen W, Fernandes K and Lim Y. 2011. High-yield oil palm expansion spares land at the expense of forests in the Peruvian Amazon. *Environmental Research Letters* 6:044029.

Gutierrez-Velez VH and DeFries R. 2013. Annual multi-resolution detection of land cover conversion to oil palm in the Peruvian Amazon. *Remote Sensing of Environment* 129:154–67.

Gwinner V. 2013. From words to impacts: The research behind Cameroon's sustainable palm oil policy. *CIFOR Forests News blog* 12 June 2013

Hakizumwami E. 2014 *Baseline study on models for smallholder development with regard to palm oil production in Cameroon* (Independent Consultant) July 2014.

Hakizumwami E. 2013. *RSPO Africa Roadshow – Ghana. Report on capacity building and awareness raising event in Cameroon.* The Proforest Initiative.

Haley I. 2014. *Decoding the Amazon: Brazil's Controversial new Forest Code*. in www.duqlawblogs.org/joule/2014/03

Harris N, Brown K, Netzer M, Gunarso P and Killeen T. 2013. Projections of oil palm expansion in Indonesia, Malaysia and Papua New Guinea from 2010 to 2050. *In Reports from the Technical Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil (RSPO)*, eds T Killeen and J. Goon RSPO Kuala Lumpur pp. 89–112.

Hartley C. 1977. *The Oil Palm (Elaeis guineensis* Jacq.*)*, 2nd ed. Longman, London and New York

Henderson J and Osborne D. 2000. The oil palm in all our lives: How this came about. *Endeavour* 24 (2):63–8.

Hew CS. 2011. Coping with change. *Critical Asian Studies* 43(4):595–616.

Hinchliffe T. 2014. Santos appoints Colombia's new ministers of interior, agriculture. *Colombia Reports*

Hirsch R. 2000. Recent dynamics of smallholders' oil palm plantations in Cameroon. *Oléagineux, Corps Gras, Lipides* 7(2)172–4.

Homma AKO, de Menezes A, Garcez Monteiro K, dos Santos J, Rebello FK, Martins Costa D, Gomes Junior R, dos Santos Sena A and Assis da Mota Junior K. 2014. *Integração Grande Empresa e Pequenos Produtores de Dendezeiro: o Caso da Comunidade de Arauai, Município de Moju, Para.* Embrapa. *Boletim de Pesquisa e Desenvolvimento* 92 Junho 2014.

Hortua-Romero S. 2014. *Representaciones discursivas sobre la palma de aceite en Colombia*

2002-2012: Analisis Critico del Discurso (ACD) desde una perspectiva ambiental [Master's thesis] Bogota, Colombia: Universidad Nacional de Colombia.

Hoyle D and Levang P. 2012. *Oil palm development in Cameroon.* WWF, IRD, CIFOR (also in French)

Hurtado Canepa, P. 2011. *Peru: Alternative crops curtailing narco-trafficking: New strategy implemented in the department of San Martin will be replicated nationwide.* 30.11.2011. http://infosurhoy.com/en_GB accessed 30.6.2013

[IDL] Instituto de Defensa Legal – Reporteros. 2013. *Deforestación entre palmas*. 12 September 2013

[IFAD] International Fund for Agricultural Development. 2012. *Enabling the rural poor to overcome poverty in Cameroon.* IFAD

Ijewere E. *Nucleus estate initiative and agribusiness development in Nigeria.* Biafra Nigeria World News (BNW News 12 October 2004).

Imprensa [Seagri] Secretaria Estadual da Agricultura. 2012. *Manejo e uso dos subprodutos do dendê são apresentados pela [EBDA] na Fenagro* (EBDA Empresa Baiana de desenvolvimento Agricola y Fenagro: 25 Feira Nacional de Agropecuaria da Bahia).

Indexmundi. 2014. *Palm oil Monthly Price - US Dollars per Metric Ton*. February 2010 – December 2014. http://www.indexmundi.com/commodities/?commodity=palm-oil&months=60

Indonesia Agribusiness Report, Q3 2013 http://www.businessmonitor.com

Instituto Peabiru. 2013. *Dende: Instituto Peabiru defende unidades de conservação municipais na área mais ameaçada da Amazônia*. 24 April 2013.

Inter-American Development Bank, Ministry of Mines and Energy Government of Colombia. 2010. *Sustainable energy and biofuel strategies for Colombia, Preliminary Report CO-T1052*. November 2010.

Investir au Cameroun. 2013. *Le Cameroun vise une production annuelle de 300 000 tonnes d'huile de palme d'ici à 2013*. No. 14. Mai 2013.

Isaacson A and Poe A. 2009. *After Plan Colombia: Evaluating "Integrated Action" the next phase of US assistance.* International Policy Report. Washington, DC: Center for International Policy.

Ismail N. 2011. *Asian Agri fund eyes Peru palm oil as Malaysia runs out of land.* Bloomberg, Businessweek 19 August 2011.

[IUF] The International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations and [UITA] La Unión Nacional Agroalimentaria de Colombia. 2011. *Colombian palm oil workers strike for a collective agreement and against precarious work.* 27 October 2011. http://cms.iuf.org/?q=print/1158

Iwuchukwu J and Igbokwe E. 2012. Lessons from Agricultural Policies and Programmes in Nigeria. *Journal of Law, Policy and Globalization* 5:11–21.

Jaccoud DB and Villela AA. 2013. *Observing opportunities and risks for the expansion of palm oil in the Brazilian Amazon.* World Bioenergy Symposium 2013, Rio de Janeiro, Brazil.

Johnson T and Franco J. 2009 *Economic Assessment of Palm Oil Production for Biodiesel in Colombia: Case Study Analysis for the Central and Eastern Zones*, Washington, World Bank Group

Julia and White B. 2012. Gendered experiences of dispossession: Oil palm expansion in a Dayak Hibun community in West Kalimantan. *Journal of Peasant Studies* 39(3–4):995–1016.

Jurnal Asia 2014. *Harga TBS turun drastis, lahan sawit terancam tak terawat.* 3 September 2014.

Kailany MN. 2011. *Smallholders in Malaysia*. presentation to RSPO meeting RT9, Kota Kinabalu, Sabah

Kajisa K, Maredia M and Boughton B. 1997. *Transformation versus stagnation in the oil palm industry: A comparison between Malaysia and Nigeria*. Staff Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.

Kandi M. 2013. Returning Nigeria to oil palm prosperity. *Peoples Daily* 1 August 2013.

Kaur G. 2014. *FGV shies away from NBPOL. The Star.* 29 November 2014.

Khor Reports – palm oil 2014. *Indonesia plantation foreign ownership limit bill tabled*? (update 5d). 16 September 2014

Kilby P. 1967. The Nigerian Palm Oil Industry. *Food Research Institute Studies* 7(2):177-201

Killeen TJ and Goon J, eds. 2013. *Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil (RSPO)* Kuala Lumpur 2013

Kinosian S. 2012. Colombia to indict 19 palm oil companies for forced displacement. *Colombia news, Colombia reports* July 31 2012

Koh LP, Miettinen J, Liew S and Ghazoul J. 2011. Remotely sensed evidence of tropical

peatland conversion to oil palm. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 108(2): 5127-5132. www.pnas.org/cgi/doi/10.1073/pnas.1018776108

Koh LP and Ghazoul J. 2010. Spatially explicit scenario analysis for reconciling agricultural expansion, forest protection and carbon conservation in Indonesia. *Proceedings of the National Academy of Sciences of the United States of America* 107:11140–4.

Koh LP, Levang P and Ghazoul J. 2009. Designer landscapes for sustainable biofuels. *Trends in Ecology and Evolution* 24(8):431–8.

Koh LP and Wilcove DS. 2008. Is oil palm agriculture really destroying tropical biodiversity? *Conservation Letters* 1:60–4.

Konings P. 1998. Unilever, contract farmers and cooperatives in Cameroon: Crisis and response. *Journal of Peasant Studies* 26(1):112–38.

Konings P. and Nyamnjoh F. 1997. The Anglophone problem in Cameroon. *Journal of Modern African Studies* 5(2):207–29.

Konings P. 1993. Contract farming and capital accumulation in Cameroon: The case of the CDC smallholder schemes. *In* Goschiere P and Konings P, eds. *Itinéraires d'accumulation au Cameroun*. Leiden, The Netherlands: Karthala Editions.

Konings P. 1986. L'état, l'agro-industrie et la paysannerie au Cameroun. *Politique Africaine* 22:120–37.

Korieh C. 2010. *The Land has Changed: History, Society and Gender in Colonial Eastern Nigeria*. Calgary, Canada: University of Calgary Press.

Kupas bengkulu.com 2014. *Harga TBS anjlok, petani malas panen.* 10 September 2014.

Lajiun J. 2012. Moratorium on expanding oil palm plantations proposed. Accessed 9 September 2014. www.theborneopost.com/2012/11/09/moratorium-on-expanding-oil-palm-plantations-proposed/#ixzz3DQirXv8d

Langford K. 2014. *Evidence mounts for oil palm under agroforestry in Brazil.* Agroforestry World Blog. 7 April 2014.

La Region (Diario Judicial de Loreto) 2013a. *Yo soy quien firma las resoluciones de desbosque y en la caso de Tamshiyacu NO hemos autorizado nada.*

La Region (Diario Judicial de Loreto) 2013b. *En Malasia prohibieron la siembra de Palma Aceitera por los efectos nocivos que ocasiona.*

La Region (Diario Judicial de Loreto) 2013c. *Empresas deforestaran 80 mil hectáreas de bosques en Loreto.*

[LEAP*] Land, Empowerment, Animals, People*. 2013. Media statement from the Malaysian Palm Oil NGO Coalition (MPONGOC).

LeBailly P and Tentchou J. 2009. *Etude sur la filière porteuse d'emploi « Palmier à huile »* Organisation Internationale du Travail (Bureau Sous-Régional pour l'Afrique centrale), Ministère de l'Emploi et de la Formation Professionnelle.

Lee JSH, Abood S, Ghazoul J, Barus B, Obidzinski K and Koh LP. 2014a. Environmental impacts of large-scale oil palm enterprises exceed that of smallholdings in Indonesia. *Conservation Letters* 0:1–9.

Lee JSH, Ghazoul J, Obidzinski K and Koh LP. 2014b. Oil palm yields and incomes constrained by harvesting practices and type of smallholder management in Indonesia. *Agronomy for Sustainable Development* 34(2):501–513.

Lee JSH, Garcia-Ulloa J, Ghazoul J, Obidzinski K and Koh LP. 2014c. Modelling environmental and socio-economic trade-offs associated with land-sparing and land-sharing approaches to oil palm expansion. *Journal of Applied Ecology* 51 (5) 1366-1377.

Le Maitre P. 2007. Black empowerment: The villagisation of an industrial plantation in Cameroon and the smallholder rubber project of SOGB – lessons learned. *In* Bruentrup M and Peltzer R, eds. *Outgrowers – A Key to the Development of Rural Areas in Sub-Saharan Africa and to Poverty Reduction*. Workshop Report. DEG and DIE.

Lees AC and Vieira ICG. 2013. Forests: oil-palm concerns in Brazilian Amazon. *Nature* 497:188. Accessed 22 July 2013. www.nature.com doi:10.1038/497188c.

Li TM. 2011a. Centering labor in the land grab debate. *Journal of Peasant Studies* 38(2):281–98.

Li TM. 2011b. *Indonesia's oil palm labor regime.* Paper presented to International Symposium on Society and Resource Management. 2011 Conference, 14–17 June 2011 Kota Kinabalu Sabah.

Lim CY. 2014a**.** *FELDA's proven track record a model to follow. The Star.* 22 April 2014.

Lim CY 2014b. *Sarawak's oil palm industry in quandary after Wilmar declaration*. *The Star* 18 January 2014

Lim CY. 2014c**.** *Addressing palm oil concerns. A conference reveals that Malaysia is constantly seeking to improve the sustainability of its oil palm industry*. *The Star.* 7 September 2014.

Lim SL and Ismar A. 2012. *For palm oil firms, Indonesian wage hike worrisome*. *Wall Street Journal*. 28 December 2012.

Llaguno DA, Killmer L, Lema L, Salazar A, Ortega A, Boulay C, Jaramillo G, Eschoyez R and Gaggero R. 2010. *Colombia: Biodiversity conservation in palm cropping areas.* Draft proposal for non-reimbursable funding. Document of the Inter-American Development Bank.

Lopez B. 2005. *Evaluation des ressources naturelles: contribution à l'étude d'impact (EIE) de l'implantation d'une palmeraie agro-industrielle de palmiers à huile au sud de Nigeria*. [Master's thesis]. Ecole Nationale du Génie Rural, des Eaux et des Forêts, Spécialisation "Foresterie Rurale et tropicale". CIRAD, Montpellier.

Lubis AM. 2013a. *GAPKI says 'no' to moratorium extension. The Jakarta Post.* 24 April 2013.

Lubis AM. 2013b. *Oil palm smallholders to get financial aid for certification. The Jakarta Post.* 8 May 2013.

Lubis A. 2008 *Kelapa Sawit (Elaeis guineensis Jacq.) di Indonesia* Edisi 2 Pusat Penelitian Kelapa Sawit, Medan Indonesia.

Luna Amancio N. 2013. *Cultivos de palma aceitera deforestaron 7 mil hectáreas. El Comercio* 3 de Marzo 2013.

Lydia 2014. *Dansa Agro Allied throws oil palm producing community a lifeline.* 25 March 2014 http://www.agronigeria.com.ng/author/lydia/page/40/ accessed June 30 2014

Mattangkilang T. 2013. East Kalimantan to halt issuance of palm oil permits. *Jakarta Globe.* 15 January 2013.

McCarthy J, Gillespie P and Zen Z. 2012. Swimming upstream: Local Indonesian production networks in "globalized" palm oil production. *World Development* 40:(3)555–69.

McCarthy JF. 2010. Processes of inclusion and adverse incorporation: Oil palm and agrarian change in Sumatra, Indonesia. *Journal of Peasant Studies* 37(4):821–50.

McCarthy JF and Cramb RA. 2009. Policy narratives, landholder engagement and oil palm expansion on the Malaysian and Indonesian frontiers. *Geographical Journal* 175(2):112–23.

McClanahan P. 2013. *Can Indonesia increase palm oil output without destroying its forest?* www.theguardian.com 12 September 2013.

McDougall A. 2013. *WWF embraces RSPO international standards on palm oil in Peru*. 11 March 2013. http://www.cosmeticsdesign.com/Business-Financial/WWF-embraces

McFerron W. 2014. *Palm oil prices seen near bottom by Oil World on demand.* Bloomberg. 2 September 2014.

McKenzie V. 2014. *Colombia's president Santos appoints second term cabinet. Colombia Reports.* 12 August 2014.

[MADR] El Ministerio de Agricultura y Desarrollo Rural, [ICA] El Instituto Colombiano Agropecuario,y [Fedepalma] La Federación de Cultivadores de Palma de Aceite 2014 *MADR, ICA y FEDEPALMA lanzan campaña contra la Pudrición del Cogollo.* 28 January 2014.

Magalhaes C and Drouvot H. 2009. *Agropalma: un exemple de politique de responsabilité sociale et environnementale associant des familles de petits agriculteurs.*5ème colloque de IFBAE (Instituto Franco-Brasileiro de Administracao de Empresas) de Grenoble, 18 & 19 mai 2009.

Majid Cooke F. 2006. Expanding state spaces using 'idle' native customary land in Sarawak. *In* Majid Cooke, F, ed. *State, Communities and Forests in Contemporary Borneo.* Canberra: ANU 'E' Press.

Majid Cooke F, Toh S and Vaz J. 2011. *Community–investor business models: Lessons from the oil palm sector in East Malaysia.* [IIED/IFAD/FAO]

Majid Cooke F. 2012. In the name of poverty alleviation: Experiments with oil palm smallholders and customary land in Sabah. *Asia Pacific Viewpoint* 53(3):240–53.

Malaysia Chronicle. 2013. *FGV raises land bank in Indonesia* 26 June 2013

Marin V, Lovett JC and Clancy JS. 2011. *Biofuels and land appropriation in Colombia: Do biofuels national policies fuel land grabs?* Paper presented at the International Conference on Global Land Grabbing, 6-8 April 2011. University of Sussex, UK: UDS.

Marin-Burgos, V. 2014. *Access, power and justice in commodity frontiers: the political ecology of access to land and palm oil expansion in Colombia*. [PhD thesis]. Netherlands: University of Twente.

Marin-Burgos V, Clancy JS and Lovett JC. 2014. Contesting legitimacy of voluntary sustainability certification schemes: Valuation languages and power symmetries in the Roundtable on Sustainable Palm Oil in Colombia. *Ecological Economics* (In press) Ecol. Econ (2014) http://dx.doi.org/10.1016/j.ecolecon.2014.04.011

Matho, A. 2012. *Le blog d'Anne Matho.* Archives de Tag: Socapalm 25 janvier 2012

Meijaard E and Sheil D. 2013. Oil palm plantations in the context of biodiversity conservation. *In* Levin SA, eds. *Encyclopedia of Biodiversity*, 2nd ed. 5:600–12. Waltham, MA: Academic Press.

Melke D. 2013. *Plantaciones de Pucallpa, Plantaciones de Ucayali: Creando Empleo Agricola Sostenible en Ucayali y Logrando Auto-suficiencia de Aceite Comestibles y Biodiesel en el Peru.* Presentation in Pucallpa. November 2013

Merem E. The Agroforestry systems of West Africa: The Case of Nigeria. 2005. Association for Temperate Agroforestry (AFTA) 2005 *Conference Proceedings.*

Merem EC, Wesley J, Twumasi YA, Richardson C and Romorno C. 2012. Tropical forest landscape change and the role of agroforestry systems in Southern Nigeria. 2012 *British Journal of Environment and Climate Change* 2(3):288–317.

Mesa-Dishington J. 2014. *Palabras del Presidente Ejucutivo de Fedepalma, Jens Mesa Dishington, en la apertura del XLII Congreso Nacional de Cultivadores de Palma de Aceite y demas eventos gremiales anuales.* Cali, 4 de junio de 2014.

Mesa-Dishington J. 2012a. *Palabras del Presidente Ejectivo de Fedepalma, Jens Mesa Dishington, en la apertura de las sesiones de interes sectorial correspondientes al XL Congreso Nacional de Cultivadores de Palma de Aceite, Buraramanga.* 30 de Mayo de 2012

Mesa-Dishington J. 2012b. *Challenges of oil palm development in Colombia.* PowerPoint presentation to RSPO meeting, Singapore 6/11/2012.

Miccolis A, Andrade RMT, and Pacheco P. 2014. *Land-use trends and environmental governance policies in Brazil*. Working Paper No. 171. Bogor, Indonesia: CIFOR.

Miccolis A and Andrade RMT. 2012. *The expansion of oil palm in the Brazilian Amazon: Paths forward for sustainability among family farmers.* Presentation to the Latin American Study Association (LASA) 2012 Congress. A copy of this report and others on the CAMTA project may be found under Langford K. 2014.

Miettinen J, Hooijer A, Shi C, Tollenaar D, Vernimmen R, Liew SC, Malins C and Page S. 2012. Extent of industrial plantations on Southeast Asian peatlands in 2010 with analysis of historical expansion and future projections. *Global Change Biology: Bioenergy* 4:908–18.

Miettinen J, Shi C and Liew SC. 2011. Deforestation rates in insular Southeast Asia between 2000 and 2010. *Global Change Biology* 17:2261–70.

Milieudefensie (Friends of the Earth Netherlands). 2013. *Wilmar International: Palm oil giant and world's least sustainable company.* 8 May 2013.

Mingorance F. 2006. *The flow of palm oil Colombia-Belgium/Europe: A study from a human rights perspective.* Human Rights Everywhere/Co-ordination Belge pour la Colombie.

Ministerio de Agricultura 2012a. *Palma Aceitera: Principales Aspectos de la Cadena Agroproductiva.* Dirección de Información Agraria, Dirección General de Competitividad Agraria (Peru).

Ministerio de Agricultura 2012b. *Estudio sobre la potencialidad de la palma aceitera para reducir la dependencia de oleaginosas importadas en el Perú*. Direccion de Información Agraria, Direccion General de Competitividad Agraria.

Ministerio de Agricultura 2000. *Plan Nacional de Promoción de la Palma Aceitera en Perú, 2000–2010.* Unidad de Desarrollo de la Amazonia.

Miotto K. 2010. Palm oil in Brazil: An idea of major proportions. *(O) eco Amazonia, Reportagens*

Mirella F. 2012. *Perú Desempeño Comercial de las Empresas Promovidas por el Desarrollo Alternativo 2011.* UNODC Jan–Dec 2011.

Molenaar JW, Persch-Orth M, Lord S, Clive Taylor C and Harms J. 2013. *Diagnostic Study on Indonesian Oil Palm Smallholders: Developing a better understanding of their performance and potential.* Jakarta: International Finance Corporation (IFC).

Monahan J. 2008. *Afro-colombians fight biodiesel producers. BBC News*. 21 December 2008. http://news.bbc.co.uk/2/hi/business/7784117.stm

Monteiro KFG. 2013. *Analise de indicadores de sustentabilidade socioambiental em diferentes sistemas produtivos com palma de óleo no estado do Pará.* Ministério da Educação Universidade

Federal Rural da Amazônia, Embrapa Amazônia Oriental: Curso de Doutorado em Ciências Agrarias.

Montfort M-A. 2005. *Filières oléagineuses africaines.* Tiré-à-part *Notes et Etudes Economiques*, septembre 2005 No. 23. République Francaise, Ministère de l'Agriculture et de la Pêche.

Moody's Credit Outlook. 2014. *Sime Darby acquisition of New Britain Palm Oil would be credit positive.* 16 October 2014.

Morgan W. 1959. Agriculture in southern Nigeria (excluding the Cameroons). *Economic Geography* 35(2):138–50.

[MPOB] Malaysian Palm Oil Board. 2014. *Statistics 2013.*

[MPOB] Malaysian Palm Oil Board. 2013. *Summary on the performance of the Malaysian oil palm industry 2012.*

Murdiyarso D, Dewi S, Lawrence D and Seymour F. 2011. *Indonesia's forest moratorium: A stepping stone to better forest governance?* Working Paper No. 76. Bogor, Indonesia: CIFOR.

Nagrace A. 2014. *Sarawak state will not bow to threats against palm oil supply, says Masing. The Star.* 15 February 2014.

Nahum JS. 2011. *Usos de territorio, dendeicultura e modo de vida Quilombola na Amazônia: estudo da microrregião de Tomé-Açu (Pa).* [Research proposal] Universidade Federal do Pará Instituto de Filosofia e Ciências Humanas Programa de Pos-graduação em Geografia, Faculdade de Geografia e Cartografia. Grupo de Pesquisa: Dinâmicas Territoriais do Espaço Agrário na Amazônia-(GDEA). Julho 2011.

Nahum JS and Malcher ATC. 2012. *Dinâmicas territoriais do espaço agrário na Amazônia: a dendeicultura na microrregião de Tomé-Açu (PA). Confins* [Online] 16. 20 November 2012. http://confins.revues.org/7947

Nahum JS. 2013. *Dendeicultura, comunidades tradicionais e Segurança Alimentar na Amazônia Paraense* . [Research proposal] Universidade Federal do Pará, Instituto de Filosofia y Ciências Humanas Programa de Pos-Graduação em Geografia, Faculdade de Geografia e Cartografia, Grupo de Pesquisa: Dinâmicas Territoriais de Espaço Agrário na Amazônia – (GDEA) Maio 2013

Ndi E. 2014. Upheaval in Nguti: Impoverished communities urge banishment of Herakles Farms. *News Watch Cameroon.* 8 April 2014.

Ndjogui T, Nkongho R, Rafflegeau S, Feintrenie L and Levang P. 2014. *Historique du secteur palmier à huile au Cameroun.* Occasional Paper No. 109. Bogor, Indonesia: CIFOR.

Nelson J and Lomax T. 2013. *They want to take our bush.* Forest People's Programme. July 2013

Neotropical Primate Conservation. *New forestry and wildlife law puts Peruvian wildlife at risk*. Press Release. 26 January 2014

[NESG] [FMARD] [NPC] Nigerian Economic Summit Group, Federal Ministry of Agriculture and Rural Development, National Planning Commission. 2013. *Report on the 19th Nigerian Economic Summit: Growing Agriculture as a Business to Diversify Nigeria's Economy* 3-5 September 2013 Abuja, Nigeria.

Nfor M. 2013. *Oiling the palms of Cameroon's farmers. Inter Press Service News Agency*. 4 July 2013.

Ngidang D. 2002. Contradictions in land development schemes: The case of joint ventures in Sarawak, Malaysia. *Asia Pacific Viewpoint* 43(2):157–80.

NGO Reporter Brazil. 2010. Family farming and the national biodiesel programme. www.reporterbrazil.org.br and www.biofuelbrazil.org

Nguiffo S and Schwartz B. 2012. *Herakles' 13th labor? A study of SGSOC's land concession in southwest Cameroon.*

Nigeria Business Guide 2014. *Sacked Risonpalm workers spit fire over gratuity.* 13 February 2014.

nigeriadailynews.com 2011. *Okomu oil palm company denies operating illegally.* 3 July 2011.

Njonga B, Nzegang M, Nkal G and Combaz D. 2012. *Systeme agraire et sécurité alimentaire des arrondissements de Toko, Mundemba et Nguti (Région de Sud-Ouest, Cameroun).* ACDIC (Association Citoyenne de Défense des Intérêts Collectifs) Greenpeace.

Nkongho R, Nchanji Y, Tataw O and Levang P. 2014. Less oil but more money! Artisanal palm oil milling in Cameroon. *African Journal of Agricultural Research* 9(20):1586–96.

Nkongho R, Feintrenie L and Levang P. 2014. Strengths and weaknesses of the smallholder oil palm sector in Cameroon. *Oilseeds and Fats, Crops and Lipids* 21(2):1–9.

Norwana AABD, Kunjappan R, Chin M, Schoneveld G, Potter L and Andriani R. 2011. *The local impacts of oil palm expansion in Malaysia: An assessment based on a case study in Sabah State.* Working Paper No. 78. Bogor, Indonesia: CIFOR.

Ntungwe Ngalame E. 2013. *Cameroon NGOs ask US Government to investigate palm oil venture.* Thomson Reuters Foundation. 9 July 2013.

Ntungwe Ngalame E. 2012. *Cameroon's forests pressured as leaders welcome palm oil investors.* Thomson Reuters Foundation. 23 May 2012.

Nzeka U. 2014. *Nigeria provides export market for oilseeds and products.* GAIN Report, USDA Foreign Agricultural Service.

Oakland Institute and Greenpeace. 2013. *Herakles exposed: the truth behind Herakles Farms false promises in Cameroon*. Oakland, CA: The Oakland Institute and Greenpeace International.

Oakland Institute (and Greenpeace) 2012. *Understanding land investment deals in Africa*: *Massive deforestation portrayed as sustainable development: The deceit of Herakles Farms in Cameroon.* Land Deal Brief, September 2012. Oakland, CA: The Oakland Institute.

Oates J. 1995. The dangers of conservation by rural development – a case study from the forests of Nigeria. *Oryx* 29(2):115–22.

Obidzinski K, Gnych S, Dermawan A and Hadianto A. In press. *Oil palm agribusiness for development: Assessing the socioeconomic impacts of oil palm expansion in Central Kalimantan.*

Obidzinski K. 2013. FACT FILE. Indonesia world leader in oil palm industry. *Forest News blog*. CIFOR 8 July 2013.

Obidzinski K, Takahashi I, Dermawan A, Komarudin H and Andrianto A. 2013. Can large-scale land acquisition for agro-development in Indonesia be managed sustainably? *Land Use Policy* 30(1):952–65.

Obidzinski K, Andriani R, Komarudin H and Andrianto A. 2012. Environmental and social impacts of oil palm plantations and their implications for biofuel production in Indonesia. *Ecology and Society* 17(1):25–45.

[OECD] Watch 2013. Issue: Environmental and labor violations at SOCAPALM in Cameroon. http://oecdwatch.org/cases/Case_203

Ogunkoya O. 2007. *Information Sheet on Ramsar Wetlands* (RIS) – 2006–2008 version: *Upper Orashi Forests.*

Oils and Fats International. 2014. *New body to regulate Malaysian Sustainable Palm oil Standard*. 6 November 2014.

Okidim I and Albert C. 2012. Analysis of determinants of growth in the oil palm industry in the Niger Delta of Nigeria: A case study of Bayelsa State. *Journal of Economics and Sustainable Development* 3 (9):25–9.

Okomu Oil Palm Company Plc 2014. *Creating wealth from the soil.*

Okwe J. 2012. *Privatised oil palm estates to create 900 jobs, revenue.* Accessed 25 June 2013. www.allafrica.com/stories/201208300343.html?aa_source=useful

Oliveira C, dos Santos Sena A and Wongan Silva M. 2013. *Relatorio Sintese do I Workshop do programa de Produção Sustentavel da Palma de Oleo no Brasil. Agricultura Familiar* E.P.D & I, Embrapa, Belém

Oliveira P, Asner G, Knapp D, Almeyda A, Galvan-Gildemeister R, Keene S, Raybin R and Smith R. 2007. Land use allocation protects the Peruvian Amazon. *Science* 317:1233–36.

Omar W, Che Jaafar N and Mansor NH. 2012. *Smallholder oil palm cluster: Sharing MPOB's experience.* Presentation to RSPO meeting RT 10, Singapore, 10 July 2012.

Onah G. 2008. *Two policemen killed in Cross River over communal crisis*. *AllAfrica Vanguard*. 11 June 2008.

ONF International. 2012. *Biomass residue availability within southern Nigeria.* Submitted to LaFarge/WAPCO, Nigeria.

Ortegon S. 2012. *El aceite que resucitó a Maria la Baja. Nación – Semana.com* 11 Mayo 2012.

Osagie C. 2013a. *PZ Wilmar: Reshaping oil palm industry with massive plantation development. This Day Live*. 7 May 2013.

Osagie C. 2013b. *FG, POFON battle to save Nigeria's oil palm plantations*. *This Day Live*. 27 May 2013.

Osagie C. 2013c. *FG confirms massive dumping of crude palm oil on Nigeria. This Day Live*. 3 June 2013.

Osagie C 2013d. *Competition good for Nigeria's Oil Palm Plantation Industry*. *This Day Live.* 10 June 2013.

Osagie C. 2013e. *Nigeria: As Presco, OZ Wilmar, OKOMU battle to dominate the vegetable oil market.* AllAfrica.com. 1 September 2013.

Osava M. 2010a. *Brazil: Small-scale palm oil production is women's work too*. *Inter Press Service News Agency*. 16 September 2010.

Osava M. 2010b. *Oil palm industry seeks to atone for its sins*. *Inter Press Service News Agency*. 1 October 2010.

Osava M. 2010c. BRAZIL: Oil palm Plantations expand on degraded land in Amazon. *Inter Press Service News Agency*. 30 December 2010.

Osemwegie O and Okhuoya J. 2009. Diversity of macrofungi in oil palm agroforests of Edo State, Nigeria. *Journal of Biological Sciences* 9(6):584–93.

Osorio CE, Torres R, Espinosa JC and Castro A. 2012. *Oportunidades del mercado de aceite de palma certificado para el sector palmero colombiano.* Presentation to *XL Congreso Nacional de Cultivadores de Palma de Aceite*, Bucaramanga, 30 May 2012.

Oxfam. 2013. *Divide and purchase: How land ownership is being concentrated in Colombia*. www.oxfam.org. 27 September 2013.

Oxford Analytica. 2011. Peru is poised to boost biofuels production. 17 October 2011.

Pacheco P. 2012. *Soybean and oil palm expansion in South America: A review of main trends and implications.* Working Paper No. 90. Bogor, Indonesia: CIFOR.

Pakiam R. 2014. Palm oil seen rebounding by Sime's Dass as demand recovers. Bloomberg. 2 September 2014.

Palm Oil HQ. 2012. *Sime Darby declines to confirm report on oil palm expansion in Peru.* 7 September 2012

Palm Oil HQ. 2009. *Malaysia not selling Sime Darby stake to China*. 4 September 2009.

Palm Watch - Africa. 2013. *Cameroon says Herakles Farms free to resume tree felling operations.* 6 June 2013.

Pamol Plantations Plc. n.d. *The history of Pamol Plantations plc.*

Paoli G, Yaap B, Wells P and Sileuw A. 2010. CSR, oil palm and the RSPO: Translating boardroom philosophy into conservation action on the ground. *Tropical Conservation Science* 3(4):438–46.

Paoli GD, Gillespie P, Wells P, Hovani L, Sileuw A, Franklin N and Schweithelm J. 2013. *Oil palm in Indonesia: Governance, decision making and implications for sustainable development.* Jakarta, Indonesia: The Nature Conservancy.

Paoli G, ed. 2014. *Best management practices in the Indonesian palm oil industry: Case studies.* Bogor, Indonesia: Daemeter Consulting.

Pautrat L and Segura F. 2010. *The risk of including the cultivatiion of Elaeis guineensis in Peruvian tropical forest and wildlife regulations – Technical and legal aspects.* Sociedad Peruana de Ecodesarrollo.

Pautrat Oyarzun L. 2013a. Letter No 039-2013/SPDE to Ambassador Michael Froman, United States Trade Representative, Washington DC.

Pautrat L. 2013b. *Empresas de palma aceitera deforestan 13,076 hectáreas de bosques primarios en los ultimos meses.* Sociedad Peruana de Ecodesarrollo *(SPDE).* 9 December 2013.

Perez-Rincon M. 2010. *Dinamica del sector palmero en Colombia y la región del sur de Bolivar: análisis de sus conflictos ambientales.* Submission to the Independent Commission on the land conflict in Las Pavas, Bolivar. Body Shop–Christian Aid.

Pickett R. 2013. Large scale palm oil deforestation of virgin rain forest discovered in Tamshiyacu. *Acate Amazon Conservation*. 4 September 2013

[PIND] Foundation for Partner Initiatives in the Niger Delta. 2012. *A scoping study on the palm oil value chain in Rivers and Imo States, Nigeria*. Foundation for Partnership Initiatives in the Niger Delta, Abuja, Nigeria www.pindfoundation-net/wp-content/plugins/.../download. php? id=20

[PIND] Foundation for Partner Initiatives in the Niger Delta. 2011. *A Report on Palm Oil Value Chain Analysis in the Niger Delta*. Foundation for Partnership Initiatives in the Niger Delta, Abuja, Nigeria.

Pinzon L. 2012. *Colombia Biofuels Annual: Colombian biofuels use close to reaching E10 and B10 levels.* USDA GAIN Report.

[POFON] Plantation Owners Forum of Nigeria. 2013a. *Communique of Extraordinary Meeting*. 7 May 2013.

[POFON] Plantation Owners Forum of Nigeria. 2013b. *Okomu strengthens leadership, builds largest mill in Africa.* 14 June 2013.

Poku K. 2002. Small-scale palm oil processing in Africa. *FAO Agricultural Services Bulletin No. 148*. Rome: FAO.

Potter L. 2014. Where are the swidden fallows now? An overview of oil palm and Dayak agriculture, across Kalimantan with case studies from Sanggau (West Kalimantan). *In* Cairns M, ed. *Shifting Cultivation and Environmental Change: Indigenous People, Agriculture and Forest Conservation*. London, UK: Routledge. 742–69.

Potter L. 2012. New transmigration 'paradigm' in Indonesia: Examples from Kalimantan. *Asia Pacific Viewpoint* 53(3):272–87.

Potter L. 2011. Agrarian transitions in Kalimantan: Characteristics, limitations and accommodations *In* de Koninck R, Bernard S

and Bissonnette JF, eds. *Borneo Transformed: Agricultural Expansion on the Southeast Asian Frontier*. Singapore: NUS Press. 152–202.
Potter L and Lee J. 1998. *Tree planting in Indonesia: trends, impacts and directions*. Occasional Paper No. 18. Bogor, Indonesia: CIFOR.
PR Newswire 2014. *Frost & Sullivan: Growth opportunity for Indonesia's palm oil market and downstream activities.*
PRESCO News 2008. *Outgrower scheme kicks off at Cowan.* Vol 14, May 2008
PRESCO News 2013. *News from SIAT Nigeria Limited.*
Proexport Colombia. 2008. *Biofuels Industry in Colombia.*
Proforest. 2013. *RSPO Roadshow in Latin America: report on RSPO lead auditor training in Belém, Brazil.* May 2013.
Prosharing.com/news/2633 2014. *Presco completes N350m Ologbo expansion project.* 2 July 2014.
Pye O, Daud R, Harmono Y and Tatat. 2012. Precarious lives: Transnational biographies of migrant oil palm workers. *Asia Pacific Viewpoint* 53(3):330–42.
Queiroz A, Franca L and Ponte M. 2012. The life cycle assessment of biodiesel from palm oil (*dende*) in the Amazon. *Biomass and Bioenergy* 36:50–9.
Rafflegeau S. 2008 *Dynamique d'implantation et conduite technique des plantations villageoises de palmier à huile au Cameroun: Facteurs limitants et raisons des pratiques*. [Thèse pour obtenir le grade de Docteur de l'Institut des Sciences et Industries du Vivant et de l'Environnement] Paris: Agro Paris Tech.
Raghu A. 2014. *Labor crunch hurts Malaysian palm oil growers as Indonesians stay home.* Reuters, 27 April 2014.
Rahman AKA, Abdullah R, Shariff FM and Simeh MA. 2008. The Malaysian palm oil supply chain: The role of the independent smallholders. *Oil Palm Industry Economic Journal* 8(2):17–27.
Rainforest Rescue. 2009. 'ALERT UPDATE! Malaysian Govt denies well-documented oil palm development plans in the Brazilian Amazon. 21 May 21 2009.
Ramalho-Filho A and da Motta PEF. 2010. *Zoneamento Agroecologico do Dendezeiro Pará as Areas Desmatadas da Amazonia Legal*. Rio de Janeiro: EMBRAPA.
Raman M, van Schaik A, Richter K and de Clerk P. 2008. *Malaysian palm oil – green gold or green wash? A commentary on the sustainability claims of Malaysia's palm oil lobby, with a special focus on the state of Sarawak.* Penang, London, Amsterdam, Brussels: Friends of the Earth International.
Ramirez Vargas R. 2012. *Informe final: Diagnóstico sobre la situación de los trabajadores de la agroindustria de la palma en el Magdalena Medio y Meta* Proyecto FOS-FENSUAGRO: Fortalecimiento de los sindicatos en el sector de la palma africana para mejorar los derechos laborales, con atención específica para la posición de la mujer, 2011–2013.
Rangel A, Ramirez W and Betancur PA. 2009. *Oil Palm in Colombia: Conflict, Myths and Realities.* Bogota: *Fundacion Seguridad y Democracia.*
Rashid A, Hamzah K and Joseph K. 2013. Land use change in Malaysia. *In* Killeen T and Goon J, eds. *Reports from the Technical Panels of the 2nd Greenhouse Gas Working Group of the Roundtable on Sustainable Palm Oil.* Kuala Lumpur: RSPO. 113–130.
Rebello FK. 2012. *Da lenha ao óleo de Palma: a transformação da agricultura no Nordeste Paraense* [PhD thesis]. Belém: *Universidade Federal Rural da Amazônia*.
Reina M. 2011. *Elementos para modificar el fondo de estabilización de precios para el palmiste, el aceite de palma y sus fracciones.* 2011 Proyecto para ASOGRASAS y FEDESARROLLO.
Republic of Cameroon. 2009. *Cameroon vision 2035: Working paper.* Ministry of the Economy, Planning and Regional Development, Forecast and Strategic Planning Division.
[PACA] Programme d'Amélioration de la Compétitivité Agricole. 2009. *République du Cameroun: Etude de Faisabilite d'un programme de développement des plantations villageoises de palmier à huile dans le cadre du projet «PACA»: Rapport définitif.* Paris: C2G Conseil.
Restrepo J. 2010. *COLOMBIA: Palm planters and displaced people wait for new government*. *Inter Press Service News Agency.* 6 July 2010.
Reuters. 2012. *Special report: Africa palm oil plan pits activists vs N.Y. investors.* Mark John 18 July 2012.
Reuters. 2011. *Siva Group in Cameroon $1.9 bln palm oil deal*. Accessed 8 September 2013. http://www.reuters.com/article/2011/08/24/ozabs-cameroon-biopalm-oil-idAFJOE77N01320110824

Revista Palmas. 2009. *Unidades de Asistencia y Auditoría Técnica, Ambiental y Social (UAATAS): Una estrategia para el manejo sanitario y para incrementar la productividad y competitividad palmera*. *Palmas* 30(3): 5-6.

Reyes E. 2014. RSPO: the road ahead for palm oil. *Eco-Business.* 15 January 2014

Reyes E. 2013. RSPO fires back at Greenpeace, calls report baseless. *Eco-Business.* 6 September 2013.

Ricq I. 2009. *Cameroun a l'arbre des palmiers.* http://isabellericq.fr/socapalm02.html

Ricq I and Gerber JF. 2010. *Dix réponses à dix mensonges à propos de la Socapalm.* WRM Bulletin No. 155.

Rincon C. 2013. *Habitantes en Tibú se sienten 'secuestrados' tras tensión en Catatumbo. El Tiempo.* 9 July 2013. http://www.eltiempo.com/archivo/documento/CMS-12919755

Rist L, Feintrenie L and Levang P. 2010. The livelihood impacts of oil palm: Smallholders in Indonesia. *Biodiversity and Conservation* 19(4):1009–24.

Rivera D. 2011. *Palma Aceitera y la securidad alimentaria en Maria La Baja, Montes de Maria 2000–2008.*

Robinson D. 2012. *Scientists sound alarm on massive oil palm development in Cameroon.* News Watch National Geographic. 20 March 2012

Rodrigues GS, de Barros I, Ehabe EE, Lang PS and Enjalric F. 2009. Integrated indicators for performance assessment of traditional agroforestry systems in south west Cameroon. *Agroforestry Systems* 77:9–22.

Rodriguez Raga MC, Carrizosa Umana A, Bonell C and Rengifo S. 2010. *De las Alianzas Productivas a los Negocios Inclusivos: Guia de Mejores Prácticas para la Implementación de Negocios Inclusivos en Palma de Aceite.* USAID Programa MIDAS

Romero-Ruiz M, Flantua S, Tansey K and Berrio J. 2012. Landscape transformations in savannas of northern Latin America: Land use/cover changes since 1987 in the *Llanos Orientales* of Colombia. *Applied Geography* 32:766–76.

Rosalina. 2013. 10 Kebun Sawit Meraih Sertifikat ISPO Perdana. *Tempo. Co BIsnis.* 8 Maret 2013.

[RSPO] Roundtable on Sustainable Palm Oil. 2014. *Revision of National Interpretations (NI) for countries with existing NI: National Interpretation, Task Force Composition.*

[RSPO] Roundtable on Sustainable Palm Oil. 2013. Resolution 6g: Proposed resolution to be adopted at the 10th General Assembly of the Roundtable on Sustainable Palm Oil. 14 November 2013. *Transparency in Plantation Concession Boundaries.*

[RSPO] Roundtable on Sustainable Palm Oil. 2012a. *Round table for sustainable palm oil new planting procedures: Summary report of planning and management.* Biase Plantations Limited (Ibiae Estate), Biase Local Government Area, Cross River State, Nigeria.

[RSPO] Roundtable on Sustainable Palm Oil. 2012b. *Round table for sustainable palm oil new planting procedures: Summary report of assessments.* Biase Plantations Limited (Ibiae Estate), Biase Local Government Area, Cross River State, Nigeria.

[RSPO] Roundtable on Sustainable Palm Oil. 2012c. *Status of complaints Herakles Farms.* 4 September 2012.

[RSPO] Roundtable on Sustainable Palm Oil/ Fedepalma. 2010. *Colombian national interpretation of the RSPO principles and criteria.*

Rudin H. 1938 *Germans in the Cameroons 1884–1914: A Study in Modern Imperialism*. New Haven, CT: Yale University Press.

Ruitenberg R. 2014. *Colombia palm oil exports forecast by Oil World at six-year high.* 6 May 2014. Bloomberg Newswires.

Ruiz E. 2012. *Aprovechamiento y efecto del escobajo de palma aceitera.* DPCA Ucayali

Rusmana Y and Listiyorini E. 2014. *Palm reserves in Indonesia falling as dryness curbs harvest.* 13 November 2014. *Bloomberg Newswires*.

[SAGRI] Secretaria de Estado de Agricultura/ Governo do Pará. 2013. *Programa de Dendê Estado do Pará.*

Santos JM. 2014. *Mensaje del Excelentísimo Señor Presidente de la República, Dr. Juan Manuel Santos Calderón, XLII Congreso Nacional de Cultivadores de Palma de Aceite. 4 de junio 2014.*

Sarawak Department of Agriculture. 2012. *Agricultural Statistics 2012*.

Sarvision. 2011. *Impact of oil palm plantations on peatland conservation in Sarawak 2005–2010.* Report commissioned by Wetlands International, Wageningen, The Netherlands.

Satriastanti FE. 2011. *Forest moratorium too harsh for some, too weak for others. Jakarta Globe.* 21 May 2011.

SAVE Wildlife 2013. *Nigerian NGO rainforest resource development centre is challenging the legality of a plantation takeover by Wilmar International in the Nigerian state of Cross River.*

Sayer J, Ghazoul J, Nelson P and Boedihartono KA. 2012. *Oil palm expansion transforms tropical landscapes and livelihoods. Global Food Security* 1:114-119.

Schrijver A. 2012. *Same, same, but different – A case study on the impact of biodiesel contracts on family farmers in Bahia* in *Biofuel Partnerships: from battleground to common ground?* The Netherlands: CordAid.

Schoneveld G. 2014. *The politics of the forest frontier: Negotiating between conservation, development, and indigenous rights in Cross River State, Nigeria*. *Land Use Policy* 38:147–62.

Schwartz B, Hoyle D and Nguiffo S. 2012 *Emerging trends in land-use conflicts in Cameroon.* WWF Report.

Seeboldt S and Salinas Y. 2010. *Responsibility and sustainability of the palm oil industry: Are the principles and criteria of the RSPO feasible in Colombia?* Oxfam Novib, Netherlands and Indepaz, Bogota, Colombia.

Semedi P and Bakker L. 2014 Between land grabbing and farmers' benefits: land transfers in West Kalimantan Indonesia. *Asia Pacific Journal of Anthropology* 15(4):376-390.

Semedo I. 2006. *O Mercado de Energia Renovável: Variabilidade Econômica do Dendê na Agricultura Familiar do Baixo Sul, Bahia.* [Dissertação apresentada na Faculdade de Ciências Econômicas de Universidade Federal da Bahia, como requisito para obtenção do título de Mestre em Ciências Econômicas] Salvador.

[Servindi] Servicios en Comunicación Intercultural. 2014. *Perdida de 347milliones de dolares causa deforestación de bosques primarios* Feb.18 2014

[Servindi] Servicios en Comunicación Intercultural. 2013. *Empresas de palma aceitera deforestan mas de 13 mil hectáreas de bosques primarios en Perú. Servicios en Comunicación Intercultural Servindi.*

[Servindi] Servicios en Comunicación Intercultural. 2010. *Perú: Grupo Romero renuncia a adjudicación de 6 mil 129 hectáreas de bosques amazónicos.* 28 de abril 2010

SGS Inspection Services. 2012. *RSPO notification of proposed new planting: Auditors' Summary for RSPO website.*

Sherpa, [CED] *Centre pour le Développement et l'Environnement*, [FOCARFE] *Fondation Camerounaise d'Actions Rationalisées et de Formation sur l'Environnement* and Misereor 2010. *L'impact de la privatisation de la SOCAPALM sur les communautés et l'environnement au Cameroun: Exposé de situation.*

Sime Darby Berhad 2012. *Annual report: 2014 Sustainability Report.*

Sinaga H. 2013. Employment and income of workers on Indonesian oil palm plantations: Food crisis at the micro-level. *Future of Food: Journal on Food, Agriculture & Society* 1(2):64–78.

Skinner EB. 2013. *Indonesia's palm oil industry rife with human-rights abuses.* Accessed 24 July 24 2013. www.businessweek.com/articles/2013-07-18/indonesias-palm-oil-industry-rife-with-human-rights-abuses

Slette JP and Wiyono IE. 2013. *Indonesia biofuels annual 2013*. Jakarta: USDA.

Slette JP and Wiyono IE. 2012a. *GAIN report 2012 Indonesia: Biofuels annual 2012*. Jakarta: USDA.

Slette JP and Wiyono IE. 2012b. *GAIN report 2012 Indonesia: Oilseeds and products update 2012*. Jakarta: USDA.

Slette JP and Wiyono IE. 2012c. USDA GAIN *Indonesia: Oilseeds and products annual 2012*. Jakarta: USDA.

Slette JP and Wiyono IE. 2011. GAIN Report 2011. *Indonesia: Oilseeds and Products Update*, Jakarta: USDA.

Sloan S, Edwards D and Laurance W. 2012. Does Indonesia's REDD+ moratorium on new concessions spare imminently threatened forests? *Conservation Letters* 5:222–31.

Sloan S. 2014. Indonesia's moratorium on new forest licenses: an update. *Land Use Policy* 38:37–40.

Sneyd A. 2012. Cameroon: Moving toward "investment–grade" food security. *Africa Portal* 20 June 2012.

Sokoudjou H. 1999. The case of Cameroon: Oil palm plantations, yet another threat to Cameroon's native forests. *In The Bitter Fruit of Oil Palm: Dispossession and Deforestation. World Rainforest Movement.*

Souza M Jnr. 2012. *Improvement and production of seeds: Approach and advances of the program of genetic improvement of the oil palm in Embrapa.* Presentation to the 17th International Oil Palm Conference, Cartagena, Colombia

Struebig M, Paoli GD and Meijaard E. 2010. A reality check for designer biofuel landscapes. *Trends in Ecology and Evolution* 25(1):7–8.

Suhardi E. 2012. *Indonesia as the largest CSPO producer: continuous commitment.* Presentation to RSPO meeting, Singapore 2012

Suharto. 2013. *Indonesian govt aims to raise mandatory level of biofuel in diesel oil. Antara News.* 28 August 2013

Suhendra Z. 2014. *Ini Dia 24 Pelabuhan yang akan Dibangun Jokowi untuk Program Tol Laut. detikfinance* 18.11.2014

Sutton K. 2001. FELDA's Sahabat complex in East Malaysia: Agribusiness on a grand scale. *Singapore Journal of Tropical Geography* 22(1):90–105.

Taylor M. 2014. *Draft plantations bill on foreign ownership limit hits presidential hurdle.* 8 September 2014.

Taylor M and Supriatna Y. 2014. *Indonesia lawmakers draft bill to slash foreign ownership of plantations.* 25 August 2014.

Taylor M and Supriatna Y. 2013. *Indonesia's biodiesel take-up to lag reform target. Jakarta Globe.* 27 November 2013.

Tenthoff M and Eventon R. 2013. *A 'veritable revolution': The land restitution law and the transformation of rural Colombia.* TNI Agrarian Justice programma.

Teo R. 2011. *Palm oil: Main contributor of Sabah's growth. Borneo Post.* 30 October 2011.

Teo R. 2010. *S'wak, Sabah suitable for SPOC pilot project. Borneo Post*. 1 December 2010.

Teoh CH. 2013. Malaysian Corporations as strategic players in Southeast Asia's palm oil industry. *In* Pye O and Bhattacharya J, eds. *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective.* Singapore: Institute of Southeast Asian Studies. 19–47.

Terazono E. 2014. *Latin American plantations – the future for chocolate? Africa instability main threat to cocoa supplies*. Commodities Note, *Financial Times*, London. 17 October 2014.

The Borneo Post. 2013. *Involve NGOs in sustainable palm oil, MPOC told.* 23 November 2013.

The Citizen. 2013. *Govt plans new land registration system.* 5 April 2013.

The Economist. 2012. *Land reform in Colombia: Peace, land and bread*. 24 November 2012.

The Financialist. 2013. *The world's biggest producers of palm oil are running out of land*. 9 May 2013.

The Jakarta Post. 2014. *Thousands of oil palm farms to miss certification.* 3 March 2014.

The Malaysian Insider. 2014. *Palm oil standard tested for usage by end 2014.* 2 September 2014

The Star. 2014 *Sarawak's oil palm industry in quandary after Wilmar's declaration*. 18 January 2014.

The Star. 2013a. *NGOs form coalition for bigger say in oil palm debate*. 2 August 2013.

The Star. 2013b. *Sustaining the palm oil industry.* 16 November 2013.

thetidenewsonline 2014a. *Ex-Risonpalm workers threaten to take-over estate.* 6 June 2014.

thetidenewsonline 2014b. *RSG shares 80,000 farm seedlings.* 25 June 2014.

Timesonline 2007. *Biofuel gangs kill for green profits.* 3 June 2007. http://www.timesonline.co.uk/tol/news/world/us_and_americas/article1875709

To Q. 2012. *Felda ignores poverty in Sabah*. *Free Malaysia Today*. 10 April 2012. Accessed 20 August 2013. www.freemalaysiatoday.com

Toh SM. 2013 *National Updates on Agribusiness Large Scale Land Acquisitions in Southeast Asia: Brief #5 of 8: Federation of Malaysia*

Trujillo Martinez A, Areval O Diaz L, Torres Tristan R, Livias Tocto G, Macedo Castro A and Fernandez Panduro R. 2009. *Palmicultores solicitan apoyo a ministros de Agricultura y Producción.*

Udo R. 1965. Sixty years of plantation agriculture in southern Nigeria: 1902–1962. *Economic Geography* 41(4):356–68.

Uekoetter F. 2011. *The Magic of One. Reflections on the Pathologies of Monoculture*. RCC Perspectives. Munich, Germany: Rachel Carson Center for Environment and Society.

Unilever 2013. *Sustainable palm oil sourcing policy.* Press release November 2013

[UNODC] 2014. *Pequenos productores de Caynarachi siembran palma aceitera en areas degradadas por coca. Oficina de las Naciones Unidas contra la Droga y el Delito (ONUDD).*

[UNOPS] 2009. *Alternative development transforms lives in Peru.* http://www.unops.org/english/whatwedo/UNOPSinaction/Pages/Alternative... 06/04/2009

[USAID/Peru] 2012. *USAID/Peru country development cooperation strategy 2012–2016.* Lima, Peru: USAID/Peru.

[USAID] 2010. *Lessons for future programming USAID/Peru's alternative development program.* Prepared by Weidemann Associates Inc. for review by the United States Agency for International Development.

[USDA] United States Department of Agriculture. 2013. Indonesia: Palm oil expansion unafffected by forest moratorium. Foreign Agricultural Service, Commodity Intelligence Report. 26 June 2013.

Uzoma J. 2013. *Imo palm industry back to life. Sunday Trust* online 28 April 2013.

van Dijk MP. 2012. Using a partnership to achieve sustainable development in the palm oil value chain in Malaysia. *In* van Dijk MP and Trienekens J, eds. *Global Value Chains: Linking Local*
Producers from Developing Countries to International Markets. EADI, Amsterdam: Amsterdam University Press. 137–62.
vanguardngr.com 2014. *Edo community alleges neglect oil palm company.* 23 April 2014.
vanguardia.com. 2014. *Esperan sanar pérdidas de $5,5 billones con plan contra la PC*. 29 January 2014.
vanguardia.com 2012. *PC en palma ya acabó 3.500 empleos en Puerto Wilches.* 15 November 2012.
vanguardia.com 2009. *En La Pampa se resistieron al despojo de las tierras.* 13 December 2009.
Vargas R. 2012 *Informe Final: Diagnostico sobre la situación de los trabajores de la agroindustria de la palma en el Magdalena Medio y Meta* Proyecto FOS-FENSUAGRO: Fortalecimiento de las sindicatos en el sector de la palma Africana para mejorar las derechos laborales, con atención específica para la posición de la mujer, 2011–2013.
Vargas R, Mow J, Perez M and Rivas A. 2010. *Report independent commission land conflict – Las Pavas-Bolivar, Colombia*. Body Shop–Christian Aid.
Varkkey H. 2012a. Patronage politics as a driver of economic regionalisation: the Indonesian oil palm sector and transboundary haze. *Asia Pacific Viewpoint* 53(3):314–29.
Varkkey H. 2012b. The growth and prospects for the oil palm plantation industry in Indonesia. *Oil Palm Industry Economic Journal* 12(2):1–13.
Varkkey H. 2012c. Malaysian investors in the Indonesian oil palm plantation sector: Home state facilitation and transboundary haze. *Asia Pacific Business Review* 19(3):381–401.
Velez Torres I. 2008. African oil palm production in Colombia. *In Fuelling Destruction in Latin America: The Real Price of the Drive for Agrofuels*. Accessed 1 February 2010. https://www.foeeurope.org/agrofuels/fuellingdestruction/FOEI_FuellingDestruction_lr_FINAL.pdf
Venturieri A, Mourao M (Jnr), Nascimento J (Jnr), Boari A and Gomes R. 2013. *Areas prioritárias para a expansão da Dendeicultura no Estado do Pará: Uma análise do Zondende e a Ocurrência do Amarelecimento Fatal do Dendezeiro*. Cididania a e Meio Ambiente. 23 outubro 2013.
Vieira C. 2011. *Colombia: Paramilitaries dig in to fight return of stolen land.* 5 August 2011. Reprint by Interpress Service Press Agency
Villaran de la Puente F, Davila Gagliardo M, Urday Beremguel P, Sanchez Llanos B and Vargas Cespedes R. 2012. *The alternative development model in San Martin: A case study on local economic development.*
Villela AA. 2009 *O Dendê como alternativa energética sustentável em áreas degradadas da Amazônia* Dissertaçáo de Mestrado apresentada ao Programa de Pos-graduação em Planejamento Energetico, COPPE, da Universidade Federal de Rio de Janeiro, como parte dos requisites necessariás a obtenção do título de Mestre em Planejamento Energético
Villela AA, Jaccoud DB, Rosa LP and Freitas MV. 2014. Status and prospects of oil palm in the Brazilian Amazon. *Biomass and Energy* 67:270–8.
Von Hellermann P. 2010. The chief, the youth and the plantation: Communal politics in southern Nigeria. *Journal of Modern African Studies* 48(2):259–83.
Von Hellermann P. 2007. Things fall apart? Management, environment and *taungya* farming in Edo State, southern Nigeria. *Africa* 77(3):371–92.
Wabiwa I. 2013. *Delight to disappointment as Herakles Farms' suspension order lifted.* Greenpeace Africa 26 June 2013
Wild Asia Group Scheme [WAGS]. 2012 MPOB SPOC Beluran "Technical Support Programme for Palm Oil" Wild Asia.
Watkins C. 2011. Dendezeiro: African oil palm agroecologies in Bahia, Brazil and implications for development. *Journal of Latin American Geography* 10(1):9–33.
Watts M. 2001. Petro-Violence: Community, extraction, and political ecology of a mythic commodity *In* Peluso NL and Watts M, eds. *Violent Environments.* Ithaca and London: Cornell University Press. 189-212.
Wetlands International 2010. *A Quick Scan of Peatlands in Malaysia.* Wetlands International-Malaysia: Petaling Jaya, Malaysia. 50 pp.
White D, Velarde S and Tomich T. 2005. *Alternatives to Slash and Burn (ASB) in Peru. Summary Report and Synthesis of Phase II.* Alternatives to Slash and Burn Program, Nairobi, Kenya.
White L and Oates J. 1999. New data on the history of the plateau forest of Okomu,

southern Nigeria: An insight into human disturbance has shaped the African rain forest. *Global Ecology and Biogeography* 8:355–61.

Wicke B, Sikkema R, Dornburg V and Faaij A. 2011. Exploring land use changes and the role of palm oil production in Indonesia and Malaysia. *Land Use Policy* 28:193–206.

Widhiarto H. 2014. *Govt asks EU to ease Indonesia's palm oil import regulations. The Jakarta Post.* 20 November 2014.

Wild Asia Malaysia. 2012. *A review of smallholder oil palm production: Challenges and opportunities for enhancing sustainability. A Malaysian perspective.* Accessed 4 April 2013. www.wildasia.org

Wilkinson J and Herrera S. 2010. Biofuels in Brazil: Debates and impacts. *Journal of Peasant Studies* 37(4):749–68.

Wilmar International Annual Report 2012, 2013.

Wilmar International 2013. *No deforestation, no peat, no exploitation policy.* Press Release 5 December 2013.

Wong SW. 2012. *Lima proposes 70,000 ha oil palm project to plantation giant Sime Darby. The Star.* 7 September 2012.

World Bank. 2008. *Cameroon: Agricultural value chain competitiveness study.*

World Bank 1978 *Report and recommendation of the President to the Executive Directors on a proposed loan to Nigeria for a Nucleus Estate/ Smallholder Oil Palm Project in Rivers State. Report No P-2336-UNI* May 24 1978

World Bank 1989 *Staff Appraisal Report Nigeria Tree Crops Project Report No 7429*-UNI February 28 1989

World Bank. 1991. *Project completion report Cameroon oil palm and rubber consolidation project. (Loan 2160-CM)* Report No. 9430.

World Bank. 1982. *Cameroon: Oil palm and rubber consolidation project.*

[WRM] World Rainforest Movement 2014a. *Nigeria: Okomu oil palm company – destroying communities for oil palm expansion.* 7 March 2014 (included in Bulletin 199, WRM)

[WRM] World Rainforest Movement 2014b. *Nigeria – RSPO legal opinion ignores core of the complaint against Wilmar International subsidiary Biase Plantation Limited.* WRM.

[WRM] World Rainforest Movement. 2012. *The fast expansion of oil palm in the Amazon region.* WRM Bulletin No 182.

[WRM] World Rainforest Movement. 2010a. *Oil palm in Nigeria.* 6 August 2010 (draft).

[WRM] World Rainforest Movement. 2010b. *Oil palm in Nigeria: Shifting from smallholders and women to mass production.* WRM Bulletin No. 161. http://wrm.org.uy/oldsite/bulletin/161/Nigeria.html

[WRM] World Rainforest Movement. 2006. *Peru: The Amazon forest threatened by oil palm plantation projects.* WRM Bulletin No. 109. Peru.

Wright T and Wiyono E. 2014. *Indonesia oilseeds and products update. July 2014.* GAIN Report.

Wright T and Abdi A. 2014. *Indonesia oilseeds and products update.* November 2014. GAIN Report.

[WWF] World Wide Fund for Nature. 2013. Palming off a National Park: Tracking illegal oil palm fruit in Riau, Sumatra. WWF Indonesia.

[WWF] World Wide Fund for Nature. 2012. *Profitability and sustainability in palm oil production: Analysis of incremental financial costs and benefits of RSPO compliance*. WWF in collaboration with FMO and CDC.

[WWF, MINADER, Proforest] Worldwide Fund for Nature, Ministry of Agriculture and Rural Development (Cameroon), Proforest 2014. *Atelier sur le renforcement des partenariats gagnant-gagnant entre agro-industries et petits exploitants pour une production durable d'huile de palme au Cameroun. Rapport de l'atelier* 13-14 fevrier 2014

Yaap B, Struebig MJ, Paoli G and Koh LP. 2010. Mitigating the biodiversity impacts of oil palm development. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources* 5(19):1–11.

Yornamue P. 2003. *The rise of Risonpalm. Newswatch* (Lagos). 7 April 2003.

Yui S and Yeh S. 2013 Land use change emissions from oil palm expansion in Pará, Brazil depend on proper policy enforcement on deforested lands. *Environmental Research Letters* 8(4): 1-9.

Yulisman L. 2014b. *RI proposal to merge palm oil certification gets warm welcome. The Jakarta Post.* 11 June 2014.

Yulisman L. 2014c. *Business groups oppose plantation bill. The Jakarta Post.* 12 September 2014.

Yulisman L. 2013d. *Investors to spend more on palm oil refineries. The Jakarta Post.* 10 June 2013.

Zainul IF. 2014. *Sime eyes at least 51% stake in NBPOL to control the PNG plantation giant. The Star Business News Home.* 14 November 2014.

Zibechi R. 2009. *Massacre in the Amazon: the US/Peru Trade Agreement sparks a battle over land and resources* (Trans L. Carlson, Americas program Centre for International policy) Centre for International Policy June 16 2009.

Zimbalist Z. 2007. Colombia oil palm biodiesel plantations: A "lose-lose" development strategy? *Food First Backgrounder* 3(4). http://foodfirst.org/publication/colombia-palm-oil-biodiesel-plantations-a-lose-lose-development-strategy/

ISBN 978-602-1504-92-5
DOI: 10.17528/cifor/005612

CIFOR Occasional Papers contain research results that are significant to tropical forest issues.
This content has been peer reviewed internally and externally.

This study comprises a review of oil palm development and management across landscapes in the tropics. Seven countries have been selected for detailed analysis using surveys of the current literature, mainly spanning the last fifteen years. Indonesia and Malaysia are the obvious leaders in terms of area planted and levels of production and export, but also in literature generated on social and environmental challenges. In Latin America, Colombia is the dominant producer with oil palm expanding in disparate landscapes with a strong focus on palm oil-based biodiesel; and small-scale growers and companies in Peru and Brazil offer contrasting ways of inserting oil palm into the Amazon. Nigeria and Cameroon represent African nations with traditional groves and old plantations in which foreign 'land grabs' to establish new oil palm have recently occurred.

The literature surveys have been conducted in English and complemented with literature in local languages (Indonesian, Spanish, Portuguese and French), and where possible have also included fieldwork. Four major themes are used to structure the argument and maintain a comparative approach. They are: 1) the influence of oil palm expansion in economic development and land use change, especially deforestation; 2) the role of government policies and corporate strategies in shaping oil palm development; 3) the business models commonly used, especially plantations and various types of smallholders, either assisted or independent; and 4) ongoing initiatives towards more sustainable and inclusive oil palm production. This study shows that oil palm development is heavily entrenched in local and national political economies and responses for advancing towards more sustainable oil palm have to look beyond oil palm as a sector and a commodity.

CGIAR RESEARCH PROGRAM ON Forests, Trees and Agroforestry

This research was carried out by CIFOR as part of the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative program aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CATIE, CIRAD, the International Center for Tropical Agriculture and the World Agroforestry Centre.

cifor.org blog.cifor.org

CGIAR Fund

Center for International Forestry Research (CIFOR)
CIFOR advances human well-being, environmental conservation and equity by conducting research to help shape policies and practices that affect forests in developing countries. CIFOR is a member of the CGIAR Consortium. Our headquarters are in Bogor, Indonesia, with offices in Asia, Africa and Latin America.