

Review of the diversity of palm oil production systems in Indonesia

Case study of two provinces: Riau and Jambi

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1 A short history of palm oil in Indonesia: A ‘success story’

Within the span of only a few decades, Indonesia has become the world’s foremost producer of CPO (crude palm oil), overtaking Malaysia in 2007. With a production of 23.9 Mt in 2011, Indonesia accounts for 49.7% of world production (Oilworld 2011), followed by Malaysia (37.8%), Thailand (3.2%), Nigeria (1.8%) and Colombia (1.7%) (Jacquemard 2012). A third of Indonesian production is consumed domestically – roughly 7.82 Mt in 2012, mainly due to growing demand from urban areas – with the rest being exported.

Demand for CPO is driven by many major importing countries, with India ranking first (7.8 Mt), representing 47% of Indonesia’s CPO exports, followed by China (6.3 Mt; although it mainly imports other palm oil products), the European Union (5.2 Mt) and Bangladesh (1 Mt), representing 10% of all Indonesian exports (BPS 2010).

Several factors are behind the economic success of the Indonesian palm oil industry: investments in agro-industrial assets, governmental support and increasing global demand. These translate into high prices. However, palm oil production also presents some drawbacks. Intensive palm oil production requires initial investments that individual farmers can rarely afford (McCarthy and Cramb 2009; Feintrenie et al. 2010). As a result, much of the Indonesian CPO market is dominated by industries that capture most of the benefits. In addition, this activity raises several broader issues: primary forest protection, biodiversity conservation, climate change, poverty alleviation and energy production. This highlights the need for research into palm oil from the socio-economic and agronomic points of view.

This Indonesian success story started at a rather slow pace in the middle of the 19th century.

1.1 Colonial times: 1848 to 1945

The African oil palm, *Elæis guineensis*, originates from West and Central Africa. The first seeds of the oil palm were brought from West Africa by the Dutch and planted in the Bogor Botanical Garden (Java Island) in 1848 (Wahid et al. 2004). Oil palm plantations expanded by 91,000 ha between 1916 and 1938 (Kehati et al. 2006), at about the same rate as rubber tree plantations. During this period, much research was undertaken on palm oil and improvements for cropping systems. The Basic Agrarian Law, ratified in 1870, was the beginning of the colonial plantations’ expansion in this Dutch colony. Since customary claims were not recognized over non-cultivated lands, such as forests, large tracts of land were considered ‘empty lands’. The Basic Agrarian Law thus encouraged the wealthy rulers to create and develop new plantations on forest lands. The first colonial plantations in Sumatra soon faced labor shortages and had to resort to forced labor from Java and in-migration of indentured servants from China, known derogatorily as coolies.

Faced with a steady increase in population and poverty on Java (which had the highest population densities in the world by the turn of the century), the Dutch colonizers started to implement the ‘*Kolonisatie* program’ from 1905. Under this program, landless people from the island of Java were moved to the less populated outer islands of Borneo and Sumatra. The transmigration program, as it was renamed after independence, had two main goals: reducing the population pressure on Java and developing food-crop production in the outer islands. Strengthening its grip on the colony by mixing populations of different origins was undoubtedly also part of the colonizer’s hidden agenda. A secondary goal of the program was to grow sufficient food crops locally to be able to provide food to

the colonial plantations in the vicinity of the colonization projects (Levang 1997; Sevin and Levang 1989). At the time, *Kolonisatie* was perceived as a ‘moral duty’ to alleviate poverty on Java and secure the supply of rice in Java and Sumatra (Levang 1997). The aim of the program was not to procure laborers for the colonial plantations, even though some porosity in this respect may have existed.

The Japanese occupation from 1942 to 1945 during the Second World War put a halt to the expansion of oil palm plantations. The Japanese accorded priority to the war and to supplying food to its army (Wan Kian 2008). Difficulties in transporting and exporting palm oil caused by tense international relations and the promotion of food crops for war needs slowed down the development of the palm oil sector considerably (Kehati et al. 2006 in Wan Kian 2008).

1.2 The old order: 1945–1966

On 17 August 1945, Indonesia declared independence. However, this independence only became effective during the final days of 1949. Sukarno became Indonesia’s first president (Vickers 2005). From 1950 to 1966, a period referred to as the ‘old order’, Sukarno opted for a ‘guided democracy’, driven in part by anti-capitalism resentment, convinced that Indonesia could “stand on its own two feet” (Casson 1999). During this period, palm oil production declined, most likely due to poor management. Indeed, plantations were nationalized and managed by demobilized soldiers with no specific knowledge of palm oil production (Fallmeier 2012). The new managers were far from efficient and most of the funds dedicated to the development of production were diverted into private pockets, contributing to the stagnation of the palm oil industry until 1967 (Sevin and Levang 1989).

At the same time, Sukarno believed transmigration was “a matter of life and death for the nation” and the program was presented as a social response to growing unemployment (Levang 1997). The program’s underlying goal was to build a new nation by reducing ethnic diversity and, in this way, reducing political unrest on the outer islands (Levang 1997; Sevin 2001). However, the program fell far short of its planned targets¹ and was seriously questioned (Sevin and Levang 1989). The program also suffered from a lack of funds, funds that most Javanese would rather have spent on modernizing and developing Java (Sevin and Levang 1989). The absence of any development of the palm oil sector, declining revenues from palm oil sales and international pressure for liberalization through both the World Bank and the International Monetary Fund (IMF) opened the door to a new era.

1.3 The New Order: 1967–98

In 1967, Suharto became the new president and he soon redefined the priorities for economic development. In a context of high inflation, he justified his politics of repression and authoritarian rule by the desire for rapid economic development (Hartveld 1985). Using 5-year plans, Suharto used the transmigration program as a key to achieving rice self-sufficiency, starting huge projects to improve rice cultivation in the lowlands of Sumatra and Kalimantan. However, these projects suffered from a lack of funding, despite the support of the World Bank (Levang 1997). As a result, most of them were far from successful and the government switched its focus to palm oil production as a way of improving the efficiency of transmigration (Zen et al. 2005; Levang 1997). Palm oil soon became a major vector for developing rural areas and lands with the help of the many transmigrants (Zen et al. 2005). In the early stages, during the 1960s, the expansion of oil palm cultivation was led by public companies called *Perusahaan Negara Perkebunan* (PNP). Subsequently, in the 1970s, these companies were turned into *Perseroan Terbatas Perkebunan* (PTP), semi-public companies supported by loans from the World Bank (Casson 1999). The government retained the management of existing PTP companies and created new ones (Larson 1996). The plantations of these companies accounted

1 For example, one target, set in 1951, called for the displacement of 48 million people to the outer islands within 35 years.

for the majority of the areas under oil palm cultivation until the 1990s (Directorate General of Estate Crops 2010).

Within the private sector, a few companies, called *Perkebunan Besar Swasta* (PBS), started to develop with the consent of the Indonesian government, which viewed them as vehicles to boost national income and attract foreign investment. The State gradually shifted away from funding its public companies and began granting large concessions to the PBS. However, the government rolled out a program designed to improve integration of smallholders in the palm oil sector.² This evolution was embodied in the Nucleus Estate and Smallholders (NES) program, launched in 1978 (McCarthy 2010). The nucleus (*inti* in Indonesian) refers to the core plantation of the company, located around the industrial mill. 'Plasma' refers to the periphery of the nucleus, which is still under the company's supervision but is allocated to outgrowers, mainly transmigrants, under various partnership contracts. Smallholders were usually allocated a 2-ha plot of oil palm (McCarthy et al. 2012a). Local people who had to surrender land for the project were included as outgrowers. The company, publicly or privately owned, could ask for a concession comprising both State land and privately owned land. As soon as the agreement was reached, the company had either to convince the local landowners to participate in the scheme or to sell their land to the company. In order to help develop oil palm plantations and create jobs, the transmigration program was then linked to the NES business models through the creation of the *Perkebunan Inti Rakyat-Trans* (PIR-Trans or NES for Transmigration) schemes, allocating plasma land to transmigrants. In the case of PIR-Trans, land usually originated from 'conversion or production forest' allocated to companies through long-term leases. Transmigrants could thus acquire forest land from State Forests converted into PIR-Trans or from local people via the NES scheme. An unconventional way to acquire land from the plasma was to illegally buy already developed plots either from transmigrants or from local people participating in the project (Colchester et al. 2006). While the physical development of the scheme was the responsibility of the company, the State took over the recruitment and displacement of the transmigrants, as well as food and housing expenses during the first few years of the oil palm plantation, i.e. during its immature stage (Larson 1996).

In 1988, the government realized that the high initial investment needed for oil palm cultivation was still an obstacle to smallholder participation in the scheme, partly because of the reluctance of banks to provide credit to individual farmers without any collateral. Local people were thus finding themselves barred from participating in outgrower schemes, even when they owned enough land (at least 5 ha were required to participate) (Colchester et al. 2006), since they were unable to pay the management costs of their plots during the immature stage (Fallmeier 2012). As oil palms only reach their maximum production 7 years after planting (Jacquemard 2012), farmers were forced to taking out long-term loans. The local people also complained that their bargaining power with the companies was very unequal, giving them little say in the allocation of lands. Very often, the companies allocated most of the land handed over to the *inti* and allocated the least productive lands to the plasma (McCarthy and Cramb 2009). Thus, in 1988, the *Koperasi Kredit Primer Anggota* (KKPA) scheme was created to improve farmers' ability to cultivate oil palm. This scheme, funded in part by World Bank loans, the Asian Development Bank and foreign investors, promoted the creation of farmer cooperatives. The cooperatives served as intermediaries between the company and the smallholders who owned plasma plots. Furthermore, the cooperative would help the farmers manage the plasma while providing credit at concessionary rates to cover their costs (McCarthy and Cramb 2009; McCarthy et al. 2012a). The concessionary interest rates offered by participating banks were 11% during land preparation and 14% during harvests (Casson 1999), which encouraged local farmers to participate in the program and migrants to buy land.

The 'New Order' represented a period of steadfast commitment by the government to developing the palm oil sector. However, despite its goodwill and best intentions, the recurrent recourse to unclear

2 Smallholders are defined as landowners with less than 50 ha of land (RSPO 2006).

regulation, the lack of commitment of cooperatives toward farmers, the above-mentioned economic reasons and all-pervading corruption started to threaten Indonesia's economic stability (Casson 1999).

1.4 The Asian economic crisis of 1998

Indonesia was one of the countries most impacted by the Asian economic crisis of 1998, with the economy shrinking by an extraordinary 13.6% in that year (Colfer and Resosudarmo 2002). This situation was partly the result of the pervading corruption under Suharto's regime, which allowed companies to take on excessive foreign currency debt and avoid transparency in accounting (Casson 1999). Thus, while the depreciation of the rupiah, combined with the earlier liberalization efforts, led to higher exports of palm oil and, consequently, immediate huge profits, the drawbacks soon caught up with the sector and the country. As an illustration, while the Lon Sum company benefited from a 17% increase in its profits through high CPO world prices and a favorable export climate, this soon turned a net loss by 1998 (Tripathi 1998). Indeed, the depreciation of the rupiah against the dollar during the crisis had dramatic consequences, especially with foreign currency debt ballooning rapidly (Colfer and Resosudarmo 2002). Companies were forced to lower their targets in terms of new concessions and planting areas (Casson 1999).

However, the symptoms of the crisis were mitigated by the agricultural sector. As an essential sector of the country at that time, agriculture was free from foreign currency debt and could help prevent foreign currency outflows for the import of expensive commodities. It was also able to absorb the workforce made redundant from the collapsing manufacturing sector (Sunderlin 1998). For the farmers, both smallholders and laborers on rented land, inflation led to hardships and forced them to extend their land in order to increase their incomes, notably by intruding into the forest. Furthermore, high export prices attracted them to cash crops, such as oil palm and rubber, in the expectation of higher revenues from selling to the company's mill or through smuggling (Colfer and Resosudarmo 2002).

The El Niño-induced drought further aggravated the crisis and the rising costs of inputs led to decreasing palm oil productivity. With the rise in production costs, the planting rate in 1999 had declined by 33% compared to 1997 (Casson 1999). As described by Casson (1999), this situation resulted in rapid inflation in the prices of palm oil products on the local market. Supply could not meet the peak demand at Christmas and Ramadan due to low production and increased smuggling. Shortages started to appear in the local market and CPO prices skyrocketed from IDR 1.245/kg to IDR 3.277/kg. In addition, export tax rates aimed at reducing exports so that domestic demand could be met, reached 60% in mid-1998, while farmers' incomes and foreign currency earnings sank dramatically (Casson 1999). On the one hand, local prices of palm oil were inflated because of the weakness of the rupiah and production shortages. On the other hand, however, world prices of CPO were declining. Indeed, CPO faced competition from cheap Brazilian soybean oil, due to massive conversion of land to this crop, and local CPO smuggling (Danareksa 1999 in Casson, 1999). This pounded both the local market and exports and the palm oil sector suffered hugely from the mismanagement of the crisis by the government (Danareksa 1999 in Casson, 1999).

1.5 The Reformasi era: 1998 to today

Eventually, even as the crisis neared its end, the uncertainty and poor communication between parties left the sector's actors in turmoil. The government proved incapable of reassuring investors and was inefficient in keeping its plantations afloat. There was massive social unrest, caused not only by the crisis but also older grievances. The lack of clarity in its new regulations concerning export taxes, sales of new concessions and business development hampered investment and proved detrimental to companies. This confusion caused the performance of the palm oil industry to start plummeting. The government responded by a drastic change in its industrial strategy, moving from a policy of heavy

intervention in the industry toward more indirect action, as discussed below. This led to the resignation of President Suharto in May 1998 and the election of Jusuf Habibie to the post.

With Jusuf Habibie as president, Indonesia adopted a strategy of increased liberalization and democratization in order to regain the trust of international institutions and donors (Casson 1999). The transmigration program was also scaled back and fewer families were moved, due to a lack of funds (Singer 2009). The land cleared by the fires of 1997–98 and the reverse effect of the El Niño oscillation gave a new impetus to the production of CPO, further bolstered by export tax reforms. The production of CPO increased dramatically (Casson 1999). In 1999, the government ratified laws number 22 and 25 that gave autonomy to regional authorities such as of districts (*Kabupaten*) and municipalities (Moeliono et al. 2009). This process of decentralization allowed the districts and villages to manage their own resources and to increase their tax revenues from their exploitation.

The Reformasi era, also called the ‘laissez faire’ era by McCarthy (2010), was marked by the withdrawal of the government from dictating or influencing business strategies. The government moved away from controlling the organization of companies, providing them with funds, land grants and regulating exchange rates, focusing instead on a ‘partnership’ approach in which it would ‘shape outcomes by establishing a regulatory framework and by providing the institutional context’ (McCarthy 2010). As a combined result of this new orientation and budget constraints, the government stopped providing credit and developing infrastructure related to the development of the KKPA scheme (McCarthy and Cramb 2009). However, subsequent years showed these joint-venture models to be rather inefficient because of the local farmers’ lack of initial capital, reduced availability of credit for every type of stakeholder and the many ways companies cheated the locals (McCarthy 2010). Smallholders could not enter or remain in the scheme because they usually lacked the cash necessary to meet unexpected health- or education-related expenses or to deal with a reduction in income. They were thus forced to sell their lands, usually before the palm trees reached maturity, but obtaining high prices resulting from the scarcity of land. Consequently, the Indonesian government adopted the ‘Plantation Revitalization Program’ to boost the sector’s recovery by providing credit (Direktorat Jenderal Perkebunan 2007). Expansion of the sector was no longer dependent on joint ventures between private companies and the local people; it was now driven more by a ‘partnership’ between the government, smallholders and companies. As a result, smallholders constituted as much as 38% of the planted area and 35% of the production in 2010 (BPS 2010).

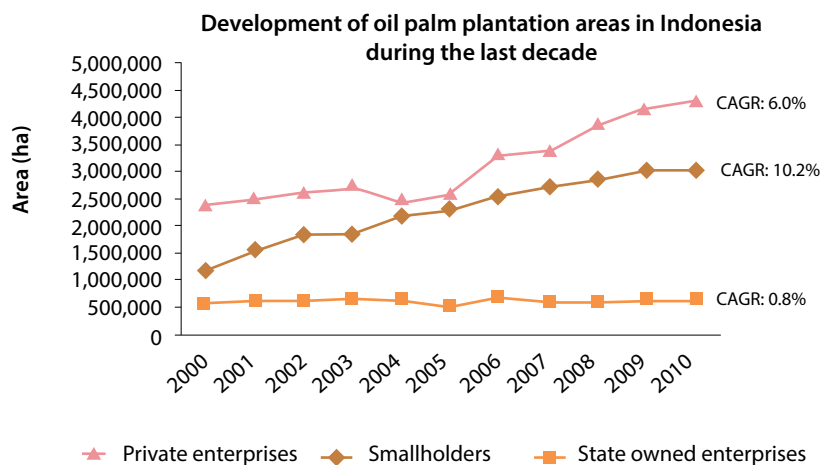


Figure 1. Oil palm plantation area in Indonesia during 2000–10 according to type of ownership

Note: CAGR (Compound Annual Growth Rate)

Source: Tree Crop Estate Statistics 2010–2011 for Palm Oil Plantations by the Directorate General of Estates in PWC (2012).

More recently, a new kind of partnership called '*kemitraan*' is becoming popular. In this model, a smallholder surrenders his land along with the property title to a company which uses the latter as collateral to obtain a loan and manage the land as part of its palm oil plantation. The smallholder then receives a 20% share of the production (McCarthy et al. 2012a). The rapid expansion of palm oil areas has led to the establishment and modification of a large number of regulations, especially concerning the status of forests. Thus, pressure from the IMF (International Monetary Fund) and discussions at the Conference of Parties in Bali led to a moratorium on the granting of new concessions of forestland by the Indonesian government in an effort to protect the forest.

2 State support to the palm oil sector and legal framework

2.1 The determining role of the State in the development of the palm oil sector

The State has played a determining role in the development of the Indonesian palm oil sector from its very beginning. During the colonial period, the government of the Dutch East Indies facilitated the setting up of large colonial plantations in Sumatra. After independence, President Sukarno nationalized the former colonial plantations and managed the sector through public companies (PNP). During the New Order, the State organized production through the PIR and KKPA schemes, introduced the transmigration program, provided a labor force and allocated land. The Indonesian government also relied on 'macro-interventions', such as controlling the exchange rate, tariff barriers and commodity prices to better control the sector (Zen et al. 2005). At present, the government has reduced its level of direct intervention, but still partially controls the sector through new legislation on the ownership and creation of new businesses (*Jakarta Post* 2012).

The pressure for liberalization and the Asian Crisis heralded a complete change in the government's role in the palm oil sector. The country shifted away from a controlled economy and moved toward a free-market economy (Casson 1999). This evolution symbolized the transition from a welfare-state development approach toward a neo-liberal one (McCarthy and Cramb 2009). Today, the government has, on the whole, given up on interventionist measures. As a combined result of this new orientation and budget constraints, it stopped providing credit and developing infrastructure related to the development of the KKPA scheme and other NES plantation models (McCarthy and Cramb 2009). The decentralization process has devolved more power to regional and local governments, which are now less accountable to the national government on how business is carried out within their territory of influence. Two main laws describe the essential framework of decentralization: Law 22 on Regional Governance and Law 25 on Fiscal Balancing, both of which were passed in May 1999 (Potter and Badcock 2001). One impact of having accessible officials who are empowered at the regional and/or district levels is that companies feel reassured. Indeed, firms prefer to deal with governance structures that reduce uncertainty, waiting time, the risk of supply failures and unclear regulations (McCarthy and Cramb 2009).

Even though land that has no rights attached to it belongs to the national government, local governments are in charge of managing the transfer of land rights as long as it can be done without any conflict. Local governments decide on the classification of forest between conversion, protection and production areas. They are also responsible for maintaining records of land boundaries. It appears that, as long as local governments can resolve their conflicts themselves and manage businesses in line with the main national regulations, there is little intervention from the national government. With provinces and districts having greater freedom in managing their own resources, the differentiation in dealing with industries and locals is likely to increase between regions, with greater dependence on drivers specific to local situations.

The national government concerns itself with setting the rules, creating a favorable overall business climate, and making information and capital resources available. It can act as a judge for conflicts over lands or business contracts since it stays the ultimate owner during the land transfer process. It also has the right to revoke transfers and disallow resource-management plans (Martini et al. 2010). Its agreement is required to obtain a business permit. The national government now favors actions through micro-interventions such as providing credit (replanting process), undertaking research and developing infrastructure. There are, however, few reports of actual intervention by the national government at the

provincial level and on the ground. The government's role today can be seen as that of a 'third party' (McCarthy and Cramb 2009). As its level of intervention has decreased, new actors have come into play. The palm oil sector has moved from a sectorial approach toward a multi-stakeholder approach in which local governments, foreign investors and even smallholders have not only taken over many of the responsibilities of the national government but have taken up new ones as well.

2.2 Issues concerning land tenure and customary rights

The question of land tenure has proved to be very controversial and is the source of many conflicts (Colchester et al. 2006; Chong 2008; Feintrenie et al. 2010a, b; McCarthy et al. 2012a). This is mainly due to unclear regulations and lack of their implementation on the ground. While some parts of the constitution of 1945 state that the exploitation of natural resources is to be controlled and managed exclusively by the State, other parts, such as Article H28, extend protection to ownership rights, especially for traditional societies. This potential contradiction was further exacerbated by the Basic Agrarian Law of 1960 (BAL) which ensured that customary rights would be recognized only to the extent that they do not hinder national interests and development. Thus, customary rights can only find their legitimacy through the State's approval (Colchester et al. 2006). These customary rights were largely ignored under Suharto's regime and its single-minded pursuit of economic development, with neither the Basic Forestry Law nor the Basic Mining Law ensuring the respect of customary rights (Basic Forestry Law no. 5/1967, Basic Mining Law no. 11/1967).

The end of the New Order, marked by many social protests, forced the government to listen to the claims of the indigenous people. Through a legislative framework it defined which land could be recognized as being under traditional or customary rights ('*adat*' rights). It stated that this status refers to land on which a community, whose members follow customary laws in their daily lives, has developed customary institutions and laws regulating its use (Regulation no. 5 of 'A Manual of Conflict Resolution for Ulayat Rights Related Problems', BPN 1999). However, this effort also clearly limited the recognition of the areas under indigenous rights. While the new Forestry Law recognized a status of 'customary forest', this status remained under the State Forest Area, explicitly defined as having 'no rights attached' (Basic Forestry Law no. 41/1999). In 2000–2001, strong protests led the Indonesian House of Representatives to vote for a Legislative Act that revised the earlier BAL, BFL and other natural resource laws to better take indigenous rights into account. Despite this move, most recent laws do not do this. As part of the government's legal reforms (PROLEGNAS) in forestry, land reform and natural resource management, new laws should comply with the Legislative Act (Colchester et al. 2006).

On 3 May 2005, Presidential Regulation no. 36 strengthened the idea of compensation for land acquisition. This regulation stated that land procurement was the fact of obtaining land by compensating those who either released their rights over lands, buildings, plantations or who revoked their rights over land. The process has to be based on a consensus between the right holders and the government. The Land Procurement Committee, bringing together the concerned governmental agency and the right holders, is mandated to help reach a consensus when faced with a dispute concerning several holders of land rights. Each party to the dispute shall have the right to have a representative address the committee, appointed with the acknowledgment of the Village Head and a written act. This type of process is especially suitable when acquiring land for community development projects, such as public roads, schools, railways, water supplies or for any other public facility for which the regional government has to acquire land (Colchester et al. 2006). In the case of disputes, the government has the right to decide the terms of the agreement (Colchester et al. 2006). This underlines the fact that the power the government has to revoke land rights for public development projects considerably limits property rights and customary rights. The only solution is to obtain the fairest compensation possible, which is hard to achieve given the unequal bargaining powers (Colchester et al. 2006). This uncertain context of land ownership may indeed have an opposite effect. On the one hand, a farmer may rush into a partnership with a company to avoid having his land being taken away – at a low price – without

even being included in the scheme. On the other hand, he may want to remain independent if he is ensured proper legal recognition of his land to avoid being cheated by the company. This also implies that cooperatives in charge of maintaining land titles have a huge responsibility toward the farmers. It might be even worth a farmer becoming a member of a cooperative in order to obtain a proper land title after repayment of any debt and thus secure his plot of land. However, as explained later in this report, there is a lack of transparency and information on what land a title concerns and for how long.

In this regard, Roundtable for Sustainable Palm Oil (RSPO) certification insists that companies have an obligation regarding land acquisition and rights. Companies must own all legal documents acknowledging their rights over lands and these documents must be accessible by everyone. There must also be proper recognition of and no infringements on existing land rights, even customary rights. There must be no sign of contestation over land whatsoever and all land must have been acquired with free, prior and informed consent (RSPO 2012).

2.3 The determining role of migrants and the legacy of the transmigration program

Viewing transmigration as a vector of development and political stability (Levang 1997), the government looked for ways to integrate transmigrants into all agricultural development schemes. To begin with, the government requested the help of the PNP-PTP companies in managing the migrants through the use of the PIR (nucleus estate) system. This scheme was called PIR-Trans to underline the priority accorded to transmigrants in the allocation of plasma lands (Levang 1997). The system was, however, manifestly unfair to local people who had to relinquish their land rights. Transmigrants would obtain plots either from land surrendered by locals or allocated by the government. This scheme thus brought together local people who obtained access to plots on a nucleus plasma estate in exchange for the land they gave up to the company and transmigrants who were allocated plots on which they had initially no rights (Sevin and Levang 1989; Levang 1997). In fact, local smallholders could often not access a plasma plantation as easily as transmigrants could and often felt dispossessed of their own land (Sevin 2001). On the other hand, a class of successful transmigrants emerged, the migrants being able to make the most of palm oil production and to acquire more land.

After being abandoned for all practical purposes in 2000, the transmigration program left behind a mixed legacy: a wealthy class of transmigrants who had acquired the technical skills to cultivate oil palm, but also tensions between transmigrants and the local population.

2.4 Forest regulations concerning oil palm cultivation

Oil palm and the forest have been closely intertwined and require the coordination of both the Ministry of Forestry and the Ministry of Agriculture. This is partly due to the impact on the forest of using slash-and-burn to open up land for plantations. Many independent plantations have been created within the forest estate and this number keeps increasing, especially since local governments recognize the expansion of oil palm cultivation as a major poverty reduction tool (Singer 2009). Moreover, the abandonment of many HPHs (logging concessions), now unsupervised, has allowed smallholders to clear the area and develop their own plantations. During the PIR-Trans program, the government instructed that cash crops should be developed only outside the forest estate (forested areas which have not yet been exploited) on APL (Areal Penggunaan Lain) or non-forested lands. Where this was not possible, priority was still given to the conversion of fallow lands, *Imperata* grassland and secondary forests (Colchester et al. 2006; Gaiser 2009). The procedure to allow forest conversion is onerous and requires the zone to be recognized as a State Forest Area (forested areas under State recognition and possibly protection) in order for the ministry to deliver permits on the land. Most of the areas have not yet been categorized as State Forest Areas. This procedure consists of five steps in which officials must compare the boundaries with already existing rights on land, such as customary lands (Singer

2009). Thus, in 2004, only 12% of the forest zone had been classified as State Forest Area. Despite this lack of clear land status, many permits are still given and the conversion process is being carried out by considering any land of interest as the property of the State, most of the time ignoring the rights already applying to the area (*Kawasan Hutan Negara*). The Ministry of Forestry's task of managing the country's forest estate is far from easy, given that pressure is increasing from the private sector for the release of land. The recent moratorium might thus be hard to maintain (Colchester et al. 2006).

2.5 The moratorium on forest concessions

Since 2011, the Indonesian government has implemented a forest moratorium (Murdiyarso et al. 2011). It has suspended the issuance of new concessions on peatlands and forests in the quest for a better balance between economic, cultural, social and environmental development. The main goal of this moratorium is the reduction of greenhouse gas emissions, an issue that grew in importance after the Conference of Parties in Bali in 2007. Climate change is now a key concern for the government (Rakhmindyarto 2012). The decision to implement a moratorium was also supported by the IMF. However, there are no clear details about how long it is expected to last or how it will be implemented on the ground. If we combine the area of forest and peatlands estimated by the Indonesian government, the area targeted by the moratorium is 65.17 million ha (Slette and Wiyono 2011). While being a significant tool for environmental conservation, the moratorium also represents a threat to businesses and a source of worry for them. Indeed, this centralized decision has not pleased many of the companies. They expect the expansion of palm oil to decrease from an average 350,000 ha added per year to less than 200,000 ha per year in the next 2 years (Slette and Wiyono 2011). Some scenario studies also forecast an impact on the growth of GDP, a slight increase in poverty and mixed effects on commodity prices (Rakhmindyarto 2012).

2.6 Administrative hurdles

Acquiring land for plantation development on State or private lands is no easy task. The transfer process is not straightforward and land rights do not pass directly from the seller to the buyer; rather the State acts as an intermediary in the transaction. First, the company has to acquire a 'location' permit after having obtained an investment permit from the Head of BKPM (the Coordinating Board of Investment) to develop an oil palm plantation. The company then has to buy progressively the rights from the owners of the land and pay appropriate compensation for the release of the land. However, the company cannot bar the community from accessing the land nor do anything that is against the public interest. The use of the land by the company is described in the investment plan submitted to the local authorities.

Once the company has identified the area for the plantation, it asks for a location permit from the local government. The latter considers how this request fits into its resource-management plan; it makes sure that there is no infringement on protected land or other plantations. Once the location permit is granted, the company has to buy the land from farmers or landowners for a proper monetary compensation.

1. Once the company has paid the farmers, their rights to the land go back to the State and all the area is temporarily owned by the State.
2. The allocation of the Izin Usaha Perkebunan (IUP) permit, after numerous impact assessments, turns the land rights over the area from the State back to the company. The company then has the right to start planting.
3. Finally, the national government approves the company's plan and delivers the HGU or business-use permit which enables the company to exploit the land. Plots delivered to the transmigrants are allocated from previous State or community land and some from the land surrendered by local farmers. Land titles for plasma plots are either held by the company as collateral (usually until repayment of the debt) or given to the farmers' cooperative, if there is one, for this purpose.

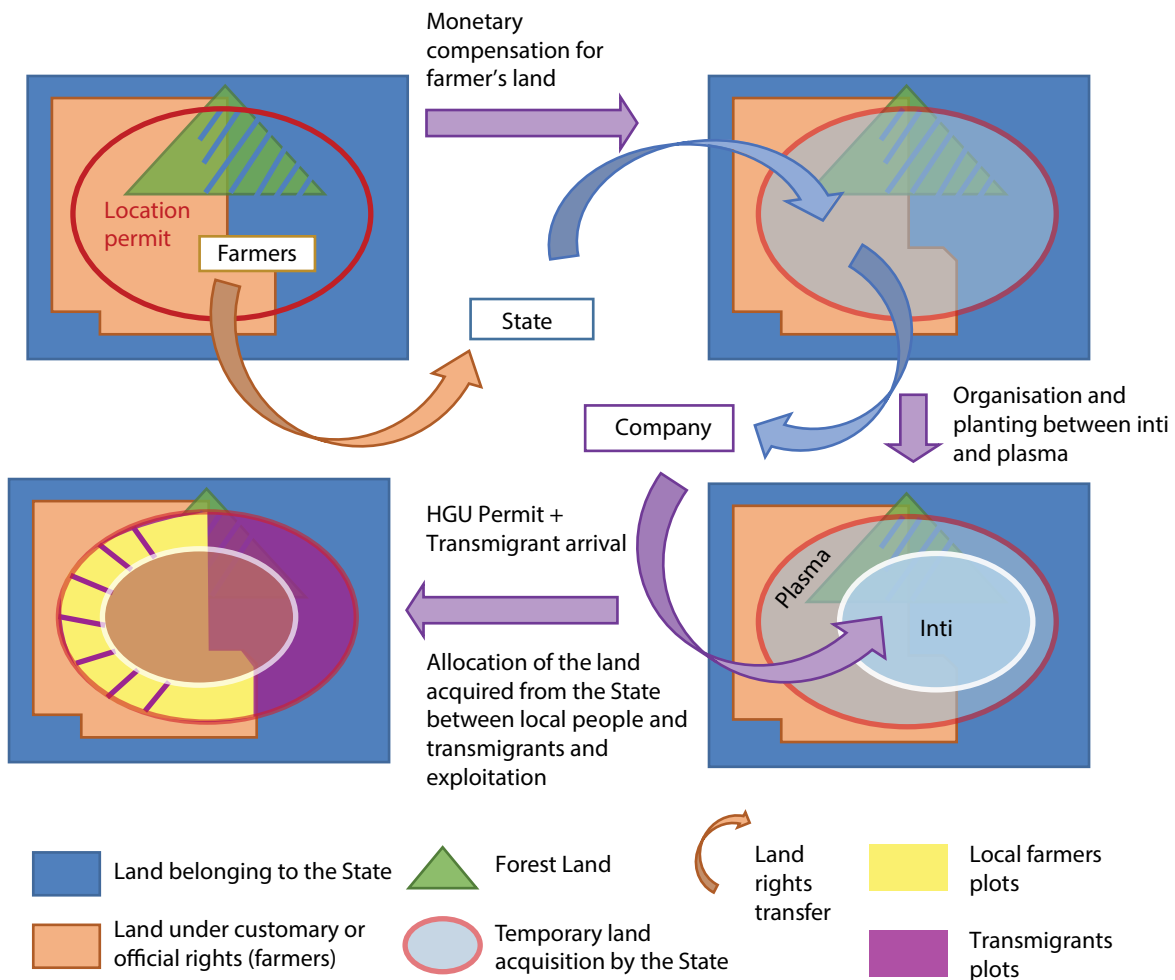


Figure 2. Process of land acquisition by companies as it concerns land rights

The land rights holders must sign an official document agreeing to relinquish their rights on the land so that the lands can be considered as empty by the BPN (National Land Agency) and thus available for new HGU (*Hak Guna Usaha*), the business utilization permit, or HGB (*Hak Guna Bangunan*) (Regulation of Minister of Agriculture no. 3, 1999). This process is undertaken in the presence of the local head of Land Affairs. After negotiations and compensation, the company must apply for an HGU (the permit differs depending on whether it is for a processing factory or a plantation). When all the land under the location permit has been acquired, it is transferred first from the community and individuals to the Land Agency, then to the company. The company has a certain amount of time – usually two years – to acquire at least 51% of the area for the process to continue. This measure aims to ensure that companies actively pursue the process and stick to their plans. Any land the company is entitled to is also free from any rights in PIR and KKPA schemes, thus smallholders participating in the project acquire full ownership of the plot, also called ‘individual property rights’ (SHM).

After the recent decentralization, central government is no longer the only authority that takes decisions to issue land permits to companies. Companies now have to go through a more complex system in order to gain permission to establish a plantation, a system that is meant to improve the participation of local people in the decision-making process. Before applying for a permit, the company has to obtain an investment permit as either a Domestic Capital Investment (PMDN) company or a Foreign Capital Investment (PMA) company. The company first needs to submit plans to apply for a Principle Permit (*Izin Prinsip*) to the district office’s economic department (Chong 2008). After a consultation with village heads and elites from other villagers, the company has to reach an agreement with the local people to form a partnership with them. The next step is the acquisition of

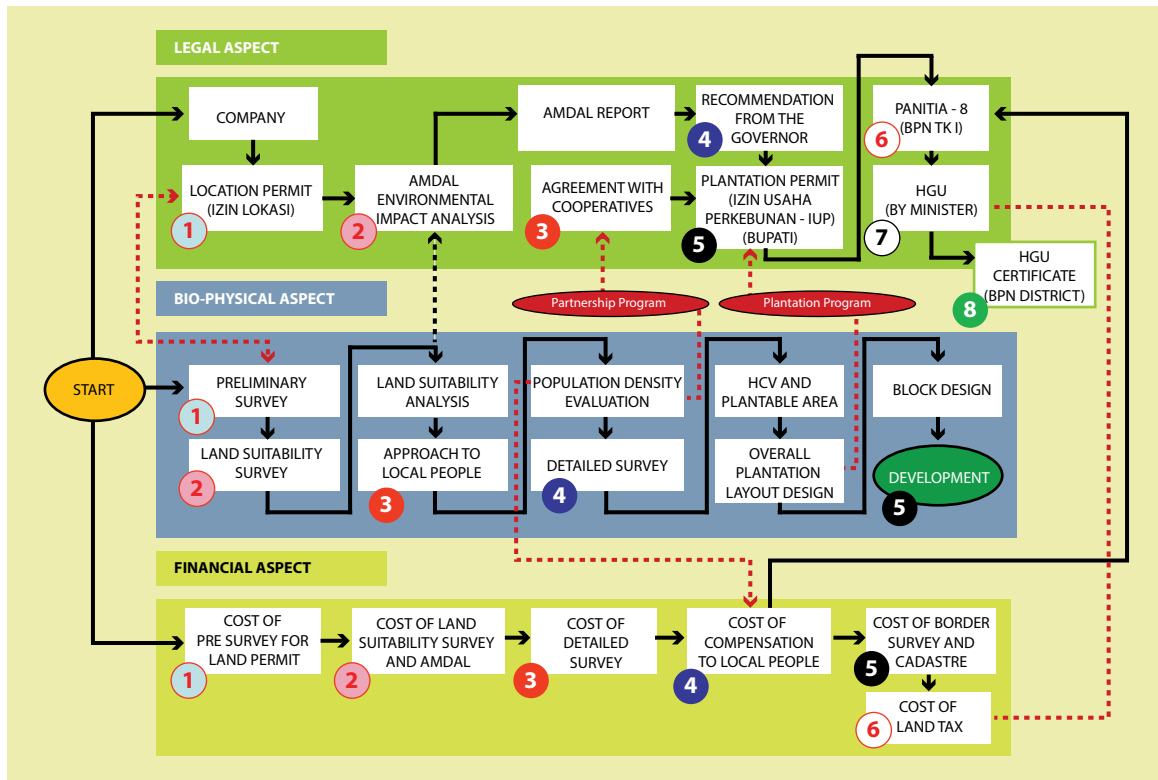


Figure 3. Process of obtaining a business permit (HGU) and the various entities involved

Source: Malangyudo (2011)

the location permit. The location permit requires the presence and approval of the province’s governor and that of a large committee, which includes village heads. After the permit is obtained, the company will have to undertake a complete analysis of the land before the AMDAL (Environmental Impact Analysis) permit is issued by the Regional AMDAL Commission, confirming the suitability of the project and its acceptable environmental impact. Fieldwork is often carried out by companies in conjunction with the local officials which is supposed to give credit for the survey to the villagers (Wan Kian 2008). To obtain the final exploitation permit or IUP from the *bupati* (head of the district), numerous requirements such as communication with the population, agreement with the farmers’ cooperative, choice of suitable agronomic practices, etc., have to be fulfilled. Finally, the issuance of the HGU, the business utilization permit, or HGB for the construction of the mills and buildings, is the last step that grants the company the land for a period of 35 years which can later be extended to 120 years. This permit is issued after compliance of the project with cadastre requirements and after decision on appropriate compensations to landowners. The following flowchart summarizes the relationships between the technical, financial and administrative aspects of a land permit (Figure 3).

3 Development models in the palm oil industry

The palm oil sector has long been dominated by public companies called *Perusahaan Perkebunan Negara* (PPN), later *Perusahaan Negara Perkebunan* (PNP), PTPN (*Perusahaan Terbatas Perkebunan Nasional*), and, finally, *Perseroan Terbatas Perkebunan* (PTP). There used to be as many as 13 PTPs, numbered I to XIII. In 1998, the private sector was dominated by eight conglomerates (Casson 1999). At present, five huge conglomerates (PT Astra Agro Lestari Tbk with 500,000 ha; PT SMART Tbk with 320,463 ha; PT PP Lonsum Tbk with 245,629 ha; PT Bakrie Sumatera Plantation with 200,000 ha; and PT Asian Agri with 160,000 ha) represent the majority of Indonesian palm oil areas, with most of them partly owned by foreign investors, mainly from Malaysia (PT Data Consult 2009). In addition to these corporations, palm oil production now involves smallholders, with their proportion totaling close to 38% of the total planted area (DJP 2010). This significant share is one of the results of the development of partnerships with companies, the transmigration programs and the dynamics of migrants who had previous experience with palm oil production (Fearnside 1997; Vermeulen and Goad 2006; McCarthy 2012). The following section aims to describe the various business models that facilitated the involvement of smallholders in the palm oil sector.

3.1 Main stakeholders

3.1.1 Diversity of stakeholders

The diversity of palm oil development models is closely linked to the political and economic evolution of the country and the geo-political and technical factors described above. Before analyzing the variety of development models, it is important to present the main stakeholders of the sector. The various categories of stakeholders represent different interests and adopt different strategies to reach their goals. Relationships between them are marked by vastly asymmetric bargaining powers. On the basis of Fallmeier (2012), we can identify four main categories of stakeholders:

- Governance bodies ranging from the national level (central government) to the local levels represented by provincial, district and village level authorities;
- The private sector, consisting of palm oil companies, banks and national or foreign investors;
- Local communities which include farmers, local officials, customary authorities and diverse interest groups;
- National and international conservation agencies, producers' organizations and nongovernmental organizations (NGOs).

The term 'smallholder' can encompass a diversity of individuals forming part of what is usually called the 'affected community'. The RSPO defines smallholders as individuals owning one or more plots whose maximum total area is less than 50 ha. Plasma farmers or outgrowers are only considered as landowners once they have repaid their debts fully and obtained possession of their land title. Independent farmers can be former outgrowers or landowners outside the influence of the company's estate.

Depending on their situation within this framework, the smallholders' bargaining power and access to capital varies.

3.1.2 Corporations dominated by the private sector

Historically, State-owned plantations called PTPN (*Perusahaan Terbatas Perkebunan Nasional*) were major stakeholders in the palm oil sector as well as in those of other commodities, such as tea, cinnamon and cloves. They are now run according to economic objectives with professional staff. However, during the privatization period, between 1996 and 1998, when foreign investment flowed in, their numbers and share of ownership decreased (Colchester et al. 2006).

To understand the development models that involve smallholders, some characteristics of the private sector, in which the corporate sector plays a major role, need to be exposed. The rationale behind them explains to a great extent the functioning of the core plantation and shapes various interests and incentives. Corporations that run plantations can be classified according to the origin of their ownership (Colchester et al. 2006):

- More than 50% of shares owned by Indonesians. Some of them are listed on the Jakarta Surabaya stock exchange. When foreign investors own less than 50% of the shares, it is called a joint venture and is regulated through the national or local offices of BKPM (Investment coordinating board, *Badan Koordinasi Penanaman Modal*);
- Owned more than 50% by foreign investors. Usually listed on international stock exchanges and operating as multinational corporations.

Medium-scale companies are usually based on private or State land and may originate from the establishment of a cooperative or be individually owned. In either case, they have to obtain a permit before they can plant anything.

Large-scale private plantations (even those under a NES scheme) are generally affiliated to an agribusiness company. These companies operate at several levels, managing plantations and mills. They are usually part of a corporation whose activities and investments cover a wide range of products of which palm oil is just one (Wan Kian 2008). PT Astra Agro Lestari Tbk is a good example of this type of company. It runs 36 plantations, two of them located in Bungo district, covering a total of 235,310 ha and operates 19 mills with a total capacity of 865 tonnes of CPO per hour. As Chong (2008) describes, this complex of industries (finance, cars, information technology, infrastructure, etc.) belongs to Astra International, a corporation that employs 116,867 workers under its 130 subsidiaries, with PT Astra Agro Lestari Tbk being one of them.

3.1.3 Development models that include smallholders

What emerges from the literature is a shared classification that makes a distinction between PIR, KKPA, independent and semi-independent farmers (Vermeulen and Goad 2006; McCarthy 2010; Vélou 2011; Fallmeier 2012; McCarthy et al. 2012b). However, a closer look into this classification reveals overlaps, especially between the PIR and KKPA systems. At the same time, there are key elements that have a deep impact on the efficiency and performance of these development models. First, it is important to identify who manages the plot: in some cases, the company does it (fully managed or semi-managed), while in other cases, the farmer is in charge. Second, the land ownership helps clarify the rights of the actors within the corresponding legal framework. Management and ownership of the plot also define the conditions under which access is available to adequate inputs (recommended by the companies) and the seedlings selected (guaranteeing their quality). In addition, operational conditions such as access to information and technical training and the nature of the marketing relationships with the buyer also influence the farmers' choices, and, ultimately, the efficiency of the production system and the level and the regularity of the farmers' incomes.

The typology designed by Vermeulen and Cotula (2010) based on management and ownership can be applied to the Indonesian situation with the classification illustrated in Table 1.

Table 1. Basic typology of inclusive business models by landholder and farm operator

Land ownership/ Land management	Smallholders	Agro-business
Smallholders	Independent smallholders	PIR
	Semi-independent smallholders	KKPA high involvement
Agro-business	Joint venture “Kemitraan”	KKPA low involvement

Source: Vermeulen and Cotula (2010)

3.2 Development models where farmers manage the oil palm plot

3.2.1 Development models where farmers are connected with agribusiness companies

Contract farming between agribusinesses and smallholders: Nucleus Estate and Smallholders (NES) schemes

PIR schemes and KKPA systems are business models that have been widely used to develop the palm oil sector. Zen et al. (2005) stated that there were almost 900,000 ha of smallholder plasma plots in 2003 with 400,000 settlers and around 2 million people including the families. According to the Indonesian Palm Oil Commission (IPOC, 2009), more than 44% of the planted area was allocated to smallholders.

These systems are based on the duality of a core nucleus area (*inti*) managed by the company and an area (called *plasma*) allocated to smallholders (Vermeulen and Goad 2006; McCarthy and Cramb 2009).

This model is based on contract farming agreements that specify the division of responsibilities for operations on the plot and its management. Farmers willing to join the scheme have to surrender part of their land to the company which pays them a monetary compensation (in theory). In exchange, the farmer will get a 2-ha plot on the plasma planted with oil palm (Potter et al. 1998; Vermeulen and Goad 2006; McCarthy 2010). Plasma owners are contractually bound to sell their fruit bunches to the company’s mill, while the company takes responsibility for planting and providing inputs according to technical recommendations (Vermeulen and Goad 2006; McCarthy and Cramb 2009; Fallmeier 2012).

As for the management component, it depends on the company’s strategy. Most plasma plots in PIR schemes are managed by the farmers themselves, working on their plot with very limited technical advice from the company (Potter et al. 1998; Zen et al. 2005; Vermeulen and Goad 2006; McCarthy and Cramb 2009; McCarthy 2012). In KKPA schemes, the KUD (*Koperasi Unit Desa* or Village Cooperative) is a specific structure which acts as an intermediary between smallholders and the company in order to improve farmers’ access to credit and reduce the risks for companies (Vermeulen and Goad 2006; McCarthy and Cramb 2009; Colchester 2011; Fallmeier 2012). Because the amount farmers are paid for their land (if they are paid at all) does not cover the cost of planting by the company, a loan system has been implemented. In PIR systems, the company provides access to capital through a loan from a bank. The loan is to be used for planting and managing the immature phase. Companies then seek repayments for the loan by taking 30% of farmer’s income (Potter et al. 1998; Colchester et al. 2006; Vermeulen and Goad 2006; McCarthy and Cramb 2009; Fallmeier 2012). Companies lacked guarantee regarding their supply because of uncertain production and unauthorized sales of plasma plots (Chong 2008). So, the KUD contracts a loan for farmers directly from the bank, the company acting as guarantee and using the farmers’ land as collateral (Potter et al. 1998; Colchester et al. 2006; Vermeulen and Goad 2006; McCarthy and Cramb 2009; Fallmeier 2012). Farmers gradually repay their debts the same way as under a PIR scheme at an interest rate that

depends on the conditions and is determined by the companies and the banks (Chong 2008; Fallmeier 2012). The KUD also provides technical training and advice for adequate management of the plots. It distributes inputs and material, keeps record of land titles, manages farmers' debts and payments for their production (Vermeulen and Goad 2006; McCarthy and Cramb 2009; Fallmeier 2012; Colchester 2011).

Under KKPA schemes, the company decides whether to have 'low involvement' of farmers (limited involvement of farmers on the plots) all the way from the planting phase to the harvest, or 'high involvement' in which case farmers manage the plasma under company's supervision through the KUD (Gan Lian Tiong 2012).

The difference in management is linked to the way plasma plots are distributed.

In a PIR scheme, plots called '*kapling*' are allocated nominally and farmers will work on their 'own' plot. The plot may not be located on the land that the farmer has surrendered though, which often leads to protests from those who receive plots of a lower quality than those they gave up.

Under PIR-Trans programs, plots allocated to transmigrants were created out of the land local communities had given up or from government land (free from attached rights).

For KKPA schemes, plots are allocated in the same way as under the 'high-involvement system'. For 'low-involvement' ones, however, the company does not attribute a '*kapling*' to each participant (Gan Lian Tiong 2012; Rafflegeau, pers. comm. 2012). The income is therefore calculated based on the individual production of the farmer's plot for PIR and high-involvement schemes, while it is based on the average production of the plasma for a 2-ha plot in the low-involvement systems. It has also been reported that in this latter case, yields are often based on a yield table and not on actual production on the ground (Barlow et al. 2003).

The final feature of these schemes is their commitment to social welfare and community development. In general, companies have to dedicate at least 20% of the land to community development. Companies also have to commit to develop infrastructure: road networks, health centers, schools, etc.

Apart from differences in management, schemes also differ in how they divide the land between *inti* and plasma (Zen et al. 2005; Colchester et al. 2006; McCarthy and Cramb 2009; Vermeulen and Goad 2006; Feintrenie et al. 2010a, b; Colchester 2011; Fallmeier 2012; Vélou 2011; Duryat 2011). Table 2 lists some of the possible arrangements (Chong 2008). However Colchester et al. (2006) and Potter et al. (1998) also report other ratios, such as 3:2, which means 3 ha to the *inti* out of the 5 ha given up by the smallholder. A total of 60% was allocated to the plasma and 40% to the *inti* in Southern Sumatra in the case of the PT. KCMU Company. The '7:5' model in which 5 ha go to the *inti* and 2 to the smallholder is also common, notably in West Kalimantan. Villagers initially tried to negotiate a '5' model with 2 ha going to the *inti*, 2 ha to the smallholder and 1 ha to the infrastructure, but the company refused (Colchester et al. 2006). Other authors report a land distribution in favor of the plasma plots such as 60:40 in South Sumatra, even going up to 80:20. These variations stem from local circumstances and the negotiating capacities of the local stakeholders.

Table 2 also illustrates the links between land ownership and the way companies allocate rights and responsibilities in their relationships with smallholders. In some cases, farmers believe they are only giving away 'usage' rights over both *inti* and plasma lands when they were sold and expect to get everything back at the end of the cycle. The government believes that the land has been leased for a fixed period of time (35 years, renewable) to the company and expects that the *inti* areas will be returned. Since few land records are kept, there will likely be numerous problems and conflicts related to the redistribution of land and its ownership in the future, which will be difficult, if not impossible, to resolve (Potter and Badcock 2004; McCarthy 2005; Colchester et al. 2006).

Table 2. Distribution of land between *inti* and *plasma* and their characteristics

Scheme	Description	Debt
100:0	Companies have full control and ownership of the plantation	N/A
80:20	This scheme is the bottom line set by local government to protect farmers from accruing any debt. Type A: Farmers are entitled to 20% of the revenue only (<i>bagi hasil</i>). Thus farmers are probably losing their land permanently. Meanwhile, the company is entitled to 80% of the revenue and controls a 100% of the plantation.	No
	Type B: Farmers are entitled to 20% of both revenue and oil palm plantation (<i>bagi hasil dan lahan</i>), while the company is entitled to 80% of both revenue and plantation.	Yes
70:30	Under the most common arrangement in Bungo district farmers are entitled to 30% of both revenue and land. Farmers also receive “consolation fees” for 70% of the land submitted. Meanwhile the company is entitled to 70% of both revenue and plantation.	Yes
60:40	The latest arrangement proposed to farmers in such a way that farmers will receive more land at the expense of more debt. Meanwhile, the company is entitled to less plantation but possibly more gain from assisting farmers in the development of their plantation.	Expected
0:100	Type A: 100% plasma system in which companies assist farmers in obtaining loans for oil palm development, while the company provides technical support in exchange for the supply of fresh fruit bunches.	Yes
	Type B: independent smallholders	No

Source: Chong (2008)

Targeted populations and entry conditions

The target population varies depending on the PIR project. Some programs, called PIR-Trans, were designed solely for transmigrants, whereas other PIR programs were meant for locals, transmigrants and spontaneous migrants (Vermeulen and Goad 2006). However, the government has now asked the companies to allocate at least 20% of the plasma land to local farmers.

Technical management: seedlings, access to inputs and training

Under the PIR and KKPA schemes, the company remains in charge of the technical management for both inti and plasma during the immature stages of the plantations (McCarthy 2010). When palm trees become productive for PIR schemes, the plasma plots are returned to the smallholders who will then farm their plots following the company’s methods and requirements. Under KKPA schemes, this is at the discretion of the company. However, in both cases, the company provides inputs, planting material and equipment, managed by the KUD under KKPA schemes.

Buyers: competition between companies and middlemen

The buyers are mainly the companies’ mills under both schemes. But companies are now being faced with new situations with the advent of middlemen, whose behavior ranges from full cooperation to outright competition. Normally, companies provide trucks for transporting Fresh Fruit Bunches to the mills. The income will then be either reported to the cooperative, which will manage the payments to the farmers while deducting debt repayments and a fee, or directly paid to the farmers by the company (Chong 2008; McCarthy and Cramb 2009; Fallmeier 2012).

Chong (2008) reported different schemes of payments under PIR and KKPA, in circumstances in which farmer cooperatives were established under both types of schemes.

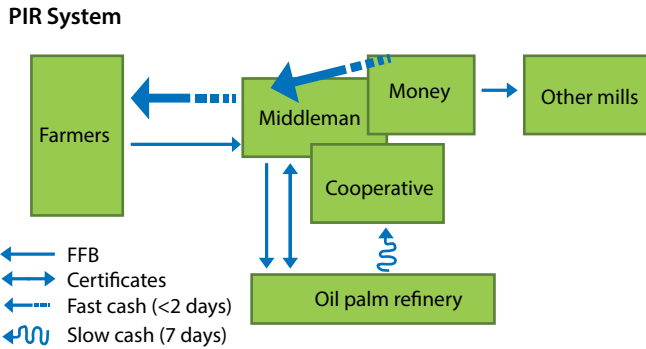


Figure 4. Business transactions in the PIR system
Source: Chong (2008)

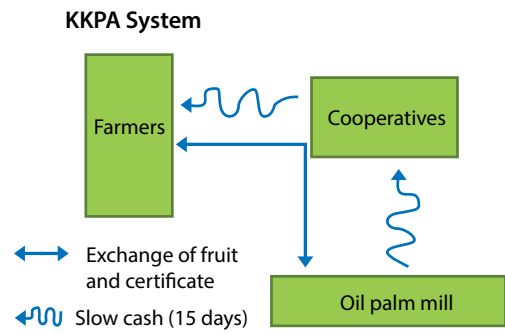


Figure 5. Business transactions under the KKPA system
Source: Chong (2008)

The company’s mills are no longer the sole buyers of the plasma’s FFB. Indeed, middlemen now represent an important alternative. They act as ‘price brokers’, able to provide ‘fast cash’ to farmers with urgent needs: they developed as service providers by ensuring cash payments within two days. Farmers often favor direct and quick payment which proves faster than from the cooperative’s administrative arrangements (McCarthy et al. 2012b). Middlemen either sell the fruits to the company’s mills or to the cooperative. In both cases, there is a delay in payment. This period is reduced if they negotiate their delivery certificate through money lenders in order to get cash fast, but this facility depends on their capital (Wan Kian 2008). Empirical reports show that middlemen and cooperatives often compete with very limited positive returns for the farmers. Companies have little control over middlemen because the latter can decide who they want to sell the fruits to (Wan Kian 2008). Middlemen tend to offer lower prices than companies for the FFBs, which they compensate for by ‘fast cash’. Middlemen can be kept at bay by certain companies (Wan Kian 2008) with guards around the plantation, while other companies decide to tackle this problem by entering into contractual arrangements with them (Fallmeier 2012).

Under KKPA schemes, payments have fewer intermediaries and the middlemen’s services are usually less important. The scheme does not take into account their intervention. Some middlemen may sometimes intervene but their main business will be with other companies. From cooperatives, the payments to the farmer for the FFB may take up to 15 days. One of the middlemen’s motivations is to mix FFB from PIR and KKPA systems which are of a better quality because the plots are fully managed by the company. This enables them to get a higher price for their fruit load, despite heterogeneous quality (Wan Kian 2008). Such middlemen are able to sell the mixed fruit to the KKPA’s mill which then loses money in the transaction. Consequently, companies try to avoid their intervention when a cooperative is set up, in order to maintain quality and prices.

The fact that farmers are tied to the company’s mill in order to benefit from credit and technical help has slowly led to the dissatisfaction among the participants, especially when prices are higher elsewhere. This has led to the gradual development of independent mills that are not linked to any specific company or NES scheme (McCarthy et al. 2012b).

Successes and limitations of the NES schemes

Asymmetric bargaining power between smallholders and the other stakeholders

PIR and KKPA schemes no longer benefit from any government support (Casson 1999), except in the issuance of land permits and forest status. Under these schemes, relationships between farmers and agribusiness companies are highly asymmetrical. The farmers are fully dependent on the company,

over which they do not exercise any influence (McCarthy and Cramb 2009). Farmers are poorly organized and have very few representatives who are truly empowered to deal with the companies. Spontaneous autonomous cooperatives are few and far between. In such a context, smallholders are closely tied to the company's intentions and interests, with direct consequences for the availability of plots and planting material, fruit prices and technical choices.

Smallholders may believe that local officials can represent a source of bargaining power on their behalf, since they have some power to revoke business permits. However, these officials' direct interests are often aligned with the establishment of the company's project, frequently presented to them as an important step in regional economic development. However, in some cases, local officials have been successful in reaching agreements to secure land for their farmers. In Sanggau district, effective village leadership combined with collective mobilization during the decision-making process on the plantation's conditions of establishment resulted in a 50:50 division between the company's plots and the plasma plots under the NES scheme. The locals contributed in an effective manner to the development of the palm oil sector, despite political uncertainty at other levels, and convinced the company that its investment was secure (McCarthy et al. 2012a). Some stakeholders, such as NGOs, play an important role in supporting the organization of smallholders and in their negotiations. RSPO standards also promote training for farmers in order to improve their capacities of governance via their empowerment. However, it seems that these initiatives to increase the level of smallholder participation have a limited effect on the dynamics concerned when participation is limited to 'sitting, listening and saying nothing' – the 3 Ds: '*duduk, dengar, diam*' (Barbureau 2010).

Hybrids: contracts with agribusinesses and independent businesses

- **Characteristics**

In several cases, PIR and KKPA schemes that have involved smallholders in the management of the plantation helped them acquire knowledge, technology, access to credit and certified land titles after their debts were repaid (Zen et al. 2005; McCarthy and Cramb 2009; McCarthy 2010; Fallmeier 2012; McCarthy 2012). Consequently, these wealthier smallholders started their own plantations independently from the estate. This new rural entrepreneurial elite benefited from the palm oil boom and 'engaged in a race to extend their plantations with oil palm' (McCarthy and Cramb 2009). Some independent producers chose to form coalitions and develop intermediate-sized holdings ranging from 5 to 200 ha. This led to the development of a new category of producers who have one foot in plasma plantations and the other in their own plantation. Quite a few of them managed to plant their independent plots with high-yield trees. A process of imitation also resulted, in which other independent smallholders, seeing the success of selected seedlings and proper management, sought technical advice from them and tried to follow their path (Zen et al. 2005). The areas planted by these actors are quite large by smallholding standards, approaching 10 to 20 ha and represent a huge social differentiation.

- **Technical management and buyers**

These dynamics are found in particular in Riau province (Vélu 2011). Producers there benefit from many advantages such as technical advice, access to inputs through their plasma plots and easy access to processing mills (Vermeulen and Goad 2006). Life cycle assessments have revealed that this category impacts the environment more than independent, nucleus and plasma plots. Farmers follow management practices similar to ones used for plasma but take some liberties, especially by applying more fertilizer than recommended or planting more trees per hectare. They also use empty fruit bunches (EFBs) and palm oil mill effluent (POME) as fertilizer following the company's example (Vélu 2011). They might represent an important target for RSPO and Indonesian Sustainable Palm Oil (ISPO) standards in order to reduce their negative impact by convincing them to adopt suitable practices. Farmers in this category are usually wealthy enough to employ wage labor.

Semi-independent farmers benefit from a secure access to the company's mill which takes FFBs from their independent plots. Thus, these farmers are able to look for better prices because they do not bear the commercial risks that fully independent farmers do. Since they are wealthy enough to earn the trust of banks, they have been known to set up their own mills, especially in Riau, where production tends to exceed the current processing capacity.

Development models without contracts with agribusinesses: the case of 'independent smallholders'

- **Characteristics**

Independent smallholders now represent an important part of the palm oil sector. Accounting for around 3 million ha and representing more than one-third of the total production in 2010 (BPS 2010), this category of producers has figured out ways of benefiting from self-owned oil palm plantations. They achieve yields of 10–17 t/ha of fruits and, in 2010, obtained an average of 3.4 t/ha, which represents a steady increase since 2004 (Vermeulen and Goad 2006; BPS 2010). There are, however, variations between provinces. Indeed, the yields for smallholders in Riau went up to 3.9 t/ha of CPO, against 3.4 in Jambi and only 2.3 in West Kalimantan (BPS 2010).

McCarthy (2010) developed a classification of independent smallholders depending on their level of income. *The prosperous farmers* are those with a good income from oil palm expansion that enabled them to buy land and use hired labor. *The progressive farmers* use palm oil income to clear old rubber plantations or fallow/forest lands to plant new oil palm trees. *The poorer farmers* often work as casual wage workers on the prosperous farmers' plantations and are often displaced and landless. Members of this last category can try to become *progressive farmers* by saving their wages until they can buy land. The problem of poor independent smallholders is often their lack of access to capital, land and information. Successful entrepreneurs have often benefited from other sources of income preceding palm oil, such as from illegal logging or acting as land brokers within PIR or KKPA schemes (McCarthy 2010).

Independent smallholders who are not part of the agribusiness system face several constraints: not only limited access to capital but also to inputs or quality seeds/planting material, which are determinants of the quality of the investments in the oil palm sector.

- **Technical management**

Many independent and often indigenous farmers have failed to create productive plantations because of lack of good quality seedlings and technical knowledge. However, some have gained knowledge through exchanges with migrants who had prior experience in oil palm cultivation (e.g. the Batak people from North Sumatra). They also developed specific cultivation patterns through intercropping oil palm with rice, corn and other annual crops during the immature phase as a source of income and a means of funding their investment. Vélu (2008) shows that yields are much lower for independent smallholders without contract with and advice from agribusinesses than for 'connected' ones. Independent smallholders' yields are 10% lower than those expected from plasma during the initial years and only 50% by the end of the production cycle. This can be explained by the lack of access to both selected seedlings and inputs, thus leading to a lower kernel oil ratio and lower oil extraction rate: 19% for independents against 23.5% for the nucleus. Another difference is the use of irrigation: independent farmers are forced to manage with limited amounts of water compared to plasma plots where there is almost no water deficit. A lower level of technical monitoring leads to increases in diseases and several deficiencies (water, mineral nutrients, etc.), which occur more frequently on independent plots: there are fewer dead trees in company nurseries (30%) than in independent smallholdings (50%). This drives independent smallholders to plant more trees to compensate for the anticipated losses (Vélu 2011). They also have limited access to markets and are less able to obtain better prices (Vélu 2008). They usually start harvesting sooner, after 3 years, and more often, 36

times a year instead of 24 times, which does not provide the best outcome. However, independent smallholders who have previously worked as casual workers on plantations can obtain a higher productivity (Duryat 2011). In some cases, local governments have provided incentives to plant selected trees. The yields of these independent plots with selected material and a minimum level of technical experience can be estimated at 17 t/ha, exhibiting an internal rate of return of 18% (Zen et al. 2005).

3.3 Development models in which participants are completely excluded from the management of the plot

3.3.1 The joint-venture system or share system: The ‘new partnership model’ or *Pola Patungan*

Characteristics

As the Indonesian State withdrew from funding and managing the plantations, companies proposed a new business model to villagers. This joint-venture model enables the company to control the entire production process from planting to harvesting. It then redistributes the benefits of a 2-ha plot under a share certificate based on the average production of the plasma. In this case, the smallholder becomes a kind of shareholder and does not farm himself (McCarthy et al. 2012b). The distribution of the land between the company and the smallholders depends on the negotiations; the usual one being 80:20. In West Kalimantan, McCarthy et al. (2012b) report a company stating that it could not afford to give back more than 20% of the land without risking bankruptcy. Most often, the calculation of the profit remains in the hands of the company. As in other schemes, the key asset is land with two different cases: one where the land is sold to the company to become part of its plasma, and one where the farmer retains ownership. Rianto and Santoso in PWC (2011) and Zen et al. (2008) suggest that the income from a 2-ha plot under such a management may be too low for farmers to make a living.

Target population

This scheme is open both to locals and transmigrants. However, since it works as a shareholding company, farmers need to have enough capital to buy the share corresponding to a 2-ha plot. This scheme is more likely to benefit farmers who have already secured income through oil palm cultivation or through off-farm activities.

Technical management and buyers

In such a scheme, smallholders do not farm directly but might find employment as hired labor on the company's estate. The company makes all the decisions, from the nursery up to the marketing of fruits, farmers have no say. They sometimes complain that the poorer land is allocated to plasma plots reducing the production and their income as shareholders (McCarthy et al. 2012b).

Relations with other stakeholders

In this model, relationships are almost non-existent between smallholders and companies. They are strictly limited to opportunities to work as hired labor, especially during the immature phase. However, most often these jobs are temporary, with a very low pay and hard working conditions (Zen et al. 2005). Many smallholders wonder whether the monthly dividend they will get will be enough to support them and their families and if it is likely to increase in the future. This lack of perspective and dialog between farmers and companies is an example of the limited bargaining power of the farmers and may lead to negative adverse effects on their livelihoods. Unlike previous NES schemes, companies have fewer obligations in terms of infrastructure improvement and poverty reduction efforts (Li 2011).

KKPA: low-involvement schemes

Farmers have no say in the way plots are managed and thus have very little power against the company. The results in terms of FFB quality and yields are usually better because of a more adapted management and optimum practices (Gan Lian Tiong 2012). The gap between nucleus and plasma yields does not seem to change significantly between high- and low-involvement KKPA schemes.

Proposed typology

These various development models are the result of an effort to adapt to the economic situation of the country, the requirements of the private sector and, to some extent, those of the population. Figure 6 summarizes the various evolutions of the schemes.

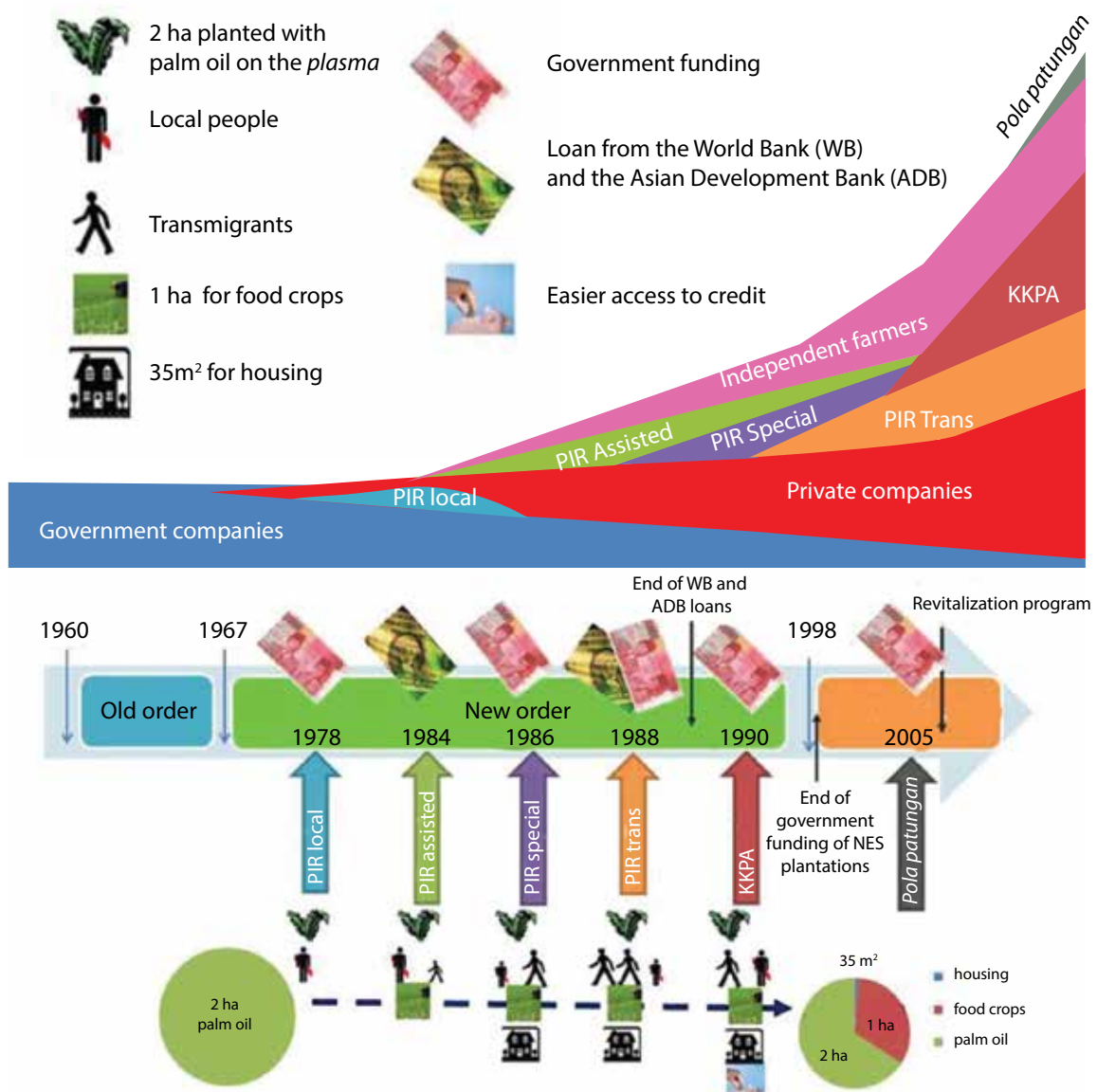


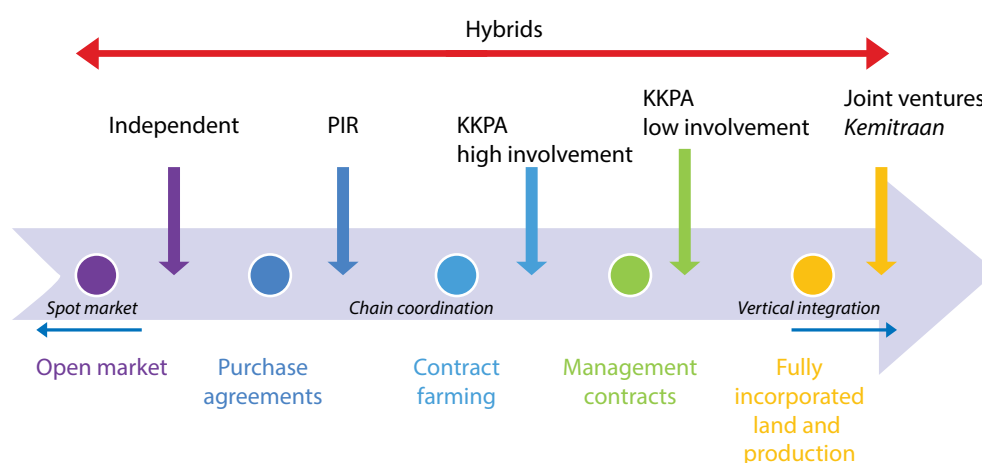
Figure 6. Evolution of the various development models in the palm oil sector along with the political context

Source: Authors based on Zen et al. (2005) and Fallmeier (2012)

Table 3. Comparison of the two major types of development models

	Supported smallholders	Independent smallholders
Advantages & opportunities	<ul style="list-style-type: none"> • Guaranteed market access • Access to inputs such as planting materials and credit • Rapid access to new technologies enabling high end productivity 	<ul style="list-style-type: none"> • Free to seek highest prices for fresh fruit bunches • Able to shift labour and other inputs between oil palm and other crops depending on prices • Low costs of inputs
Disadvantages & risks	<ul style="list-style-type: none"> • Can suffer overdependence on a single crop with price volatility • Less flexibility in land use and labour allocation • Hierarchical and rigid arrangements often limit farmer decision making 	<ul style="list-style-type: none"> • Risk that mill will not buy fresh fruit bunches • Reduced access (and risk aversion) to credit and technology • Often viewed as unreliable by mills that purchase fresh fruit bunches

Source: Vermeulen and Goad (2006)

**Figure 7. Comparing two classifications of the development models**

Source: Authors based on Vermeulen and Cotula (2010) and Zen et al. (2005)

Comparative strengths and weaknesses of the various development models

Development models are crucial to understanding production systems. Indeed, access to selected seedlings and inputs will not only impact the way farmers manage their plots but also their capacity to adapt. While most of the companies can now expand on both mineral and peat soils, independent farmers can hardly afford any plantation on peat soils since they very rarely possess the requisite capital and technical knowledge. Table 3 and Figure 7 list the strengths and weaknesses of the two major categories of development models: whether farmers are in a partnership with a company (supported smallholders) or not (independent smallholders).

There is a striking contrast between the uncertainty of being an independent farmer and the strong control exerted by companies when in a 'partnership'. The trade-off between risky freedom and overly restricting security is hard to assess.

Typology: toward a proposal

Creating a comprehensive classification of the development models of the palm oil industry in Indonesia is a complex challenge. Our proposal only partly fits into the theoretical organization offered by Vermeulen and Cotula (2010). The status of the estate plantation – the *inti* – differs from the

contract farming that applies to the plasma plots. Depending on the level of the farmer’s involvement, KKPA and PIR schemes tend toward more or less vertical integration in the chain. Moreover, hybrids or semi-independent farmers can fit in many of the possible categories.

However, several features of the current situation on the ground – especially the capacity of certain smallholders to develop complex combinations of the various types of oil palm business models and to add a diversified off-farm portfolio – drive us to develop a classification that tries to integrate these strategic behaviors (Figure 8). We also draw from Duryat (2011; Figure 9) to include in our consideration the type of cultivation that existed before the oil palm for its potential impact in the early stages. Figure 8 is based the following questions:

- Who manages the plot?
- Type of access to inputs?
- Type of access to credit?
- Type and conditions of market access?
- Type of diversification pattern?

In this context, ‘fully managed’ means that the company takes care of all the operations on the plots from planting to harvesting, while hiring workers from plasma participants whenever necessary. This type corresponds to low-involvement KKPA schemes. On the other hand, ‘semi-managed’ refers to plasma plots being managed by the smallholders under the close supervision of the company, corresponding to PIR and high-involvement KKPA schemes.

To obtain a unified picture of the various levels of a smallholder’s possible involvement in farming, we can group KKPA and PIR schemes under the ‘partnership with companies’ category, and we can propose three levels when answering the questions of Figure 8. The description of the different categories and levels is as follows.

Independent farmers

A: independent farmers / low yields / family labor / low access to inputs and seedlings / physical constraints (sloping land, risk of drought, low fertility) / poor technical management / indirect access to mills through intermediaries / no reuse of wastes / limited investment capacity.

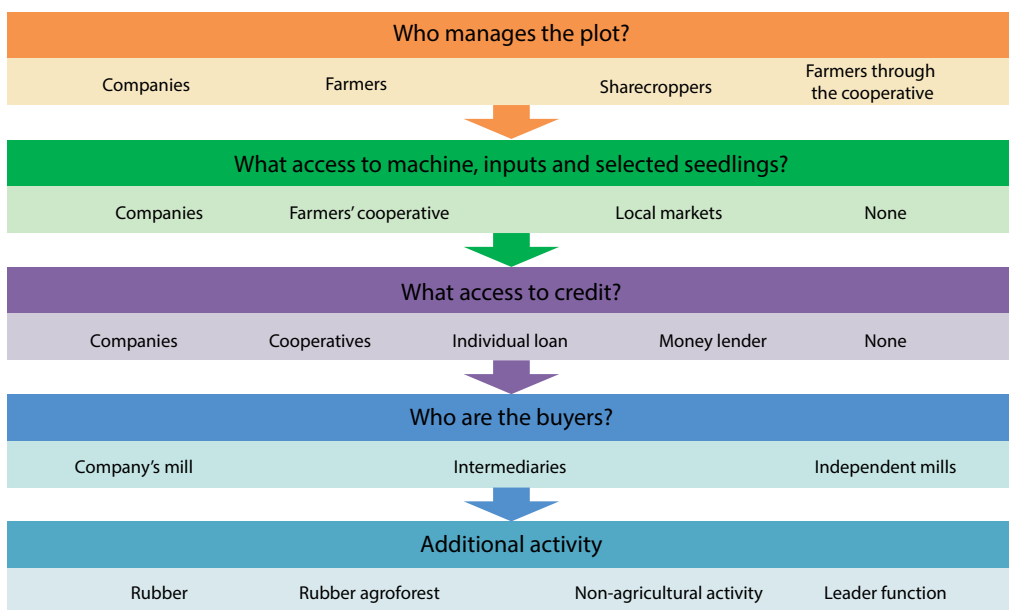


Figure 8. Guide to classifying development models and identifying strengths and weaknesses

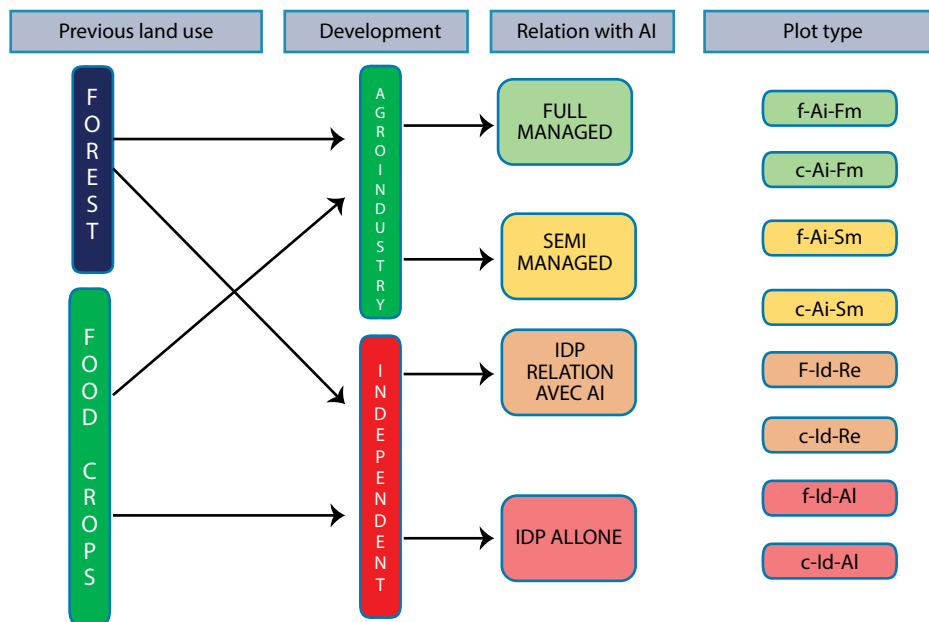


Figure 9. Classification suggested by Duryat (2011) depending on the type of management of the plot

B: independent farmers / low yields / mainly family labor / access to inputs and seedlings but poor technical management or low access to inputs and seedlings and good technical management / physical constraints managed to some extent / indirect access to mills through intermediaries / reuse of waste or alternative solutions developed / limited investment capacity.

C: high yields / family and hired labor / access to inputs and seedlings / good technical management / physical constraints managed / direct access to mills, limited reliance on intermediaries / reuse of wastes / access to banking system / investment capacity.

Partnership with companies

A: low yields / insecure access to inputs and seedlings / physical constraints / poor technical management (lack of technical advice) / waste not reused / dependency on the company's mills or intermediaries / high debt burden / no investment capacity.

B: medium yields / access to inputs and seedlings / poor management of physical constraints / technical management in the process of being improved (through technical advice) / wastes reused / dependency on the company's mills or intermediaries / fully or almost debt free / limited investment capacity.

C: high yields / good access to inputs and seedlings / good physical conditions or adequate management of physical constraints (irrigation, terraces, palm leaves for fertility) / good technical management / waste managed / free to choose market outlet / debt free / investment capacity.

Semi-independent farmers (hybrid systems)

A: low yields / family and company labor / access to inputs and seedlings / physical constraints poorly managed / average or poor technical management on both independent and plasma plots / good access to mills and intermediaries / waste reused / high debt burden / no investment capacity.

B: medium yields / family and company labor / access to inputs and seedlings / physical constraints managed to some extent / good technical management on plasma plot, less so on independent plots (or the other way around) / good access to mills and intermediaries / waste reused / fully or almost debt free / limited investment capacity.

C: high yields / family, hired and company labor / good access to inputs and seedlings / no physical constraints or adequately managed / good technical management on both type of plots / good access to mills and intermediaries / waste reused / debt free / good investment capacity.

4 Issues of palm oil development and the actors involved

4.1 Impact on livelihoods: Who is better off?

4.1.1 Intensification over traditional systems: What accessibility? Which outcomes?

Compared to the more traditional local systems, such as shifting rice cultivation and jungle rubber agroforestry, oil palm production is a much more intensive system (Potter et al. 1998). The optimization of planting density and the systematic use of inputs such as fertilizers are apt illustrations. The comparison between rubber and palm oil in terms of labor has been widely studied (Tomich et al. 1998; Bonnart 2008; Chong 2008; Feintrenie et al. 2010a, b) and has highlighted the heavy labor requirements of oil palm plantations during the establishment phase compared to rubber plantations or agroforests. Intensification in the form of oil palm cultivation is attractive because of the potential for income generation. However, the intensification process may also present potential obstacles for smallholders. First, as opposed to rubber, which is relatively easy to sell on the market, fresh fruit bunches of the oil palm need to reach a processing mill within 24 to 48 hours, which means that producers need to have access to a good marketing chain. This is not often the case, especially for independent smallholders. The uncertainty surrounding the sale of their products, company quality and quantity requirements, and difficult access to the market for inputs are major obstacles to converting to oil palm cultivation. Second, as oil palm is not native to Indonesia, there is a lack of traditional technical knowledge among farmers. Therefore, the extent to which companies and local governments can provide assistance and information is a key factor in helping the adoption of the oil palm. Third, the initial investment in terms of capital and labor for setting up a plantation may be prohibitive for all but the wealthiest farmers. Finally, this intensification is associated with long-term risks: uncertainty of success in establishing the plantation, continuity in inputs management, and the very volatile price of palm oil. Given the fact that, after conversion to oil palm, it is very hard and expensive to revert to the earlier crop and change the farming system again, the decision has serious implications for the future of the household (Papenfus 2000).

Even when smallholders can enter into a partnership scheme with a company, the outcomes depend on the quality of the planting material, the adequate management of their plots, technical support and how farmers are treated by the company (Zen et al. 2005). Indeed, many farmers do not have the pre-requisite skills that will allow them to quickly assimilate knowledge transmitted to them by the experts. Thus, relationships between farmers, their advisers and companies are also a key component in the process of intensification. In addition, the government has made efforts to make high-yield seedlings accessible to farmers, in partnership with Indonesian Oil Palm Research Institute (IOPRI) and local companies. In relatively wealthy provinces, such as Riau and East Kalimantan, high-yield planting material and access to inputs is easier because these provinces can allocate the funds required to design an effective program. However, in poorer provinces, which do not benefit from financial support from the central government, decentralization has led, in fact, to a worsening of the situation (Zen et al. 2005).

If conversions toward intensive oil palm cultivation are successful within a village, other smallholders are more likely to adopt the new scheme. For example, by extending the planting of high-yield trees outside the plasma onto other plots, NES farmers have inspired others to convert. Technical spill overs have also been reported with independent farmers benefiting from either a neighbor who is a participant in a NES scheme or demonstrations that are sometimes organized by local officials or companies (Zen et al. 2005).

4.1.2 Impact of palm oil cultivation on employment and social relations

The contribution of the palm oil sector to employment generation is still debated. On the one hand, in the case of NES schemes, jobs were indeed created but were not spread out evenly over time (Potter and Lee 1998; Jelsma et al. 2009; Clerc 2010). Comparing the increase of employment in palm oil producing and non-producing provinces has not revealed a clear difference. However, since unemployment was previously higher in palm oil producing provinces, one can assume that palm oil did reduce unemployment (Hirawan 2011). Various job opportunities were opened up. The plasma plantations mainly created temporary day jobs for planting, harvesting and fertilizer application (McCarthy 2005, 2010; Potter 1998; Clerc 2010). These jobs are usually low paying ones and involve heavy labor and thus older people are not eligible, while they can still tap rubber trees (Clerc 2010). Salaried jobs are also created, usually regular ones, which can be seen as an improvement (Hardjono 2009; Obidzinski et al. 2012). The combination of a growth of oil palm plantations and the advent of successful independent oil palm producers has created another kind of job: wealthy landowners have started hiring their neighbors, both landless in-migrants, also called ‘waiting farmers’ (McCarthy 2012) and local people looking for extra income. Indeed, they could afford to pay them double the minimum wage in 2009 to manage their plots. The sub-contracting of plot management has created another class of workers called ‘*borongan*’ (McCarthy 2010). These workers are usually migrants working on wealthy landowners’ oil palm plantations who pay ‘daily laborers’ to do the actual labor while retaining a margin. Their aim is also to save enough money to become landowners themselves. In this respect, a distinction has been made in Jambi between migrants, who tend to be more entrepreneurial than the locals, and the Melayu farmers who tend to remain ‘daily laborers’ (McCarthy 2010). Finally, another source of employment is the company itself, which can provide well paid and secured jobs (Hardjono 2009; Obidzinski et al. 2012).

However, there have been complaints of unfairness in job distribution. Job opportunities within palm oil companies are usually scarce and companies often prefer to employ their own professionally trained workers rather than the local people. Companies’ preference for Javanese transmigrants and even for the Chinese over indigenous people is often attributed to the ‘myth of the lazy native’ (Li 2011). Thus, most of the jobs tend to be allocated to the transmigrants instead of to the local people. Another explanation pertains to the differences in labor costs. Local people have better opportunities since they can exploit their own plots or work for landowners rather than working for a low wage on company plantations. Companies therefore feel compelled to create fixed contracts for jobs, paying on average Rp 1.5 million per month. This is less than workers on independent plots could earn, but these jobs come with in-kind benefits such as health care, rice, annual bonuses and other incentives. These jobs attract the children of transmigrants, ‘waiting farmers’, who are aiming to save enough in order to buy their own land later and landless Melayu farmers (Li 2011).

The creation of employment opportunities is an objective of the companies as well as local landowners. The Ophir project showed that good relationships with the company and a participatory approach to the development of the plasma can result in a high level of job creation. The more the business model involves the farmer, the more jobs become available, both on the plantations and in other sectors, as they develop due to an overall increase in income which will be spent locally. Indeed, the development of the palm oil sector has a multiplier effect, with higher incomes improving consumption and leading to the growth of various others sectors, such as that of construction (Hirawan 2011).

4.1.3 How high are the incomes?

According to several authors, palm oil production has lifted many families out of poverty (Susila 2004; Zen et al. 2005; Gaiser 2009; Jelsma et al. 2009; Sheil et al. 2009; Feintrenie et al. 2010a, b; Rist et al. 2010; Hirawan 2011; Obidzinsky et al. 2012). The main characteristics of palm oil production are: regular incomes, lower intensity of labor, improved access to infrastructure and services (education

and health), development of off-farm activities, improved access to education due to higher levels of income generated for the households (Bonnart 2008; Feintrenie et al. 2010a, b; Obidzinski et al. 2012). The emergence of *Borongmen* reveals the dynamism of the labor markets. *Borongmen* are brokers who are hired to find workers to undertake operations on a plot for its owner (McCarthy 2010). Workers hired on the plantations can also benefit from improved regularity of income and side-benefits such as health care (Obidzinsky et al. 2012; McCarthy 2010). Riau presents many cases of transmigrants and in-migrants who became very wealthy (Levang 1997). The particular success of Riau can be linked to its extensive development of individual oil palm plantations, which proved to be viable due to lower costs and the protection of land proprietorship (Vermeulen and Goad 2006). Once trees become productive, incomes are higher than most other crops, except for clonal rubber in some cases, and prove very beneficial to smallholders, especially when they are included in a nucleus–plasma scheme (Feintrenie et al. 2010a, b). In Kampar and Musi Banyuasin, farmers could earn on average USD 2090 and USD 1210 per year respectively, 60% of which came from palm oil. This is well above the poverty threshold of USD 780 and USD 550, respectively (Susila and Bourgeois 2007). In some areas, incomes per kilogram of FFB can be substantial, especially for plasma smallholders with a net income of IDR 273 per kilogram of FFB against more than IDR 300 for private estates and only IDR 150 for independent farmers with low yields (Zen et al. 2005).

However, the income from oil palm cultivation and the consequent improvements in livelihoods usually come at a cost and many are left out of the process. There have been large winners in the process of expansion of the oil palm sector, but also many losers (Obidzinski et al. 2012). Many locals feel disappointed by the gap between expectations and results, with often only a small part of the local population being effectively integrated into the palm oil industry (McCarthy 2010). One of the main drawbacks is that returns from oil palm cultivation become significant only after 9–10 years, of which the first 3–4 years have no production (Zen et al. 2005). During this period, smallholders have to depend on alternative sources of income or financial support. Initial and long-term investments are critical in order to purchase selected seedlings, inputs, repay potential debts and sustain the family during the unproductive phase (Potter and Badcock 2004; Clerc 2010) and to ensure long-term productivity and profitability. Some smallholders face a decrease in productivity after only 15 years, leading to a loss of income with consequent snowball effects on debt repayments and fertilizer supply, often exacerbated with high price volatility (Potter et al. 1998; Colchester et al. 2006; Jelsma et al. 2009).

Farmers who are included in KKPA and PIR schemes suffer from debt burdens but benefit from good yields and incomes (Vermeulen and Goad 2006; Rist et al. 2010). They can also benefit from technical support and from the impact of the farmer cooperative, which can act as their representative to defend their interests and ensure fairness in their accounting system, which translates into regular and fair incomes (Vermeulen and Goad 2006; McCarthy and Cramb 2009). Unfortunately, these structures, which are indeed proliferating, often lack transparency, are indirectly managed by the company and do not provide farmers with fast cash payments (Barlow et al. 2003; Chong 2008; McCarthy 2010; McCarthy et al. 2012b). Semi-independent farmers not only benefit from all these advantages but also have the freedom to manage their own plots as they see fit. This model seems to provide a good source of income and enable good yields even on their independent plots (Vélu 2011; Duryat 2011). In contrast, the results of fully independent farmers are more nuanced. While those who already had some knowledge of oil palm cultivation and/or had access to a source of capital may have turned successful, many independent farmers do struggle to access inputs, selected seedlings, mills and information (Vermeulen and Goad 2006; Zen et al. 2008; Vélu 2011). The more recent business model, Kemitraan, seems to provide a more uncertain income (Zen et al. 2008).

Profitability from oil palm cultivation varies greatly depending on the local context and the business model (Table 4). According to Susila and Bourgeois (2007), the great majority of smallholders remain below the poverty level despite oil palm incomes, while about one-fifth of them earn more and, in some cases, much more:

- <1 million IDR/ annum (USD 110/year): 8% of the sample of population, below poverty level.

Table 4. Variability of income reported in the literature in relation to the type of business model

Income	Business model
USD 300 to USD 1090 per ha per year (Vermeulen and Goad 2006; Fallmeier 2012)	PIR scheme
USD 242 to USD 1234 per ha per year (Fallmeier 2012; Gan Lian Tiong 2012)	KKPA scheme
USD 1234 per ha per year (Zen et al. 2008)	Kemitraan scheme
USD 582 per ha per year (Vermeulen and Goad 2006)	Supported smallholders
USD 127 to USD 1424 per ha per year (Vermeulen and Goad 2006; Fallmeier 2012)	Independent smallholders
USD 284 per ha per year (Zen et al. 2005)	Sharecropper

- Between 1 and 5 million IDR/annum (USD 110–550/year): 75% of the smallholders surveyed.
- >5 million IDR/annum (USD 550/year): 13% of smallholders, often transmigrants.

4.1.4 Indebtedness: is the risk worth it?

The level of indebtedness has a profound impact on the farmer's capacity to invest and to sustain his family's livelihood. One of the main interests in joining a PIR or KKPA scheme is the access to the initial technical management to set up the plot. In both cases, with or without access to an initial loan backed by the government, the costs for the establishment of the plot must be reimbursed through the deduction of part of the income from the sales of FFB. The duration and cost of the credit depend on the percentage of the income the parties agree on (Rist et al. 2010). A typical case would be a 2-ha plot generating a debt of USD 1470 at 14% interest rate. The loan would be repaid in 6 years by giving 30% of the Net Added Value (NAV) toward the repayment with prices as high as IDR 1500/kg (Rist et al. 2010). Some smallholders in Bungo are eager to get rid of their debt even faster and allocate 60% of their NAV in order to pay off the debt in only 3 years. The graphic below shows a debt burden of 13 years, with repayment starting after 5 years, leaving 9 years of repayments. Other case studies mention very variable interest rates, ranging from 1.25% to 14% (Fallmeier 2012).

However, when prices fall, indebtedness becomes a major problem for the farmer. With prices as low as during the crisis of 2008 (around IDR 800/kg), with the same debt and level of repayment, it would have taken 12.5 years for the smallholders to climb out of debt (Feintrenie et al. 2010a, b; Rist et al. 2010;). Since repayment can only start when production starts, 4–5 years after planting, the debt would take 18 years to repay, not much before the 25-year life cycle of the tree (Rist et al. 2010). This considerably reduces the duration of the period where income is secured and reduces the capacity for re-investment in replanting.

Many smallholders do not read the terms of the contract or cannot properly understand or negotiate it. They often do not know how much they still owe or under what terms (McCarthy 2010; Fallmeier 2012). Thus, there is both a lack of information and of transparency concerning the contract, the amount of the debt, the interest rate and the way costs are calculated by the company (Chong 2008; Zen et al. 2008). This partly explains why some farmers struggle to repay their debts or even are not able to (Colchester et al. 2006; Marti 2008; Zen et al. 2008). Furthermore, banks are understandably reluctant to extend credit without being assured of the farmer's competence and without a proper land title as collateral (World Bank 2010). It is also an unattractive situation for companies, which must stand guarantee for the farmers with the banks, because the amount of the credit is often too low to

cover the costs of developing plasma areas (McCarthy et al. 2012b). If farmers are not able to repay their debts, they usually lose their land leaving them landless, a situation that affects as many as 30% of villagers in a remote village in Jambi district (McCarthy 2010). Finally, the lack of understanding between the different parties stems from the different ways they are organized and function. Indeed, villagers are not used to dealing with bureaucratic institutions such as banks or companies, and are thus unable to determine what to do and what to ask for (McCarthy et al. 2012b). In addition, in their lives, the oral tradition used to count for something, thus indigenous people are easily manipulated by people who accord little value to what has been said until it is written down (McCarthy 2005).

The shortcomings of the credit system are mainly caused by the volatility of CPO prices, the level of inflation in the country and in the lack of clarity in the terms and arrangements between farmers, companies, banks and the government. In such a context, micro-credit could prove more effective by bringing people together to manage their own debts with lower interest rates and more favorable repayment terms (Chong 2008). Alternative sources of income can also help smallholders cope with price volatility as well as provide opportunities to accumulate capital. Despite decreasing access to forest timber, some landowners have been able to accumulate enough capital to participate in palm oil schemes either through a partnership with a company or as independent growers (McCarthy 2010). Furthermore, they were able to buy more land from people unable to repay their debt or in dire need of cash. However, varying access to timber has created inequalities, and now that forest resources have drastically decreased and logging has been restricted, newly established growers cannot benefit from the same opportunities as their predecessors did.

4.1.5 Short-term vs. long-term perspective

One of the main motivations for poor or middle-class smallholders is their need for money. Smallholders who lack capital and a financial safety net often choose the 'fast cash' option (Chong 2008). Therefore, smallholders who cannot afford to manage an unproductive oil palm plot over its initial 3–4 years may be often tempted to sell it (Rist et al. 2010).

Furthermore, farmers are rarely aware of the real value of their lands and do not necessarily negotiate the best price or wait until it gains in value (after improvement in infrastructure, for example) (Rist et al. 2010). With poor people being more vulnerable to price volatility and often in need of fast cash, a considerable amount of land has been sold at a low price through land brokers to wealthy transmigrants or local elites (McCarthy 2010). With transmigration, more than 50% of the Javanese sold back their plots and returned to Java where they could earn a real income straightaway (McCarthy 2010). Local people also sell their land, even though they should keep it, when the price of land is increasing 'to change their fate' (Rist et al. 2010). This behavior offers opportunities to buyers to make an advantageous purchase and has resulted in an accumulation of land by some elites and migrants, along with a few local owners who persevered with oil palm cultivation long enough to be able to extend their plantations.

4.1.6 'Inclusion-exclusion and adverse incorporation' process

Adopting a strategy of intensification usually implies improving the management and often the acquisition of new lands to increase revenue. This process is not accessible to everyone; indeed, it requires either a substantial amount of capital or high revenues. It also means that smallholders have to save and invest their money rather than spend it on direct consumption and goods. This is not a behavior that is easy for local people to adopt and it is mainly people with regular incomes outside of agriculture, such as teachers or company employees, who can adopt this strategy, partly because they bear fewer risks in terms of income (McCarthy 2010). The example of the Batak who settled in Riau province to buy more land after capitalizing on their land in North Sumatra is illustrative and reveals how people can make the most of the steady expansion of oil palm cultivation (Potter and Badcock 2004).

The government has attempted to implement policies to help small farmers embark on the intensification process but many shortcomings persist (McCarthy and Cramb 2009; Zen et al. 2005; McCarthy 2010; Colchester 2011). The farmers' level of inclusion in the palm oil system depends on how well they are able to cope with the intensive farming requirements. Existing obstacles to efficiency and access to intensive practices remain significant for farmers wanting to join the palm oil schemes. Thus, farmers who missed the expansion through the NES schemes and did not have capital have missed their chance to benefit from palm oil and to expand in the same way as successful NES farmers (McCarthy 2010).

4.2 Land security: between theory and practice

4.2.1 Customary and official rights, two conflicting systems

Both for the local people as well as for transmigrants, land security remains an uncertainty in every deal with palm oil companies. In Indonesia, widespread corruption and unclear land tenure, combined with customary rights, has increased access to land that Ribot and Peluso (2003) define as a 'bundling' of power, i.e. in the hands of the elite (McCarthy 2005; Sheil et al. 2009; McCarthy et al. 2012b). For locals, the palm oil industry has brought fierce competition for access to land and made it difficult for them to retain ownership of their lands (McCarthy 2005; Sheil et al. 2009; McCarthy et al. 2012b). The main hurdle has been the lack of recognition of customary rights (Colchester et al. 2006; Potter 2008; Clerc 2010; Colchester 2011; McCarthy et al. 2012b). In the Indonesian constitution and, as previously explained, in the BAL, customary rights are recognized only to the extent that they do not hamper the country's development (Colchester et al. 2006; Sheil et al. 2009; Sirait 2009; Clerc 2010; Zen et al. 2005). Considering that many activities, including the development of the palm oil sector, can be labeled as contributing to the country's economic development, these laws offer very little protection (Colchester et al. 2006; Sirait 2009). Despite recent attempts to equate these rights legally to normal ones and limit the cases of dispossession, the reality on the ground does not show much improvement. Because of their customary status, the local people rely on the traditional concept of ownership, such as the fact of exploiting the land, as in the case of the Dayak (McCarthy 2005; Potter 2008). Ownership of the land and the transmission process is far from clear and depends on the family's situation and unexpected events. This situation contributes to the lack of clearly defined boundaries between plots (Colchester et al. 2006; Potter 2008; Sheil et al. 2009; Sirait 2009; Clerc 2010). Overlaps between two owners' plots may exist and while they may not lead to disputes during the use of the land, they will certainly do so when the land is sold (McCarthy 2005; Colchester et al. 2006; Clerc 2010;). In certain areas, oil palm cultivation has thus led to increasing conflicts among villagers and between villagers and the company or officials. Disputes over land tenure tend to arise more in areas with higher demographic pressures and more intensive developments of land-dependent activities such as rubber or oil palm plantations. In some cases, the land promised to developers may have already exceeded the extent the province could really provide without infringing on existing rights. In these areas, disputes may or may not be directly related to disagreements with a palm oil company or local officials; the actual source of the conflict could sometimes lie elsewhere and not be obvious (Clerc 2010; Levang 2012). In any case, companies are made responsible so that the victims or the villagers can receive cash compensation, something that may not be possible through legal claims.

Bridges between customary rights and formal legal institutions have been created and many customary officials are also included in formal power groups (McCarthy 2005; Colchester et al. 2006). However, the customary rights system, or adat system, is not as direct as the State's system in empowering representatives or attorneys. In the State's systems, the attorney has power through a letter on official paper stating clearly that he is the recipient of this power (McCarthy 2005; Colchester et al. 2006; Fitzpatrick 2008). However, the customary rights system only assigns to its leader the role of communicator, responsible for reaching a consensus. This leader does not have the power to take any

decision that has not been previously discussed and agreed upon in a meeting with his community. Interests, offenses and sanctions are not perceived at the same level and can hardly be equated, let alone merged, between the two systems. Up to now, the legal process to recognize customary rights has been driven by the desire to include customary rights in a Western legal framework (Fitzpatrick 2008). The creation of 'universalist' customary principles has overlooked the fact that customary rights were constructed in a very specific context and vary from one village to another. The eventual result is an increase in the domination by the bureaucracy and the central State over these populations rather than their empowerment.

4.2.2 Lack of transparency and proper regulation for land purchase, transfer and allocation

As previously stated, the lack of recognition of customary rights has favored the spoliation of land from the indigenous people. Another factor is the need to have administrative documents. Indeed, very few farmers can produce a land title, the more formal paper they can usually get is a 'letter of acknowledgment of rights' (SKT) issued by the village head (Fitzpatrick 2008; McCarthy 2010). During the land acquisition process, many villagers do not ask for sufficient official documentary evidence of ownership, being satisfied with a letter with the seal of the village head, which is only the first step in obtaining a SKT. This process for the sale of land within villages, lacking in checks and balances, leads to increased discontent and disputes about ownership (McCarthy 2005; Zen et al. 2005; Wiyono et al. 2007; Potter 2008; Colchester and Marcus 2011). The difficulty in translating informal rights into formal ones and legal titles has made landowners more vulnerable to manipulation by land brokers, outsiders and company representatives (McCarthy 2010). When companies do try to abide by the rules and acquire the land legally, land compensations are often low, calculated in an unclear and opaque manner, with farmers having little say in the process (Colchester et al. 2006; Cheyns 2011). 'Sleeping land' is particularly vulnerable to these land brokers and outside buyers because it has no real formal status. The creation of an intensive land market within village boundaries and land ownership by the locals led to a 'commodification' of the village commons. NGOs and local officials try to produce maps of boundaries, village frontiers, etc., but the negotiations are long and the disagreements many (McCarthy 2005; Zen et al. 2005; Potter 2008; Wiyono et al. 2007; Colchester 2011).

Within NES schemes, the promise of a 2- or 3-ha plot, despite being very attractive may well end up unfulfilled (Colchester et al. 2006). Indeed, many villagers reported delays in getting their plots back or delays in the planting process. The fact that the most fertile lands are kept for the *inti* of the plantations and the less productive lands are allocated to the smallholders can have a serious impact on their ability to survive on palm oil income (Colchester et al. 2006; Chong 2008). Some smallholders surrendered more land to the scheme but did not necessarily obtain more plasma land, while some were even kept out of the reallocation of the plots (Zen et al. 2005).

The decision of how much the land will be allocated to *inti* and how much to plasma is very important. Indeed, the smaller the allocation to the plasma, the lower is the bargaining power of the smallholders (McCarthy 2010). Allocation to the plasma varies from as little as 20% to as high as 70%. Thus, the impact on smallholder livelihoods and their importance to the company varies widely. For plasma plots, the farmer does receive a land title certificate as soon as his debt is repaid. Thus, the larger the plasma area, the more land may eventually remain the property of the villagers. However, this observation does not apply to districts which limit ownership of a plasma plot to 4 ha (Colchester et al. 2006). In addition, the terms of the partnership contract are often misunderstood leading to possible mismanagement to the detriment of the smallholders. Many villagers believe that they still own their land, which should indeed be the case since the company is only renting the land (Colchester et al. 2006). However, the regulations do not clarify whether the land will be given back to the State which will then redistribute it or whether the farmers will be given the same amount of land back at the same place or elsewhere. This is yet another example of customary and official rights overlapping without

actually contradicting each other. For the Dayak, for example, customary rights do not allow the sale of any land but only granting of permission to exploit it (Colchester et al. 2006; Potter 2008), whereas the companies involved think that they have acquired the land (Colchester et al. 2006). Negotiating advantageous conditions for the smallholders through a large allocation to plasma may still demonstrate to the company that the village and its officials will not bend to the company's wishes. The company may thus be forced into communicating more clearly and adopting a more participatory approach to the development of oil palm cultivation. This situation also exists in West Kalimantan with the negotiation of a 50:50 partnership thanks to efficient and dedicated officials (McCarthy 2010).

In addition to issues of land tenure and allocation, problems may arise after land concession agreements have been signed due to the lack of monitoring of the fulfillment of contractual obligations. Some oil palm concessions were used in the past only to extract timber, without planting any oil palms (Casson 1999). The Indonesian government now reacts to such cases by cancelling permits, which it has often done. Companies now have to plant the trees within a certain period, usually of 3 years, if they want their permits to remain valid (Colchester et al. 2006; Wildlife Conservation Society 2010). However, some areas that should have been planted are yet not operational (Casson 1999; Wildlife Conservation Society 2010) do not have the expected number of trees per hectare or are still unproductive after 5 or 6 years (Colchester et al. 2006; McCarthy 2010). This lack of proper use of the land is due to various actors, such as the village team, contractors or plot managers, especially in plasma areas. This leads to delays in returns on investments for smallholders, which can lead to terrible consequences for farmers in dire need of cash, who could again be tempted to sell their land given the presence and the pressure of land brokers (McCarthy 2010; McCarthy et al. 2012ab).

These various causal chains converge in encouraging speculative and land-grabbing behavior (McCarthy et al. 2012b). Along with big agribusinesses and wealthy landowners, local officials and land brokers foster what can be called a 'land bubble'. This has a snowball effect, increasing the number of landless people and the amount of land sold. Indeed, land has now become the target of speculative strategies, especially since the actors are certain that the value of land will keep rising. Therefore, many companies who asked for permits did not proceed with the full business permit (HGU) process but just what was necessary to retain land ownership before selling it at substantial profit (McCarthy et al. 2012b). In such a situation, with limited access to clear and stabilized information, local people have very limited power. There is consequently an urgent need to protect the weakest among them from falling victim to these dynamics. If people cannot afford to keep their land nor want to do so, solutions need to be found to redirect them toward new activities. In this case, the Ophir project has shown the positive spill over effect of oil palm development on the development of other job opportunities, in construction, restoration and small businesses (Jelsma et al. 2009).

RSPO certification aims to clarify and secure land rights, especially customary rights. Therefore, companies are making efforts to comply better with land regulations (RSPO 2006). The position of local officials, on the other hand, varies, with some acting honestly and defending the villagers, making the case with higher authorities for compensation to be paid to them; others are corrupt and favor the company in its land-grabbing process (McCarthy 2002; Martini et al. 2010; McCarthy et al. 2012a). It has now become important to ensure proper governance and management of resources, in particular to prevent opportunistic relationships and rent-seeking behavior (McCarthy 2002). From a production system perspective, land security is best ensured when land is registered with clear boundaries and the land title is owned by the farmer. PIR and KKPA schemes tend to ensure this, though independent smallholders may find themselves more threatened by predatory behavior on matters pertaining to land, especially if it is under customary rights. Under the *Pola Patungan* scheme, very little is known about the ownership of the land but it seems that it belongs to the company.

4.3 Transmigrants and internal migrants: a not-so-safe status

4.3.1 A risky status

Transmigration programs played an important role in the development of the oil palm sector and its current state. Despite the promises of the government to the transmigrants that they would access land and be paid for some of their expenses, very few of these promises were actually kept (Fearnside 1997). Many transmigrants confirmed that they did not get their plots on time or had to fight for them (Colchester et al. 2006). They also had to contend with food insecurity in the early years of the program because they were not allowed to grow intercrops with oil palm trees and were not yet allocated their 1-ha plots to grow food crops (Zen et al. 2005). Another major aspect was the way transmigrants were used as a labor pool. Indeed, migrants were sometimes brought to villages that had a limited amount of land. With the next generation competing for land, impoverishment soon followed and these migrants were forced to look for jobs on oil palm plantations, where wages were very low due to the high demand for jobs, or had to decide to go back home (Colchester et al. 2006; Li 2011).

Most of the land allocated to growing rice or food crops was of poor quality, without irrigation or proper infrastructure, which most often explains the failure of the process. However, some transmigrants resisted the pressure and chose to grow rubber and rice. The most successful were those who had previously received a proper technical training (Colchester et al. 2006). In Riau, internal migrations have been very important especially once the availability of land in North Sumatra declined. Some Toba Bataks from North Sumatra have settled in Riau, selling only rubber to buy cheap new lands for oil palm. Some migrants have managed to increase their capital and improve their livelihoods over the long term (McCarthy 2010;), but many migrants still only own enough land for their bare survival (Potter and Badcock 2004).

Compared to transmigrants who came to cultivate rice, transmigrants settled near oil palm plantations seem to have fared better, despite the risks already mentioned (McCarthy et al. 2012b). If oil palm cultivation is correctly managed and the land tenure issue settled, it can provide a good income making some transmigrants relatively wealthy – such as transmigrants in Riau who did not sell their lands (Levang 2012). All in all, when transmigrants left their home villages, they left for a risky future with no guarantee of obtaining land of their own, being able to cultivate it and earn enough for a living. However, when investments, strategies and opportunities were appropriate, many transmigrants, especially those integrated into partnerships with palm oil companies, ended up making a successful living.

4.3.2 Relationships with the local people: Between conflict and collaboration

Many studies do report conflicts between indigenous people and transmigrants. However, in a village of Rokan Hulu district in Riau, the relationship between Christian Bataks and Mandailing seems to be normal despite the latter having bought almost one-third of the land by 2004 (Potter 2004). This situation may be based on the satisfaction that the local people derived from the compensation they received, which allowed them to send their children to school and provide a better life for their families, at least for some time. There have also been some positive experiences. For example, the Toba Bataks initiated the development of oil palm cultivation, even before companies arrived in the area, and transferred their knowledge to local people. However, the lack of technical support and access to good seedlings and inputs led to many failures (Potter 2004). Over the long term, with increasing pressure on land, the lack of income from land for those who had sold it finally led to tensions in some cases. Some local leaders noticed a negative change in the ‘harmony’ of the village due to the migrants (Potter 2004). The arrival of newcomers did lead to changes, a mingling of cultures and, ultimately, to distrust, especially when transmigrants received benefits such as free land and complementary revenues during the unproductive phase (Fearnside 1997; Colchester et al. 2006; McCarthy and Cramb 2009).

4.4 Markets and prices: How to avoid a monopolistic situation and reduce risks?

4.4.1 A monopolistic situation

Smallholders suffer from two major constraints: they have to deliver the fruit to a mill within 48 hours or the fruit will be unusable, and they are forced to deliver to a particular mill in the case of a scheme where smallholders operate under a contract with a company. This creates a monopsony situation, with farmers having very few choices. Unless mills are in competition with each other, with a large need for fruit in order to reach full capacity, smallholders do not have much bargaining power (Papenfus 2000). This is especially true for independent growers whose fruit quality may not be up to the standards of the companies' mills. In most cases, mills reach their full capacity with supplies from their own estates and companies maintain control over their suppliers since they can reject their production. KUD, independent cooperatives and entrepreneurs (very large landowners or company managers) are usually well-connected people who find it easy to enter into agreements on prices and the share of the production they will take care of. This situation forces the smallholders to remain 'price takers' (Clerc 2012).

Compared to the prices set by the local Government Plantation Agency Office, the prices paid to the farmers are often much lower. The K index, which represents the amounts deducted for the costs of management, is a very useful tool for companies to justify a lower price. This index, supported by the government, is variable and never really known to those outside the close circle of company managers.

4.4.2 How do people overcome their status as 'price takers'?

This monopsony has triggered two forms of resistance from the smallholders. First, there is a growing movement by the independent smallholders to build independent and collectively owned mills to process their fruits (McCarthy 2010). Second, the monopsony has led to the proliferation of intermediaries who buy the fruits from both plasma farmers and independent smallholders and sell them to the mill as only originating from the plasma. This expedient is, however, risky given the possibility of being caught by the company and the economic cost of relying on intermediaries. Cooperatives have long been seen as a defense against the manipulation from oligopoly tenants. However, a lack of transparency and efficiency, combined with corruption, have disappointed many villagers and led to a deficit of trust. Local governments should be able to act in favor of the villagers, notably through permitting the establishment of mills without plantations (Chong 2008) or through improved regulation over the fixing of prices. However, local governments often lack the means required and its functionaries are, unfortunately, subject to corruption.

4.4.3 How to manage risks related to price volatility?

As villagers in Jambi say, 'palm oil is good as long as prices are good', but a dramatic fall in prices will lead to terrible difficulties for smallholders, who hardly benefit when prices increase but have to bear the entire burden of decreasing ones. Indeed, when income is falling, they tend to reduce the use of inputs, stop hiring labor, and stop sending their children to school. If cash is really needed, they will even sell their assets, beginning with the relatively liquid ones, such as motorcycles, and going as far as to sell their land, which constitutes their main capital (Gilbert et al 2004). Thus, mechanisms to manage price risks are an important way of reducing the large-scale sale of land and could help farmers cope with difficult financial situations, if there would be a political will to do so. Fixing the price of the fruits at the beginning of the season would certainly lead to less uncertainty and ease decision making by the smallholder on how to manage his plot.

One solution is price insurance, undertaken either by intermediaries such as processors or by cooperatives (Gilbert et al 2004), provided that smallholders sell their fruits to the intermediaries even

when prices are higher than the insured prices. This kind of exclusive relationship is already well developed within PIR and KKPA schemes. However, 'intermediaries' such as the ones found in Jambi, who buy from smallholders and sell to whoever they want, may represent a threat to the process. Price insurance could alternatively be undertaken by a financial institution or the companies themselves. In Jambi and Riau, the price of the fruit is determined by exporters and processors two weeks before the sale and based on their sales of the previous two weeks, even though international prices usually vary more frequently. There is thus a very low correlation between fruit prices paid to smallholders and the international price (Gilbert et al 2004). The basic risk, i.e. the one caused by the difference between international prices and local prices, would decrease substantially if prices were determined more often, such as once a week.

The palm oil industry exhibits many characteristics of the globalization of trade: powerful multinationals hold all the cards and manipulate local actors such as KUD or the local government to fix prices and to grant exclusive rights for production or processing. Moreover, the fact that palm oil has a long marketing chain leaves the smallholders far behind, accruing little benefit from any increase in prices or reduction in downstream costs. Cutting the chain and allowing the producers to control a larger part of it by empowering them and implementing price insurance mechanisms could improve their living conditions.

4.5 Environmental impacts: who is the most concerned?

4.5.1 Deforestation and biodiversity loss

One of the main environmental concerns in Indonesia is deforestation. Numerous studies have tried to quantify the impact of oil palm cultivation on the loss of forests but the numbers differ significantly (Wicke et al. 2011; Koh et al. 2007). There is no doubt that oil palm cultivation does contribute to deforestation, especially through the conversion of areas previously forested but used by the logging industry (Singer 2009; Koh et al. 2012). Transmigration for developing the palm oil sector has also led many migrants to clear land in forests to grow staple crops or produce palm oil (Fearnside 1997). The land bubble has also contributed to the reduction of forest cover (McCarthy et al. 2012b). The protection of peatlands and forest forms a major part of the debate on carbon emissions (Koh et al. 2011; Murdiyarso et al. 2011; ISPO 2012b). Indeed, peatlands and forests represent major carbon stocks and biodiversity hotspots (Uryu et al. 2008; Gunawan 2009; Koh et al. 2011; ISPO 2012c). Consequently, their exploitation leads to increased carbon emissions and biodiversity losses (Sandker et al. 2007; Sodhi et al. 2010; Koh et al. 2011; Murdiyarso et al. 2011; World Bank 2011). Of Indonesia's greenhouse gas emissions, 85% are due to deforestation. Peatlands are especially threatened because they are easily accessible and free from local claims, thus whoever develops on these areas avoids land disputes (Murdiyarso et al. 2011). In Riau, for example, the tiger population has fallen by 70% and that of the Sumatran elephant by 83% (Uryu et al. 2008).

Despite conservation concerns, the desire for economic development trumps indigenous attachment to traditions and the environment (Sirait 2009; Feintrenie et al. 2010). When villages reject oil palm cultivation, most of them do it more out of mistrust and unfulfilled promises by the companies than to protect their forests and traditional livelihoods (Potter 2008; Sirait 2009; Feintrenie et al. 2010). However, conservationists also often highlight the cases of villagers complaining about the negative environmental effects of the activities of palm oil companies. Water and air pollution, and the reduction in forest cover are often cited, even though they may not outweigh the desire of the local people for a better life (Orth 2009; Sirait 2009; Rist et al. 2010). The division between conservationists and local pro-development people highlights the need to identify the trade-offs between conservation and development. Some attempts have already been made through the modeling of different scenarios (Sandker et al. 2007).

4.5.2 Initiatives toward sustainable palm oil

RSPO and ISPO

Specific measures have been introduced to promote sustainable development of the palm oil sector, with guidelines for sustainable palm oil expansion (Cheng 2011). The major initiative is the RSPO (Roundtable for Sustainable Palm Oil), created in 2004 (RSPO 2006). It is an industry-dominated organization that aims to promote transparency and accountability in producing certified sustainable palm oil. All the sub-sectors and stakeholders of palm oil production are represented, with over one-third of the members being processors and traders, one-third being consumer goods manufacturers, and just over 17% being producers. Certified Sustainable Palm Oil (CSPO) now represents over 17% of the global palm oil market. Approximately 2.9 million ha of oil palm plantations are certified (RSPO 2016). Despite its good intentions, the RSPO suffers from shortcomings, which have often been denounced by NGOs, such as Greenpeace (Laurance et al. 2010; Paoli et al. 2010). Most notably, RSPO lacks the economic and human resources to fulfill its ambition. Therefore it does not have enough control over its members and cannot enforce compliance with its mandated criteria (Laurance et al. 2010). Moreover, its present criteria are not stringent enough to ensure a systematically quantified reduction of environmental impacts. Even though these problems are common to most organizations trying to regulate production, RSPO does suffer from an industry bias. It needs a ‘watchdog’ to put its results in perspective and advance constructive criticism. RSPO should become bolder, both in its environmental requirements and in the methods it relies on to ensure compliance by its members. It should also try improving the demand for sustainable palm oil, of which only 52% is bought on the market (Laurance et al. 2010). These levels of improvements are again common with this type of initiative and take some time to be fine-tuned. In 2013, principles and criteria were revised for the first time; revisions are now planned to take place every 5 years. New criteria were implemented, including the quantification of greenhouse gas emissions along the supply chain and a new planting procedure. Stakeholders are now discussing ‘RSPO next’, which would further strengthen its principles and criteria. The Indonesian government also decided to develop its own organization for sustainable palm oil, called Indonesian Sustainable Palm Oil (ISPO), first presented in 2010 at a RSPO roundtable (Meulen 2011; ISPO 2012a). The ISPO criteria are mandatory and underscore the government’s commitment to the conservation of the environment (Colchester 2011). The government has been actively promoting this initiative to ensure its recognition by the European Union’s sustainability requirements (Meulen 2011). ISPO aims to surpass RSPO requirements with the help of the IPOC as a partner (ISPO 2012; Meulen 2011). Such parallel systems may allow for further improvement of the sector, provided that counterproductive competitive effects are avoided.

Smallholders who were able to implement RSPO standards and to benefit from its other external programs have obtained higher yields, enjoy better social conditions and experience less corruption (Laurance et al. 2010; WWF 2012). Large companies have also acknowledged interest in supporting the certification of smallholders, given the increase in smallholder productivity that results and the savings due to avoided disputes (WWF 2012). The results are more nuanced for medium-scale companies, for whom the compliance costs are still excessive (WWF 2012). Globally, certified smallholders nowadays represent only 9% of RSPO-certified producers on a hectare basis³.

Governmental commitments to limit deforestation

For many years, international pressure has been brought to bear on Indonesia to take rapid steps toward more sustainable production of palm oil and better management of its forests. Donors and NGOs have mobilized to urge an end to continued environmental degradation, and have sponsored research programs. The European Union has asked the Indonesian government for transparency on its forest products, which it demands should not come from illegal logging (Singer 2009). This pressure

3 An area of 2.93 Mha RSPO certified, 263,908 ha of smallholders’ certified area.

and exposure has helped the development of RSPO and ISPO certifications and the tightening of regulations concerning logging. The Indonesian government has invested in its own wood certification program, called LEI (Lembaga Ekolabel Indonesia), which is now more widespread in the country than the international FSC certification, and implemented SVLK (Timber Legality Verification System) in 2009. Finally, Indonesia has “to ensure that all traded Indonesian timber products in the market hold responsible certification with a legal status. It should increase the credibility of Indonesian timber product among consumers worldwide and, in this way, help build up the reputation of the country’s timber producers” (WWF 2012).

The Indonesian government has also agreed to undertake a REDD project with Norway. Norway has offered a grant of USD 1 billion to help cover implementation costs and achieve a reduction of 26% in carbon emissions by 2020 (Wijker 2012). The forest moratorium declared by the president is part of this program and should protect carbon rich areas such as peatlands and forests, while slowing down the conversion of new land into oil palm in fragile areas (Koh and Ghazoul 2008; Colchester 2011; Edwards et al. 2012; Wijker 2012). However, because this decision is just a presidential instruction, actors are under no legal obligation to comply and will suffer no punishment for non-compliance (Murdiyarto et al. 2011). The moratorium aims to reduce deforestation and carbon emissions by slowing down the issuance new concessions. It involves three ministries, including the Ministry of Forestry, five agencies and the heads of district governments. It lays out a 2-year program. A glaring omission is the exclusion of the Ministry of Agriculture and the Ministry of Energy and Mineral Resources from the program (Murdiyarto et al. 2011). The moratorium targets the ‘primary natural forest’ areas, that is to say untouched and unmanaged forests, and peatlands. The first shortcoming here is that the interpretation of primary natural forests does not seem to include secondary forests, which, if included, could have doubled the area concerned. Indeed as much as 41 million ha of forests are considered secondary or logged over (Murdiyarto et al. 2011). These areas are also rich in biodiversity and play a significant role in stocking carbon. All categories of peatlands are, however, included in the moratorium. This decision only protects an additional 22.5 million ha of peatlands and primary forests over the 60.1 million ha existing in 2009. Another negative aspect of the moratorium is that permits which have been issued prior to the Inpres will remain effective (Colchester 2011). Thus, oil palm expansion may continue over peatlands and primary forests if the HGU has already been acquired. Furthermore, areas which can be developed for ‘vital’ use such as for energy, rice or necessary resources are excluded from the ambit of the moratorium regulation (Murdiyarto et al. 2011). Indeed, the impact of the moratorium might be different than expected. From an economic point of view, conclusions of studies differ. Some analyses show that the moratorium will act as a deterrent for new and foreign capital investments in the country. They have also simulated different outcomes in terms of poverty reduction, employment and productivity (Rakhmindyarto 2012). CIFOR argues that it could force companies to develop already existing estates. Indeed, palm oil yields in Indonesia are still far below potential and the 6.5 t/ha of Malaysia. Improved exploitation of oil palm could lead to increased job creation as well. Also a study by Reuters assumes that with permits already issued, oil palm cultivation will continue to expand at the existing rate for longer than the 2-year period of the moratorium (Murdiyarto et al. 2011).

4.5.3 Implementing good governance: the magic wand?

The issue of governance in the palm oil sector in Indonesia shares common features with other rural developing economies where land is particularly prized and where multinationals want to grow cash crops or extract resources. There are many instances of ‘bad governance’ and of ‘free riding’ behavior in development of the palm oil sector (McCarthy 2005; Zen et al. 2008; Feintrenie et al. 2010; Martini et al. 2010; McCarthy 2012). However, ‘bad governance’ is a risky term to use since it can be made to encompass many ills that plague a community. Here, we will focus on the repeated observations made in the palm oil sector of land disputes, corruption, environmental degradation and issues related to the plantations (McCarthy 2002, 2012; Greenpeace 2006; Zen et al. 2008; Feintrenie et al. 2010a, b; Martini et al. 2010; Colchester et al. 2011). From a theoretical point of view, governance can be described through a set of questions, as suggested by Bebbington et al. (2005):

- a. What capacity exists to address problems of livelihood and governance in the villages studied?
- b. What are the sources of this capacity?
- c. How far were villagers able to solve key livelihood and governance issues?
- d. What factors determine the effectiveness of local capacity?

An approach through these questions allows an in-depth analysis of social connections, power relationships and the dynamics within and between villages. As underscored by McCarthy: “A range of factors, including the physical location of a village, the heterogeneity of its population, its openness to change, and the caliber, charisma and commitment of the village leadership and their position *vis-à-vis* patron-client arrangements, all coalesce to shape the webs of personal connections, influence and accountabilities that mediate social choices” (McCarthy 2010). According to this reading, social choices will differ from one situation to the next, and the community’s strength and unity will depend greatly on these factors. A few trends can, however, be discerned in the palm oil sector pertaining to governance, local powers, villagers and external actors. The problems are recurrent: reduced access to land because of land grabbing by elites, lack of recognition of customary rights, predatory behavior by land brokers and reduced access to forest resources. A significant lack of transparency in the whole process of palm oil production has been noted, combined with unclear boundaries and plot overlaps (McCarthy 2007). For example, information on the real costs of management, the amount of debt, setting of prices and land titles is usually inaccessible to villagers (Feintrenie 2008; Zen et al. 2008; McCarthy 2010). Some authors also explain the failure of many cooperatives by bad governance and lack of accountability. Indeed, most local people have no experience in managing the revenues and assets of others (Levang 2012). McCarthy (2012) also emphasized the point that when governments gain access to assets without the help of their people, they tend not to make any efforts to include them into the development process nor do they feel accountable. Many also report instances of bribery involving local officials, company representatives and even wealthy villagers (McCarthy 2005; Colchester et al. 2006; Feintrenie and Levang 2011; McCarthy 2012; Wijker 2012). This type of behavior must be opposed in order to ensure a fairer redistribution of wealth and opportunities.

The case which has been the most studied is the one of the district of Bungo. We use it here as a way of presenting the tools, questions and global trends pertaining to the issue of governance and the questions suggested by Bebbington et al. (2005). Villagers have come up with several solutions to address their problems and their capacities have built up considerably in the process. Indeed, compared to the repressive Suharto period, the new process of decentralization, combined with a more open national government, has increased the opportunities available to the villagers. For example, people can elect their representatives and the process is now ‘bottom-up’ compared to previous years when officials were appointed and only accountable to their superior, ultimately the State (Bebbington et al. 2005; Martini et al. 2010; Feintrenie and Levang 2011). Ethnic groups now have organizations that enable them to participate and integrate properly (Feintrenie and Levang 2011).

This new organization favors communication with the villagers and many customary representatives have become officeholders in this new system, interlinking formal and *adat* organizations in this way, which has certainly increased the credibility of the officials (Bebbington et al. 2005; McCarthy 2005; Colchester et al. 2006). Surveys even reveal that people are satisfied by their level of participation in the process and by their representatives’ development agenda (Feintrenie and Levang 2011). The structure has also created a board, BAPPEDA, responsible for land-use planning, thus improving, at least by a little, accountability and knowledge of the various types of land (despite many blurry boundaries and discrepancies in figures) (Wiyono et al. 2007; Martini et al. 2010). The plan is being implemented by representatives of BAPPEDA, BPN (National Land Agency) and the Forestry Department (Martini et al. 2010). These institutions are also key governance levers for managing and resolving land disputes and for the recognition of customary rights (Bebbington et al. 2005; McCarthy 2005; Martini et al. 2010). Furthermore, the mapping of boundaries and the establishment of a check-and-balance system for land has been promoted, most notably through direct villager participation. The proof of the efficiency of institutions and of proper governance can be found in the sanctions. In Indonesia, the informal aspect of the institutions is very important, as are the customary sanctions

(Bebbington et al. 2005; Colchester et al. 2006; Clerc 2010; Martini et al. 2010; Feintrenie and Levang 2011). Most punishments forming part of the regulations are based on customary sanctions. In addition, a lack of knowledge of procedures for reporting formal crimes or for seeking legal justice leads villagers to resort to customary rules. However, this comes with some disadvantages, with a major risk for communities in which customary rights are still embedded in the village organization being the capture by the elites of both formal and informal powers. This quickly leads to almost total control by the elites over the management of resources, legal activities and political decisions (Bebbington et al. 2005; Martini et al. 2010; Feintrenie and Levang 2011).

This new organization and the increased freedom villagers have acquired have helped to improve social capital, which can be considered a tool and a means for appropriate resource management and social organization. Fox (1996) has explained this positive evolution through three pathways, which have enhanced cooperation between villagers, as well as increased their influence, a key factor when the customary framework which used to closely bind people is weakening (Martini et al. 2010). Fox (1996) noted that the first way to improve capacity building through organization is a convergence between the State and the village. This favors the development of a new rural organization, benefiting both sides. Villagers and local governments agree on their wish for economic development (Feintrenie and Levang 2011). Who will benefit from development is the heart of the problem. Villagers can now address their claims directly to the district head or to the head of the customary system (Feintrenie and Levang 2011). People can also create a village regulation (*peraturan desa*), which can be approved by the village officials and the head of district. A second option, referred to as the second pathway by

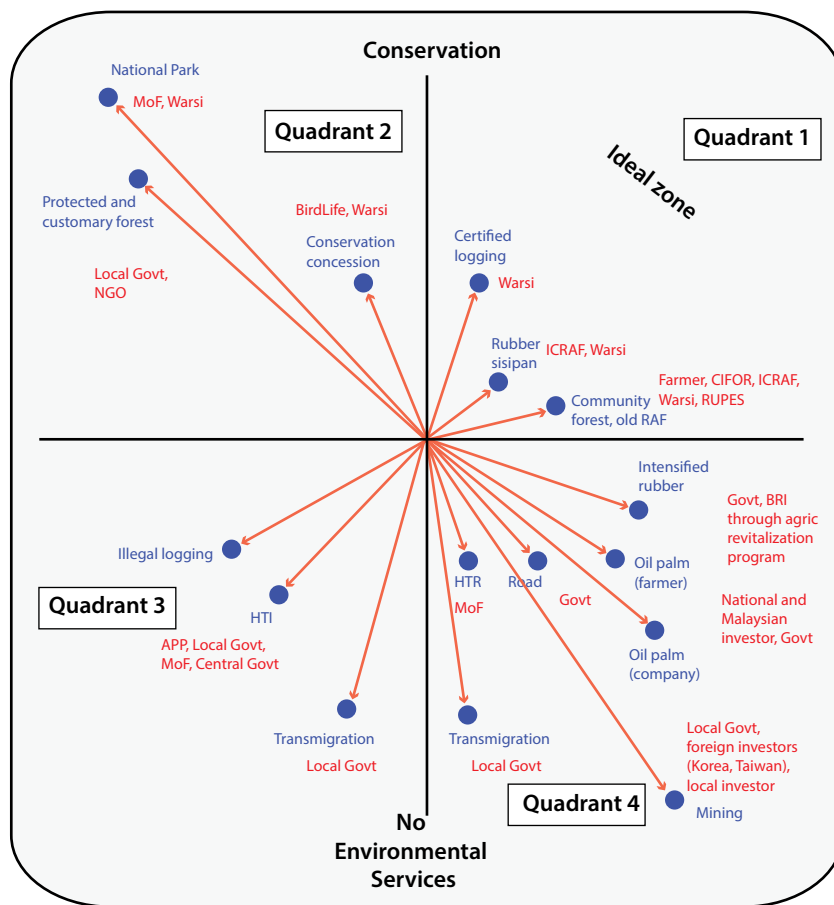


Figure 10. Organization of the various activities and actors in the Bungo district according to their economic interests and environmental impacts.

Source: Martini et al. (2010)

Fox (1996), is the intervention by non-village or external actors, such as NGOs or research centers. These new structures often side with the farmers, and NGOs, in particular, highlight any complaint concerning the development of the palm oil sector or forest conservation (Bebbington et al. 2005; Gaiser 2009; Martini et al. 2010; Feintrenie and Levang 2011). They make themselves known to the villagers and try to provide them with relevant information. They have provided support, especially against repressive moves by the government soon after Suharto's fall. The third dynamic that Fox (1996) refers to is the spontaneous creation of rural organizations (Bebbington et al. 2005). Farmers coming together on their own initiative to form cooperatives or setting up systems of rotating savings are some illustrations of this process.

The problem of governance is one that can often be viewed through conflicting interests of the actors. Figure 10 organizes the actors and activities according to their economic interests and environmental impacts along two axes: conservation versus no environmental services and zero profitability versus intensification. The extent of the differences between them is truly striking.

Initiatives are now trying to reconcile both aspects to attract more participants. For example, REDD and a tax payment on carbon emissions could make forest protection an economically profitable strategy (Feintrenie and Levang 2011). An increasing number of villages are calling for the recognition of some part of their forests as 'village forest' by the government. Unfortunately, most of the efforts in this regard by the villagers do not reach up to the provincial government, with the result that projects do not take off or are dropped. The Ophir project has shown that well-organized NES production systems can be efficient and groups of farmers effective in implementing good governance, notably within the cooperative (Jelsma et al. 2009). The RSPO program is having an even wider impact. It not only aims to combine palm oil production with respect for the environment and biodiversity but also addresses the problems of transparency, customary rights, accountability and better agricultural and social practices (RSPO 2006; Laurance et al. 2010; Levin 2012). It also calls for a form of Corporate Social Responsibility (CSR) that targets companies directly (Paoli et al. 2010). Thus, governance has now firmly become part of the quest for sustainable production. Pfund et al. (2011) list three major points to implement this:

- a participatory process of land-use planning to design a landscape with clear goals of preserving and restoring multifunctionality for local livelihoods and an accountable monitoring system to ensure this is acted upon;
- payments for environmental services (PES), with arrangements to ensure local benefits for rendered services, trying to cover as many services as possible and needed;
- fair and transparent community-based institutions. The presence or absence of community rights can have a significant impact on the management of a landscape. Accountable landscape-level institutions and organizations are necessary to ensure equitable governance of rural landscapes.

To ensure a suitable design for these institutions, there is a need for a participatory approach to development, notably for the RSPO and village forest programs, through regular meetings, technical training and other forms of communication. In conjunction with NGOs, the RSPO program has to strengthen its regulatory and audit procedures (Paoli et al. 2010). A shortcoming of the RSPO program is the limited extent to which it is effective in including local villagers. Many villagers report having no real say in the discussions or only attend meetings for a possible monetary reward. Therefore, the question of the adaptation of the participatory process to the villagers' expectations and availability is crucial. Cheyns (2011) describes what she calls the 'inclusiveness paradigm' in which she describes the pressure for participation, questions the topics that are discussed, the way local knowledge is dismissed and how language barriers exclude people who, in the end, feel less and less concerned by the program. This author also underlines the gap between participation and practical actions, which can be extended to the level of the company and the government (Cheyns 2011).

All in all, institutions are evolving and improving in securing a certain level of accountability and transparency. People are yearning for economic development, with the expectation of a proper redistribution of generated value and their right to be involved in the decision-making process. Local

officials are not all corrupt, with some at least maneuvering for what they consider best for their villages, sometimes embracing oil palm cultivation, sometimes rejecting it, depending on the external actors involved. However, getting rid of blatantly predatory behavior is not an easy task, especially since local governments are now more accountable to their people and have more autonomy from the national government. Good governance may not be enough to keep control over the ongoing dynamics and undo the wrong that has been already been done, especially in Riau. Positive efforts are currently being made, such as the RSPO and REDD programs, or even the decision of the Riau local government to hand over oil palm plantations to the poorest farmers. NGOs may have also become more effective by taking into account the desire of the villagers for a better life rather than a better access to the forest (even though both factors are often correlated). Capacity building of populations in certain areas is increasing while in others it is shrinking because of heavy pressures. The next generation will also offer new perspectives, being likely more educated and aware of the international context.

5 Palm oil development: Case studies in Riau and Jambi

5.1 The case of the province of Riau (Sumatra): A well-established and dominant palm oil industry

5.1.1 Geography and recent economic development background

Riau province is rather low lying with vast areas covered by swamps. The few hilly regions are mainly along its western and southern borders. Soils are either highly acidic, as on peatlands, or podzolic and leached as in most of Sumatra (Potter and Badcock 2001). Its surface area is about 87,000 km² with a population density of 64 inhabitants/km² (BPS 2011). There are four major rivers flowing through the province. They represent an important asset, both for the local population and as transportation routes. The capital city, Pekanbaru, is located on the banks of the Siak River which ocean-going ships are able to navigate, constituting a key asset to export palm oil, pulp and paper, natural rubber, plywood and other wood-based products (Singer 2009).

5.1.2 Population diversity

Riau has the reputation of being a mixed-population province, with the original Melayu representing only 37% of the population in 2000 (BPS 2001). Western and southwestern areas of the province received the Minangkabau people from West Sumatra and the northern part received the Batak people from North Sumatra (Potter et al. 2004). Banjarese also arrived from Kalimantan, while Singaporean Chinese also settled in the province. There are also few minorities such as the Talang Mamak. These minorities along with the remote Melayus are relatively poor with a low level of access to health care and education (Potter and Badcock 2001). There have been demands for an increased participation of the Melayus in economic development, especially because Javanese migrants formed the core of the transmigration programs. Due to this cultural diversity, with some settlers arriving decades ago (such as the migration of Mandailing people which took place 60 years ago), many migrants from various origins are now asking for the status of indigenous people and want to be recognized as 'Riau Melayu' (Kato 1997 in Potter et al. 2004). Increased local participation resulting from the decentralization process has lent support to these demands.

5.1.3 Economic development

The province has developed through the exploitation of natural resources (oil and gas mainly), agriculture through the cultivation of cash crops, and forestry (timber) supported by waves of transmigration. The development of the oil industry in the 1950s was followed by the government's desire to develop the palm oil sector through public and private schemes with the required labor force being brought from outside the province. Starting in the 1980s, this development policy was supported by large-scale transmigration programs, with more than 500,000 transmigrants arriving from Java in the 40 years leading up to 2001 (Potter and Badcock 2001). The extraction of gas and oil since the 1950s and the extensive development of both timber concessions and plantations have led to population growth at a rate of 3.4% between 1990 and 1995. However, the poverty level remains below the national average, with 8.5% of the population being classified as poor, mainly in the province's rural districts. The Human Development Index is 75.6, higher than for Jambi province. These aggregate figures portray a definite improvement in living conditions (BPS 2011).

Kampar and Rokan Hulu districts have been most affected by the expansion of oil palm cultivation. Pelawan district, comprised of vast areas of swamp forests, has also been subject to massive exploitation, especially by the pulp and paper industry (Riau Andalan Pulp and Paper, RAPP). The National Park of Bukit Tigapuluh (Thirty Hills), located in the Indragiri Hulu district, is a notable home of rainforest flora and fauna. Siak district mainly consists of peatlands and timber plantations. It is also a major producer of oil.

5.1.4 Government and the management of resources

Riau is richly endowed with resources, to the benefit of local government budgetary resources, in which the oil palm sector has been a key player. Local people have long complained about the lack of local benefits from oil revenues and a separatist movement was even launched, partially on this basis (Potter and Badcock 2001). However, the decentralization process, despite a difficult implementation, seems to have benefited the province through development and welfare programs (Zen et al. 2008).

5.1.5 Forest management

Forest management in Riau has been heavily impacted by intensive timber exploitation and the development of the pulp and paper industry. The timber industry found good conditions in Riau: large areas, valuable species and accessible waterways to export by sea. However, this industry suffered greatly from the combination of the Asian Crisis, the political instability following the end of Suharto's regime (which was in favor of these timber concessions) and from the exhaustion of the resource (Singer 2009). The decline of the logging industries associated with the slowdown of the timber industry left many lands that could be converted easily into oil palm plantations. Indeed, Figure 11 highlights the fact that most of Riau province is under some sort of exploitation. Limited production, conservation and production forests constituted up to 78% of the forest estate in 2007, thus allowing a vast margin for the exploitation of forested areas (Singer 2009). This trend is confirmed by the very high rate of deforestation, reaching an annual rate of 5.4% in 2006, with forest cover falling from 78% of the province to 36% in the 22 years leading up to 2004 (Singer 2009).

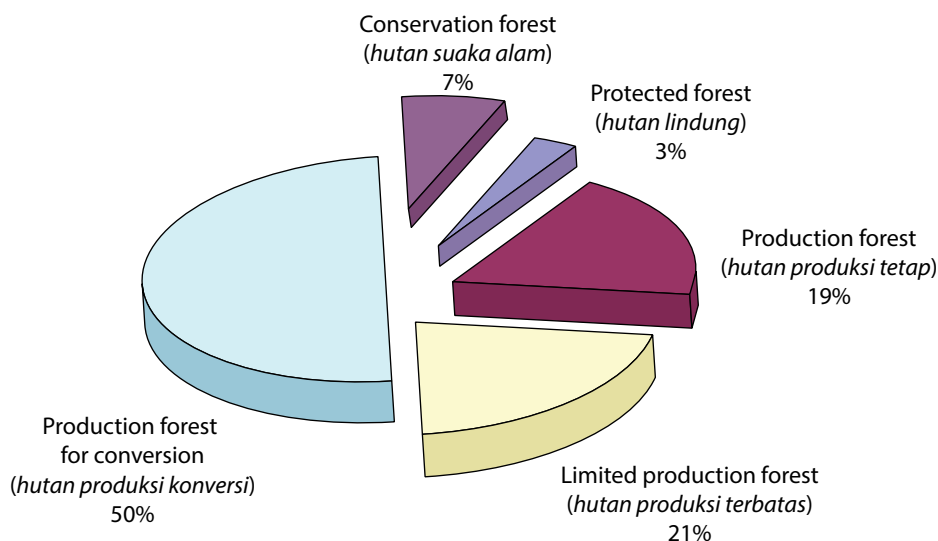


Figure 11. Riau's forest estate according to forest status in 2007, the total forested area being around 8.6 million ha

Source: Singer (2009) and BPS Riau (2007)

FSC certification has allowed the remaining timber industries to access foreign markets. The vast areas cleared through logging have also benefited the pulp and paper industry, represented by the Asian Pulp and Paper (APP) and RAPP companies, which are being used to grow *Acacia mangium*. The lack of clarity in forest status has allowed these companies to expand their planted forest concessions considerably (Singer 2009).

5.1.6 An assessment of the palm oil sector development

Development of the palm oil sector: an overview

Development of the palm oil sector began in Riau at the beginning of the 20th century (1920) at about the same time as the first government plantations were set up in North Sumatra, followed later on by PIR-Trans programs and other partnership schemes with corporations. Favorable soils and climatic conditions, combined with the availability of the required labor force, saw oil palm plantation areas skyrocket within a few years, as shown in Figure 12.

The continued acceleration of this expansion has confirmed Riau's reputation as Indonesia's foremost producer of CPO. Indeed, production reached 5.4 million tonnes in 2010, an increase of 12.5% over 2008. It also ranks first in terms of cultivated areas, with 1.6 million ha under oil palm cultivation and ranks second in terms of productivity with an average of 4 t/ha of CPO. The presence of smallholders, including those in partnerships with companies, is particularly high and represents half of the area and more than half of the production (SPKS 2015). 'Independent' smallholders have also become

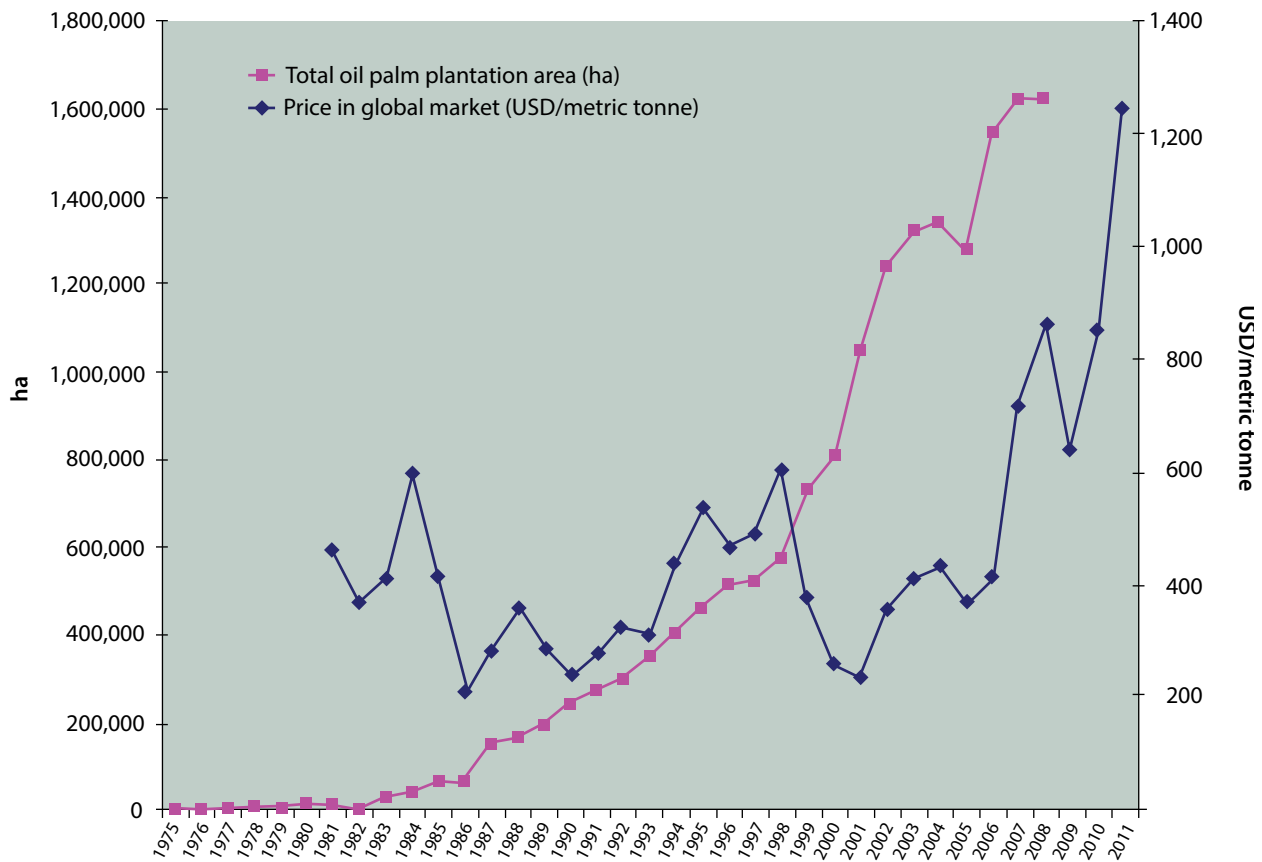


Figure 12. Development of oil palm plantations in Riau Province in relation to the international palm oil price

Source: Susanti and Burgers (2011)

successful through technical spillovers from companies, transmigrants and migrants from North Sumatra. Policies have long favored the expansion of oil palm cultivation and local governments rely on the development of the palm oil sector as a poverty alleviation tool. In 2004, the governor of Riau launched a 'Battle against Poverty and Ignorance and for Infrastructure Development' (*Pemberantasan Kemiskinan dan Kebodohan dan Pembangunan Infrastruktur* or *K2I*) with the goal of allocating 50,000 ha of land to families under the poverty line by 2014 (Singer 2009). Climate change has also been used as a rationale to promote the large-scale conversion of areas to oil palm cultivation for biofuels (Singer 2009). To address the issue of conflicting land uses, a province-wide land-use mapping project, known as RTRWP (*Rencana Tata Ruang Wilayah Propinsi* or Mapping the Use of Land at the Provincial Level), was launched in 1994 as stipulated in national Law 24/1992. It is managed by the Regional Agency for Planning and Development (*Badan Perencanaan Pembangunan Daerah* or BAPPEDA) (Singer 2009). However, the process has not yet come up with a map that satisfies all stakeholders and the possibility of land-related conflicts remains.

5.1.7 Companies and business models

Importance of migrants and independent smallholders

The first plots to be managed as independent plots were developed by workers from the local oil palm plantations with limited capital (Duryat 2011; Barral 2012). Their connections with the agro-industry helped them to some extent, but very few were able to plant selected material and follow suitable technical itineraries.

The arrival of transmigrants opened a new phase in which some of the planted plots were sold by their allottees either within PIR-Trans schemes or later KKPA, even though such sales were prohibited by law (Duryat 2011). This emerging market benefited the companies' workers and/or allottees who had accumulated savings, as well as outsiders who were able to buy planted land. Access to a plasma plot, either fully managed by the company or semi-managed as in KKPA schemes was, in many cases, the starting point on trajectories of land accumulation that benefited plantation workers and other stakeholders. By remaining owners of a plasma plot, company workers under a stable contract were able to acquire new lands to plant in pursuit of livelihood strategies that allowed them to rise far above the poverty line (Barral 2012).

These strategies increased the number of smallholders holding plasma and independent plots, both transmigrants as well as some local people. Traders, some of them of Chinese origin, began offering services as intermediaries between smallholders and mainly (but not only) independent mills (Levang 2012).

In 2000, there were an estimated 47,000 independent growers in Riau, many of them spontaneous migrants from North Sumatra (Potter 2004). It seems that timing has played an important role in independent ownership of plots and the growth of smallholders. Indeed, because oil palm cultivation developed earlier in the neighboring provinces, before companies came to Riau, migrants with knowledge of oil palm cultivation and a little capital from their previous activities were able to settle in Riau and start oil palm cultivation (Duryat 2011). The trend was further strengthened by the increased inclusion of indigenous people within the PIR and KKPA schemes. The relatively easy availability of land at that time allowed the local people who surrendered land to the company to keep some for themselves and grow oil palm as independent smallholders.

Independent smallholders have not established any independent mill and are still heavily dependent on company mills. Thus, when prices decrease to the point that it does not pay for the company to pick up the FFB from the smallholders, many fruits are left to rot. In addition, companies do not really like to collect fruit from farmers who are outside the ambit of their control and management. Therefore, despite a large number of processing units, production tends to exceed the processing capacity of the companies. The possibility of establishing small-scale mills could have buttressed

the strategies of the independent smallholders. These opportunities for independent smallholders are reinforced by the rising proportion of palm oil trees that are getting old and will soon have to be replanted, with companies having pledged to provide credit to enable smallholders to do so (Potter and Badcock 2001).

The Kemitraan model in Siak district

This business scheme was in line with the desire of the local government to tackle poverty, especially by targeting the Melayu population, which had been left landless (Zen et al. 2008). Financial resources, notably acquired through the oil sector, allowed the government to undertake social policies, as well as development efforts (McCarthy et al. 2012b). Thus, the district government decided to implement its own oil palm development scheme. In this scheme, the local government had to provide funding and management while the local public company PTP 5 would prepare the land, supported technically by the IOPRI (Zen et al. 2008).

The goal was to target the landless and oldest residents of the poorest villages by reallocating the land, at a subsidized credit rate (50% lower than current rate), that was left over after land was allocated to the companies. An important attempt at clearly delimiting land rights and avoiding land manipulation was made in order to avoid land disputes, and land titles were retained as long as possible to prevent the poor allottees from reselling the plots directly to outsiders or wealthy locals. However, some village land did fall under the 'empty land' or 'State land' status because of a lack of records of customary rights, and land sales to outsiders did take place (Zen et al. 2008). The scheme did not meet its initial expectations because it could not gather enough land to help all the targeted poor nor offer the promised 3 ha. Plots usually ranged from 1.5 to 2 ha (Zen et al. 2008). The final results of this scheme are awaited.

Transfers of land to companies have not always been legally undertaken. Indeed, many indigenous owners ended up landless because of land grabbing enabled by asymmetric power relationships with companies (Singer 2009). Later on, however, many companies started to apply the free and prior informed consent requirements. But despite this, many locals did sign away their lands even though the deals they were offered were highly unfair (Levang 2012).

Because land pressure is now particularly high in Riau due to large concessions granted to palm oil companies and timber industries, the land transfer process is a keystone for the local population in the negotiation process with companies. The case of the *Kemitraan* model in Siak district showed that local governments can intervene to improve the transfer conditions and land security for local populations, which has not been generally the case in the recent history of oil palm development in Riau. The registration of land avoided many disputes and brought clarity to mechanisms of accountability (McCarthy et al. 2012b). The district model also offered an 'opt out' for those who did not want to join the scheme, and the tight management of land titles limited the volume of rapid resale of land. This example illustrates a clear attempt toward a better implementation of existing land rights.

The management of oil palm cultivation refers to a standard technical model in all the provinces but peatlands require a specific attention in Riau, where they form an important and fragile component of the ecosystem.

Changes in land-use patterns: the historical importance of rubber

Riau has been a major destination for both transmigrants and in-migrants (coming from within Sumatra), with a strong and rapid influence on traditional land uses. However, rubber has long remained the most important crop on the plains, while coconut and rice are cultivated on coastal swamps (Potter and Badcock 2001; Hardjono 2009). Local government programs to support rubber cultivation, especially through improved access to monoclonal seedlings, have met with mixed success (Potter and Badcock 2004). Before oil palm took over the region, the low population density

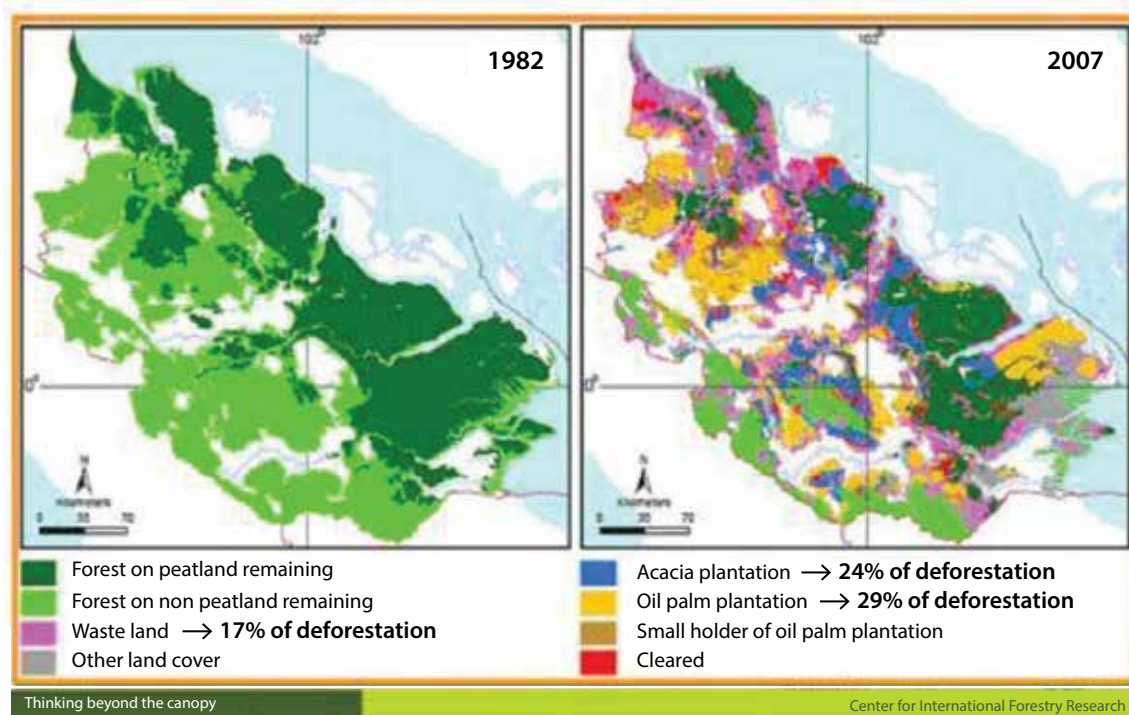


Figure 13. Changes in forest cover and land use between 1982 and 2007 in Riau

Source: Uryu et al. (2008)

allowed an extensive cropping system based on agroforestry, diversified multiple cropping systems and shifting agriculture for the annual crops, beside small-scale logging activities and timber exploitation allowed by the existing extended forest cover (Potter and Badcock 2004; Hardjono 2009). Both rubber and logging were important traditional sources of income that were replaced by the oil palm but rubber still retains its significance, especially in southern Riau, being mainly grown by smallholders. In 2003, it was still the main income-generating commodity in the villages of Kuantan Singingi district (Potter and Badcock 2004). Some areas have been conserved as ‘common lands’ when no other competing use was allowed, giving free access to fruit harvesting, grazing for cattle and the development of jungle rubber.

In the village of Pulau Padang, a World Bank SRDP (Smallholder Rubber Development Project) project (1984–89) planted large areas and sold them to farmers who each incurred a debt up to IDR 1.6 million for a 2-ha plot (Potter and Badcock 2004). This approach was only partially successful because many farmers could not afford the 4 ha required for a decent livelihood, and those with rubber did not follow the officers’ technical advice in managing their plots and ended up with lower yields than expected. Only those who were better off in the village (10%) could continue with the 4 ha, and planting new lands by 1995 was limited to the few that could afford to fence the plots to protect the young rubber trees from wild animals.

The expansion of the oil palm sector, in combination with dynamics prevailing earlier, led to the following changes in land use and forest cover between 1982 and 2007 (Figure 13).

The palm oil sector had an impact on traditional land use in various ways and magnitudes. Indeed, in Potter and Badcock (2004), oil palm cultivation had not yet developed in Pulan Patungan village mainly because neither State-led projects nor companies intervened in the area. In the Rokan Hulu district, the arrival of the Barat people, who had already acquired the skills required for oil palm cultivation in their home villages in North Sumatra, led to

the progressive conversion to oil palm from rubber. However, when this study was undertaken, the transition was slow, people kept on planting both rubber and rice while developing oil palm plots (Potter and Badcock 2004).

The sharp acceleration in oil palm planting in this province is linked to the combination of investment by State-led companies and the advent of private companies, both supported by significant migration flows and high CPO prices.

Indeed, a study of two transmigrant villages revealed that many villagers were tempted to switch from food cultivation to oil palm cultivation (Hardjono 2009). They were attracted both by high CPO prices and the labor wage they could earn through the establishment of a palm oil company close to the area. These wages were higher than incomes from rice and other food crops. However, at that time, few were able to adopt oil palm cultivation due to the high level of investment required and because of the resistance from the company to developing partnerships with the local people. Transmigrants abandoned unproductive plots, which were then sold to the palm oil company without prior consent, leading to disputes (Hardjono 2009).

5.1.8 The impact of timber, pulp and paper, and oil industries

Logging has always been an alternative source of income for local farmers, who cut down trees illegally to sell the logs to the local sawmills (Hardjono 2009). For example, in Pulau Padang, the logging industry kept around 30% of the village population working full time, especially during periods of low rubber prices, offering an alternative income (Potter and Badcock 2004). Indeed, the activity proved very profitable, with an income of as much as IDR 40,000 per day for a specialist working with an assistant and two chainsaws after paying all transport costs and police fines. This was twice as much income as on a rubber plantation at 2001 rubber prices, with a weekly yield of 80 kg. Logging relied on easy access to the forest and dependence on local elites to provide materials (chainsaws and transport) and on bribing officials. In doing so, both the timber and pulp and paper industries encouraged the spoliation of indigenous people from their land (Singer 2009). These activities also threatened the livelihoods of those reliant on forest products. Furthermore, the extraction of oil has also helped in reshaping land use through large concessions granted to oil companies and the construction of roads and industrial plants (Potter and Badcock 2001).

5.1.9 The impact of palm oil on livelihoods

Land security: Most of the province is now owned by migrants

Land ownership is legally backed by the land certificate, SKT, issued by the local authorities to the landowner after payment of a substantial fee. In Tambusai Barat village (Rokan Hulu district), the SKT can be obtained for a 2-ha plot at a price of IDR 150,000 paid to the sub-district leader and another IDR 150,000 to the village head (Potter and Badcock 2004). This certificate can be used for transactions and appears to be easier to obtain than the proper legal title, which requires a survey form from the Land Office and a payment of IDR 1 million. The main risk of disputes is that transmigrants have often bought land from the local people without maintaining a written record, thus claims can be made on the sale (Hardjono 2009). This can become contentious since a significant share of land ownership in Riau has shifted to migrants. Because local people were interested in short-term improvements to their livelihoods and/or because they underestimated the value of their land, many sold at low prices (Levang 2012).

In Riau, there has been intensive foreign investment by palm oil companies, especially Malaysian ones. Consequently, almost 20% of the companies operating in Riau and 25% of the palm oil plantations were owned by Malaysians in 2011 (*Jakarta Post* 2011). This trend led local governments, such as the Riau Plantation Office, to decide to restrict land ownership for foreign investors.

Impacts on income and prospects for future generations

In Riau, the growth of the palm oil sector seems to have benefited migrants and transmigrants more than the local population. Indeed, jobs were usually allocated to the Javanese or in-migrants rather than to local Malays (Hardjono 2009; Li 2011). Demand for low-skilled jobs was high during planting and the immature phase before the Asian Crisis that led to a general slowdown of oil palm expansion. Thus, palm oil companies dismissed most of their labor forces (Hardjono 2009). Although wage levels mainly depend on labor market prices across sectors, it can be assumed that the impact of the massive early development of the oil palm sector on other sectors of the economy might have been significant because most jobs were created in this sector (Hirawan 2011).

The benefits the palm oil sector has brought to Riau province can easily be seen on the ground: the conversion of wood houses to brick houses and the increased number of children being sent to school and even to university (Potter and Badcock 2004; Levang, pers. comm. 2012). The province seems to have undergone a rapid modernization process in the form of a road network and infrastructure development, combined with increases in incomes. However, the many landless people – mainly locals but also migrants who could not retain their investment – challenge at least part of this success story. So does the level of inequality, which is the direct result of the differentiated strategies among smallholders, a few of whom became rich or even very rich in comparison to the majority.

It is clear that the first generation involved in oil palm cultivation was able to increase and consolidate its ownership, but subsequent generations will therefore end up with much less than they require for a decent livelihood. While investments in education may contribute to reducing tensions by providing new opportunities outside agriculture, there is no doubt that the new generations of different origins will challenge the land distribution that resulted from the deals between local populations, migrants – irrespective of their origins – and the companies. This is all the more important since Riau's population is growing fast (Levang 2012).

Household typology

Several typologies have been proposed to analyse smallholder diversity (Hardjono 2009; Duryat 2011). These authors recommend focusing on determined variables to differentiate smallholders, but this is a key challenge since the recent history of the development of the oil palm sector has created huge inequalities that the current statistics system does not reflect. For example, the records of companies based on the initial plasma allocation of 2-ha plots no longer represent the actual pattern of holdings, since the plots have subsequently changed ownership.

5.1.10 Environmental impacts

Use of fire in the development of the palm oil sector

Fire has played – and still plays – an important role in changes in land use and is widely used as the cheapest way to clear forest areas and prepare land for oil palm plantations. Since the 1900s, most of the haze pollution in the region has come from burning forest lands, especially peatlands. Fire also appears to have been used as a means to fight against company settlements or by some companies to force local people to move out (Suyanto et al. 2004).

Despite the ban on using fire to clear land, smallholders and some companies in Riau may keep using the method, since preparing land by using fire is IDR 300,000/ha cheaper than using mechanical techniques (Suyanto et al. 2004). Unlike companies, very few smallholders can afford to stop using fire, despite the risks of being fined. The international community, and notably RSPO stakeholders, have recently worked toward developing tools that allow the origin of fires to be monitored in order to pinpoint responsible actors and claim compensation (e.g. Global Forest watch n.d.).

Oil palm expansion on peatlands: CO₂ emissions and water pollution

Land-use change for oil palm cultivation in Riau accounts for 22% of the emission of carbon from deforestation, fire and degradation of peatland, which reached an estimated total 220 Mt of CO₂/year between 1990 and 2007 (Uryu et al. 2008). In Riau, the extensive promotion of the logging industry, supplemented by the pulp and paper industry, has played a key role in reduction of forest cover. The oil palm sector has contributed to deforestation through forest clearing, but palm plantations were also established on logged-over areas (Fearnside 1997; Singer 2009; Wicke et al. 2011). Various studies were published that investigated the rate of deforestation in Indonesia and the multiple drivers. The total loss of forest in Sumatra between 2000 and 2010 reached some 4.5 Mha, roughly 10% occurred within oil palm plantations (Abood et al. 2015).

Peatlands are a key resource in Riau, especially with the very high pressure on land. They represent a significant part of the province; even with 450,000 ha of cleared peatlands, there are still 1.4 million ha of peat swamp forests (Koh et al. 2011). However, the plantations have resulted in the release of a vast amount of carbon and have led to deep-water pollution (Gunawan 2009; Koh et al. 2011). Despite the moratorium on the use of peatlands, the ongoing pressure on land in Riau may well challenge the intent to protect this resource (Murdiyarso et al. 2011). Many companies have now set up plantations on peatland to be able to keep on expanding areas under the oil palm (Duryat 2011; Bonneau, pers. comm. 2012). Cleared peats often catch fire because they are no longer protected by the forest cover. Thus for the past decade, Riau has contributed greatly to the haze that covers Singapore and Malaysia every dry season (*Straits Times* 2015).

5.1.11 Actors and interests

NGOs have been particularly active in Riau in getting local populations and international agencies involved. The local population has often complained about the unfair methods used to take their land away from them, but one needs to recognize that determining whether and to what extent these deals were unfair is not easy. International agencies have mainly focused on environmental degradation in Riau. In 2002, various NGOs created Jikalahari, a network of environmental NGOs supported by WWF (Singer 2009). This network now consists of 29 local NGOs and maintains a website on conservation issues in Riau. Among these NGOs, Walhi Riau deserves special mention. It was established in 1990 has been successful in a case involving pollution by PT Indorayon. Hakiki is another important NGO which was founded in the late 1990s. It focuses on the relationships between people and their environment and works with the indigenous people. WWF-Riau has adopted a more cooperative attitude toward the companies and avoids taking positions in disputes in order to be effective in addressing issues (Singer 2009). Despite some attempts to coordinate the campaigns of these various entities, it has proven difficult to adopt a collective position and undertake coordinate actions.

5.1.12 Preliminary conclusion

Riau embodies an example of ‘successful’ development of oil palm cultivation, with an increasing share of the land covered by this crop. The province’s success is the result of a combination of several factors that are particularly significant for this province (they do exist in Jambi but they seem to have less impact there):

- the arrival of migrants who had knowledge about oil palm cultivation;
- transmigrants providing an abundant workforce;
- the low pressure on land allowing land purchases and the development of independent smallholders;
- available financial resources to implement developmental programs;
- ideal climate and soil for cultivation of oil palm (common to Jambi);
- the rise and fall of the logging industry, which opened up new areas and allowed some people who had accumulated capital from this activity to invest in oil palm cultivation.

However, the rapid expansion of oil palm cultivation has led to heightened land insecurity, with many indigenous people as well as transmigrants ending up dispossessed of their lands, especially in the period before decentralization. Transmigration programs were relatively unsuccessful for food crops and many transmigrants contributed to the land market. This resulted in a land transfer from local ownership to migrants and local landowners who were already wealthy due to rubber or logging activities.

The diversity of statuses of the various categories of producers led to a stratification in wealth, which is not fully described and estimated empirically, even if we already know that inequalities are high since many indigenous people have been left behind. The saturated land market, which represents a threat to the future generations, also refers to these inequalities in terms of availability of this resource, since a large share of the land has been captured by companies.

Environmental concerns have also increased since most of the forest cover has been removed and NGOs have now stepped into the debate. Thus, after worsening inequalities, the main concerns in Riau province pertain to the exploitation of peatlands for oil palm cultivation, a land-use change that has dramatic environmental effects. The limited availability of land has increased the pressure on protected areas such as peatlands, since the impetus of economic development has long prevailed over environmental issues. However, research is still needed to evaluate the actual effects of the technical management of the plots depending on the practices implemented.

5.2 Jambi province: The case of Bungo district, between rubber and oil palm

5.2.1 Overview of Jambi province

Jambi province is composed mainly of large peneplains and some hilly areas in the southwest. It had a land area of just over 50,000 km² with a population of around 3 million at a density of 62 inhabitants/km² in 2010 (BPS 2010). The people are mainly of Melayu origin, which is the main indigenous group. The family model has remained matrilineal, which means that both rice fields and rubber agroforests are transmitted from mother to daughter. Men need the agreement of the whole family if they want to bring about any changes to the farm and the land (Bonnart 2008).

The province has also been the destination of both internal migrations (from Sumatra) and external ones (from Java) through transmigration programs.

Agriculture in Jambi has been shaped through the extensive development of rubber cultivation, which provided most of the incomes during the 1930s. Rubber smallholdings developed so fast that the labor force quickly became the limiting factor, preventing large-scale plantations from being developed. High rubber prices attracted temporary additional labor through migrations from elsewhere in Indonesia, including from Java (Martini et al. 2010). After a period of political uncertainty (struggle for independence and relationship with the federal State), the New Order regime brought about many changes by promoting commercial logging and timber exploitation in the 1970s, which was helped by the construction of the Trans-Sumatran Highway. Labor demand was met through the implementation of two transmigration waves from Java in 1905–25 and later in the 1980s that increased the population density considerably (Levang 1997). The 1990s saw the development of large-scale oil palm plantations protected from any competition with smallholders. The land-use changes were led by rubber, oil palm and logging industries whose development was supported by accessible waterways throughout the province and the development of secondary roads such as the Muara Bungo-Muara Kuamang road (Martini et al. 2010).

As in other provinces, the history of palm oil production in Jambi is marked by the advent of PIR-Trans schemes and the emergence of State-owned and private companies. Smallholders started entering the palm oil production process through governmental support for their inclusion in the

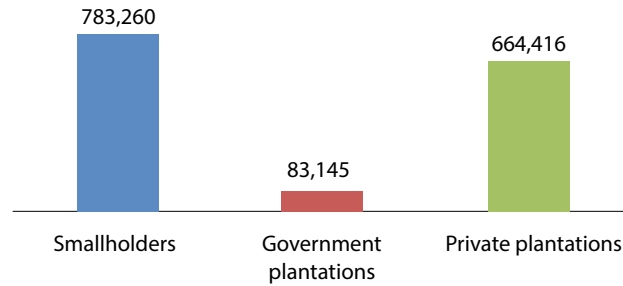


Figure 14. Distribution of oil palm areas by type of owner in Jambi in 2010 (ha)

Source: Authors based on BPS (2010)

plasma areas. There has been a steady increase in palm oil production, reaching 664,000 t for private companies in 2010 and 783,000 t for smallholders, both independent and plasma. Productivity has also improved, especially for smallholders, who reached yields of 3.37 t/ha in 2010, the same level as for private plantations (BPS 2010) In Jambi, most plantations are under farmer–company partnerships, as previously described, or belong to private companies as Figure 15 shows.

Smallholders now dominate production in the province. They account for 57% of the production against 43% for companies. In Jambi, 33 palm oil processing industries were functioning in 2010, with an installed capacity of 1,625 tonnes of FFB per hour, along with 2 cooking oil industries employing 294 workers. There is, however, no biodiesel or oleo-chemical industry in this province.

Agroforestry systems took over forests in a context of low population densities. These systems were mainly based on slash-and-burn techniques to open up the forest, establish rice cultivation, followed by planting of rubber once the land was cleared. This started early in the 20th century (around 1920) and had covered up to 500,000 ha by the early 1990s (Jambi province). It remained the main source of income for agricultural households, even during the 1990s (Joshi et al. 2002; Bonnart 2008; Feintrenie and Levang 2009). In Jambi, before Suharto’s rule, forest areas were also used for some small-scale logging activity (Bonnart 2008). However, in the 1970s, there was a rapid development of the logging industry and deforestation rates shot up. Even though the logging activity sanctioned by government concessions stopped in 2000, the decrease in forest cover continued and, like elsewhere in Indonesia, attempts such as the Selective Logging System, which aimed to regrow forests for a new round of logging after 30 years, were not successful (Martini et al. 2010). The shift to local governance did not change this trend of deforestation and areas that were already logged over were easy targets for palm oil companies looking for lands to establish their plantations. Their approach was facilitated by easy access to these areas via logging trails connected to roads, the absence of local policies on land tenure of such lands and the availability of labor (Martini et al. 2010). Consequently, palm oil companies took over most of these areas with the support of local governments, also infringing on many rubber agroforests areas either through the development of independent smallholding within or beside the agroforest systems or through plasma lands when common lands came under the control of local authorities. Several factors, often supported by local governments since 2000, promoted the development of monocropping clonal rubber and oil palm as well as plantations of industrial timber for the pulp and paper industry. These factors converged to put a high pressure on logged-over

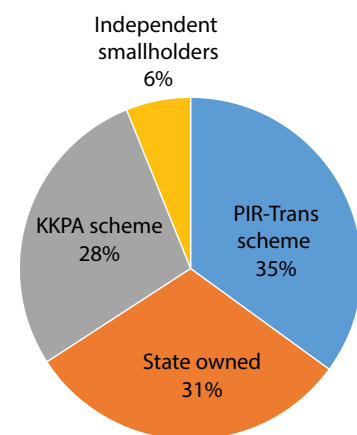


Figure 15. Distribution of oil palm areas between various business models in Bungo district in 2006

Source: District profile (2006) in Chong (2008)

lands, agroforestry systems and other cleared lands under annual cropping systems. The case of Bungo district is illustrative. Its forest cover dropped from 75% to 35% between 1973 and 2004, and only 16% of the natural forest of large size and complex shape, usually located on higher altitudes, remains in 2007 (Dewi and Ekadinata 2010).

5.2.2 Focus on Bungo district

Situation and recent development options

Bungo district is located in the lowlands and foothills of the Bukit Barisan mountain range in Jambi province with an area of 716,000 ha. It presents a mosaic landscape consisting of 10% protected natural forest in the foothills, 34% logged-over/degraded forests, 50% agriculture and 6% other land-use types (settlements, rivers, roads, etc.) (Murdiyarsa et al. 2002). With an average annual precipitation of 3300 mm and a mean temperature around 27°C, the availability of water is not a limiting factor. These landscapes are structured around a clear topographic structure organized as follows:

- The piedmont in the south, close to Kerinci National Park, presents a large succession of hills ranging from 200 to 1400 m above sea level.
- The buffer zone between the piedmont and the peneplains ranges from 100 m to 450 m above sea level in a less hilly landscape.
- Peneplains with few hills. Tuff is the main bedrock and replaces granite found in the piedmont areas and buffer zones.

The main soil type is ferralitic, very sensitive to erosion if there is no vegetal cover. These soils are usually poorly drained, acidic and with limited nutrients.

The recent history and the evolution of Bungo district is marked by three main factors:

1. Development of the transportation network
The construction of the Trans-Sumatran Highway has linked Bungo district to other regions, thus permitting an increase in capacity in order to be able to supply export markets and improve access to consumer goods. It also led to many settlements along the highway. The development of the regional road network may have led, at least partially, to reducing the use of the waterways for transportation (Bonnart 2008). The district is also building a national airport to allow direct connections to Jakarta and provincial capitals and to boost tourism (Fallmeier 2012).
2. Transmigration programs
Bungo has been an important destination for transmigration programs. The programs with the largest impact were the third and fourth ones from 1979 to 1989. They led to transmigrant settlements in Bungo's northern and eastern parts (Sevin and Levang 1989) and an increase in population density by 62% in 20 years to reach 47 inhabitants/km² in 1990. These inflows also led to the development of a large rubber industry based mainly on jungle rubber (Ekadinata and Vincent 2010). The programs were also linked to the development of the palm oil sector with companies establishing plantations under the PIR-Trans scheme.
3. Massive conversion of land cover since 1970
In the early 1920s, the province started to develop around rubber cultivation and this activity continues to this day (Martini et al. 2010). Mining, initially for coal and later for gold (1993–99), also attracted companies. This enabled the district to collect taxes, especially after decentralization in 2000. The mining sector grew exponentially from 2002 to 2006, at an average annual rate of 51% (Bonnart 2008). Subsequently, the oil palm sector also saw considerable growth, especially on conversion forests, rubber agroforests, rice fields and logged-over areas.

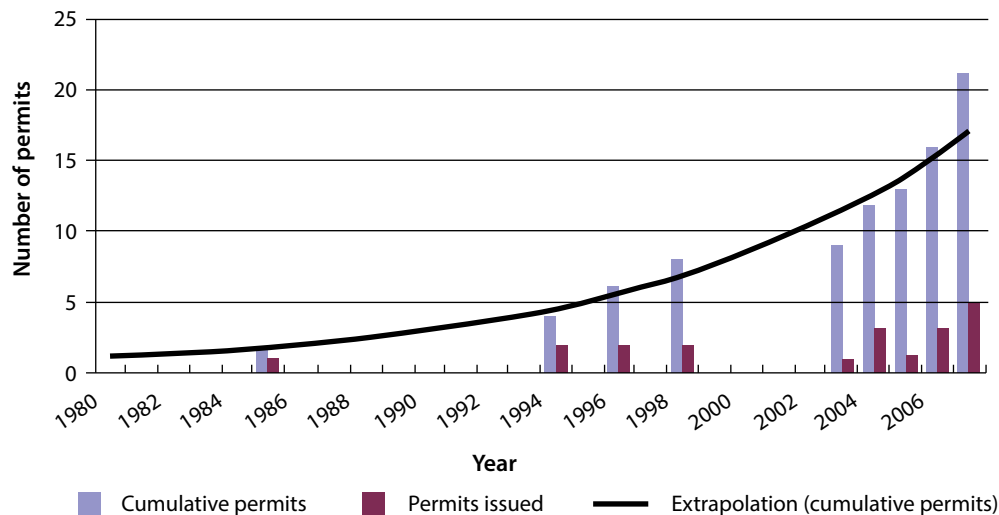


Figure 16. The number of permits issued in Bungo over the past decades

Source: Chong (2008)

5.2.3 An assessment of the oil palm development dynamics

Palm oil production

In 2006, Bungo district was divided between State-owned plantations (PBSN), NES PIR-Trans schemes, KKPA schemes and smallholders (see Figure 16). From the same source of data (District Profile, unpublished), Chong (2008) reports that areas under rubber (88,664 ha) still account for 70% of all plantations, while oil palm covers just 29% (36,062 ha). In Bungo district, there are four palm oil refineries, which together can produce up to 240 tonnes of CPO per hour (Chong 2008).

The first permits were granted to PT SAL in 1983, but land clearing only started in 1988. In 2008, 16 companies had received permits (Chong 2008). Despite the ‘confidentiality’⁴ of the area of exploitation by each company, the number of permits issued helps in discerning the dynamics involved within the district. Indeed, the rate at which permits have been issued slowed down during the Asian Crisis in 1998 but saw a sharp uptick in 2004 (see Figure 16). The rapidly increasing number of permits and the associated amount of land coming under control of the companies is different – usually higher – from the area that is actually planted and producing. For instance, since 1994, PT Tebora has planted only 35% of the area granted to it, while this figure ranges between 55% and 78% for other companies (Chong 2008, p. 24, quoting CIFOR).

5.2.4 Dynamics of change in land use

The dynamics of land use vary across districts and villages but there are some similarities. Bungo district was part of the development of rubber agroforests within a more general agricultural landscape where shifting cultivation was the norm (Bonnart 2008). Most of the community forests were exploited under this system. The move toward more rubber, which took place between the 1970s and the 1990s, occurred at different speeds, depending on local conditions. In Dasa Danau, close to a colonial rubber plantation, people soon switched to monoculture rubber on small plots, in combination with rice cultivation. High rubber prices and easy availability of chainsaws were powerful incentives to switch to rubber cultivation. The oil palm was introduced in the late 1980s, at about the time that local

⁴ The RSPO process encourages the development of the website of SPOTT (Sustainable Palm Oil Transparency Toolkit), which documents land occupation for companies.

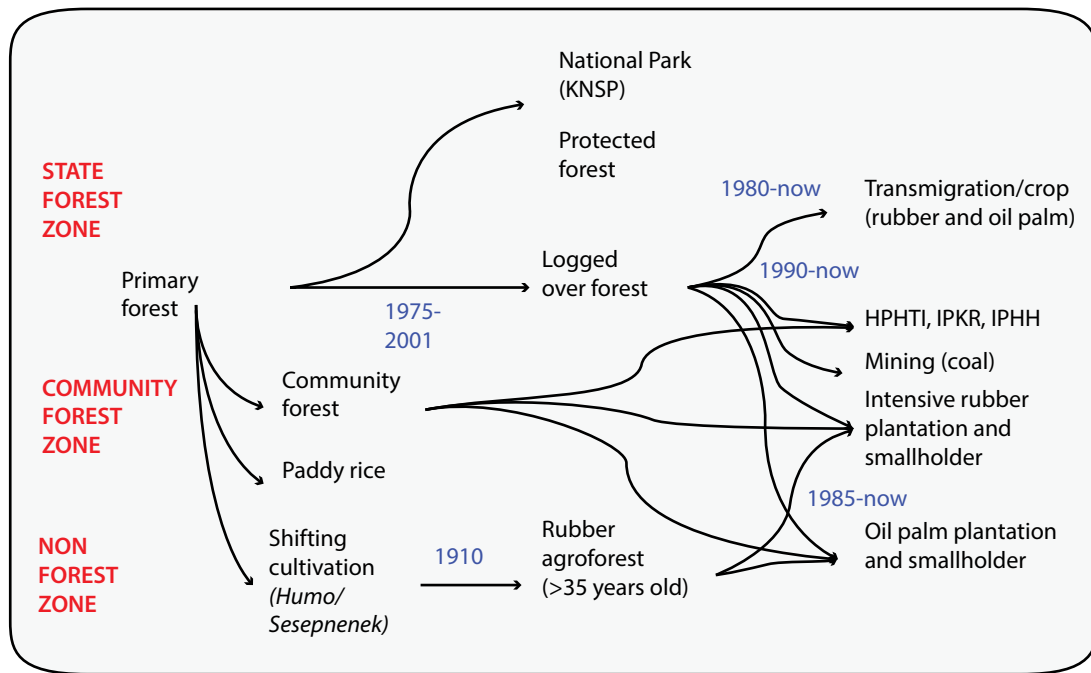


Figure 17. Land-use change trajectories in Bungo district, Jambi province (based on focus groups at the Bappeda office in Muara Bungo)

Source: Martini et al. (2010)

governments started lending support to clonal rubber. The oil palm started to replace rice fields, as well as old agroforests whose productivity had dropped.

Villages can be classified according to their level of intensification depending on the pace of these transformations, ranging from low intensification in large forest areas, with the landscape also including complex agroforests, up to high intensification with reduced agroforests and rubber and oil palm monocultures. Diverse intermediate situations can be identified between these extremes, including a simplification in agroforest systems (Therville 2011). Variations can be observed within this general pattern of change, summarized in Figure 17, according to specific local conditions among which topography and transport infrastructure play a key role.

Bonnart (2008) notes that the hilly areas present a high proportion of rubber agroforests with significant slopes and high erosion risks. Rubber is often combined with fruit trees such as *Parkia speciosa* and *Durio zibethinus* (durian trees), timber species such as *Shorea* spp. or cinnamon. Trees are rather old and agroforests are often managed through progressive replacement of old trees by new ones, resulting in a variety of ages for rubber trees, the oldest ones being almost 50 years old. The most unproductive agroforests are left fallow (Bonnart 2008; Therville 2011). Transport infrastructure remains inadequate with few proper roads. Some areas are reachable only on motorcycles via dirt roads.

Flat areas were earlier used to cultivate rice and for grazing but they are now increasingly being planted with rubber and oil palm. These areas are often located close to rivers or villages in the case of rubber. Monospecific rubber plantations can be used as an indicator of intensification, but most trees come from local seedlings since specific planting material remains expensive. The expansion of these plantations has led to the conversion of communal forests, old and unproductive agroforests and fallow lands.

Palm oil plantations are most likely to be found in peneplains, usually close to asphalt roads in the case of company-owned plantations.

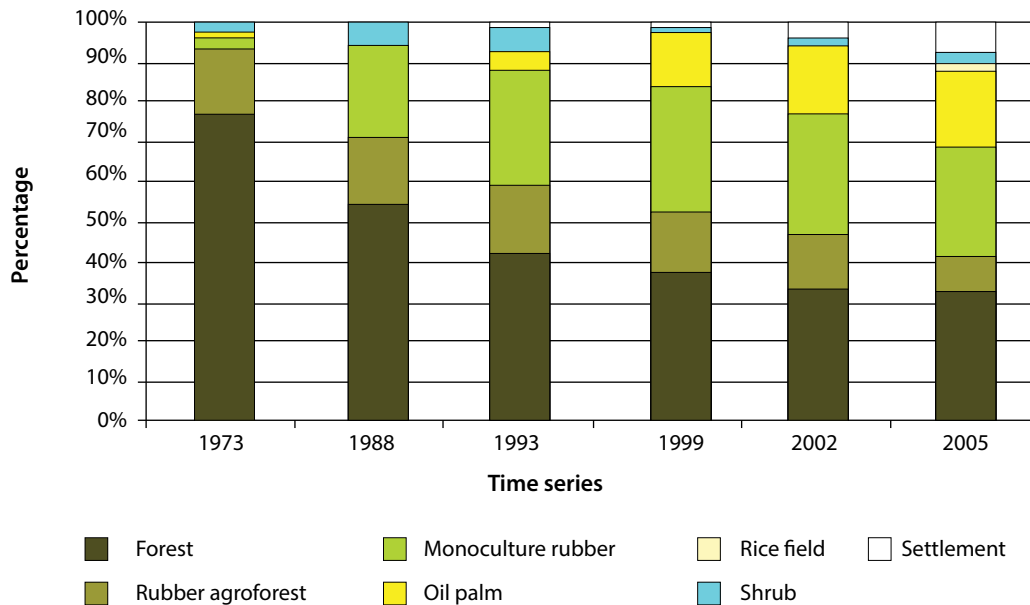


Figure 18. Land cover dynamics in Bungo district from 1973 to 2005

Source: World Agroforestry Center Asia Program, Spatial Analysis Unit (2008) in Martini et al. (2010)

Rice cultivation on riverbanks has managed to survive the wave of conversion to these perennial crops. The construction of irrigation systems and concrete dams to improve the flooding of paddies led to an intensification in rice cultivation that coincided with the influx of workers resulting from the transmigration programs of the 1980s. It is only possible to compete with rubber with the use of fertilizer and suitable water management within irrigation systems.

Figure 18 illustrates the trends that have reshaped the landscape within Bungo district and which could further be extrapolated for Jambi province. The systems whose surface areas are decreasing are now considered to be not as productive as rubber and oil palm. Even though high rubber prices, and sometimes high durian fruit prices, have maintained agroforests for a long time, today oil palm has become an overwhelmingly more attractive crop, especially for those who have capital to invest.

5.2.5 Households typology

Based on existing studies, we can draw a preliminary typology of agricultural households.

Sharecroppers

Households without land often enter into sharecropping contracts with landowners, but we need to differentiate between locals and migrants. Sharecroppers try to save to buy land of their own but as land prices rise, the time needed to save tends to increase. It used to be 5–7 years before they could open up land on primary or secondary forests to plant oil palms. Depending on the dominant use of the land, sharecroppers work either in agroforests or on local rubber plantations. They can also work on oil palm plantations, which are often owned by a family member. Parents in the households are usually young, because they have recently settled down, with one or two children. Both migrants and local sharecroppers live in wooden houses and enjoy limited luxuries, such as motorcycles. Migrants may build their houses closer to the plantations, which reduces travel and transport time.

Migrants can work on oil palm plantations, but they usually enter into full-time sharecropping contracts as workers on rubber plantations, which enables them to tap 4 ha of rubber.

When local sharecroppers become landowners, they usually remain sharecroppers during the immature phase of the plantation, but then progressively shift to working on their own plots.

5.2.6 Diversity of smallholders

We draw on Bonnart (2008) and Fallmeier (2012) to propose five types of smallholders on the basis of their land assets, the level of intensification of their production system and the diversification of their activities:

- **Smallholders owning agroforest**
In the sample studied, the head of the household is around 55 years old with children who have dropped out of school to work on the farm. They own between 2 to 5 ha with an average of 3 ha, acquired through purchase or inheritance. Their social status is higher than sharecroppers because they own land. They may move to a higher density of rubber trees, which would lead to a progressive conversion toward a monospecific rubber plantation.
- **Smallholders owning agroforest and rubber plantations**
They own both agroforests and rubber plantations, with around 5 ha of land. In the sample studied, the head of household is usually young and typically owns 3 ha of agroforest from inheritance and has been able to buy an additional 2 ha. At harvest time, the 5 ha of land requires three workers to tap all the trees, which means hiring labor from outside the household, either a migrant or a relative. They are already engaged in converting their agroforest to more intensive rubber plantation.
- **Smallholders owning rubber plantations**
They own only rubber plantations and, in the sample, the head of the household is around 40 years old with 2 or 3 children. He has around 2 ha of rubber plantation, which he and his spouse tap. The rubber plot was often planted after an old agroforest or slash-and-burn on communal forest. They often had to work for others during the immature phase.
- **Smallholders engaged in an oil palm development scheme (Fallmeier 2012)**
Some households may only be part of oil palm development schemes. These smallholders may also develop independent oil palm plots beside their plasma plots. These households may then work either under a PIR contract, in which they have to work themselves under the company's supervision, or under a KKPA scheme for which all the management is done by the company through a farmers' cooperative. In this case, participants have a choice of working for the company or not. In some places like Pelepat and Pelepat Illir, located in the peneplains, Fallmeier (2012) found that half of the landowners were transmigrants and half of them used hired labor. Within his sample, smallholders mainly own lands planted with oil palm that are smaller than 5 ha (76%), 16% had between 6 and 10 ha and 8% have more than 10 ha (see Table 5).
- **Smallholders with additional sources of income and oil palm plantations**
These smallholders own between 4 and 6 ha of land each and earn additional income from off-farm activities, either through self-employment or through salaries. Some smallholders belonging to this category have attended high school. They may also receive rents from earlier investments. These households engage in sharecropping. Those who have studied at the high-school level or higher can get better paid jobs (civil servant, officer and teacher) that allow them to buy more land. They can also be part of various oil palm development schemes as part of their individual strategies. They become part of a nucleus estate scheme but may well retain a few hectares of rubber plantation, converting only the most unproductive ones into oil palm cultivation. They may own up to four 2-ha oil palm plots.

In Bonnart's sample, the share of smallholdings cultivating oil palm is limited to the ones owning the largest land holdings and having off-farm incomes (merchant, civil servant) or to those who are part of transmigration programs associated with an agro-industrial scheme.

This situation appears to be specific to Bungo district, where oil palm industrial schemes have been developed more recently than in Riau and develop in systems which used to consist of rubber

Table 5. Distribution of the total land farmed and the corresponding share of oil palm plantations in Fallmeier's sample

	< 5ha	6-10 ha	Over 11 ha	Total
Total farm land	67% (#37)	20% (#11)	13% (#7)	#55
Total oil palm plantations	76% (#42)	16% (#9)	8% (#4)	#55

Note: Size of sample in brackets.

Source: Based on Fallmeier's data (2012)

agroforests and new rubber plantations. However, it seems that because the development of oil palm cultivation started later in Jambi than in Riau, it has led to more diversified production systems.

5.2.7 What improvements in livelihoods?

A strong push toward oil palm development

Even if the landscape mosaic presents many theoretical advantages (Bonnart 2008; Feintrenie 2010), as studied mainly in Bungo district, other surveys carried out in the same district show that local people are not interested in environmental conservation. They are more than willing to shift to oil palm cultivation (Feintrenie et al. 2010b; Therville et al. 2011). One has to understand their perception of the changes they desire in a realistic rather than an idealistic perspective. The challenge is to anticipate the changes and adopt a pragmatic vision that pursues more sustainable approaches since rural people will not save the environment just because the environmental conservationists ask them to (Therville et al. 2011).

Incomes and job creation

The impacts of the various business models on livelihoods are difficult to assess. A cost-benefit analysis can be a step forward to evaluate the economic interest of each business model. The first factor is the high variability in production costs. Furthermore, smallholders under contract with a company and engaged at the same time in developing independent oil palm plots have higher costs for up to 15 years. But these costs are higher still for plots managed by the company over 15 years. However, since data are not available for every stage and every business model, only preliminary and partial conclusions can be drawn, mainly concerning the net return on average. It seems that fully independent smallholders earn only 50% of the net return of a smallholder within a NES scheme. The net returns seem to be lower for farmers who combine independent plots and plasma plot(s) but they show a higher and quicker return on investment.

Infrastructure development

Access to electricity and other basic infrastructure is a key development improvement for rural areas. The most remote villages can be connected to power networks through either the central system or the construction of dams, which can also be used for irrigation. Development of infrastructure is also visible in the educational sphere with the establishment of public and Islamic primary schools along with nurseries in some places.

Economic development through rising incomes is also visible at the housing level, with wooden houses being replaced by those built with bricks and cement.

But the development of the road network remains a key factor. Private companies usually contribute to the creation or maintenance of asphalt roads. Some set up dirt roads to improve the collection of fruits (FFB) that need to reach the mill within 48 hours of harvesting. All kinds of negotiations can result: for example, in one village, a trade-off was made between the land taken from the village for the road and the concession of new lands south of the village.

The wealthiest hamlets, such as Desa Danau, are composed of cement and brick houses that have electricity, and easy access by road to local markets and shops. Water is available in such locations via public systems or through private wells.

Assets and opportunities

In Bungo, the income derived from latex helped households obtain satellite television and motorcycles. Villagers also re-invested in buffaloes as a form of savings that can be sold when needed for productive investments or for one-off needs (marriage, education, etc.).

In his study, Bonnard (2008) distinguishes three categories of households differentiated by the combination of domestic and productive assets. The rich ones usually have a high level of facilities, such as a large house with a tiled roof, and own at least one car, they farm a large area of self-owned land, mainly with perennial crops, and are able to send their children to university. The second category consists of medium households. The third category is of poor households. They are defined as those who cannot buy a piece of land with a head of the household being older than 35 years. The house is usually made out of wood and the family does not own any modern facilities. Their children usually do not study further than primary school.

5.2.8 Actors and interests

The presence and strategies of middlemen have been well studied (McCarthy 2005; Chong 2008; Fallmeier 2012). Mainly of Chinese origin, they used to be wealthy, buying land and turning to political activities (Chong 2008; Martini et al. 2010). Because they play the dual role of money lender and buyer, they have established a strong reputation and represent a kind of short-cut in the organization set up by the palm oil companies (Chong 2008).

The roles of customary representatives and local officials are similar to those in other provinces, even though customary rules seem more significant in the villagers' day-to-day life than in Riau (McCarthy 2005; Colchester et al. 2006; Martini et al. 2010). The proximity of the Kerinci Seblat National Park is at the origin of different strategies that are directed more toward environmental conservation in Bungo district. Many villages are also applying for 'village forest' recognition (Martini et al. 2010; Akiefnawati et al. 2012). This appellation enables the local community to manage their forest, despite the forest being part of the National Forest Estate, after the community submits its plans for management and for respecting biodiversity, environmental and legislative constraints. When approved, the village can obtain economic benefits from these lands; the forest is no longer perceived as non-profitable land (Feintrenie and Levang 2011; Akiefnawati et al. 2012). Activities can vary from agriculture to exploitation of timber or the extraction of non-timber products. This recognition is hard to obtain (Martini et al. 2010) and, so far, only Lubuk Beringin has been accorded this status (Martini et al. 2010; Akiefnawati et al. 2012). Consequently, NGOs have been very active in protecting National Parks and promoting village forests.

In pursuit of a more environmentally sensitive form of agriculture, many studies (CIFOR, CIRAD, or the World Agroforestry Center) have focused on jungle rubber and on improving the economic and environment aspects of managing the forests.

Villagers and smallholders negotiate with local governments and powerful companies to try to implement development strategies that are economically viable and attractive. But power asymmetries remain and bargaining is more difficult when villagers have limited area to offer to the companies. If land is abundant, the villagers tend to cede their plots on hilly areas or where transportation is difficult to the company. For their part, the companies tend to manipulate the reallocation of the plots to farmers in PIR schemes in order to assign the most unproductive land to the plasma and keep the best for the nucleus.

Nevertheless, the dynamics between actors seem more balanced than in Riau. Even though companies and local officials are linked through corruption in the form of bribes for favorable discretionary behavior, there seems to be greater efforts on both sides to agree on shared solutions for rural development, at least in the areas studied.

Companies are in cut-throat competition with middlemen. Indeed, farmers often prefer the informal relationships they have with the latter and the cash they can provide than having to deal with the cooperative or the company. Moreover, the costs of transportation, maintenance and security fees due to the company often outweigh the higher prices they can offer (Chong 2008; Levang, pers. comm. 2012). Middlemen can also organize strikes and boycotts when they are not satisfied with the marketing conditions (Feintrenie and Levang 2011). Companies now use local officials to decrease the impact of middlemen and try to empower the cooperatives to better serve their own interests (McCarthy 2012). This leads companies, such as PT SAL, into giving IDR 1 for village development projects and IDR 1.25 to cooperatives for every kilogram of FFB delivered. The cooperative also receives 2% interest out of the 14% charged by banks on farmer loans. Attractive prices from PT SAL can also create an incentive for middlemen not to cheat (addition of water and sand before selling the FFB) (Chong 2008).

Dominant players do not welcome competition. Such is the case of a refinery without plantation recently set up in Bungo district. Because of reduced costs of operation and without having to invest in infrastructure, this mill can pay higher prices for FFB. The refinery is considered by the companies and associated local officials to be getting a 'free ride' and the latter may have less power over it, thus reducing the benefits that they can extract (Chong 2008). Companies are thus urging the local government to set up a regulatory framework to limit the advantages of such refineries.

But in Bungo, as well as in Jambi as a whole, land demand by companies remains high and land-brokering arrangements involving local officials are also increasing as land becomes scarce and prices rise. Villagers are increasingly looking for opportunities to enter into palm oil schemes (Martini et al. 2010; McCarthy 2012).

5.2.9 Conflicts and resistance

Villagers in areas where all the land has been converted into oil palm plantations feel quite secure about their land rights (villages of Sungai Mengkuang, Senamat, Danau-Padang Palangh, Baru Pusat Jalo, Koto Jayo, Tebing Tinggi) even though this observation is not supported by current research or the perception of local NGOs (Feintrenie and Levang 2011).

In fact, there are already many overlaps between the official land status and actual land cover and use rights in place, thus generating disputes over land boundaries and forest rights (Colchester et al. 2006; Kusters et al. 2007; McCarthy 2007; Pender et al. 2008 in Feintrenie and Levang 2009; Martini et al. 2010). In some cases, due to an intervention by an NGO (Lubuk Beringin village), the local populations commit themselves to better respecting the land status as a way of protecting the environment (Wyiono et al. 2007; Akiefnawati et al. 2012), but the situation in the future will depend on external support. In contrast, the villagers of Talang Sungai Bungo rarely respect the land status, partly because of their village's very remote location and because of high pressure on land (McCarthy 2002; Akiefnawati et al. 2012).

The lack of clarity on boundaries feeds the opportunistic strategies of the various stakeholders. The boundaries do exist but are not explicitly made clear or visible through any demarcation. The only point of reference for the entire village is the location of the village office (Wyiono et al. 2004; Martini et al. 2010; Feintrenie and Levang 2011).

Another source of dispute is the unkept promises of the palm oil companies, with villagers not having received the agreed upon land, incomes or inputs (Colchester et al. 2006; Chong 2008).

Despite ongoing efforts by public agencies and Dinas (Department of Forestry, Mining, etc.) to provide information on the programs implemented, their activities, the opportunities and the importance of participating in such programs, villagers often believe they do not have sufficient information (Martini et al. 2010; Feintrenie and Levang 2011). However, Javanese migrants benefit from an association at the district level which helps in airing their views and increases their weight in negotiations through active participation by representatives (Martini et al. 2010).

As in many situations marked by stark power asymmetries, villagers adopt silent forms of resistance, such as the quality of the lands they choose to surrender to the company, their limited efforts when hired as workers by the plantation, even cheating on their production level by diverting part of production to middlemen (Potter 2004; Gaiser 2009; Barbereau 2010).

While no violence has been reported, Jambi ranks third in terms of number of disputes in a province, with 60 being reported in 2008 (Sawit Watch, in Sheil et al. 2009). Early in 2001–02, an incident took place following the arrival of PT SAL. The land allocated to it was part of transmigration schemes, which designated the village of Sungai Buluh as a transmigrasi area. However, claims arose that the land was already occupied by the local population from the village of Babeko. Without much discussion, PT SAL gave up on the initial settlement (Colchester et al. 2006).

Mass protests are also used as a tool for renegotiation with the company. Indeed, many smallholders and villagers now find the 80:20 schemes very unfair and ask for land compensation from the company (Colchester et al. 2006; Martini et al. 2010; Fallmeier 2012). In order to convince companies to reopen negotiations, they sometimes hold demonstrations. However, companies may themselves also engender conflicts; one of them went as far as to burn the smallholders' rubber plantations in order to force them to sell the land (McCarthy 2002). Companies spend a considerable amount of time and money in acquiring land because of the new regulations (Chong 2008). Moreover, with increasing competition for land among companies, villagers and smallholders now ask for more for their lands through more advantageous agreements (Chong 2008).

Companies are economically powerful and have legislative connections and legal skills (Colchester et al. 2006). They are in a position to use legislative tools and even influence the elaboration of new legal depositions. The mechanisms of negotiation may require financial means and adequate knowledge to manipulate the legal framework. Thus, there is a real imbalance between the short paragraph allocated to the rights of the farmers and the full page concerning those of the company. Most of the formulations also present the farmer as one who is obligated to the company and insist on the power of the latter. Companies also usually hire employees temporarily rather than permanently to circumvent strict labor regulations and avoid claims from the workers over the long term. Even though the villagers' bargaining power has improved, it remains limited and restricted by their high level of dependency on the companies (Chong 2008).

5.2.10 Preliminary conclusion and prospects

The process of changes in land use is accelerating and rice lading is being converted to either oil palm or rubber. Indeed, both of these perennial crops are now present and in competition with each other, in some situations threatening the old rubber agroforests and forest biodiversity. Companies are prominent actors but NGOs too have been quite active due to the presence of the National Park. Populations in villages expect the implementation of oil palm schemes to fulfill the promises of economic development. Diverging views prevail; some local voices express a certain level of satisfaction while others and external stakeholders point to the capture of benefits by the elite and the lack of accountability. Population growth and the accumulation of land by middlemen have led

to serious land shortages. The next and future generations will face a challenging situation, just like in Riau. Inequality will increase as any land that is sold will very likely be bought by wealthy 'smallholders' (not so small!), middlemen or established individual oil palm growers. Most studies have mainly focused on Bungo district and provide a wide range of data. It seems that the trend heads toward intensive agricultural production through the development of oil palm cultivation. However, alternative options are not completely ignored and recent programs such as those concerning possible improvement of economic returns from forested lands, through the 'village forest' title, for example, or agroforests could preserve at least some diversity in the production systems.

6 Comparison of the different provinces: What has been found and what is yet to develop?

6.1 Two provinces, two stages of oil palm development

Riau has a longer experience in oil palm development than Jambi. It also shows a higher level of development due to its multiple sources of growth since 1950. In Riau, according to the locals, the benefits of oil palm cultivation are no longer in doubt. However, they do come at a certain social and environmental cost. Indeed, oil palm plantations are now expanding on peatlands, increasing CO₂ emissions and polluting water without offering worthwhile yields. In Jambi's case, oil palm remains in competition with rubber, partly because of earlier programs to develop monoclonal rubber trees and the prevalence of agroforests in hilly areas. Palm oil has had a positive impact on livelihoods but key issues of land security and accountability remain unresolved, especially in districts undergoing rapid changes, where land use is trending toward monoculture. In both provinces, the palm oil sector has advanced enough to allow the development of independent palm oil smallholders, many of them benefiting from technical spillovers from companies and transmigrants.

6.2 Two different social contexts and sets of actors

In Riau, transmigration from Java and migrations from North Sumatra have promoted a rapid expansion of oil palm cultivation and the transmission of information. Most of the province is now dedicated to oil palm with rubber being progressively replaced, and timber becoming scarcer. Because land pressure is particularly intense, many land brokers have appeared. However, the fact that the province is endowed with good resources seems to have reduced predatory behavior, especially from local governments, and programs for poverty alleviation have been implemented, enabled by a good financial situation. In Jambi, transmigration has also played an important role, especially through PIR-Trans schemes. Even though the Melayu have been keen on protecting their rubber plantations and agroforests, traditional organizations have welcomed the arrival of the oil palm and the situation seems to increasingly resemble the one in Riau. It seems, however, that the slower development of the palm oil sector has allowed intermediaries and independent mills to acquire a more important role as compared to Riau.

6.3 Different kinds of information available

The data collected so far for Riau pertain mainly to the technical management of oil palm plantations. CIFOR is also a source of significant data, albeit with a dominant interest in forests and conservation issues. Thus, there seems to be a lack of social and economic analysis of the impact of the palm oil sector. In comparison, for Jambi, there are ample resources pertaining to the social and economic aspects of the development of this sector. In-depth analyses of changing landscapes and of the internal dynamics between actors in the palm oil sector are available.

6.4 What is there yet to be found?

Riau is an interesting case because cultural changes have been significant, reshaped both by transmigration programs as well as more recently by a more 'capitalistic' view of life. The issue of peatlands is also a key concern because, in the long run, these investments will not benefit the locals. Because pressure on land is excessively high, the land market is well developed and those who are left landless must find new sources of income. Research projects in this province should aim to address the following questions:

- How well-off are the successful palm oil producers? What are the improvements in infrastructure, education and health?
- How did the relationship change between companies and smallholders, especially since the rise of independent producers?
- What are the strategies to avoid poverty for those who could not become part of a scheme? Does the development of the province open up new opportunities in terms of entrepreneurship and new sources of income?
- How well organized are the farmers? What initiatives have proved successful? How to improve the integration of smallholders into the development of the palm oil sector? How to enable improved access to good technical management?
- How can the impact of the exploitation of peatlands be limited? Can these areas be protected without preventing development? The same questions apply to forested areas.
- Do people feel more concerned about their environment now that they have become richer?
- How is governance working at local level? How can it be improved?

Jambi has already been extensively studied. However, because of competition between rubber and palm oil, it can be useful to evaluate how the management of palm oil activities can be improved. Middlemen and mills without plantations are also interesting actors to study because they are key avenues for farmers to escape a monopolistic situation. The increasing interest shown by migrants from saturated provinces such as North Sumatra or Riau also presents a threat to land security though their involvement is a source of information. Thus, further research could help provide answers to the following questions:

- What are the differences between the management of the different kind of palm oil producers? What improvements can be made, especially for independent smallholders?
- To what extent can rubber and palm oil production be made complementary? To what extent can their management be made more efficient?
- What are the impacts of middlemen and independent mills? What is their future?
- How can land security and governance be improved?
- How can the palm oil and rubber sectors and agroforests protect and enhance biodiversity while ensuring sufficient incomes?

The issues of governance, transparency and the role of the central State are of concern in both provinces. There is also a need to evaluate the level of participation of smallholders in the decision-making process and ways to improve this process. Indeed, most of the time, villagers lack a forum in which they can voice their claims while being listened to and without elevated risks of corruption nullifying their efforts. Finally, improving access to inputs and selected seedlings are equally important in Riau and Jambi, as is developing more sustainable management techniques and appropriate access to information, both social and technical.

7 Conclusion

This report aims to provide an inventory of palm oil production systems in two provinces of Indonesia. Production systems are driven by several factors. The type of business model adopted defines many aspects of plot management. For plasma producers, the company supervises the management, although this is not always the case. This contractual arrangement gives farmers access to selected seedlings, inputs and a reliable buyer, which is the company's mill. The cost is long-term debt. For independent plots, the situation is riskier and access to the above-mentioned products is much harder, which explains the lower yields they usually obtain. Mixed farmers, with plasma plots as well as independent plots, could be the strongest players because they do not rely as much on the company while benefiting from its advantages. They do, however, need to own enough land or enough capital to buy and develop oil palm plantations. The allocation of labor and type of workforce also depends on the business model. For example, wealthy landowners can afford to hire sharecroppers or daily laborers, while independent and plasma farmers usually rely on family labor. There is a strong need for a clarification of the concept of "smallholder" which covers a too wide array of situations. One major factor that also impacts production systems is technical and financial information. Companies and cooperatives are not transparent in how they calculate the prices, costs and debts, nor in how they determine land rights or decide how to manage the plasma. Facing such a variety of unknown variables is disturbing and detrimental for the less informed farmers.

Many studies have explained the dynamics within these business models and have tried to quantify their social and economic impacts. However, there has still been little published data on the different types of technical management and agroecological impacts across the various types of holdings and production systems. Findings have highlighted the difference in the amounts and types of inputs or seeds used by farmers depending on their relationships with agribusinesses. The management seems to be better on the whole and more intensive when growers have closer relationships with the companies. However, smallholders also face land constraints and individual capital constraints. The increasing development of palm oil on peatlands requires technical adaptation that smallholders cannot always afford. Sloping and low-fertility soils also force smallholders to adapt. Whether the company takes all these variables into account has not yet been determined. Thus, helping farmers to improve their production system requires developing different trajectories. For independent and isolated smallholders, accessing selected seedlings, inputs and technical information is a priority. Farmers who expand onto peatlands or hilly areas should be aware of techniques to preserve soil properties, avoid erosion and the waste of inputs. When it comes to farmers embedded in a company partnership, the strategy should target their level of empowerment and the way they can escape the monopolistic situation they may find themselves in. Individual access to banking services is also a key point considering how capital intensive oil palm cultivation is in the initial planting phase. There should be a balance between free but risky production systems and safe but constraining ones.

It is also important to tackle the questions of land tenure security and environmental protection because they are not only the major drivers of the opposition to oil palm cultivation but also a direct source of problems for the farmers. Who owns the land and who works on it are also two different questions that need to be answered for a proper diagnosis. Empowering farmers and fighting corruption lead to a better business climate and avoid the waste of time, money and resources. New actors have appeared such as land brokers and intermediaries, who represent both new opportunities and new threats, complicating the picture of the production systems a little bit more. Thus farmers must be provided with the information and the legal support required to face a more competitive context, ensure a proper production system and livelihood, and increase their opportunities. In a fast-changing environment and a race toward economic development, discourses must also be adapted. Young people are less and less attached to their land, life in the city remains attractive, and money

outweighs tradition and appreciation of the environment. From all the limitations and successes cited previously, many studies have suggested possible solutions for improving the management of the palm oil sector. For example, the RSPO includes the respect of land rights, the economic viability of the plantation and proper technical training of the farmers (RSPO 2006). There is a need to develop small mills, in particular to improve access to the market for independent farmers. More transparency in pricing and evaluation of costs will also benefit the farmers. The Indonesian government has supported the setting up of nurseries for selected trees and promoted better practices through its ISPO program, which also aims to protect the environment of the farmers. NGOs can play a role in providing information, as well as in helping map existing boundaries. Income diversification has also been promoted through cattle breeding and intercropping of young palm trees.

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This paper proposes an overview of the development of oil palm production in Indonesia combining two levels: (i) a national and historical perspective of the development of the sector; (ii) a regional approach considering two contrasting provinces, Riau and Jambi. Starting with colonial times, the national approach deals first with the main periods that punctuate the development of oil palm plantations up to the contemporary period, marked by the liberalization of the economy. It emphasizes several factors that played a strategic role in the development of palm oil production, such as the role of the State and migration. After presenting the different models that structure the relationships among stakeholders and how these relationships have evolved, the role of small family planters is analyzed. This section ends with a review of some controversial issues: livelihood improvement, land tenure and customary rights, inclusion versus exclusion, market risks, forest and environmental threats and governance. The regional approach gives context to the development of palm oil production within two territories that have different historical backgrounds, with Jambi entering into production relatively recently. In each of the two provinces, the themes and issues involved in palm oil development identified at national level are analyzed, with specific emphasis on stakeholders' strategic behaviours. The paper concludes with a comparative perspective on both provinces.



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