

At the bottom of the value chain

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AT THE BOTTOM OF THE VALUE CHAIN
Sustainability certification and the livelihoods
of palm oil smallholders in Indonesia

Nia Kurniawati Hidayat

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Sustainability certification and the livelihoods of
palm oil smallholders in Indonesia

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Chapter 1

Introduction

1.1 PALM OIL PRODUCTION AND SUSTAINABILITY CERTIFICATION

The concept of sustainable development has been widely applied to a broad range of issues, including agriculture (Du Pisani 2006). Sustainable agriculture refers to environmentally sound, productive, economically viable, and socially acceptable agricultural practices (Hall 1998, Schaller 1993, Senanayake 1991). However, debates on the meaning of sustainable agriculture in a developing context have not been conclusively settled. Agricultural expansion has been blamed for causing various problems, including deforestation and destruction of wildlife habitat, environmental degradation (such as poor water and soil quality), and unhealthy and unsafe working conditions due to the excessive use of chemicals (Schaller 1993). This dissertation focuses on an agricultural commodity that has been the target of a great deal of criticism in the field of sustainability: palm oil in Indonesia.

The oil palm (*Elaeis guineensis*) is an ancient tropical plant originating in West Africa. The first oil palm seedlings were brought from Bourbon (Mauritius) to Indonesia by Dutch tobacco planters in 1848 and planted in the botanical garden of Bogor in Java as ornamental plants. The first commercial oil palm plantations were established in the East Coast of Sumatra (in Pulu Raja-Asahan and Sungai Liput-Aceh) in 1911 (Badrun 2010). However, due to an unstable political situation, structural development of oil palm plantations did not get off the ground until the 1970s. The development and expansion of palm oil plantations increased significantly after plantation development became an important topic in governmental policies for agriculture. These policies mainly focused on the provision of credit for private plantation companies and the introduction of the Nucleus Estate Smallholders (NES) financing program (Budidarsono et al. 2013).

The expansion of oil palm plantations was also triggered by increasing demands for palm oil in the global market and awareness that the production of palm oil may contribute to economic development, as it creates job opportunities in rural areas and generates government revenues from exports (Rifin 2013, Rist et al. 2010). However, and more on the negative side, many studies show that the expansion of oil palm plantations generally takes place in tropical forest and peat land areas, resulting in the loss of wildlife habitat (Obidzinski et al. 2012, Sheil et al. 2009); loss of biodiversity (Koh and Wilcove 2008, Wilcove and Koh 2010, Fitzherbert et al. 2008); and greenhouse gas emissions (Sheil et al. 2009, Fargione et al. 2008). The expansion of oil palm plantations also often lies at the core of social conflicts between companies and local communities, or between local communities and migrants (Obidzinski et al. 2012, Marti 2008, Colchester and Jiwan 2006).

Many initiatives, mainly initiated by Northern non-governmental organizations (NGOs) and businesses, aim to improve the sustainability of agricultural production in Southern Countries (Bitzer and Glasbergen 2015). These private initiatives comprise sustainability standards, i.e. documented agreements containing specific criteria to be used consistently as rules, guidelines or definitions, to ensure that products and pro-

cesses fit sustainability purposes. They use certification, i.e. a procedure by which a third party gives written assurance that a product and process is in conformity with sustainability standards, as the main instrument to govern agricultural production (Dankers 2003). Private sustainability initiatives can be considered value chain approaches, as Northern manufacturers and retailers in collaboration with NGOs define the sustainability standards that are channeled down to producers in Southern countries as a prerequisite to enter (parts of) the international market. The most important initiative for the governance of palm oil production in Indonesia is the Roundtable on Sustainable Palm Oil (RSPO). Originally, this initiative was mainly directed at large estate companies, which have the means to comply with the sustainability standards that are part of the certification (Lee et al. 2011). More recently, the RSPO established a Smallholder Task Force (STF) to decompose the standards in a set of Principles and Criteria (PnC) that are more relevant for, and applicable to, smallholders. The RSPO also launched a Smallholders' Fund Initiative (SFI) to financially support smallholders in the certification process (Pesqueira and Glasbergen 2013). In 2009, the Indonesian government also took up the idea to improve the sustainability of palm oil production, and initiated its own sustainability standard: Indonesian Sustainable Palm Oil (ISPO). ISPO is a public sustainability standard system that is mandatory and intends to certify all palm oil companies, including smallholders, in the near future.

Smallholders are a relevant group of producers as they own 41% of the Indonesian oil palm plantations (in terms of land area) and are large in number: more than two million farmers in 2016. As smallholder inclusiveness and participation are necessary to realize sustainability changes at a production level, smallholders can be considered gatekeepers of sustainability in palm oil production. Smallholders, however, are vulnerable (Mol 2007). First, because they experience uncertainties in access to the market and are often confronted with price fluctuations (Vermeulen and Goad 2006). Second, palm oil smallholders are dependent on companies or middlemen to sell their products (Papenfus 2000), which implies a low bargaining power compared to other actors in the value chain. Moreover, palm oil smallholders lack capital and up-to-date agronomic knowledge, and consequently their productivity is far below its potential (Brandi et al. 2013, Marti 2008, Papenfus 2000). Participation of smallholders in sustainability standard systems and certification is generally expected to accelerate a transformation towards more sustainable palm oil production and simultaneously improve smallholders' livelihoods.

The impact of sustainability certification on smallholders' livelihoods is still debated (Bitzer et al. 2012, Auld 2010, Méndez et al. 2010, Blackman and Rivera 2010) and remains inconclusive (Beuchelt and Zeller 2012). Many impact studies on certification have studied coffee smallholders (see Ayuya et al. 2015, Jena et al. 2012, Ruben and Fort 2012, Barham and Weber 2012, Méndez et al. 2010, Arnould et al. 2009, Bacon et al. 2008, Bacon 2005). Impact studies with a focus on palm oil certification are still rare. This dissertation aims to contribute to our knowledge about the impacts of sustainability

certification on the livelihoods of palm oil smallholders in Indonesia from a smallholders' perspective, while differentiating between different types of smallholders based on differences in their social context of production.

This introductory chapter will first specify the concept of smallholder and sketch a profile of a smallholder as the focal point of this dissertation (section 1.2 and section 1.3). Next, we will elaborate on the context in which Indonesian palm oil smallholders operate (section 1.4), before we review research on sustainability certification (section 1.5). Based on the literature review, the objectives and research questions of this study will be presented (section 1.6). Next, the key concepts (section 1.7), research methodology (section 1.8) and relevance of this study (section 1.9) will be explicated.

1.2 PROFILE OF THE INDONESIAN PALM OIL SMALLHOLDER

A blueprint of what being a smallholder entails cannot be given, as several combinations of criteria and indicators have been used to define smallholders. Examples include orientation (i.e. subsistence in addition to the market), relatively small landholding sizes, labor input (i.e. a high ratio between family labor and hired labor), having the main responsibility for a farm's management, and limited income (Calcaterra 2013). Among those criteria, limited landholding sizes represents the most frequently used variable to define smallholders (Calcaterra 2013). The RSPO defines palm oil smallholders as "farmers growing palms sometimes along with subsistence production of other crops, where the family provides the majority of labor and the farm provides the principal source of income and where the planted area of oil palm is usually below 50 hectares in size." The Ministry of Agriculture in Indonesia defines smallholders as "farmers owning plantations smaller than 25 ha" (Regulation No. 33/Permentan/OT.140 /7/2006). However, in practice, most Indonesian palm oil smallholders own plantations that are, in terms of size, far below the baselines mentioned in these definitions. On average, oil palm plantations owned by Indonesian smallholders are 3.6 ha in size and 18 years old. The majority of smallholders plant oil palms in non-peat land areas, which used to consist of secondary forest (re-grown forest after timber harvest) or primary forest (primeval, previously untouched forest). The average productivity equals 19 ton/ha/year. The average age of smallholders is 44, and the majority of smallholders only went to elementary school. More than 90% of the smallholders in our study depend on palm oil as their main source of income and more than 80% uses family labor to manage their plantation. Moreover, the majority of these smallholders have an additional income, either from cultivating other crops such as rubber or paddy, or from working as agricultural contractor or trader.

Based on this profile and in this study, we define smallholders as farmers owning a plantation of no more than 4 ha (2 *kapling*), depending almost completely on oil palm as

their main source of income, and using primarily family labor to manage (parts of) their plantations.

1.3 DIFFERENT TYPES OF SMALLHOLDERS

Based on our definition we can distinguish different types of Indonesian palm oil smallholders. A distinction that is often made in the literature (see for example Brandi et al. 2015, Lee et al. 2014, Feintrenie et al. 2010) divides smallholders into scheme smallholders and independent smallholders. Scheme smallholders are farmers whose oil palm plantations were established by private and/or public companies and who used external financial sources for the establishment of their plantations. Independent smallholders established their oil palm plantations autonomously and with their own resources.

Scheme smallholders

Scheme smallholders can be further differentiated based on the financial program and management system they are part of. The first sub-category contains smallholders who initially joined the Nucleus Estate Smallholders (NES) financing program from the late 1970s till the 1990s. The NES program was initiated by the Indonesian government in response to advice from the World Bank to provide credits to farmers for establishing oil palm plantations. These credits had to be repaid by the farmers. NES scheme smallholders further cultivate their oil palm plantations with ongoing monetary and/or non-monetary support from either the government or private companies (mostly mills), including technical assistance, input provisions, and guaranteed purchase of the oil palm's fruits, called Fresh Fruit Bunch or FFB. They manage their plantation independently (i.e. self-management). In 1992 the NES program was replaced by a similar, but new program called KKPA (*Koperasi Kredit Primer untuk Anggota*, or in English: Primary Cooperative Credit for Members) which ran till 2006 (Pramudya et al. 2017). The KKPA program – the members of which represent the second sub-category of scheme smallholders – is similar to the NES program in the sense that it provides credit for the establishment of plantations and ongoing support to the smallholders. It differs with respect to giving more responsibility to cooperatives and companies and taking away management responsibilities from the smallholders. The underlying reason was that this shift in responsibilities may contribute to improving the productivity of oil palms. Because of this we see a new group of smallholders emerging: scheme smallholders under *manajemen satu atap* (one-roof management) which implies that cooperatives assigned by the companies manage the plantation administratively. The cooperatives then pay the smallholders for their palm oil harvest and/or their work on the plantation on a monthly basis (Gillespie 2012). This also implies that smallholders do not necessarily work on the plot of land they own; they may be asked to work on any plot belonging to the KKPA. Not all farmers under the

KKPA program are part of this one-roof management system. Some are still self-managed, and therefore very similar to the NES smallholders described earlier. Since 2006, there are no structural, long-term support systems from the Indonesian government anymore. Structural funding has been replaced by smaller funding initiatives, for example for replanting and for a reduction of credit interest. Companies wishing to establish a palm oil plantation can still use a scheme-smallholder construction, but we have hardly observed such initiatives in the field anymore after 2006.

Independent smallholders

Although independent smallholders establish and manage their plantations ‘fully independently’, they collaborate with other actors (i.e. middlemen, NGOs or companies) to access credit, receive training or sell their FFB. Independent smallholders collaborating with middlemen cultivate their oil palms with their own resources. The number of independent smallholders in Riau, one of the most important palm oil-producing regions in Indonesia, has increased as from 1995 when government regulations allowed investors to establish oil palm mills without owning an oil palm plantation (Budidarsono et al. 2013), which led to a sharp increase in the demand for FFB from independent smallholders. Independent smallholders often collaborate with middlemen because these can provide credit at the moment the smallholders need it (for example when they need to buy fertilizer). As a reciprocity, the smallholder agrees to, at a later moment, sell a specific amount of their FFB to the same middlemen (Susanti and Burgers 2011), often at a preset price. The next sub-category encompasses independent smallholders collaborating with companies. These smallholders differ from the previous ones as they are tied to a specific mill through a formal contract. The contract states that the smallholder should sell all FFB to the mill under contract. To guarantee the receipt of good quality FFB, the mill usually arranges support (i.e. training or road maintenance) for the farmers via the farmer groups. Another sub-category comprises independent smallholders collaborating with NGOs. This type of smallholder emerged relatively recently in a response to private certification, as RSPO recommends a formal relation between farmers and an NGO or company (previous category) in order to become certified. NGOs strengthen the way in which these smallholders are organized and provide training on Good Agricultural Practices (GAP) and certification. These smallholders are not tied to specific mills, but sell their FFB to cooperatives that subsequently choose the mill to whom they want to sell their FFB.

Certified smallholders

As from the 1990s, palm oil smallholders are increasingly confronted with sustainability standards and certification. The first initiative was the RSPO, initiated in 2004 by Unilever in collaboration with the World Wildlife Fund (WWF), which aims to set standards to

improve the environmental conditions of palm oil production while simultaneously serving the social and economic interests of the producers. It does so through setting standards and verifying compliance. The RSPO works via NGOs or companies who organize training for the farmers to comply with the criteria. Producers who meet the standards may become certified. The miller companies (farmer organizations in the case of independent smallholders) hold the certificates and also pay for the costs of certification. The farmers benefit in the form of premium prices (additional price resulting from the higher quality of their FFB) and premium fees (resulting from the approved certified CPO/FFB). Given the RSPO's way of working, and the recommendation that farmers should collaborate with NGOs or companies, RSPO certification is not accessible to all farmers. Independent smallholders collaborating with middlemen, and scheme smallholders under the KKPA one-roof management system are currently excluded from RSPO certification. More recently, a public certification scheme called ISPO was initiated by the Indonesian national government. ISPO is inspired by the RSPO to a great extent, but differs a bit in its standards and, unlike the RSPO which has a voluntary character, the intention is to make the scheme compulsory for companies first and later also for smallholders.

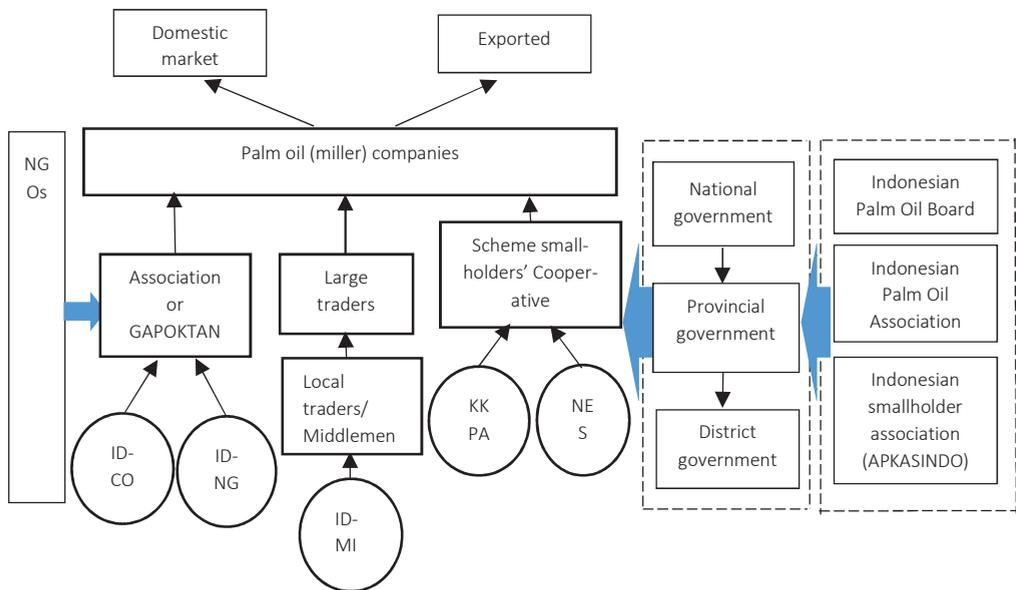
Table 1. Summary of different types of palm oil smallholders in Indonesia

	Connection	Management system	Actor of collaboration	RSPO certified versus uncertified
1	Independent	Self-management	Miller company	Certified
2	Independent	Self-management	NGO	Certified
3	Independent	Self-management	Middlemen	Uncertified
4	Scheme KKPA	One-roof management	Miller company	Uncertified
5	Scheme NES or KKPA	Self-management	Miller company	Certified and uncertified

The exact numbers of smallholders in each category are not documented, and are therefore largely unknown. During our research, however, we have seen that a small majority of Indonesian palm oil smallholders (i.e. around 60%) can be considered independent. From the independent smallholders, most smallholders collaborate with middlemen. In the category of scheme smallholders, we see that most are Nucleus Estate Smallholders (NES)/KKPA smallholders under self-management, followed by KKPA smallholders under one-roof management. Relatively few smallholders are independently collaborating with companies and/or NGOs. In this dissertation we use these categories (see Table 1) to analyze different ways in which the different smallholders relate to, and potentially benefit from, certification.

1.4 THE ACTOR-NETWORK CONTEXT OF SMALLHOLDERS

We already touched upon some actors Indonesian smallholders directly or indirectly collaborate with. This section further elaborates on the institutional context in which the palm oil smallholders' livelihoods are embedded (see Figure 1). Smallholders are at the bottom of the value chain and are generally regarded as the most powerless actors in the value chain (McCarthy et al. 2012). They operate in the same value chain as estate companies and are confronted with international and national initiatives that intend to change their production practices toward more sustainable production. Whether smallholders will succeed in meeting sustainability standards and benefit from participation in certification depends also on actions undertaken by other actors in the value chain (e.g. verification of compliance, demand for sustainable palm oil, the materialization of ISPO, and support for farmers).



Note:

Five types of smallholders:

ID-COM = (Semi) Independent smallholders collaborating with company

ID-NGO = (Semi) Independent smallholders collaborating with NGOs

ID-MID = (Fully) Independent smallholders collaborating (informally) with middlemen

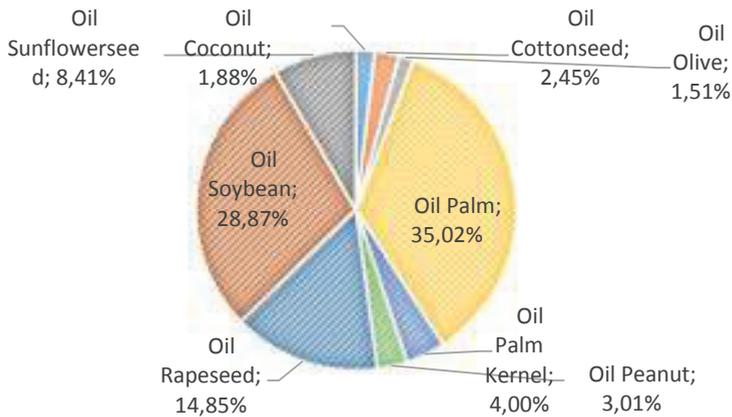
KKPA = *Koperasi Kredit Primer untuk Anggota*, scheme smallholders (partly one-roof management)

NES = Nucleus Estate Smallholders, scheme smallholders (self-management)

Figure 1. Overview of actors in the palm oil value chain and their relationships with (different types of) smallholders

Miller companies

Indonesian smallholders own around 4.8 million hectares of oil palm plantations (equally 41%); another 6.9 million hectares of oil palm plantations (equally 59%) belong to (public and private) companies (known as estate plantations) (Directorate General of Estate Crops 2016). Approximately 1,500 companies are currently active in palm oil production in Indonesia. These companies are diverse in terms of concession sizes. According to the Directorate General of Estate Crops (2016), approximately 3% of the oil palm estate plantation area is managed by foreign private companies, 11% belongs to public companies and 86% is managed by private national investment companies. Most companies have their own mill and are therefore able to directly process their Fresh Fruit Bunch (FFB) into Crude Palm Oil (CPO) and Palm Kernel Oil (PKO). Both CPO and PKO belong to the edible plant oils, although PKO is more saturated. Oil palm fruits contain more CPO than PKO, as the latter is only derived from the relatively small kernel of the fruits. CPO is the most widely consumed vegetable oil worldwide (see Figure 2). About half of the packed products in supermarkets, including food and cosmetics, contain palm oil. Companies and smallholders together produce around 31.5 million ton of Indonesian Crude Palm Oil (CPO) per year. Roughly 80% of this production is exported and 20% is used in the domestic market.



Source: Food Agricultural Services (2016)

Figure 2. Global consumption of vegetable oils in 2016

All types of palm oil smallholders depend on miller companies to sell their Fresh Fruit Bunch (FFB), although fully independent smallholders do not have direct relationships with companies, because they sell FFB through middlemen and traders (see Figure 1, ID-MID). Large traders are tied to miller companies through a formal contract. This contract specifies the quantity of palm oil that the large trader should deliver to the miller every

year. If large traders do not succeed in meeting the specified quota, their selling quota (and with it, their income) will be reduced in the following year. To meet selling quotas, large traders build informal relationships with middlemen and (more rarely) with smallholders. Through these relationships, large traders provide support to middlemen in the form of financial credit or the provision of transportation (e.g. trucks). Middlemen may subsequently use this financial support to provide financial credit, fertilizers, pesticides, and means of transportation to smallholders. As an act of reciprocity for the provided credit or inputs, traders (and middlemen) expect the middlemen (and smallholders) to deliver specific amounts of FFB at predetermined prices.

Independent smallholders collaborating with companies and NGOs are organized in a farmer association or *Gabungan Kelompok Tani* or farmer group (GAPOKTAN), and through the farmer organizations they can sell their FFB directly to (their affiliated) miller company (see Figure 1, ID-COM and ID-NGO). Although these smallholders have to arrange the transport of their FFB to companies on their own, they can bypass middlemen and receive relatively higher farm-gate prices compared to the fully independent smallholders. These two types of smallholders are formally independent from miller companies, as they can deliver their FFB to any company offering a good price. However, to be assured of market access during the palm oil peak season, many smallholders prefer to establish a formal selling contract with specific companies.

KKPA and NES smallholders can be considered to have a relatively good position in the market as they are closely connected to a company (see Figure 1, KKPA and NES). This connection does not only relate to a guaranteed supply and purchase of FFB, but also to the mill's supply of training to the smallholders and monitoring to ensure a good quality of palm oil production. Companies even fully manage and control oil palm plantations of KKPA smallholders under a one-roof management system. To reward smallholders for the good quality of their production, FFB produced by KKPA and NES plantations are prioritized by companies and receive higher prices than FFB from independent smallholders. All KKPA and NES smallholders are organized in a cooperative where all support, including the provision of fertilizers and training, and FFB transactions (FFB selling and its payment) are managed collectively.

Producer organizations

In Indonesia, we can distinguish two producer organizations that are directly linked to oil palm producers: the Indonesian Palm Oil Enterprise Association (GAPKI or *Gabungan Pengusaha Kelapa Sawit Indonesia*) and the Indonesian Palm Oil Smallholders Association (APKASINDO or *Asosiasi Petani Kelapa Sawit Indonesia*). Both are part of an umbrella organization called Indonesian Palm Oil Board (DMSI or *Dewan Minyak Sawit Indonesia*) that aims to improve cooperation and coordination among palm oil business actors (including smallholders) and to facilitate national palm oil policies and regulations to improve the competitiveness of Indonesian palm oil in the global market, as well as the

environmental conditions of palm oil production. GAPKI is an Indonesian business organization established in 1981 and consists of 644 palm oil estate companies (roughly 43% of all Indonesian palm oil estate companies). GAPKI communicates with and facilitates communication among palm oil companies through its platform and closely collaborates with the national government to provide suggestions for palm oil policies. GAPKI does not directly collaborate with smallholders, although its policies and actions may indirectly affect smallholders. Different from GAPKI, which represents the interests of companies, APKASINDO serves the interests of Indonesian palm oil smallholders. This organization was established in 2000 by Indonesian palm oil farmer representatives and is supported by the Ministry of Agriculture as a professional organization for palm oil smallholders in Indonesia. APKASINDO tries to support palm oil smallholders to better compete in the global market and to prevent policies that may negatively influence smallholders' livelihoods.

Government

The Indonesian government, on different levels, may enable or constrain the sustainability of smallholders' agricultural production. On the national level, the government provides the macro-legal framework within which smallholders have to operate (Gillespie 2012). The Ministry of Agriculture provides the legal basis for palm oil plantations, whereas the Ministry of Agrarian and Spatial Planning and the Ministry of Environment and Forestry define the regulations about land use and the environment. Besides, the national government has programs specifically aimed at improving smallholders' agricultural productivity, such as training in Good Agricultural Practices (GAP), financially supported through a so-called CPO Fund, and the provision of subsidies and grants. These subsidies and grants are further managed by the provincial and district governments. Moreover, provincial and district governments have the authority to grant licenses for palm oil development and, through technical offices (e.g. the Agricultural Office, Forest Office, Agrarian and Spatial Planning Offices on the local level), enforce regulations from the different Ministries on the ground. The public initiative of ISPO is regulated by the Ministry of Agriculture on the national level and consists of regulations coming from different ministries.

NGOs

Many NGOs with various backgrounds and aims have become involved in the palm oil sector. Most of them are inspired by (increasing awareness of) the negative social and environmental effects of the expansion of oil palm plantations. NGOs provide trainings to palm oil smallholders to improve the sustainability of their production and some of them provide staff to help smallholders become certified. The World Wildlife Fund

(WWF), for example, provides training and support to smallholders in Riau to become RSPO certified.

The government, seeing the success of NGO programs in bringing smallholders into certification, also took up the idea and developed a pilot project in Riau to support independent smallholders to become ISPO certified. The government (i.e. the Ministry of Agriculture) in collaboration with the United Nations Development Program (UNDP) and a palm oil company took the initiative with support from an NGO (SNV Netherlands Development Organization) to facilitate training and technical support to independent smallholders to become the first farmers with ISPO certification in Indonesia.

In this dissertation we use the actor-network context as background knowledge to understand the social context in which the smallholders operate and through which certification (potentially) affects their livelihoods.

1.5. NORTHERN CERTIFICATION INITIATIVES DEBATED

The attempt to overcome sustainability problems of agricultural production in Southern countries through partnerships between Northern businesses and international NGOs has been widely debated. Previous studies focus on two related concerns: the legitimacy and the effectiveness of voluntary standards to solve sustainability problems. Some studies on the RSPO revealed a legitimacy problem resulting from a lack of representation of stakeholders, and in particular smallholders, in the Roundtable (Marin-Burgos et al. 2015, von Geibler 2013, Schouten and Glasbergen 2011, Cheyns and Riisgaard 2014). The issue is that RSPO standards need to be translated into national (i.e. Indonesian) interpretations. This translation was initially formulated without the involvement of smallholders, which can be considered problematic as it reproduces and reinforces asymmetric power balances.

Other literature questions the effectiveness of the voluntary standards and enforcement principles to solve sustainability problems (Bitzer and Glasbergen 2015, Ruysschaert and Salles 2014). First, because of the dominance of Northern stakeholders in standard-setting processes (Fuchs et al. 2011, Bitzer et al. 2008), which implies the risk of mismatches between Northern knowledge, interests, and discourses on sustainability on the one hand and Southern knowledge, interests and discourses on sustainability on the other hand. As a consequence, standards formulated by Northern actors may not fit and harmonize with realities of the Southern producers (Bitzer and Glasbergen 2015, Busch 2014). Second, because private standards tend to focus on benefits for large-scale plantations, and by doing so, may marginalize smallholders (Bitzer 2012). This relates to the fact that private standards are often expensive and difficult to apply, particularly for smallholders (Perez-Aleman and Sandilands 2008). And third, because standards promise benefits (e.g. higher prices, premium fees or opening a niche market) that remain highly uncertain for smallholders (Bitzer and Glasbergen 2015). Moreover,

private standards do not seem to improve the vulnerable position of smallholders significantly (van Rijn, Burger, and den Belder 2012, Bacon 2005).

Uncertainties about the effectiveness of private voluntary standards (Ruyschaert and Salles 2014, von Geibler 2013), inclusiveness of stakeholders' interests (Bitzer and Glasbergen 2015, Cheyns and Riisgaard 2014, Silva-Castañeda 2012), and their ability to contribute to sustainability changes (Bitzer and Glasbergen 2015) have stimulated Southern governments to develop their own standards (Wijaya and Glasbergen 2016, Hospes 2014); for example, the standards of Indonesian Sustainable Palm Oil (ISPO) and Malaysian Sustainable Palm Oil (MSPO). Public standards are largely based on laws and policies from state agencies that reclaim part of their national sovereignty to decide on acceptable effects of palm oil production, such as deforestation and the emission of greenhouse gases (Hospes 2014, 434). Public standards are designed to be less expensive and stringent compared to the private standards in order to facilitate widespread adoption. By doing so, the government expects to strengthen the national agricultural sector by promoting a good image through sustainability certification (Schouten and Bitzer 2015). Public standards may better fit the national context, but other challenges may remain the same, such as the presence of variation in regional and local socio-economic, political and environmental contexts and production systems (Schouten and Bitzer 2015, 182), which implies a challenging implementation process of the standards on the ground. Moreover, as these relatively new, public initiatives take place in rather weak administrative states, the capacity of the public standards to induce changes toward a more sustainable agricultural production remains questionable.

1.6. OBJECTIVE AND RESEARCH QUESTIONS

This dissertation views sustainability standards and certification as an intervention logic that intends to improve the sustainability of agricultural production. We aim to investigate how and to what extent this intervention affects smallholders in their social (i.e. economic, cultural and political) contexts, to explore the capacity of certification to bring about changes toward more sustainable palm oil production in Indonesia, and the capacity of certification to contribute to improvements in Indonesian smallholders' livelihoods. This objective has been specified in the following research question:

In what way and to what extent does sustainability certification contribute to improvements in the livelihoods of palm oil smallholders in Indonesia? This question is specified in three sub-questions:

1. *How does private sustainability certification relate to smallholders' livelihoods?*
2. *To what extent can public sustainability certification become a viable alternative to private certification?*

3. *What might be a potential pathway towards a more sustainable livelihood for Indonesian palm oil smallholders?*

1.7. LIVELIHOOD AS THE MAIN CONCEPT

In our analysis, we explicitly question how and under which circumstances certification, as an intervention logic, may bring about sustainability changes in smallholders' livelihoods. The livelihood concept is not new and has been used as an important concept in development studies since the 1990s. Its development can be seen as a response to the realization that the concept of development was too narrowly focused around economic realities and opportunities of the poor, and hence did not sufficiently allow giving meaning to the complexity of interacting aspects that influence the situation of the rural poor in making their living (Chambers and Conway 1992). The rise of the concept of livelihood widened the angle taken in development studies from a focus on production, employment and income to describe poverty levels towards a description of a diverse combination of activities adopted by the rural poor when trying to make their living (Scoones 2009, 1998, De Haan 2012).

The connection between the livelihood concept and sustainability was firstly made and introduced in the Brundtland Commission report in 1987 (Solesbury 2003, Scoones 2009), and was further specified during the Earth Summit held in Rio de Janeiro (Brazil) in 1992 and in the document resulting from this summit, Agenda 21. In Agenda 21, specific attention was paid to sustainable livelihoods (Chambers and Conway 1992) as the means of gaining a living, including livelihood capabilities, tangible and intangible assets, and activities that are required for a means of living. In 1998, Ellis (1998) added the component of availability to the definition of sustainable livelihoods and argued that activities and assets should also be available and accessible to and for individuals or households to gain a living. Later, Tang et al. (2013) further expanded the scope of the sustainable livelihood concept to also include the mediating role of institutions and social relations that may enable or constrain individuals and households from making their living. We define sustainable livelihoods as the availability of assets including access to these, that smallholders need to make their living. Livelihoods need institutions and social relations to be sustained and to further improve the availability of, and access to, assets in the future.

The sustainable livelihood concept has been operationalized by different development organizations (Carney et al. 1999, Krantz 2001), e.g. DFID, Oxfam, CARE and UNDP, and applied in their development programs. These organizations use a comparable framework, although they are slightly different in their emphasis dependent on their goal. Oxfam (in 1993), for example, operationalized the sustainable livelihood concept and loosely applied it across its organization to formulate strategic programs on alleviating poverty. In 1994, CARE operationalized the sustainable livelihood concept and ap-

plied it to develop effective programs for the poor and vulnerable. In their operationalization, CARE put less emphasis on institutional and organizational factors and stresses the fulfilment of basic needs as one crucial element of livelihood security (sustainability is not explicitly mentioned in their framework). In response, the United Nations Development Programme (UNDP) (in 1995) used the livelihood concept to think about ways to reduce poverty. In its framework, UNDP emphasized the importance of technology that could improve the use of livelihood assets and help people rise out of poverty. It also stressed adaptive and coping strategies which are crucial for sustainable livelihood. The scientific prominence of the sustainable livelihood concept increased after it was promoted by the Department for International Development (DFID) in 1997 (De Haan 2012, Morse et al. 2009). The DFID operationalized the sustainable livelihood concept and applied it in their programs on poverty alleviation. In its operationalization, the DFID stressed the access to assets and structures (i.e. including government policies, institution), which may influence access to assets and livelihood strategies, as core elements of sustainable livelihood that are crucial for poverty alleviation.

The sustainable livelihood concept (mostly using the DFID's operationalization) has also been applied to a wide range of subjects, including rural development in agriculture (Tang et al. 2013, Bezemer and Lerman 2004), small-scale fishery (Allison and Ellis 2001), forest management (Das 2012, Nath and Inoue 2013), poverty alleviation (Adato and Meinzen-Dick 2002, Ansoms and McKay 2010, Bebbington 1999), environmental risk management (Anand and Forsyth 2007), and impact assessments of development projects (Ashley and Hussein 2000). The operationalization of sustainable livelihoods as developed by DFID has been given a central role in our study and consists of assets that are further operationalized in terms of human, social, financial, natural, and physical capital (Carney 2003). These assets provide people with the capacity to act and to sustain and enhance their livelihood. They are influenced by what is known as the vulnerability context (i.e. exposure to stresses and shocks) (DFID 1999, Morse et al. 2009), transforming structures and processes (e.g. policies and regulations) (Carney 2003), and strategies of smallholders (i.e. activities and choices to improve livelihood outcomes) (Scoones 1998).

However, the sustainable livelihood concept and the way in which it is operationalized has also been criticized: first, the framework is said to neglect economic and commercial factors such as profitability (Utting 2009) and enabling and constraining market issues (Carney 2003). Second, the framework does not capture cultural issues, and neglects the role of power relationships and politics (Adato and Meinzen-Dick 2002, Carney 2003, De Haan 2012), for example in providing access to assets. Third, farmers' priorities and preferences are commonly missing, although these are crucial to understand the livelihood strategies chosen and preferred by the farmers (Ashley and Hussein 2000). Fourth, inadequate representation of the relation between access to assets and a proper use of those assets was suggested (Bebbington 1999); having access to assets does not automatically imply a proper use of those assets. A fifth point of criticism relates to the

narrow scope of the livelihood approach, because it emphasizes vulnerability and strategies to cope with potential stresses and shocks, while it neglects farmers' ability to recover from stresses and shocks (i.e. their resilience) (Marschke and Berkes 2006, Scoones 2009, Nyamwanza 2012, Speranza, Wiesmann, and Rist 2014).

In response to these criticisms, this dissertation suggests an amended sustainable livelihood framework in Chapter 2, and a way to include resilience into the discussion on sustainable livelihoods in Chapter 4. In Chapter 2 we further connect the livelihood concept to impact research and we use the sustainable livelihood concept as an approach to analyze relationships between sustainability certification and smallholders' living conditions. In Chapter 3 we zoom in on one of those relationships: the economic profitability of participation in sustainability certification of palm oil. Chapter 4 broadens the interpretation of sustainable livelihoods to include the ability to recover from stresses and shocks and investigates how participation in sustainability certification correlates with livelihood resilience. Chapter 5 investigates the potential of ISPO certification in improving smallholders' livelihoods.

1.8. RESEARCH DESIGN AND METHODS

This dissertation takes a socioeconomic perspective. Socioeconomics is an interdisciplinary study field that provides knowledge for policy making (Stern 1993) and recognizes that we cannot understand economic phenomena without considering the social context they belong to (Hellmich 2017, Zafirovski 2000). By adopting this approach, this dissertation considers a more complete range of assumptions underlying human actions than orthodox neoclassical economic approaches that explain human decisions as rational (economic) choices, and therefore fail to account for the social nature of economic activities (Hellmich 2017). We see economic phenomena as part of a complex world in which spheres of social life, for instance culture and politics, relate to economic phenomena. Managing a palm oil plantation can therefore be seen as an economic activity, but the decisions made by smallholders cannot be explained through economic incentives and interests alone, as political, cultural and social aspects may play an important role as well. Smallholders provide meaning to certification, which does not happen in a vacuum, but in a dynamic sociopolitical environment that is subject to external changes, e.g. market changes, government interventions and climate change.

Following the interdisciplinary nature of the socioeconomic approach, we integrated qualitative and quantitative analyses to address our sub-questions. The first sub-question, on the relationship between private sustainability certification and smallholders' livelihood, is answered in Chapter 2, Chapter 3 and Chapter 4. In Chapter 2 we perform a qualitative analysis, combining semi-structured in-depth interviews to investigate smallholders' perspectives on sustainability certification with informal discussions, observations and literature studies. Interviews were transcribed and coded based on key

words. Codes and keywords resulted in a pattern that was further used as the main basis for deriving results and conclusions. A more quantitative approach was used in Chapter 3 to assess the profitability of sustainability certification and in Chapter 4 to assess the livelihood resilience of different types of Indonesian palm oil smallholders. In both chapters we used a survey and, in addition, interviews with key informants to get a better understanding of the data resulting from the survey. In Chapter 3 we calculated the Net Present Value (NPV) as an indicator of profitability and employed statistical regression analysis to analyze the factors that influence smallholders' profit. Statistical analyses were also employed in Chapter 4, where we used the t-test and ANOVA test to quantify differences in livelihood resilience among different types of smallholders.

The second sub-question, on public sustainability certification, is addressed in Chapter 5. Similarly to Chapter 2, we employed semi-structured in-depth interviews to analyze the potential of ISPO for solving palm oil-related problems. These interviews were enriched by document analysis and participation in events. All interviews were transcribed and analyzed with the help of computer-assisted qualitative data analysis (CAQDA). In most chapters, we adopt an ex-post analysis to investigate the impact of certification on livelihoods. In Chapter 5, however, and given the fact that ISPO has not been fully implemented yet, we applied an ex-ante evaluation to investigate what ISPO potentially implies for the livelihood of smallholders.

The third sub-question, on what could be a potential pathway towards a more sustainable livelihood for Indonesian oil palm smallholders, will be answered in Chapter 6. Chapter 6 also reflects on the findings from the four empirical chapters (2, 3, 4 and 5) of this dissertation. In this chapter, and based on the knowledge gained during this study, we define a potential sustainable future for Indonesian palm oil smallholders. Next, through a back-casting approach, we first identify crucial steps and prerequisites that need to be fulfilled to guarantee a sustainable future for smallholders. In the identification of steps and prerequisites, we take as our premise that smallholders' agency and empowerment are crucial for the improvement of their livelihoods. These steps and prerequisites subsequently form the basis of our reflections on a potential pathway.

1.9. RELEVANCE OF THIS STUDY

This dissertation is motivated by the observation that current research on palm oil certification pays limited attention to the impacts of sustainability certification from a smallholders' point of view, and to smallholders' social contexts (i.e. their economic, cultural and political realities). We tried to cover this gap in knowledge by connecting the sustainable livelihood concept to the literature on sustainability certification. Another contribution to the current literature comprises the way in which we go beyond the common distinction between independent smallholders and scheme smallholders (see for example Brandi et al. 2015, Lee et al. 2014, Feintrenie et al. 2010). To better represent

the different institutional settings smallholders are part of, and therefore confronted with, we distinguish five different groups of palm oil smallholders in Indonesia, including two groups of scheme smallholders and three groups of independent smallholders.

The need for a transformational path towards a more sustainable agriculture increasingly demands the involvement of private and public actors. This dissertation has policy relevance in both domains. For the private sector, we provide insight on how and to what extent private initiatives may lead to sustainability changes for smallholders. We shed light on the challenges experienced by smallholders when being confronted with private sustainability certifications. For the public sector, this dissertation provides insight into the relatively new trend in which Southern governments develop their own public standards, by focusing on one of those recently established standards: ISPO. More specifically, it analyses the feasibility and governance capacity of ISPO in bringing together actors for concerted action and solving palm oil-related sustainability problems.

Chapter 2

Sustainability certification and palm oil smallholders' livelihood: A comparison between scheme smallholders and independent smallholders in Indonesia

POSITIONING CHAPTER 2

Chapter 2 answers the following research questions:

1. *How can we conceptually understand the relationships between certification and the livelihood of smallholders?*
2. *What does an application of this conceptual understanding learn us about factors that play a role in improving farmer's livelihood through certification and what challenges can be identified?*

Given uncertainties around the implications of sustainability certification for smallholders' livelihoods, this chapter explores the potential of sustainability certification to improve the livelihood of smallholders. To achieve this objective we developed an amended sustainable livelihood framework that we used to analyze the livelihoods of Indonesian smallholders participating in the Roundtable of Sustainable Palm Oil (RSPO). We find that although access to markets and vulnerability are not improved through certification, indirect effects through organizational changes increase productivity. Certification schemes are also weakly institutionalized, and farmers will easily shift to a more profitable way of production if they get the chance to do so.

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2.1. INTRODUCTION

Since the mid-1990s, voluntary sustainability standards and certifications have been introduced as a new governance model in global agrifood chains. Most of them aim to regulate the negative environmental and social effects of food production in Southern, often developing countries. However, their impacts on the livelihood of smallholder farmers at the production level are still widely debated (Auld 2010, Blackman and Rivera 2010, Bitzer 2012, Glasbergen 2013, Méndez et al. 2010).

Most of the studies analyze the impact on a combination of social, economic, and environmental indicators related to production processes of agricultural commodities. These studies show contradictory results and fluctuate between attributing positive economic effects (Becchetti and Costantino 2008, Brandi et al. 2013, Bacon 2005, Beuchelt and Zeller 2011), social effects (Elder et al. 2012, Giovannucci et al. 2008), and environmental effects (Melo and Wolf 2007, Blackman and Naranjo 2012), towards insignificant effects (Ruben and Fort 2012, Valkila 2009, Bacon et al. 2008), mixed results (Pirotte et al. 2006), and even negative consequences of certification (Beall 2012).

We assume that these contradictions may be due to the different indicators that are used to measure impact, the different research methods, and, as we see as most important, the lack of a more generally accepted underlying theoretical consideration for the choice of variables.

Based on this assumption, this paper aims to further explore the potential of certifications to improve the livelihood of smallholder farmers, asking the questions:

1. How can we conceptually understand the relationship between certification and the livelihood of smallholders?
2. What does an application of this conceptual understanding learn us about factors that play a role in improving farmer's livelihood through certification and what challenges can be identified?

We are particularly interested in smallholder farmers' perspectives - what participation in the certification implies for them, what they value, what they regard as long term positive and negative effects. To that end we developed an amended livelihood framework which comprehensively defines economic, social and environmental variables that may influence the relationship between certification and smallholder's livelihoods.

This analytical model is applied in an exploratory study of Indonesian smallholders who participate in the Roundtable on Sustainable Palm Oil (RSPO). The RSPO, formally established in 2004, is a Northern-based international multi-stakeholder initiative in sustainable palm oil cultivation with members and participants from different backgrounds and with different interests, including palm oil processors and traders, consumer goods manufacturers, retailers, banks/investors, representatives of oil palm producers, and social and environmental NGOs. The RSPO is generally regarded as a promising

certification scheme; it has a considerable impact on production processes and a market share of certified palm oil of about 15% (Schouten and Glasbergen 2012, Schouten et al. 2012).

Indonesia was chosen as our study field because this country is the largest producer and exporter of palm oil world-wide (WWF 2013). However, the inclusion of smallholders in palm oil certification has proven to be difficult (van Opijnen et al. 2013), despite efforts of the RSPO to accommodate smallholders in the RSPO system. The General Assembly established a Smallholder Task Force (STF) in 2005, focusing on the relevance and applicability of the RSPO principles and criteria for smallholders. In 2012, the RSPO's Smallholders' Fund Initiative (SFI) was launched to support the smallholders' certification process and to increase smallholders' awareness of the advantages of certification (Pesqueira and Glasbergen 2013).

Smallholders are an important but economically vulnerable production group in palm oil. Their vulnerability is partly due to the characteristics of the commodity: Fresh Fruit Bunch (FFB) or palm oil fruit should be milled within 24 hours after harvest to maintain its quality. As palm oil smallholders often do not have the means to sell and transport their FFB quickly, the quality of their FFB is easily reduced (Colchester and Jiwan 2006, Hanu and Sadjli 2013). Other factors contributing to smallholders' economic vulnerability are uncertainty about market access, price fluctuations in the market, lack of knowledge about maintaining palm oil plantations which reduces their productivity, and their dependency on agents to sell their outputs to mills (Marti 2008, Papenfus 2000).

In the coming years, the claim for a more sustainable production, including that of smallholders, will become even more important. Smallholder oil palm plantations in Indonesia increased from 3,125 ha in 1979 to 3,387,257 ha in 2010 and cover 40% of the total area of oil palm plantations. These areas are predicted to increase continually and reach 4,166,778 ha by the end of 2014 (Directorate General of Estate 2011). Moreover, the Indonesian government is in the process of developing its own sustainability standards and certification scheme called Indonesian Sustainable Palm Oil (ISPO), which will be mandatory, and aims to include the smallholder farmers (Hospes 2014).

Presently, only 3.8% of the 4,415,800 hectare of smallholders' oil palm plantations has been certified (estimated value¹). We can expect that experiences of the first certified smallholders (either positive or negative), on which our study focuses, may have an influence on the willingness of the target group of uncertified farmers to participate in a certification scheme.

This article is structured as follows. In the first section we develop the analytical framework that conceptualizes the relationship between certification and livelihood outcomes. Thereafter we introduce the research field and our research methods. Our

¹The percentage of certified plantation is calculated by comparing total certified (independent and scheme) smallholders' land area with total area of smallholders' oil palm plantation in Indonesia. Certified Independent smallholders in Indonesia: 1,199 ha; certified scheme smallholders in Indonesia: 165,181 ha (Primary data).

research findings are presented in the next five sections. The last section reveals the pattern of relationships that has become visible and reflects on our research findings.

2.2. CONCEPTUAL MODEL

Following van Rijn et al. (2012), who connected the livelihood concept to impact research, we take the livelihood concept as a starting point to analyze the relationships between certification and smallholders' living conditions. We consider the livelihood concept a powerful notion to select and arrange variables and to create order in the conceptual complexity underlying the relation between certification and impact.

The livelihood concept is rooted in development thinking that traditionally focused on production, employment and income to describe poverty levels. This approach was considered too narrow and could not explain the complexity of interacting aspects that influence the situation of the rural poor. The livelihood notion therefore introduced a more comprehensive approach to poverty alleviation (Chambers and Conway 1992, Scoones 1998, Carney 1998, DFID 1999, Ellis 2000) that goes beyond analyzing the economic realities and opportunities of the poor.

Based on the definition of the Department for International Development (DFID), the concept of livelihood comprises the capabilities, assets and activities required for sustaining or improving a means of living (DFID 1999). At the core of the livelihood concept lie the assets (resources) that can be utilized to undertake production, engage in markets, and improve ways of living (Scoones 1998, Utting 2009). Assets are conceptualized as different forms of capital: human, social, financial, natural, and physical capital (Scoones 1998, DFID 1999). Human capital refers to skills, knowledge, and health needed to enable people to pursue different livelihood strategies and achieve their livelihood goals (DFID 1999). Scoones (1998) explains that social capital refers to empowerment, the opportunity to form networks, membership of groups, and relationships. Financial capital comprises all stocks and flows in income, credit, and savings (Scoones 1998, DFID 1999). Natural capital encompasses natural resources including biodiversity, land, and forests. Issues of transport, shelter, water, energy, and communication belong to the category of physical capital (DFID 1999, Scoones 1998, Utting 2009).

These forms of capital provide smallholders the capacity to act and sustain or improve their livelihood. However, all these forms of capital are assumed to be influenced by (a) external factors, referred to as the vulnerability context, which encompasses critical economic trends, shocks and seasonality; (b) transforming structures and processes, such as policies and legislation; and (c) strategies of rural entities, which refers to activities and choices that smallholders make with the intention to improve their livelihood. A livelihood is considered sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natu-

ral resource base (Scoones 1998, Carney et al. 1999). In the sustainable livelihood approach this is indicated with the variable of outcomes, which results from livelihood strategies, and covers the conservation and enhancement of social, environmental and economic aspects.

Although it provides an underpinned interpretation of the potential relationships between certification and impact on living conditions, the sustainable livelihood concept has also been criticized. First, the concept is said to give scant attention to commercial factors such as profitability (Utting 2009) and lacks understanding of economic and market issues (Carney 2003). Second, it does not capture cultural issues, and lacks attention to power relationships, politics (Adato and Meinzen-Dick 2002, Carney 2003, De Haan 2012), and the role of history and historical experiences (Adato and Meinzen-Dick 2002, Carney 2003). In addition, people's priorities and preferences are commonly missing from the framework while they are believed to play a fundamental role in determining livelihood strategies (Ashley and Hussein 2000). Another criticism relates to the inadequate representation of the relation between access to assets and a proper use of assets. Bebbington (1999) emphasized that social capital (indirectly) affects livelihoods because it provides access to resources. However, access to assets is a necessary but not sufficient condition to guarantee sustainable livelihoods, if the productive capacities of farmers are not linked to access to markets (Bitzer et al. 2013).

Taking these criticisms into account, we developed an amended livelihood framework (see Figure 3) that connects certification to livelihood outcomes and addresses the criticisms by including additional variables. In this framework certification intervention is the independent variable and the livelihood outcome is the dependent variable. The framework consists of the following components: (1) the certification intervention; (2) livelihood components which consist of assets, livelihood strategies (activities), and livelihood outcomes; (3) smallholders' priorities and preferences; and (4) external factors.

Based on this conceptual model (Figure 3) we hypothesize that sustainability certification can potentially support smallholders to improve their livelihood. This hypothesis has been further explicated in four assumptions.

- First, and most general, we assume that certification affects assets, which will then be used to perform activities that are expected to create better livelihood outcomes. We operationalized outcomes as increased and stable income, increased market access, conserved and enhanced environmental quality, better health and education, and organizational strengthening.
- Second, we assume that certification may improve livelihoods in three ways: (1) through directly changing the assets of smallholders, such as skills and management practices; (2) through increasing smallholders' access to the global market; (3) through reducing the economic vulnerability of smallholders, understood as the extent to which smallholders are influenced by uncontrolled or limitedly controlled factors such as price volatility.

- Third, we assume that the preferences of smallholders play a role in the intervention process, as they influence choices to decide on what assets to invest, what activities to pursue, and what outcomes to be achieved.
- Fourth, we assume that changes in livelihood should also be understood in the context of external socio-economic factors. Besides the context of the global market and external vulnerabilities, these are the cultural contexts (beliefs, history and traditions), politics, and other regulations.

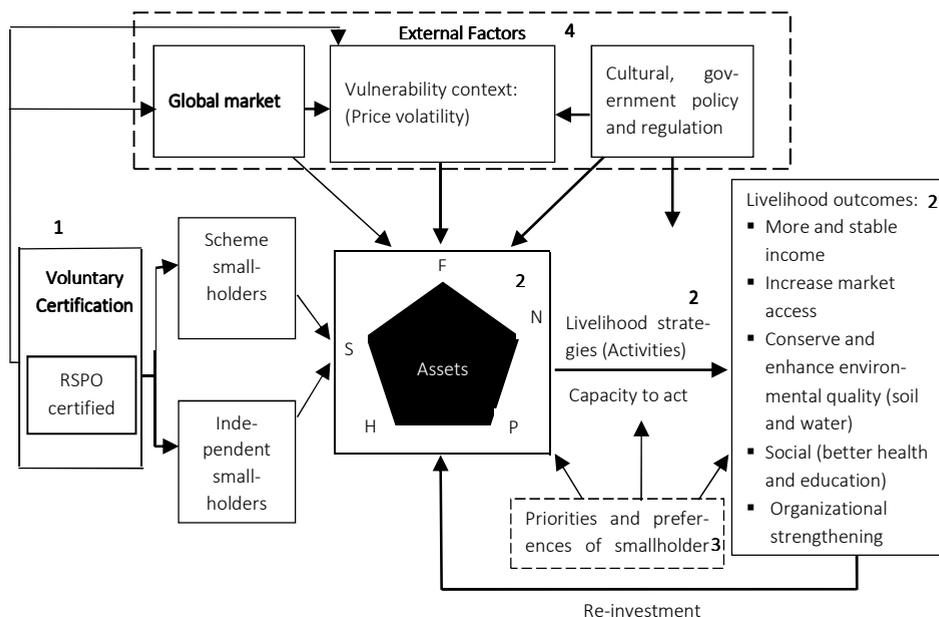


Figure 3. Conceptual framework amended from DFID (1999)

2.3. RESEARCH FIELD AND METHODS

We took the conceptual model of Figure 3 as starting point and comparatively analyzed the role of certification in sustaining and enhancing the livelihoods of two groups of smallholders: scheme smallholders and independent smallholders.

Respondents in the certified scheme smallholders group live in the province of South Sumatera, which is the third most important province in Indonesia in terms of smallholder land-area and an important site of scheme smallholder production of palm oil. Scheme smallholders are structurally bound by a contract or credit agreement to a particular mill or estate. Scheme smallholders are often not free to choose what crop they develop, are supervised in their planting and crop management techniques, and are

often organized, supervised or directly managed by the managers of the mill, estate or scheme to which they are structurally linked (RSPO 2009). Scheme smallholders in our research represent the PT Hindoli/ Cargill Group, which was the first RSPO certified scheme-smallholder group in the world.

The scheme smallholders group consists of 8,797 members and covers 17,594 ha oil palm plantations. Ross (2010) explained that the scheme smallholders in PT Hindoli originate from a government transmigration project (PIR-Trans scheme), which was established in the early 1980s for growing soybean. The soybean project, however, failed and in 1991 PT Hindoli received government approval for the development of oil palm plantations including a plasma (smallholders) plantation establishment. The scheme is financed by PIR-Trans scheme and KKPA (*Koperasi Kredit Primer Anggota* or Cooperative Credit Scheme). PT Hindoli hired “Farmer Development Assistants” who are located in the village in order to train the smallholders. PT Hindoli was taken-over by Cargill in 1995. The smallholder oil palm plantations were planted in the early 1990s and the palms are now mature and in the first cycle.

The respondents from the independent smallholders group are from the province of Riau, which has the highest share of smallholder land-area and smallholder production of palm oil in Indonesia. Independent smallholders are characterized by freedom to choose how to use their lands, what crops to plant and how to manage them. They are self-organized, self-managed, self-financed, and not contractually bound to any particular mill or association (RSPO 2010). We studied the *Asosiasi Swadaya Amanah* group. This is the second largest independent smallholder group in the world and the first RSPO certified in Indonesia (Savi 2013).

There are 349 independent smallholders in *Asosiasi Swadaya Amanah* who have individual agreements with the association to comply with the RSPO certification requirement. *Asosiasi Swadaya Amanah* comprises 10 sub-groups of farmers and covers 763 ha of land. All the palms are in the first planting cycle and matured. Gustomo (2013) explains that the land of *Asosiasi Swadaya Amanah* members was originally obtained via government lease and the land status is officially issued by The National Land Agency in the form of *Sertifikat Hak Milik* or Land Ownership Certificate. This certificate indicates that the land of the association is neither illegal nor under conservation areas. The independent smallholders in *Asosiasi Swadaya Amanah* sell FFB to a partnering mill, specifically Ukui Palm Oil Mill that belongs to PT Inti Indosawit Subur (IIS).

The data collection methods covered semi-structured in-depth interviews, informal discussions, and participant observation and literature studies. The interviews consisted of questions regarding smallholders’ motivation to join the RSPO, the institutional changes the membership induces, and perceived effects of certification on livelihood outcomes. Semi-structured interviews were held with 66 certified smallholders (34 scheme smallholders and 32 independent smallholders). Farmers were selected with the help of representatives of farmers group. To guarantee that the results would not be colored by the influence of (changes in) property rights and livelihood strategies im-

posed by actors outside the certification schemes, we only selected farmers who own and manage their land themselves. Farmers had to be literate and able to communicate in the Indonesian language (Bahasa).

During the time at the villages the first author participated in meetings and also had many informal discussions with farmers about the topic of the research, for example with those farmers that were hesitant to participate in the formal interviews. Additional Interviews were conducted with other stakeholders, such as companies, government actors, farmer organizations, an NGO and experts (see Table 2). These interviews were partly used to verify the results of the interviews with the smallholder farmers.

As the farmer groups are very homogeneous in aspects such as ethnic background, level of education, land area, and start of the plantations, this sample is regarded to represent a normal distribution of the population in the villages; results will not be influenced by significant differences in demographic background. A tabulated pivot table was used to note down whether respondents experienced any relationship between the components of Figure 3, and the type of relationship they experienced. This table was subsequently used as the main basis for deriving our results and conclusions.

Table 2. Interview subjects by affiliation

No	Respondent	Number of formal interviews
Smallholder groups		
1	Independent smallholders from Asosiasi Swadaya Amanah, Riau	32
2	Scheme smallholders from PT Hindoli, Cargill Group, South Sumatera	34
Key informants		
1	Farmer organizations (cooperative, association)	5
2	Government (district, regional and national such as Directorate General of Estate)	6
3	NGO (WWF)	1
4	Expert (Green Palm Company, RSPO Secretariat and researcher)	3
5	Palm oil company (PT Hindoli)	3
	Total	84

2.4. MOTIVATIONS TO PARTICIPATE IN THE CERTIFICATION SCHEME

The two groups of smallholders in our study came to participate in the RSPO with a similar understanding of the potential of certification. For both groups, certification was something new; a program that came from abroad and that was introduced to them by an external actor. In fact, the smallholders were unaware of the philosophy behind sustainability certification and the concept of the RSPO. For them, certification was (and still

is) a set of technicalities that need to be fulfilled to improve their production and get a better price for their FFB. One farmer said:

“RSPO is English, I am Indonesian and I did not go to school. I do not know what the RSPO is. But I do know and do apply the technical things. RSPO obliges farmers to have a land certificate; we are banned to do total spraying.... Obviously, I want to join the RSPO because the RSPO guarantees selling of the certified product ...” (Independent farmer).

Another farmer said:

“... I do not know where the RSPO stands for; after joining the RSPO our oil palm plantation became environmentally friendly because we reduced the use of chemicals For farmers the first and the most important thing is a higher price of the product” (Scheme farmer).

Their motivation to join the certification is related to this unawareness about what the RSPO stands for. Our data show that all smallholders mention financial considerations as their main motive for joining RSPO. Motives related to social and environmental improvements did not play a significant role in their decisions. The smallholders see certification as a marketing tool and not as a tool to create a more sustainable production. In our cases, participation in the RSPO certification scheme was even more attractive as the certification-related costs were covered by external actors; the nucleus company for scheme smallholders and an NGO for the independent smallholders. These motivations give a first indication on how farmers may value the effects of the RSPO on their livelihood, namely, in economic terms.

2.5. ORGANIZATIONAL CONSEQUENCES OF PARTICIPATION IN THE CERTIFICATION

As smallholders cannot directly access certification individually (Bitzer et al. 2013, Brandi et al. 2013), and need support from external actors to comply with the standards (Lemeilleur 2013), participation has implications for the organizational structures within which they work. Regarding the RSPO, the organizational changes also result from the obligation that the smallholders should join a group certification and establish a group manager who is responsible for an internal control system (ICS) to monitor smallholders' performance (RSPO 2013b).

These organizational requirements have different consequences for the groups of smallholders. Scheme smallholders can only enter the market of certified palm oil when the nucleus they are connected to is certified. Their organizational embeddedness does not change that much. For scheme smallholders, certification is led by a group manager coming from the nucleus company. This nucleus company is responsible for the estab-

lishment of internal control mechanisms including the standard operational procedures (SOP) and a 'farmer development' team in order to conduct an internal audit. Figure 4 shows three important actors supporting scheme smallholders to become certified, namely a group manager, the Cooperative/Village Unit Cooperative/*Koperasi Unit Desa* (KUD), and farmer groups.

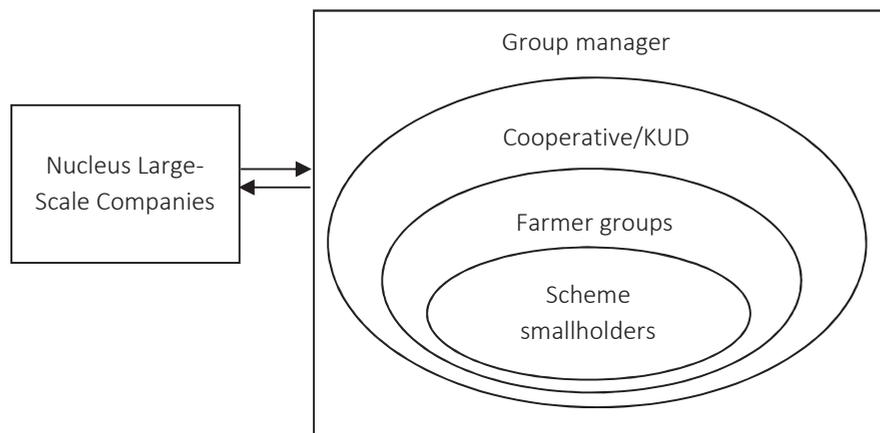


Figure 4. Key actors supporting scheme smallholders to participate in sustainability certification.

Although participation in the certification does not change the scheme smallholders' organizational embeddedness, the roles of the cooperative and farmer groups become more pivotal. After joining the certification, all plantation activities ranging from input supply and credit support to FFB selling, are centralized in a KUD. The KUD also provides a forum for sharing and communicating problems as well as the possible solutions related to palm oil plantation. The KUD, however, cannot manage all individual smallholders directly; farmer groups are important to link the KUD with individual scheme smallholders. The farmer groups are a forum for sharing knowledge and information on a smaller scale. They also supervise all oil palm plantation activities, including fertilizer application, harvesting, sorting, loading and transporting the FFB, and distributing income from FFB selling to farmer members. A post harvesting monitor needs to guarantee traceability of the RSPO FFB from certified smallholders to mills.

The independent smallholders entered the RSPO scheme after being made aware of the certified market by an NGO: WWF Indonesia. The NGO purposefully selected these independent smallholders because -as Java Trans migrants- they already had a long experience with farmer groups and a legal status of their land. The same ethnical background translates into comparable interests and easiness to communicate with each other. The smallholders were also selected because they are located near a conservation area. This is related to the objective of the NGO: conserving biodiversity through the certification of sustainable palm oil plantation management.

Participation in the RSPO certification changes the independent smallholders' organizational structure more fundamentally than for scheme smallholders. Joining certification implies that the smallholders need to select a group manager from the farmers; one who is experienced in managing cooperatives or farmer groups. They also have to organize themselves to establish a quality control mechanism. They need to construct an internal control system (ICS) team for the internal audit and arrange the standard operational procedures (SOP). In the audit process they have to convince the third party auditor about the reliability of the SOP and the capability of managers and the ICS team. Figure 5 illustrates actors that support independent smallholders to participate in the sustainable certification.

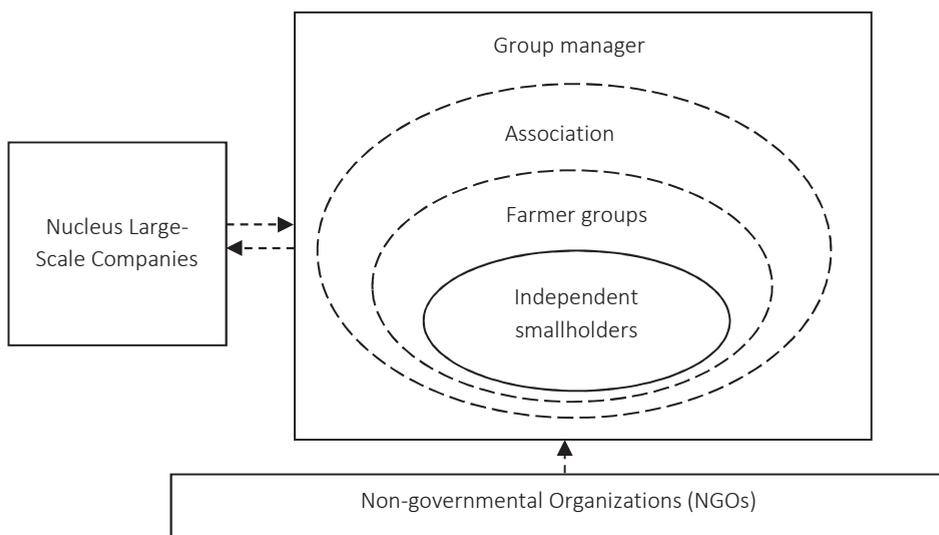


Figure 5. Key actors supporting independent smallholders to participate in sustainable certification

The independent smallholders' cooperative or association has more responsibilities than the scheme smallholders' cooperative. The association is not only responsible for the internal control mechanisms, which is also part of the nucleus company's responsibility for scheme smallholders, but also for selling the FFB, buying production input, and providing credit. In the same way, independent smallholders' farmer groups have more responsibilities than scheme smallholders' farmer groups. The functions of the independent farmer group are not only limited to supervision and knowledge sharing, but also include activities such as coordinating plantation activities to gain benefits from economics of scale.

2.6. EMBEDDEDNESS OF THE SMALLHOLDERS IN NEW DEPENDENCIES

In both cases, participation in the certification put the smallholders in a system of new dependency relationships, which determined their action space. The smallholders are dependent on the other stakeholders to get the RSPO certification and to gain benefit from participation in the certification. In the scheme smallholder case, the dependency on the nucleus company is stronger than before participating in the certification due to the rules of the RSPO. These rules require that certified palm oil growers with a Nucleus Estate Smallholder (NES) scheme are obliged to certify their smallholders within three years after the certification of the nucleus. The nucleus company is directly involved in the certification process; it pays for the RSPO membership and the costs of audits and takes responsibility for capacity building of the connected smallholders (e.g. training and strengthening farmer organizations). The company is also contractually bound to buy certified FFB from scheme smallholders and responsible for the distribution of a premium for Crude Sustainable Palm Oil (CSPO) sales (if buyers can be found who are willing to pay a premium). The new dependency of the scheme smallholders on the company obviously relates to the fact that the company is the one who holds the RSPO certificate.

Different from scheme smallholders, independent smallholders hold their own sustainability certificate. However, although independent smallholders are characterized as independent and not bound by a contract to a nucleus, participation in the certification makes them reliant on external actors. This dependency is triggered by smallholders' demand for, but incapacity to gain, credit, risk management, information, technology, and market access. The independent smallholders in our research became particularly dependent on an NGO: WWF Indonesia. The independent smallholders entered the RSPO scheme after they were made aware of the certified market by the NGO. Furthermore, the NGO socialized the required standards, conducted training, and helped to prepare for the RSPO certification audit. In turn, WWF was funded by the philanthropic Carrefour Foundation, which is concerned about the negative impacts of uncontrolled production of palm oil, to organize trainings.

WWF also facilitated the smallholders to join a company to receive technological help and they have sold their RSPO certificate via the Green Palm trading system, which is the channel to the market of sustainable palm oil, and the way to get a premium fee. The certified independent smallholders can sell their products in two ways. The traditional way is selling the FFB (physical) to a nucleus company/mill. If the FFB has a higher quality than uncertified FFB, the smallholders can get a higher price. However, in this case smallholders are fully dependent on the company. The second way is new and opened by the RSPO certification scheme. RSPO certified palm oil producers can register a quantity of their output with the Green Palm program. It is only through this trading program that the smallholders can sell their certified products to buyers (e.g. consumer goods manufacturers). They are awarded one Green Palm certificate for each ton of

palm oil, which has been sustainably produced. They can then put those certificates up for sale on the Green Palm web based trading platform to get a premium fee (see also <http://greenpalm.org/>).

2.7. BENEFITS OF PARTICIPATION IN THE CERTIFICATION

Although the dependency relations of scheme and independent smallholders change in a different way through certification, the influence on their assets is more or less the same. Direct effects are observable in the assets of social and human capital, as well as some provisions that are related to physical capital. These direct effects are closely related to the new organizational structure, which provides the farmers with the necessary training to become certified. Therefore, these direct effects have already been visible or materialized from the first year of certification and can be identified as short term benefits.

Farmers' organizations are trained by the certification facilitators (companies or NGOs) to better manage their business (including filing data), to better communicate with members, and to build business relationships with the company and input supplier. This contributes positively to farmer's social capital (e.g. increase opportunities for networks and relationships) and human capital (skills and knowledge). The majority of smallholders hold the view that the farmer organization's staff is better trained and their services improved. They also feel that they have more opportunities to participate in the organizations.

Social and human capital is further strengthened through training of farmers in Good Agricultural Practices (GAP), focusing on integrated pest management, limited use of pesticide and spraying, proper fertilizer application, and best harvesting techniques. Furthermore, human capital is improved via trainings on High Conservation Values (HCV) and trainings on the concept of protected animals and Environmental Impact Assessment. At this training, farmers receive ample information on the safe use of chemical pesticides and safe ways to deal with chemical waste. In addition, they are also introduced to healthy and safe working conditions, first aid, and ways to deal with fire (see Ekayani et al. 2015), that, in turn, contribute to better health conditions. Next to that, smallholders get access to elements of physical capital such as safety tools (masks, boots, helmets, gloves and affronts), chemical storage systems, sanitary rooms, waste ponds, and owl nests.

Other assets (natural and financial) are not directly improved through participation in the certification scheme, but indirectly through the process of capacity building. Moreover, these improvements are seen as long term effects that are not visible yet. Although smallholders cannot specify the value, they believe that sustainability certification may preserve natural capital. Our interviews indicate that scheme and independent smallholders, after becoming a member in the RSPO, have undertaken several conservation

activities, which result in positive livelihood outcomes in the area of conserving and enhancing environmental quality, such as planting bamboo or trees to prevent erosion and floods. They also conserve soil and water quality, for example through arranging palm oil midribs in a 'U' shape to reduce erosion, maintain soil fertility, and keep the irrigation channels clear from any obstructions to prevent flooding. Due to better understanding of the harmfulness of pesticides and herbicides to health and biodiversity, the farmers apply a waste management system. They never wash chemical containers in the river, but collect used chemical containers and send them to the cooperative and company to be destroyed safely. Furthermore, farmers use natural predators for eradicating pest by building owl nests and plant *Turnera ulmifolia* and do not hunt protected animals - such as cobra snakes, owls, and *Varanus salvator* (water monitor lizard)- to safeguard biodiversity. The following comment of an independent smallholder is an illustration:

"... Maybe the effects [of certification] on environmental quality cannot be seen yet, because we are recently certified. But at least to reduce land and water degradation we have already applied many activities. We do not apply fertilizer in the dry season and do not wash fertilizer containers in the river to protect animate creatures in the river. In essence, RSPO teaches us to protect our nature...." (Independent smallholder).

A scheme smallholder opinioned:

"... Effects on the environmental quality can be seen if we look at our plantation, which is greener now because we keep weed in our plantation to cover soil and reduce erosion due to surface runoff (rainfall), although it looks messy. Before joining RSPO, we believed that a good plantation is the one that is free from weed, so we applied total spraying with excessive herbicides" (Scheme smallholder).

Certification is also considered to potentially contribute to an increase of smallholders' financial capital and hence to contribute positively to the livelihood outcomes (more income). Within this context, certification is particularly valued by the smallholders because participation increases the volume and quality of their production, which opens opportunities for a higher income. Furthermore, understanding of Good Agricultural Practices encourages them to apply the right fertilizers at the right time and with the right dosage, which also increases the productivity of the plantation. Next, increasing knowledge on harmful chemicals leads the smallholders to reduce pesticide and herbicide use, which reduces the cost of spraying from approximately IDR 900,000 – 1000,000 /ha/year to IDR 400,000 /ha/year (interview with head of independent smallholder association). Also, compared to uncertified smallholders, most certified scheme and independent smallholders believe that they get a higher price for their FFB. This higher price does not so much result from the fact that the FFB is certified, but from the fact that the quality of certified FFB is generally higher than uncertified FFB. In addition, centralization

of plantation activities (including fertilizer application, spraying and selling FFB) increases smallholders' economies of scale that allows to share costs of production, management and transport. Table 3 shows the perception of farmers concerning the effects of certification on price, production volume, costs and income. Based on Table 3, the majority of smallholders perceived participation in the RSPO to positively contribute to price, production of FFB, and income, while decreasing cost of production.

Table 3. Smallholders' perception regarding certification effect on price, production, costs and income.

	Price (%)	Production (%)	Costs (%)	Income (%)
Higher	86	80	11	74
The same	14	17	12	11
Lower	0	2	77	2
Do not know	0	2	0	14

Table 4 summarizes the analysis of our data related to the different types of capital and several dimensions. The first dimension (direct versus indirect) refers to the presence of intervening variables that specify how a given effect occurs between an independent variable and a dependent variable, such as capacity building. The second dimension (short term versus long term) refers to the expected time lag between participation in the certification and effects. The third dimension (visible versus expected) takes the actual presence of results into account.

Table 4. Benefits of certification on smallholders' livelihoods

Assets	1st Dimension		2st Dimension		3rd Dimension	
	Direct	Indirect	Short term	Long term	Visible (materialized)	Expected
Social capital						
Strengthening organization	√		√		√	
Increasing smallholders' trust in organization		√		√		√
Increasing participation in organizations		√		√		√
Increasing connections and networking		√		√		√
Human capital						
Increasing opportunity for training (improving knowledge and skill)	√		√		√	
Better health		√		√		√
Physical capital						
Providing safety equipment and building chemical storage system, sanitary room, waste pond, owl nests and planting <i>Turnera</i>	√		√		√	
Natural capital						
Conserving soil and water quality		√		√		√
Protecting biodiversity		√		√		√
Financial capital						
Increasing income		√	√		√	
Increasing credit access		√		√		√
Premium fee		√	√		√	

2.8. UNCERTAINTIES OF PARTICIPATION IN THE CERTIFICATION

Participation in the certification scheme does not only create benefits, but also new uncertainties that may hamper or counteract the earlier described positive effects of certification on livelihood outcomes. These uncertainties regard the premium fee, price volatility, market access and access to credit.

Premium fee

Certified palm oil smallholders receive an annual premium fee, which is different from premium prices for certified FFB at the farm gate². Smallholders consider the premium fee as a bonus from a company or the Green Palm certificate sales. The amount of premium fee gathered by smallholders depends on their production capacity and (for scheme smallholders) on the affiliated company. Therefore, the policy and ability of the company to access international buyers who are willing to pay a premium fee plays an important role in the amount of premium fee. For independent smallholders, although they are facilitated by an NGO, their capability to negotiate with buyers of GreenPalm certificates determines the amount of premium fee they are able to receive.

The low uptake and slow growth of the Crude Sustainable Palm Oil (CSPO) uptake also influence the extent to which premium fees will be paid to the smallholders. In 2012, the actual volume of the CSPO produced was 6,724,236 tons, while the CSPO sales were 3,479,415 tons, which is only 51.7% of CSPO produced (RSPO 2013a). In 2013, the CSPO uptake did not significantly increase as the market absorbed only 52% of the global CSPO production in that year (WWF 2014). Furthermore, the global market share of CSPO is approximately 6% of the 58 million tons of global palm oil production (RSPO 2013a). WWF (2013) reported that in 2012 CSPO usage by the most important European markets equals 2,534,767 tons, which is approximately 43% of the 6,384,000 tons palm oil usage (Gerasimchuk and Koh 2013). These data show the lack of commitment of international buyers to support the sustainable certification and little possibilities to shift part of the certification costs to the buyer (World Growth 2013). It needs to be seen each year again if buyers are willing to pay a premium fee. This uncertainty becomes higher if more certified palm oil enters the market, while the demand for CSPO is not significantly changing.

²For Independent smallholders, average premium price is approximately \$50/ton FFB, and premium fee is around \$1.82/ton FFB; For scheme smallholders the premium price is managed by the farmer organization, there is no premium fee and premium price directly received by scheme smallholders as additional income (Primary data).

The premium fee is managed by the cooperative (scheme smallholders) or association (independent smallholders) and is used to fund surveillance preparation such as training, safety tools, and ICS wages (for independent smallholders). It can also be used to fund social activities such as building a mosque. Premium fees are thus no direct source of income. The relationship between certification and livelihood outcomes in the financial domain should not be seen merely in terms of the availability of premium fees. Increased productivity and improved product quality more importantly contribute to the higher income of certified smallholders.

Price volatility

Our interviews indicate that price volatility can be considered the most important factor to explain income insecurity. As an illustration, at the end of 2007, smallholders experienced a sharp decrease of FFB price from IDR 2100/kg to IDR 760/kg (for scheme smallholders) or IDR 250/kg (for independent smallholders). This situation significantly decreased the smallholder's income. Smallholders try to cope with this permanent instability in different ways. The majority of the independent smallholders (56%) depends on a cooperative or association and uses savings and loans from the cooperative to temporarily set-off a decrease in income. Around 16% of the smallholders employ non-agricultural activities and 13% has livestock as alternative source of income. The remaining 15% has even more than one income alternative. Different from the independent smallholders, the majority of scheme smallholders uses crop diversification as an income alternative (50%), although many of them still depend on the cooperative (26%) for a loan to fulfill their daily needs when their income decreases. Furthermore, approximately 9% of scheme-smallholders work in non-agricultural activities, 3% has livestock as alternative income, and 12% even has more than one income alternative.

Certification does not change the price volatility the smallholders need to cope with. Because of this we can say that certification –although generally leading to a *higher* income- does not result in a more *stable* income. After becoming certified, smallholders stay (scheme) or become (independent) dependent on the company. Whether the company is willing to pay a higher price for certified palm oil depends on its policy, which may be different for each company. Although the FFB price is, formally and by regulation, the same for scheme smallholders within a region, the incentive for certification is not regulated, which gives more freedom to companies to differ in their prices and limit surplus prices for certified palm oil. Scheme smallholders can, however, not go to another company (that may pay higher prices) because they are bounded to a company by contract. Independent smallholders have more leeway. They are free to decide to whom their FFB will be sold. Their choice is mainly determined by prices (which depends on the number of certified companies), and the distance to mills. However, the characteristic of FFB as a perishable commodity and the limited number of certified mills mostly constrain their choice. Also, independent smallholders tend to avoid risk and prefer to stay

with one mill/company by arranging contracts and building commitment with this company. Here we see that maintaining commitment and social relations (social capital) are sometimes equally decisive for smallholders to engage in a buyer-seller relationship as the chance of gaining higher prices.

Market access

Smallholders do not have much insight into the market and global value chains. They consider the market as a place where they can sell their FFB directly, such as to middlemen (for independent smallholders), or to mill companies (for scheme smallholders). The smallholders perceive palm oil companies as the most important market for them as they pay higher prices than middlemen. Nevertheless, the number of certified mills is still limited; 107 mills (out of 324) are under 34 RSPO certified companies in Indonesia (RSPO 2014). In Pelalawan, Riau where independent smallholders reside, there are only three certified mills and in Musi Banyu Asin, South Sumatera there are only two. Certification limits smallholders' opportunities to access market due to the limited availability of mills.

Scheme smallholders do not consider market access as a benefit of certification. They have a market; the FFB of scheme smallholders must be bought by the corporation. In contrast to the scheme smallholders, independent smallholders perceive an improvement of their market access through increased opportunities for collaboration with companies. The FFB of certified independent smallholders is prioritized over uncertified FFB. Although in a peak season the certified smallholders are still able to sell their FFB easily. Therefore, independent certified smallholders do not need to spend extra transport costs and time to find alternative buyers. Furthermore, they can avoid deterioration of FFB quality and depreciation costs due to the time lag between harvesting and milling.

Access to credit

Regarding access to credit, our research shows different results for scheme and independent smallholders. Our interviews indicate that the majority of independent smallholders (66%) do not observe an improvement in access to credit after joining RSPO. However, most of the scheme smallholders (59%) do experience better access to credit. Independent smallholders believe that access to credit is not influenced by participation in the certification, but by membership of a farmer organization; 56% of the independent smallholders rely on farmer groups, cooperatives or associations for their credits compared to 26% of the scheme smallholders. In contrast to independent smallholders, scheme smallholders believe that access to credit is affected by participation in the certification scheme because it increases income and therewith their ability to repay loans.

Moreover, better record-keeping and management of cooperative and farmer groups indicate the improvement of organizations' transparency. As a consequence, banks or other financial institutions have more trust in them and are more willing to provide loans.

2.9. ON THE ROLE OF GOVERNMENTS

Our data show that external factors, such as the difficult access to the global market and vulnerability in terms of price fluctuations, do not change significantly with certification. Our research findings also indicate that government programs that are intended to improve smallholders' livelihood (for example through increasing oil palm productivity by providing palm oil seeds and subsidized fertilizers) do not succeed in doing so either. This can be explained by limited information and/or access of the smallholders to these programs and the fact that some of these programs are not even known by the smallholders. Training arranged by the government is only available to farmers who have just established new plantations or those who request training, which hampers the continuous development of human capital. Furthermore, and in line with Gauthier (2000) our study indicates that in the view of the smallholders, the policies often do not reach the poorest farmers due to limited budget allocation and bureaucracy. Improvements in infrastructure for example, are limited to village roads (*jalan desa*), while agricultural roads (*jalan usahatani*) that are crucial to transport FFB) have to be established by the smallholders themselves. The smallholders in our research view the role of the government as non-responsive and even an obstacle to participate in the certification scheme. Because of complicated checks and approvals all smallholders face a lot of difficulties to receive the Cultivation Registration Certificate (which is one of the RSPO requirements) showing that they comply with the national and local regulations. The following comment by the association management illustrates this:

“Cultivation Registration Certificate (Surat Tanda Daftar Budidaya/ STD-B) is very important after the Land Ownership Certificate (Surat Hak Milik/ SHM). The process is difficult because we need verification from the District Plantation Office and it should be signed by Head of the District Government... There has not been any support yet from the government... I think they only see oil palms as a matter of business...”

2.10. CONCLUSIONS

To better understand the potential of sustainability certifications for improving the livelihood of Indonesian smallholder farmers we developed an amended sustainable livelihood framework as a conceptual model for our empirical study.

In accordance with the study of van Rijn et al. (2012), who studied the impacts of coffee certification from a livelihood perspective, our research reveals that capacity building plays a vital role. Certification encourages the transformation of an unorganized, fragmented and uncontrolled plantation production into an organized one. First, certification requires organizational changes that are a condition to participate in the certification. Second, through the organizational structures the smallholders get access to training, valuable relationships, and technology, which secures their ability to comply with the prerequisites, but also to improve their production methods.

Organizational and technological changes induce a higher production quality that may benefit smallholders indirectly and financially. We found that certification, as a tool to create a more sustainable agriculture is not fully understood by the smallholders. Rather, certification is seen as an economic tool in the pursuit of a better livelihood. Smallholders participate because they have to (scheme smallholders) or because certification is introduced by trustful people who open opportunities for higher incomes (independent smallholders). Non-economic benefits of certification such as social and environmental improvements are less valued by the smallholders unless they lead to economic benefits.

Consistent with the findings of van Rijn et al. (2012), our study reveals that participation in the certification does not change the farmers' dependency relations, nor their economic vulnerability and access to the market (scheme smallholders). Smallholders do not have much insight into the price setting of their products and they are still subject to unpredictable price fluctuations. There is also uncertainty about the uptake of certified palm oil in the market as well as the premium fees. Furthermore, the governmental programs designed to improve smallholder livelihood rarely reach them. Neither have the difficulties that result from smallholder alignments with certification programs become visible enough to influence the governmental programs designed to improve them.

Different from earlier research has focused on the impacts of certifications on the environmental, social, and economical effects of sustainability certification (see for an overview Blackman and Rivera 2011, Von Hagen 2011), our research provides some first insights into the relationships between these impacts. These findings have led us to hypothesize that the ethical aspects of sustainability must be better aligned with the economic interests of the (Southern) farmers or the certifications will likely lead to a weakly institutionalized practices.

This need to better accommodate the economic interests of the farmers will probably increase with more smallholders are certified whereas the demand for certified palm oil is not growing. Currently the overproduction of certified palm oil of about 50%; and many markets are not interested in buying certified palm oil if the price is higher than conventional palm oil a similar trend is seen among other agricultural commodities certification (KPMG Sustainability 2013).

This study examined two smallholder groups that are culturally homogeneously. Naturally, certification more difficult if the farmers do not share similar backgrounds as group belongingness and organizational identity are essential components to cohesiveness and willingness to work together in a group towards a shared goal. Cultural diversity and its impact on certification schemes in an underexplored topic in the current research. Such knowledge might further improve our understanding and potential for schemes to induce more sustainable livelihoods.

Also, the scope of this research did not examine the outcome and relationships of uncertified smallholder groups, the difficulties in compelling them to participate in a certification scheme; and analyzing strategies to incorporate them while improving the livelihood effects of participation in sustainability certification.

Last, our research was focused on actors at the bottom of the value chain. However, these value chains are not power-neutral. As Bitzer and Glasbergen (2015) observed, with certification smallholder farmers need to change their production processes in a context of existing resource and power asymmetries. Their relative vulnerable position may influence the farmers' ability to cope with uncertainty inherent to participation in a certification scheme. Therefore, we suggest exploring the connection between the 'horizontal' livelihood framework and the logics of a 'vertically' organized agricultural value chain (see also Vellema and van Wijk 2014).

Chapter 3

On the profitability of sustainability certification: An analysis among Indonesian palm oil smallholders

POSITIONING CHAPTER 3

Chapter 3 answers the following research questions:

1. *To what extent and in what way is sustainability certification profitable for Indonesian palm oil smallholders?*
2. *Following from the fact that certification costs are currently paid by the affiliated miller companies or donors we question: Is certification still profitable for Indonesian palm oil smallholders if they had to pay all certification costs themselves? If not, how much premium fee would then be necessary to make certification profitable for the smallholders?*

Economic profitability is at the core of chapter 3 in which we analyze the profitability of private palm oil certification through the use of Cost-Benefit Analysis (CBA) and the assessment of Net Present Values (NPV). Understanding the investment value of certification adoption can be used by policy makers or certification providers to bring in more smallholders and to make certification more beneficial for the generally vulnerable smallholders. The results indicate that certification is currently profitable for different types of Indonesian palm oil smallholders. The extent to which certification can be considered profitable depends on the smallholders' pre-conditions. If smallholders had to pay the certification costs on their own, certification is not profitable for scheme smallholders and only remains profitable for independent smallholders when they continue to receive premium prices. If premium prices are however removed, the independent smallholders may need unrealistically high premium fees for certification to remain profitable in this scenario. Next to certification, we found that the organization of farmers around miller companies contributes positively to their profit, even before certification takes place. Therefore, investing in farmer organizations and linking organized farmers to companies may be an effective form of government involvement.

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3.1. INTRODUCTION

If we consider monetary returns in relation to investments, oil palm is one of the most attractive commodities for smallholders, also compared to crops like cassava, rice, and rubber (Subervie and Vagneron 2013, Brandi et al. 2015). Although the expansion rate of oil palm plantations in Indonesia is slowly decreasing from 11% in 2009 to 7% in 2013 (Statistik Indonesia 2014), the total land area of oil palm plantations owned by smallholders in Indonesia still increases every year. Oil palm plantations contribute positively to the economic situation of smallholders by reducing unemployment and poverty, particularly in rural areas (WWF 2013, World Growth 2011, Blackman and Guerrero 2012, McCarthy, Gillespie, and Zen 2012). Notwithstanding these positive effects, the expansion of palm oil plantations is not undebated as many studies also discovered negative effects of oil palm plantations on the environment and social position of smallholders (McCarthy et al. 2012). More specifically, palm oil expansion is said to contribute to deforestation, greenhouse gas emissions, and land conflicts (Fitzherbert et al. 2008, Obidzinski et al. 2012).

Increasing awareness of international buyers about sustainability problems related to the production of agricultural commodities has led to the emergence of private sustainability certification standards (Jena et al. 2012, Basu et al. 2004), such as the Roundtable on Sustainable Palm Oil (RSPO). These standards can be seen as new governance models (Glasbergen 2013) and alternative steering instruments for governmental regulation to overcome the downside effects of agricultural production (Oosterveer et al. 2014).

The RSPO, as one of the most important organizations for sustainability certification (Offermans and Glasbergen 2015), was established in 2004 (Preusser 2015) and initially targeted large-scale producers (Schouten and Glasbergen 2011, Silva-Castañeda 2012). However, 42% of the Indonesian palm oil producers are smallholders who together own 4.42 million ha of oil palm plantations (Statistik Indonesia 2014). Although palm oil certification has a potentially positive effect on smallholder's livelihoods, certification does not improve smallholders' vulnerable position or market access (Hidayat et al. 2015). There are two types of oil palm smallholders in Indonesia (Brandi et al. 2013): the scheme smallholders, who are tied to a palm oil company through formal partnerships that also provide the farmers with technical assistance, and the independent smallholders, who operate independently and without assistance from palm oil companies. Although both groups are differently institutionalized, they face comparable challenges to enroll in certification (Brandi et al. 2013), which puts them in a marginalized position from the sustainable palm oil market (Pichler 2013, Asfaw et al. 2010). These challenges include the lack of capacity and knowledge regarding compliance to the standards, the lack of organization and incentives to become involved, and high certification cost (Brandi et al. 2015). Therefore, even though the establishment of the RSPO took place

more than a decade ago already, only 3.8% of the total Indonesian smallholders are certified (Hidayat et al. 2015).

Acknowledging the importance of smallholders in the oil palm production, the RSPO developed many sub-programs intended to bring in more smallholders in the certification. Examples are the Smallholder Task Force (STF) and the RSPO Smallholders Support Fund (RSSF) (Pesqueira and Glasbergen 2013). Furthermore, the Indonesian Sustainable Palm Oil (ISPO) sustainability standard that was developed by the Indonesian Government, is now mandatory for large-scale companies, and will become mandatory for smallholders in 2022 (for more information see Hospes 2014, Schouten and Bitzer 2015, Hospes and Kentin 2012).

Earlier research shows that financial benefits are the main motivation of smallholders to participate in sustainability certification (Hidayat et al. 2015). So far, it however remains unclear whether the new practices that go together with palm oil certification, present better profit. We argue that, for smallholders, certification adoption may be seen as an investment project that should offer tangible financial benefits in order to consider participation in it. Next, it is not only the present profitability of palm oil certification that remains unclear, but also the potential future profitability. The latter is particularly uncertain because certified smallholders are currently dependent on companies or NGOs to pay the certification costs (Hidayat et al. 2015, Bitzer et al. 2013), and to provide the farmers with a premium fee. Both forms of support can however not be guaranteed into the future, and changes may result in consequences for smallholder's profit, making certification adoption less attractive.

To this end, this study analyses whether or not certification is profitable for Indonesian palm oil smallholders. We defined two research questions: (1) to what extent and in what way is sustainability certification profitable for Indonesian palm oil smallholders? (2) Following from the fact that certification costs are currently paid by the affiliated miller companies or donors we question: Is certification still profitable for Indonesian palm oil smallholders if they had to pay all certification costs themselves? If not, how much premium fee would then be necessary to make certification profitable for the smallholders?

A way to analyze the profitability of palm oil certification is to use cost-benefit analysis. This analysis assesses the profitability of an investment project or program (Campbell and Brown 2003) as an aid for decision making (Zerbe and Dively 1994). It provides information on whether or not a particular project is worthwhile (Campbell and Brown 2003, Prest and Turvey 1965) given present resources and expected future outputs and by comparing costs and benefits in the case of project adoption and in the case wherein the project will not be adopted, or will be adopted in a different way. This approach helps to better understand the investment value of certification adoption. This information, on its turn, can be used by policy makers or certification providers to bring in more smallholders and to make certification more beneficial for the generally vulnerable smallholders.

First we present information from previous studies on profitability of certification adoption (section 3.2), that results in our conceptual framework to assess profitability of the sustainability certification, which is presented in section 3.3. Sections 3.4 and 3.5 introduce the research methods, study sites and characteristics of the smallholder respondents. Our findings are presented in section 3.6 to 3.8, before turning to the conclusion in section 3.9.

3. 2. LITERATURE REVIEW

There are several studies on the economic effects of certification. Most of them however focus on the effects of certification on gross income. For example, Méndez et al. (2010) who indicate positive effects of certification on gross income, or Ruben and Zuniga (2011) and Ruben and Fort (2012) who use a so-called Propensity Matching Score to compare differences in gross income between certified and uncertified farmers. Other impact studies compare differences between certified and uncertified farmers by looking at the revenues (e.g. incomes) minus the costs of production. Some authors refer to this as profit (Valkila 2009, Blackmore et al. 2012), others as net income (Bacon et al. 2008, Jena et al. 2012), or gross margin (Beuchelt and Zeller 2011, Bachmann 2012). Although these studies use the same concept, they show conflicting results. Bachmann (2012), Bacon (2010), Blackman and Rivera (2011), and Blackmore et al. (2012) for example, conclude that certification contributes to higher profits for farmers. Bacon et al. (2008), Beuchelt and Zeller (2011), Valkila (2009), however, argued that the economic effect of certification is not clear and dependent on the type of certification, the price of uncertified commodities and the existence and size of a price premium. Jena et al. (2012) in their study about the profitability of coffee certification even reveal a negative contribution of certification to net income. The above presented studies share one important limitation as they only focus on production costs and therewith neglect the costs of certification in their calculations. Therefore, these studies can be expected to present an incomplete understanding of the effects of certification on profitability.

Studying the profitability of sustainability certification while including the costs of certification is not entirely new, but results from existing studies often conflict. Some studies pointed out that certification adoption is profitable for farmers (Nuva et al. 2013, WWF 2012), while other studies revealed that certification adoption is not profitable (Simula et al. 2004, Wangrakdiskul and Yodpijit 2013, Beall 2012) or only reaches a break-even position (Victor et al. 2010). To calculate the size of benefits and costs, some studies (Nuva et al. 2013, Wangrakdiskul and Yodpijit 2013, Simula et al. 2004) use Net Present Values (NPV), which refer to the discounted value of the returns minus the discounted value of the costs of investment projects (Campbell and Brown 2003). Others

(Beall 2012, WWF 2012), use numbers for input, yield and price to calculate benefits, and some (Victor et al. 2010, Beall 2012) conduct scenario studies.

Nuva et al. (2013) conducted a cost-benefit analysis to assess the profitability of Eco-labelling for Indonesian coffee smallholders, concluding that certified plantations generated a higher NPV than non-certified plantations. Victor et al. (2010) explored the future profitability of Rainforest Alliance certified Cocoa in Ghana. They developed several scenarios for the use of inputs, farm gate prices and yields, and different parameters for technology advancements and the use of shade trees. Their results show that Rainforest Alliance certification may only reach a break-even point. Simula et al. (2004) also investigated the profitability of forest certification for Brazilian, Indonesian and Malaysian companies, showing different profitability results depending on the location and the initial performance of the adopters. The implementation of forest certification is profitable for companies in Malaysia and Indonesia, while it is not financially feasible in Brazil due to the high investment costs.

Regarding profitability of palm oil certification, WWF (2012) investigated the financial costs and benefits of RSPO compliance in Indonesia and Malaysia. They studied ranges for costs and benefits and did not use an aggregate measurement (such as NPV, IRR and ROI) and solely looked at certification costs and benefits without comparing these with costs and benefits of non-certified farmers. They conclude that the annual certification costs range from \$1.19 to \$34.66 per smallholder per hectare and that the annual benefit equals 9.4 to 26.9 MT yield improvement (WWF 2012). They indicate that certification adoption is profitable as the benefits generally outweigh the costs of implementation.

Beall (2012) also used the concept of profitability to measure monetary effects of palm oil certification on smallholders in Thailand. Beall (2012) simply subtracted the average costs of certification from the average income (per hectare/year) in one specific year. However, she neglected investment costs and possible long-term benefits, such as the effects of yield improvement. She did however consider different scenarios for premium fee, yields and fertilizer costs in her analysis. The study points out that certification is only financially viable if smallholders receive a premium fee higher than US\$ 13.34/ton crude palm oil (CPO), if certification increase yields, and if fertilizer costs decrease.

Where Beall (2012) analyzed the profitability of certification in one random year, Wangrakdiskul and Yodpijit (2013) performed a cost-benefit analysis of RSPO certification for Thai smallholders based on 5 years. Wangrakdiskul and Yodpijit (2013) conclude that the prevailing premium fee of \$15/ ton CPO is not enough to make RSPO certification a profitable project for farmers. The standard may however become profitable if training costs and certification costs decrease by 30% and if the premium price increases by 20%.

These limited numbers of studies about the profitability of oil palm certification have some limitations. First, none of these studies assess the profitability of non-certified palm oil smallholders. This is however crucially important as smallholders will only consider certification adoption if it results in higher net profits compared to their profit as

non-certified smallholder. Second, only parts of the certification costs are included in their analyses. Previous studies, for example, do not include investment costs, such as the cost for capacity development, membership fees, the establishment of waste management systems, and safety tools into their calculations. Therefore, it is not unlikely that the results of these studies give a too positive impression of the profitability of certification. Third, previous studies only assess the profitability of palm oil certification for one year net return (Beall 2012), or for one certification project life cycle (5 years, see Wangrakdiskul and Yodpijit 2013). Average oil palm plantations however, have a long lifespan of about 25 years (Pahan 2008). Zooming in on a specific period of the plantation neglects variations in productivity resulting from the age of the oil palms. This may lead to misleading conclusions, e.g. too low if the plantation under analysis is very young or too high if the plantation is in its most productive stage. Considering these limitations, we identify the need for a cost-benefit analysis to assess the profitability of palm oil certification for smallholders' by comparing certified and non-certified farmers, considering the investment costs and the entire oil palm plantation lifecycle.

3.3. CONCEPTUAL FRAMEWORK

Profitability is commonly defined as the ability of an investment project to earn a return from its use (Howard and Upton 1953) and generally implies that benefits are, or income is, higher than the costs. Following earlier research revealing financial benefits as the most important motivation for smallholders to participate in certification (Ibnu et al. 2015, Hidayat et al. 2015, Ibnu et al. 2016), we have an additional requirement to speak of profitability as certified smallholders need to earn more profit than non-certified smallholders. To decompose all costs and benefits of palm oil certification we developed a conceptual framework (see Figure 6), which adopts four starting points:

First, the profitability of certified and non-certified oil palm plantations depends on: (1) investment costs, such as the cost of establishing the plantation and purchasing agricultural equipment, (2) operating costs, like the costs for fertilizer and labor, and (3) benefits resulting from the revenues of selling Fresh Fruit Bunch (FFB). Certified farmers have additional costs related to certification, but also additional benefits in the form of a premium fee (resulting from the certificate) and, for the certified independent smallholders, a premium price (resulting from higher quality FFB).

Second, we assume that profitability may be influenced by governmental policies or programs such as fertilizer subsidies, and relationships between farmers and market chains, for example in the form of contract farming (Simmons et al. 2005) or, specifically for Indonesia, Nucleus Estate Smallholder schemes (NES).

Third, we also assume that social economic characteristics, such as relatively high education, long experience, good access to agricultural extension programs, tenancy,

and the presence of non-farm income may contribute to smallholder's profit (Rahman 2003).

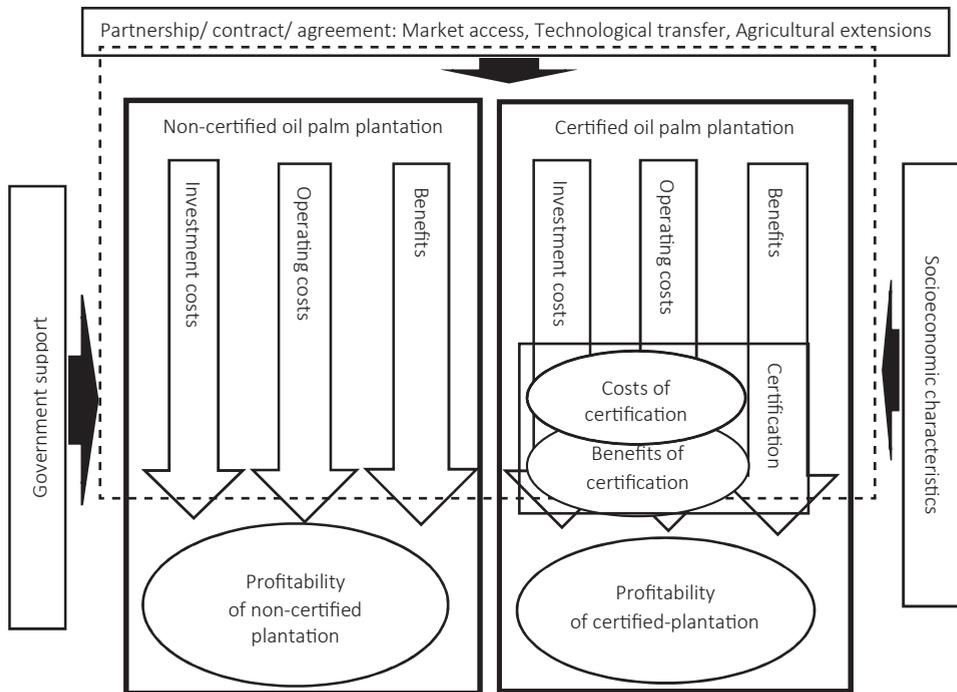
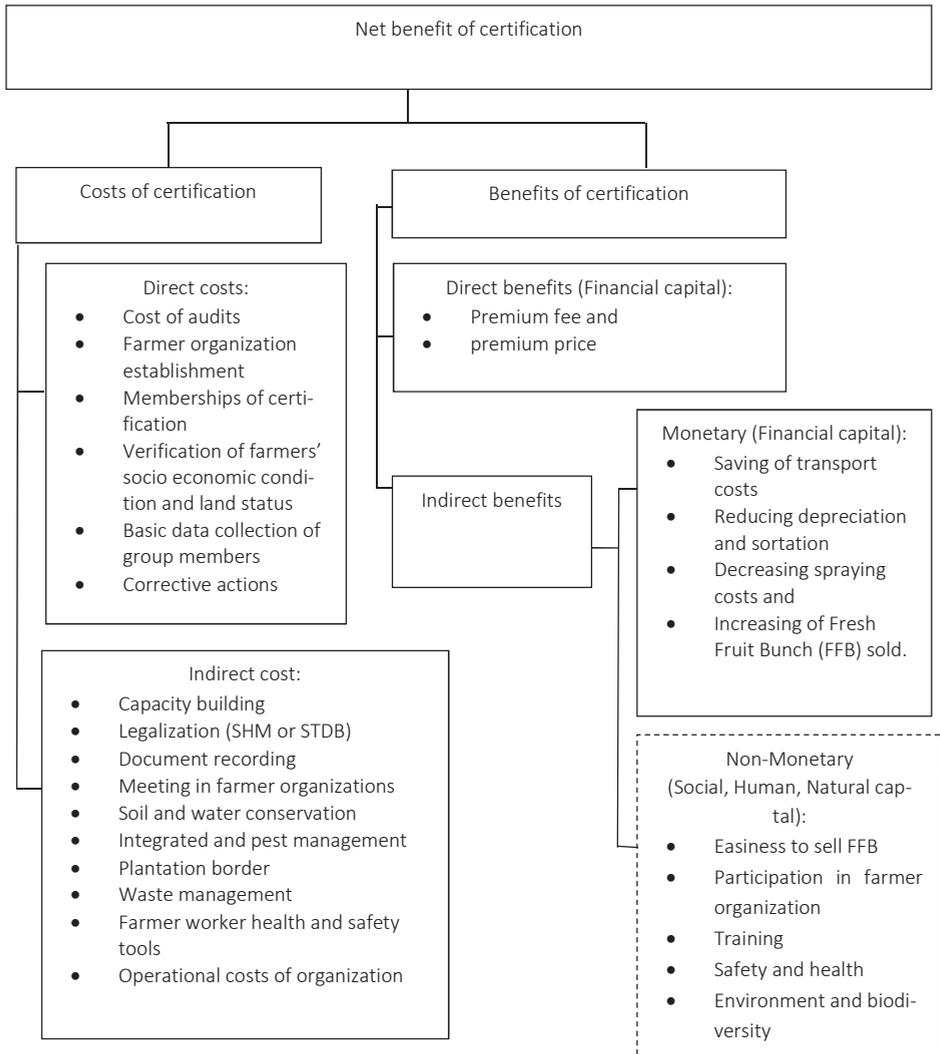


Figure 6. Conceptual framework to assess profitability of certification adoption

Fourth, following Simula et al. (2004), we distinguish between direct costs and benefits and indirect costs and benefits of certification (see Figure 7). The direct costs refer to all costs associated with the certification process, such as the auditing costs and costs to prepare for the certification process. Indirect costs result from activities that are required as part of the certification, such as document recording, and the costs for soil and water conservation.

Direct benefits are monetary benefits directly resulting from certification (premium fee and premium price). The indirect benefits consist of monetary benefits (e.g. cost reductions resulting from economies of scale, higher revenues following better FFB quality, and reductions in FFB depreciation resulting from better harvesting practices and post harvesting treatments) and non-monetary benefits. The latter relate to human capital (for example, better knowledge), social capital (e.g. participation in farmer organizations) and natural capital (e.g. better environmental quality) (see Hidayat et al. 2015 for more information).



Source: adopted from Simula et al. (2004)

Figure 7. Monetary costs and benefits of the certification adoption

3.4. RESEARCH METHODS

In order to assess the profitability of certification adoption, we interviewed five groups of smallholders: (1) certified scheme smallholders, (2) non-certified scheme smallholders, (3) certified independent smallholders, (4) non-certified independent smallholders and (5) prospective independent smallholders. Prospective smallholders are non-

certified independent smallholders who are in the preparation phase to become certified. Although they do not comply to all standards yet, they can be considered to be organized around a miller company already, and therefore generally receive higher prices for their products compared to non-certified independent smallholders. The surveyed smallholder groups were selected using cluster sampling techniques. We interviewed 214 smallholders, 50 being drawn from each of the certified and noncertified groups (both scheme and independent) and 14 from the prospective smallholders. To guarantee data reliability we conducted interviews aimed at verification of the data with 7 informants: the head of a farmer association (N=1) and cooperative (N=1), plantation workers (N=2), experienced smallholders (N=2), and a Nucleus Company representative (N=1).

To analyze whether certified smallholders gain more profit than non-certified smallholders, we calculated and compared the Net Present Value (NPV) of all smallholder groups³ through a two-step approach. In the first step we calculated the present nominal values of costs and benefits based on interviews with farmers. In these interviews we asked the farmers about the quantity of their FFB production/ *kapling* = 2ha/ year, the latest price received for their FFB, and the latest input costs.

To estimate past and future costs and benefits, we asked the farmers to specify quantities of products used and sold in the past⁴ and we approached quantities of products in the future by interviewing farmers and agronomist palm oil experts. These quantities are multiplied with current prices to specify past and future costs and benefits in cash flow.

Directly summing up these values to calculate the overall NPV of a plantation for its entire lifetime would neglect the influence of time preference. Therefore, in the second step we corrected all costs and benefits resulting from the first step- for time preference. We multiplied the numbers for costs and benefits that resulted from the first step by the compounded interest factor for the years in the past till the present time. We multiplied values in the future by the discount factor for the years between the current plantation's age and 25 years. The used formula of NPV equals:

$$NPV = \sum_{t=0}^n PVB_t - \sum_{t=0}^n PVC_t \quad (1)$$

$$NPV = (\sum_{t=0}^z PVB_t + \sum_{t=z}^n PVB_t) - (\sum_{t=0}^z PVC_t + \sum_{t=z}^n PVC_t) \quad (2)$$

$$NPV = \sum_{t=0}^z (PVB_t - PVC_t) + \sum_{t=z}^n (PVB_t - PVC_t) \quad (3)$$

³ Alternative methods to measure the profitability of certification exist, for example, modelling the same smallholders with and without certification based on data about what changes as a result of certification. Although also offering relevant results, it may neglect profit-related factors that only apply to one specific group of smallholders (independent, scheme or prospective). Therefore we decided to follow the approach as suggested in this article.

⁴ Different from prices, farmers record quantities of products used and sold in a detailed way.

Where,

PVB_t = Present value benefit year-t; where compounding⁵ is used if $0 \leq t \leq z$ (for the past, and discounting⁶ is used if $z < t \leq n$ (for the future)

PVC_t = Present value cost year-t; where compounding⁷ is used if $0 \leq t \leq z$ (for the past), and discounting⁸ is used if $z < t \leq n$ (for the future)

t = year-t

z = age of the plantation (representing the present point of time)

n = project life time (25 years, based on the economic life-time of oil palm trees)

r = real discount rate (5.58 %)⁹

Following our earlier mentioned interpretation of profitability we consider certification profitable if the NPV of certified farmers is higher than the NPV of non-certified farmers (see Figure 8). However, to be sure that differences in NPV can be attributed to certification, we included three control variables that are largely believed to influence profit in our analysis:

Socio-economic characteristics to control for the potential effects of education, experience and the receipt of governmental support on profits. These characteristics were included in a regression analysis¹⁰. We define the average of last year's monthly profit (B-C) as dependent variable whereas the independent variable of certification refers to the level of compliance with the certification standard (1=non-compliance/ uncertified, 2=in the process to certification, but not fully certified yet and 3=full compliance/ certified) (CERT). Subsequent independent variables include: government support (GOV_USED), education (EDU), experience (EXP), income from other activities than oil palm plantation (OTH_I), status of smallholders/scheme or independent smallholders (STATUS), ownership of other oil palm plantations (OTH_LAND), and productivity per *kapling* (PROD). The equation of the regression analysis equals:

⁵ $PV = PastValue * Compound\ interest\ factor$; where $Compound\ interest\ factor = (1 + r)^{t-z}$ if $z \leq t \leq n$; FT = future value, PV=Present Value, t=year-t, z=age of plantation (in the year of observation), n=project life time of the plantation

⁶ $PV = FV * Discount\ factor$; where $Discount\ factor = 1/(1 + r)^{z-t}$ if $0 \leq t \leq z$; PastV = Past value, PV=Present Value, t=year-t, z=age of plantation (in the year of observation)

⁷ See footnote 5

⁸ See footnote 6

⁹ We use real interest rates (real discount rate) because we also used constant or current prices to estimate past and future benefits and costs in step 1 (instead of nominal prices). The real interest rate is calculated by subtracting inflation rates from nominal interest rates: 12% (based on the average (nominal) commercial credit interest in Indonesia in 2014) - 6.42% (based on average of inflation rate in 2014) = 5.58%

¹⁰ Although we see that it may be reasonable to include the age of a plantation as independent variable, it could not be done for this case, as we have already included the experience of farmers (in years) as an independent variable. The majority of farmers are under their first plantation cycle. Therefore, the plantation's age and the farmers' experience are—in almost all cases— similar. Including both would result in severe multicollinearity problems. The selection of variables results from the literature overview provided in section on the conceptual framework and relies on Simmons, Winters, and Patrick (2005), Rahman (2003)

$INCOM_MON = f(CERT, GOV_USED, EDU, EXP, OTH_I, STATUS, OTH_LAND, PROD)$

If the variable certification (CERT) significantly influences last year's monthly profit (B-C), we can conclude that certification explains variation in profitability.

Organization. To see whether differences in NPV mainly result from certification or from a better organizational structure in which the certified farmers are embedded, we included the NPV of prospective independent farmers (who are organized already, but not certified yet) in our analysis. We calculated the NPV values for this group and performed an independent T-test to statistically compare the differences in profit between the different smallholder groups.

Pre-condition before certification. Hidayat et al. (2015) observed that certified smallholders may have been better off in terms of productivity before they became certified compared to non-certified farmers. In a first step, we therefore used the independent T-test to compare the productivity of certified smallholders before and after certification adoption. If this test indeed reveals no significant differences between the productivity before and after certification adoption, we can conclude that the certified smallholders have been better off, and continue to control for the influence of productivity on profitability by defining the NPV of a so-called preliminary group. This group comprises certified smallholders that are treated as non-certified by leaving out all costs and benefits directly related to certification. In Figure 8, the criteria for profitability that are adopted in this study are summarized.

The second research question considers the profitability of certification in the case that smallholders have to pay the costs of certification themselves. Although external stakeholders, i.e. companies, NGOs, and other donors, currently pay certification costs for the farmers, the long-term continuation of this support is uncertain (Hidayat et al. 2015). This issue was addressed by complementing the NPV with a sensitivity analysis (Campbell and Brown 2003, 195) in which we included certification costs and premiums as critical variables. We performed the sensitivity analysis under a so-called self-funded scenario, which is the scenario wherein certified smallholders pay all certification costs themselves (while maintaining the premium prices and fee). For the certified scheme smallholders we consider it likely that they will receive the premium fee themselves in the self-funded scenario; i.e. if they have to pay the costs themselves, they will also receive the benefits themselves. Other institutional arrangements between smallholders and their nucleus company do not change in the self-funded scenario. This implies that the nucleus company remains responsible for providing agricultural assistance (training), monitoring and paying the RSPO membership fee (as in the RSPO, the out-grower smallholders are part of the company and registered under the company's name). Compared to the procedure followed to answer the first research question, we included the certification costs in the calculation of the NPV for the certified farmers. Next, we also included the benefits from receiving premium fees in the calculation of the NPV of certified scheme smallholders.

	NPV non certified within the same category (a=scheme/ b=independent)	NPV prospective independent c	NPV without within the same category (d=scheme/ e=independent)
NPV certified scheme (A)	Profitability of certification for scheme smallholders (O) = (A-a)	NA	Profitability of certification for scheme smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification (R) = (A-d)
NPV certified independent (B)	Profitability of certification for independent smallholders (P) = (B-b)	Profitability of certification for independent smallholders corrected by influence of organization on profit (Q) = (B-c)	Profitability of certification for independent smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification (S) = (B-e)
The adoption of certification is profitable for the smallholders if O, P, Q, R and S are positive.			

Figure 8. Criteria for profitability: Certification is profitable if the certified NPVs are higher than the NPVs of the controlling groups (i.e. non-certified smallholders, prospective smallholders and preliminary smallholders (those who were better off already before joining certification))

If the results of the sensitivity analysis show that certification is not profitable under the self-funded condition, we employ a switching value analysis to determine the size of a minimum premium fee to make certification profitable. To also consider uncertainties regarding the provision of premium prices, that heavily depend on company policies, we calculate the size of the premium fee in two situations: (1) premium prices are available and (2) premium prices are not available. Premium prices are paid per ton CPO or Palm Kernel Oil (PKO). Based on interviews with employees from the nucleus companies and heads of independent smallholder associations we equal 1 ton of the scheme smallholders' FFB to 21% CPO and 5% PKO, and 1 ton of the independent smallholders' FFB to 19.4% CPO and 2% PKO.

3.5. STUDY SITES AND CHARACTERISTICS OF THE SMALLHOLDER RESPONDENTS

This study was conducted in two important oil palm producer regions in Indonesia, i.e. Riau and South Sumatra. These study sites were purposely selected as the first certified

independent smallholders and the first certified scheme smallholders reside in Riau and South Sumatera respectively. The non-certified and certified smallholders were selected within the same district and therefore located in vicinity of each other. Almost all scheme smallholders and certified independent smallholders are Javanese ex-transmigrants, while the non-certified independent smallholders consisted of Javanese migrants and locals (Melayunese and Bataknese).

Most smallholders are between 41 and 60 years old and have more than 15 years' experience in managing oil palm plantations; 89% of the respondents are men and most smallholders have had a low education. For 96% of the smallholders, palm oil encompasses their main source of income. The average land area owned by the certified scheme smallholders equals 3.90 hectare (ha) and does not differ substantially for the non-certified scheme, certified independent, and non-certified independent smallholders, as their land ownership covers 3.21 ha, 3.87 ha and 3.82 ha respectively. The prospective smallholders own, however, relatively smaller plots: 2.21 ha on average. Approximately 33% of the smallholders own both independent plantations and scheme plantations, while 42% of the respondents solely own independent plantations and 25% only scheme plantations. The smallholders who own both types of plantation are treated either as independent or scheme smallholder, based on the status of their farmer organization.

All plantations covered by this research are matured, although the average age of the plantations differs between the smallholder groups. The scheme smallholder's plantations are relatively old (22 years in the case of the certified scheme smallholders, and 25 years for non-certified scheme smallholders), which implies that their productivity will steadily decrease. The plantations of the independent smallholders are younger: 15 years on average in the case of the certified independent smallholders and 13 year for the non-certified smallholders. This means that these plantations are currently on, or just before, the top of their productivity. As we consider and calculate the profitability of the entire palm oil plantation life-span ($t=25$, see section 3.4 on research methods) these differences in the plantations' age will be considered in our study and therefore not bias our results.

3.6. PROFITABILITY OF PALM OIL CERTIFICATION UNDER ACTUAL CONDITIONS

Our profitability analysis suggests that oil palm certification is currently profitable for scheme and independent smallholders. The NPV of certified scheme smallholders is 35% or \$48,919.72 higher than the NPV of the non-certified scheme smallholders. For independent smallholders, certification is even more profitable as the NPV of certified independent smallholders is 89% or \$39,279.38 higher than for the non-certified independent smallholders (Table 5). Although the certified scheme smallholders can be consid-

ered the most profitable palm oil farmer group, the independent smallholders relatively gain most when they become certified (e.g. a 89% increase in profit).

Table 5. Net Present Values of smallholders' oil palm plantations

No.	Type of smallholder	Certification	NPV (\$)
1	Scheme	Certified	187,854.23
2	Scheme	Non-certified	138,934.52
3	Independent	Certified	83,603.19
4	Independent	Non-certified	44,323.81
5	Independent	Prospective non-certified	62,368.45

The certified scheme smallholders have a higher NPV than the non-certified scheme smallholders because they have higher benefits (32%) and lower operating costs (9%) (See Table 6 and Table 7). The higher benefits result from higher productivity, and following from this, higher FFB sales. The productivity of the certified scheme smallholders reaches on average 25 ton/year/ha, whereas the non-certified scheme smallholders produce around 19 ton/year/ha. The certified scheme smallholder's premium fee is received and managed by the farmer organizations that also pay the certification costs. In terms of operating and investment costs, the certified scheme smallholders pay relatively lower costs than the non-certified scheme smallholders (see Table 7). This results from the lower costs for the plantation's establishment and lower costs for spraying. The latter can be explained by referring to their centralized plantation management system that allows benefiting from purchasing large quantities for lower prices and changing agricultural practices that require less chemical usage.

Table 6. Benefits of the oil palm smallholders, average value per year^{11,12}

Smallholder group	FFB selling (\$/year/ <i>kapling</i>)	Premium price (\$/year)	Premium fee (\$/year)	Total benefit
Certified scheme	6,492.39	-	-	6,492.39
Non-certified scheme	4,900.45	-	-	4,900.45
Certified independent	4,950.64	197.14*)	60.00*)	5,207.78
Non-certified independent	3,037.33	-	-	3,037.33
Prospective independent	4,280.38	177.02*)	-	4,457.40

Note: *) The average is counted by considering the period in which the smallholders have adopted the certification: for the scheme smallholders this equals 6 years and for the independent smallholders 13 years.

The difference between the NPV of the certified and non-certified independent smallholders' results from higher benefits, and not from lower costs as was the case for the scheme smallholders. A higher productivity, resulting from changing practices, again explains why certified independent smallholders have higher benefits than the non-certified independent smallholders. (On average, the productivity of the non-certified smallholders equals 12 ton/year/ha, compared to 15 ton/year/ha for the prospective smallholders and 17 ton/year/ha for the certified independent smallholders). Moreover, a stronger organization opens opportunities for the certified independent smallholders to bypass middlemen through directly selling their FFB to a Miller Company. This results in higher selling prices that lie around \$17 (per ton FFB) higher than the prices for FFB received by the non-certified smallholders. Additionally, the certified independent smallholders receive a premium price of about \$5/ton FFB (average premium price of the last year) or \$197.14/year/*kapling* from the Affiliated Miller Company. The sale of Green Palm certificates (i.e. premium fees) offers another \$60.00/year/*kapling* to the certified independent smallholders. The prospective independent smallholders do not receive premium fees from the Green Palm certificate sales yet, but they do benefit from higher FFB prices as they are already affiliated to a miller company (see Table 6).

¹¹ The average is counted by considering the period in which the smallholders have adopted the certification: for the scheme smallholders this equals 6 years and for the independent smallholders 13 years.

¹² Standard deviation: overall=28%; certified scheme=14%; non-certified scheme=20%; certified independent=17%; prospective independent=29%; non-certified independent=34%

Livelihood resilience of Indonesian palm oil smallholders: An analysis among different types of smallholders with and without certification

Table 7. Costs for Indonesian oil palm smallholders, average value per year¹³

Costs structure	Certified scheme	Non-certified scheme	Certified independent	Non-certified independent	Prospective independent
Investment costs	351.27	389.37	388.85	293.26	271.47
Land	-	-	226.04	197.10	164.03
Agricultural Equipment	74.78	79.18	85.64	51.96	51.96
Plantation establishment	276.49	290.53	47.37	32.88	39.10
Land clearing	-	-	22.02	9.68	9.94
Rehabilitation of Plantation	-	7.93	-	-	-
FFB collecting place	-	11.73	7.78	1.63	6.44
Contribution of farmers to association /costs of certification	-	-	30.75	-	31.78
Operating costs	1,390.34	1,529.85	1,439.04	1,020.78	1,341.39
Plantation maintenance					
Spraying	76.12	176.51	102.45	138.46	158.54
Irrigation and <i>tapak kuda</i> ¹⁴ maintenance	7.97	22.62	5.26	39.75	-
Fertilizer application	442.14	469.04	744.05	629.38	665.94
Pruning	88.66	103.01	73.24	70.14	36.42
Management Fee	16.08	112.49	80.68	-	71.11
Road maintenance	45.77	16.08	54.80	-	77.74
Harvesting	385.85	358.59	192.59	143.05	125.93
Weighing	-	59.99	40.34	-	35.56
Transportation costs	327.76	211.52	145.63	-	170.16

The cost structure also differs between scheme and independent certified farmers (see Table 7). Whereas the certification costs of the scheme smallholders are paid by the affiliated Miller Companies, the certified independent smallholders pay the certification costs themselves. The results furthermore indicate that certified independent smallholders have higher investment- and operating costs compared to their non-certified counterparts. This can be explained by the fact that non-certified independent smallholders generally have a lack of capital (Molenaar et al. 2013), therefore, they often used low quality of seedlings, limited agricultural equipment e.g. manual weeding tools,

¹³ Coefficient of variation (CV): overall=28%; certified scheme=11%; non-certified scheme=22%; certified independent=15%; prospective independent=24%; non-certified independent=42%. The CV for non-certified independent is relatively high due to variation in input use, as a consequence of differences in capital ownership. It further implies higher CV of profit gained by non-certified independent smallholders.

¹⁴ *Tapak kuda* (horseshoe) is a technique of soil and water conservation in oil palm plantation which located on sloped areas (3°-28°)

no adequate safety tools, and they apply land clearance with slash and burning, which is commonly done by family labor. Moreover, non-certified independent smallholders are not organized, and therefore do not have to pay management fees. Next, although bypassing middlemen may result in higher FFB prices, it may also reduce income for the independent smallholders, as the middlemen pay for the post-harvesting expenses of non-certified independent smallholders (e.g. transportation costs). In addition, due to the lack of capital the non-certified independent (Molenaar et al. 2013), smallholders generally use lower amounts of fertilizers and commonly use family labor for pruning and harvesting, which further reduces their monetary costs. Only some operating costs (e.g. spraying and irrigation) are higher for the non-certified independent smallholders than for the certified independent smallholders as the former generally apply blanket spraying (or total spraying), which is banned by the RSPO, and involves higher costs. Irrigation costs only play a minor role in explaining differences in profit as it is only applicable to young plantations; maintenance is however applicable for the entire plantation life time.

3.7. CONTROLLING THE RELATION BETWEEN CERTIFICATION AND PROFITABILITY FOR ORGANIZATION, SOCIO DEMOGRAPHIC CHARACTERISTICS, GOVERNMENTAL SUPPORT AND PRE-CONDITIONS

Although the results in section 3.6 seem to indicate a positive relationship between certification and profit, we want to verify this relation through a regression analysis wherein we also include other variables (see the section 3.4, on research methods). First, the regression analysis (see Table 8) shows that certification significantly and positively contributes to smallholder's profit ($P=0.001$). Second, the inclusion of an organization variable in the profit analysis for the independent smallholders indicates that the organized (non-certified) independent smallholders obtain significantly more profit than the non-certified smallholders ($P=0.011$, see Table 5). The profit may further increase if the smallholders fully comply with the certification ($P=0.013$, see Table 9). Certification therefore seems to be an important vehicle to increase profit in the sense that it opens opportunities for better organization in relation to the Miller Companies, and for better access to training. Better organization ultimately leads to benefits in terms of higher FFB prices and improved productivity.

Table 8. The results of the regression analysis: we observe significant effects of certification, status and productivity on profit

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-	174.651		-5.479	0.000		
Certification ¹⁵	113.190	33.034	0.080	3.426	0.001	0.624	1.603
Other income	-34.908	140.793	-0.005	-0.248	0.804	0.892	1.121
Other land outside current land	29.493	61.158	0.010	0.482	0.63	0.773	1.294
Experience	-6.773	3.93	-0.034	-1.724	0.086	0.845	1.184
Education	7.079	8.951	0.015	0.791	0.43	0.977	1.024
Productivity per <i>kapling</i>	126.738	3.326	0.899	38.107	0.000	0.607	1.647
Dummy Government Support ¹⁶	33.682	63.884	0.012	0.527	0.599	0.628	1.592
Status ¹⁷	183.258	68.683	0.067	2.668	0.008	0.542	1.845

F-test=344.377; R2=0.931; Prob-F=0.000

Third, Table 8 shows that smallholders' profit is not influenced by governmental support and socio-economic variables such as education, experience, ownership of other plantations, or having alternative sources of income. Certification, status and pre-condition before certification productivity, however, significantly influence smallholder's profit. The significant and positive relation between certification and profit validates our argumentation in section 3.6. The significant effect of status refers to the fact that scheme smallholders (both certified and non-certified) gain significantly more profit than the independent smallholders. This can be explained by referring to the scheme smallholders' higher productivity, the higher prices for their FFB, and the technological support they receive from their NES Company. Further, Table 8 shows that productivity is the most important variable explaining variation in the smallholders' profit. The higher the productivity of the smallholders, the higher their profit.

¹⁵The scores describe the level of compliance with the certification standard (1=non-compliance/ uncertified, 2=in the process to certification, but not fully certified yet and 3=full compliance/ certified)

¹⁶ Dummy government support: 1=receive government support; 0=do not receive government support

¹⁷ Status: 1=scheme smallholders; 0=independent smallholders

Table 9. The results of the T-test analysis for fertilizer expenses, productivity, price, and profit among small-holder groups

	certified vs. non-certified Independent smallholders		Prospective vs. certified independent smallholders		prospective vs. non- certified independent smallholders		non-certified vs. certified scheme smallholders	
	Sig. (2- tailed)	Mean Difference	Sig. (2- tailed)	Mean Difference	Sig. (2- tailed)	Mean Difference	Sig. (2- tailed)	Mean Difference
Fertilizers expenses (\$)	0.002	194.6123	0.383	-57.7739	0.06	136.8384	0.281	-55.5086
Productivity (ton/kapling/year)	0.000	13.0732	0.003	-7.3866	0.055	5.6866	0.000	-6.89
Price (\$/ton)	0.000	17.84	0.601	-0.14	0.000	17.7	0.866	0.167
Profit (\$/kapling/year)	0.000	1799.282	0.013	-882.924	0.011	916.3584	0.000	-1223.4

Fourth, and following from the important role of productivity in explaining profit, we analyzed the potential influence of pre-condition before certification productivity on profit. Table 10 indicates a significant difference in productivity before and after independent smallholders become certified. We can say that, for the independent smallholders, their productivity and therefore also their profit goes up as a result of certification. For the scheme smallholders, however, we could not identify significant differences in productivity before and after the adoption of certification. This result indicates that the certified scheme smallholders may have been better off already before they joined the certification.

Table 10. The result of T-test analysis of the certified smallholders before and after the certification adoption

	Scheme smallholders (before and after)		Independent smallholders (before and after)	
	t-test for Equality of Means		t-test for Equality of Means	
	t	Sig. (2-tailed)	t	Sig. (2-tailed)
Productivity	1.271	0.219	3.966	0.002
FFB sale ^{*)} (Revenues)	1.096	0.287	4.221	0.001

Note: *) It is analyzed based on price in 2014

Figure 9 (last column) subsequently shows the effects of certification on NPV corrected for the fact that (scheme) smallholders were already better off in terms of productivity before they adopted certification (see previous paragraph). The results show that the certified scheme smallholders still increase their profit by adopting certification, although the additional profit is relatively low (0.06%).

	NPV non certified within the same category (a=scheme/ b=independent)	NPV prospective independent c	NPV without within the same category (d=scheme/ e=independent)
NPV certified scheme (A= \$187,854.23)	(a= \$138,934.52) Profitability of certification for scheme smallholders	NA	(d= \$187,742.55) Profitability of certification for scheme smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification
	(O)=(A-a)= \$48,919.72		(R)=(A-d) = \$111.68
NPV certified independent (B= \$83,603.19)	(b=\$44,323.81) Profitability of certification for independent smallholders	(c= \$62,368.45) Profitability of certification for independent smallholders corrected by influence of organization on profit	(e= \$81,320.65) Profitability of certification for independent smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification
	(P) = (B-b)= \$39,279.38	(Q)=(B-c)= \$21,234.73	(S)=(B-e)= \$2,282.54
The adoption of certification is profitable for the smallholders if O, P, Q, R and S are positive.			

Figure 9. Summary of profitability of the certification adoption under actual condition

Figure 9 shows that under the actual condition, where smallholders do not (fully) pay the costs of certification, certification adoption is profitable for all types of smallholders. Certified actors have a higher NPV than the uncertified actors. Although productivity and organization play a role in explaining differences in profit as well, certification still contributes positively to the smallholder's profit, also for well-organized non-certified smallholders with a relatively high productivity. To what extent the certification can be considered profitable depends on the initial performance of the smallholders as adopters e.g. productivity, and their status (scheme or independent).

3.8. ON THE SELF-FUNDED CONDITION: PROFITABILITY OF THE CERTIFICATION ADOPTION

Under the self-funded scenario, in which the smallholders pay all certification costs themselves, certification adoption will still be profitable for the independent smallhold-

ers, but not for the scheme smallholders who were already better off at the moment they become involved in certification (see Figure 10). The NPV of certified independent smallholders in this scenario is still much higher (i.e. 84%) than for the non-certified independent smallholders. The well-organized independent smallholders also still receive 31% higher profits (about \$19,308.82 in terms of NPV) if they fully adopt certification. Scheme smallholders with a low initial productivity improve their profitability by 35% in the self-funded scenario. However, for the scheme smallholders who have been better off (i.e. who had a high initial productivity), certification will not be economically appealing if they have to pay all certification costs themselves. Even if they receive the present premium fees, certification adoption will not be profitable as the scheme smallholders' NPV decreases by 0.14% (equal to \$259.65).

	NPV non certified within the same category (a=scheme/ b=independent)	NPV prospective independent c	NPV without within the same category (d=scheme/ e=independent)
NPV certified scheme (A= \$ 187,482.91)	(a= \$138,934.52) Profitability of certification for scheme smallholders	NA	(d= \$187,742.55) Profitability of certification for scheme smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification
	(O)=(A-a)=\$ 48,584.39		(R)=(A-d) = \$ (-259.65)
NPV certified independent (B= \$ 81,677.28)	(b=\$44,323.81) Profitability of certification for independent smallholders	(c= \$62,368.45) Profitability of certification for independent smallholders corrected by influence of organization on profit	(e= \$81,320.65) Profitability of certification for independent smallholders corrected by all factors that might influence yield and profit such as age of plantation, agricultural practices used; only consider direct costs and benefits of certification
	(P) = (B-b) = \$37,353.47	(Q) = (B-c) = \$19,308.82	(S) = (B-e) = \$356.63
The adoption of certification is profitable for the smallholders if O, P, Q, R and S are positive.			

Figure 10. Profitability of certification adoption in the self-funded scenario

Table 11 further specifies the certification costs for scheme and independent smallholders in the self-funded scenario. These costs are much lower for the scheme smallholders (56%) than for the independent smallholders. This results from the fact that some costs are necessary to be paid by independent smallholders but not by the scheme

smallholders (for example data verification costs, certification group establishment (Association), RSPO membership costs, compliance to legal aspects (Cultivation Registration Certificate/*Surat Tanda Daftar Budidaya*/STDB) and the operating costs of farmer associations). Moreover, due to the connectedness of scheme smallholders with their Nucleus Company, some certification costs, like the costs of training and internal audits, can be saved as they are taken up by the Nucleus Company.

Table 11. Annual costs of certification adoption in the self-funded scenario

Costs of the certification component	Certified scheme*) (\$/year)	Certified independent*) (\$/year)
Direct costs	44.75	65.94
Audit implementation	0.23	-
Capacity building and training	-	13.49
Data verification	-	0.22
External audit	44.35	37.03
Follow up audit	0.18	8.02
Internal audit	-	3.25
organization establishment	-	2.86
RSPO membership	-	1.07
Indirect costs	56.07	164.82
Document recording	36.00	5.89
Environmental and biodiversity standard compliance	6.24	2.60
Farmer organization meeting and for independent smallholders also incentive for ICS	8.10	130.92
Legal aspect compliance (STDB/ Cultivation Registration Certificate)	-	7.76
operational costs of organization	-	5.82
Social standard compliance	5.74	11.84
Total Costs of the certification per year	100.83	230.76

Note: *) The average is counted by considering the period in which the smallholders have adopted the certification: for the scheme smallholders this equals 6 years and for the independent smallholders 13 years.

In the scenario we assume that not the farmer groups, but the smallholders receive the premium fees and prices (see section 3.4). This implies that the certified scheme smallholders receive a premium fee in the worth of \$37.35/ year, while the certified independent smallholders maintain their \$197.14/year premium price and \$60.00/year premium fee (Table 12).

Table 12. Benefits of certification in the self-funded scenario

Smallholder group	Premium price (\$/year)	Premium fee (\$/year)
Certified scheme	-	37.35*)
Certified independent	197.14*)	60.00*)

Note: *) The average is counted by considering the period in which the smallholders have adopted the certification: for the scheme smallholders this equals 6 years and for the independent smallholders 13 years.

To transform certification into a profitable investment project for the scheme smallholders in the self-funded scenario, a minimum premium fee of \$8.6/ton CPO, which is roughly twice as much as the fee that is currently received by the scheme smallholders' organization (\$4/ton CPO), is necessary. The minimum premium fee decreases if the scheme smallholders adopt certification from the beginning of the plantation period, as this may allow costs to be distributed over a longer period. In the case of early adoption, a minimum premium fee of \$8.5/ton CPO is necessary to maintain the same profitability compared to the pre-condition before certification (break-even point). As this is still a significantly higher amount compared to the current fees, it is questionable whether certification will be profitable for scheme smallholders in the self-funded scenario.

In the long-term, the receipt of a premium price is uncertain as it relies on the policies of affiliated companies to provide an incentive for independent smallholders of being certified and applying the best management practices. If the independent smallholders do not receive premium prices anymore, but nonetheless pay all certification costs themselves, certification adoption is no longer profitable for them: the NPV will go down by 5%. In this case, the independent smallholders need to receive a minimum of \$29.7/ ton CPO to reach the break-even point. Considering the rate of the actual premium fee for independent smallholders, which reaches \$15/ton (Wangraskiskul and Yodpijit 2013), the sustainability certification may only be profitable for independent smallholders if they receive a premium fee that is 93% higher than the actual premium fee. However, this seems to be an unrealistic situation, particularly as the supply of Crude Sustainable Palm Oil (CSPO) is already much higher than the demand, leading to an oversupply of 55%¹⁸. Given this oversupply, it is unlikely that premium fees will increase dramatically. Therefore, certification will likely not be profitable for independent smallholders in the self-funded scenario wherein premium prices will be cut.

3.9. BEYOND DIRECT MONETARY BENEFITS

Next to monetary benefits, certification contributed positively to non-monetary aspects. These aspects include ease of selling FFB, participation in farmer organizations, access to knowledge and training, better safety and health, environmental conservation and biodiversity.

After joining the RSPO, the independent smallholders perceive better access to a miller company, which made it easier to sell their FFB. However, for scheme smallholders, certification does not contribute to better market access, because they are already con-

¹⁸ CSPO production in 2014= 11,909,121 tonnes; CSPO uptake in 2014= 5,349,666 tonnes (<http://www.rspo.org/about/impacts>)

tractually bound to a miller company from the moment they join the Nucleus Estate Smallholder (NES) scheme.

Both independent smallholders and scheme smallholders argue that certification enhances the exchange of knowledge and participation of smallholders in farmer organizations. Farmer organization meetings are attended more frequently by certified scheme smallholders compared to non-certified scheme smallholders. Similarly, the participation of certified independent smallholders in farmer organizations increases after they become certified. Through these regular meetings, members have the opportunity to become informed about activities undertaken by the farmer organization, which contributes to transparency and accountability, and about recent developments in, or affecting, the palm oil sector.

Further, certification is believed to improve the safety and health of farmers, both for the independent and scheme smallholders. The farmers are, for example, required to use safety tools and instructed on how to use safer equipment. The health condition of the farmers is checked regularly and health care expenses are covered by cooperatives or associations. The latter does not only lead to better health, but also to lower expenses (around \$11.67 - \$ 158.13 for medical expenses and \$26 - \$120 regarding the redundancy of an income-free recovery period after accidents that may occur without certification).

Certification also creates awareness about the importance of environmental conservation (Brandi et al. 2013). Certified farmers arrange the palm oil midrib in the plantation in a specific way, planting Bamboo or other trees along the river and do not apply chemical substances along the river side to reduce erosion and pollution of waterways. Almost all certified scheme and independent smallholders apply soil and water conservation techniques, which they evaluate as a positive effect of certification.

Protecting biodiversity is one important objective of the RSPO and was –among other causes- threatened by illegal hunting practices. However, we found that most smallholders, also those who are not certified (yet), do not hunt protected animals. The smallholders prefer to use natural predators to get rid of unwanted species, but, in alignment with Brandi et al. (2013), we found that certification increases knowledge about integrated pest management (IPM). Therefore, besides leaving useful animals, such as mice-eating snakes, in their plantation, certified scheme- and independent smallholders tend to plant *Turnera ulmifolia* (yellow alder) as a habitat for natural predators consuming bagworms (moths damaging oil palm trees), and build owl nests as a natural way to contribute to eradicating pests. The protection of biodiversity implies that the smallholders use less chemicals in their plantation. It, therefore, contributes to a better health and prevents soil degradation ultimately contributing to sustained long-term income.

3.10. CONCLUSION

This paper contributes to our understanding of the profitability of palm oil certification for Indonesian smallholders and to methodological and conceptual advancements in the academic field of sustainability certification. Our conceptualization of certification as a profitable investment project is rather novel as it not only considers the profit resulting from certification, but also compares this profit to the profit of non-certified actors. Smallholders will only consider certification adoption if they can increase their profit compared to their current, non-certified situation. Methodologically we presented a procedure to include a more realistic range of costs and benefits for both certified and non-certified farmers. By doing so we also considered direct and indirect costs and benefits of certification, as well as the entire lifespan of a plantation. Neglecting the entire lifespan may lead to misleading conclusions as a plantation's productivity, and therefore profit, strongly depends on its age. Next, some costs that mainly apply to young plantations (e.g. irrigation), may be neglected if the analysis only considers matured plantations. Given these novelties, this research can be considered to offer a clearer and more nuanced picture of the profitability of sustainability certification.

Under the actual condition, in which the smallholders do not pay the certification costs, certification adoption is profitable for all different types of smallholders (scheme smallholders and independent smallholders). To what extent the adoption is profitable depends on the smallholder's conditions before they adopt the certification. In the self-funded scenario wherein smallholders pay all certification costs themselves, certification remains profitable for smallholders except for scheme smallholders who were already better off before certification. Certification might still be profitable for them if they would receive premium fee \$8.6/ton CPO. However, as this amount is twice as much as what is currently received by their organization, we doubt whether certification will ever be profitable for these smallholders in the self-funded scenario. For independent smallholders, premium prices turned out to be crucial to speak of certification as a profitable investment project in the self-funded scenario. A collapse of premium prices implies that the independent smallholders would need \$29.7/ ton CPO premium fee to reach a breakeven position. This amount of fee is however twice as much as the current premium fee. Considering the current oversupply of sustainable palm oil (SPO), it seems that an 100% increase in premium fee is not realistic. Therefore, it is very unlikely that certification remains profitable for independent smallholders if they do not receive premium prices anymore in the self-funded scenario.

The practical relevance of this study is two-fold. First, it may support the RSPO's intention to bring in more smallholders. The results indicate that in the present situation, certification is financially profitable for all types of smallholders. Given the fact that financial considerations are among the most important drivers for smallholders to join certification, communication of the results may result in higher smallholder adoption rates and make smallholders decide to invest upfront costs with the prospect of higher

profits. Although investment costs for independent smallholders can be substantially limited by making use of hand-tools and family labor, the time needed to develop a well running plantation will be relatively high. It may be good to smoothen the access of independent smallholders to credit. We have also seen that certification adoption is not only profitable for farmers with young plantations, but also for farmers with old plantations (20-25 years). This indicates that certification as an investment project already offers tangible benefits in the short term. What we have furthermore seen is that certification (although still being profitable) does not significantly contribute to a better productivity for the scheme smallholders. The explanation is that these smallholders were already better off in terms of productivity before they became involved in the certification process. The question why the certification process with its trainings and focus on Good Agricultural Practices (GAP) does not succeed to increase the productivity of this group of smallholders needs further investigation. Possibly, the plantation's age may play a role in this, or the level and intensity of trainings that are (sometimes) already provided to scheme smallholders by the affiliated companies.

Second, it may contribute to better targeting certification programs (privately e.g. RSPO and publicly e.g. ISPO) for the benefit of the smallholders. We furthermore found that the organization of farmers around a miller company significantly contributes to higher profits. Such an organization assures higher FFB prices, lower costs, and better opportunities to structurally sell FFB. In the current structure, however, it is impossible for independent smallholders to become organized around a miller company without being in the process towards certification. Certification in this scenario will still be profitable, but also implies a rather long and sometimes difficult process to comply with all formal requirements. Organization on the other hand, would be a faster less complicated process if it is focused around an agreement between farmer groups and a miller company. Investing in organization may therefore be an effective form of government involvement, especially as our results indicate that governmental provision of seeds and fertilizer does not contribute to farmer's profits. A further exploration of the ineffectiveness of current governmental programs to increase profits, and the potential role of the government in organizing farmers around miller companies, would be an interesting topic for further research. Furthermore, if certification will turn out to be a self-funded project, it is absolutely crucial that premium prices will be maintained. Otherwise, certified farmers will need unrealistically high amounts of premium fee, which most likely implies that certification adoption will no longer be profitable.

This study reveals the importance of relations between farmer organizations, certification and the ability of farmers to improve their profit. However, the exact interrelations between these components, as well as their effects (individually, but also holistically) on smallholder's livelihoods remain unclear. Particularly the question whether strengthening the organization of farmers, without certification, would contribute significantly and positively to the smallholders' livelihoods, and how and to what extent certi-

fication could potentially play an additional role in this, deserves further investigation. An example of such a study applied to coffee certification can be found in Ibnu et al. (2016).

In next research, it may also be interesting to investigate how profit would change if the institutional arrangements between certified scheme smallholders and their affiliated companies would change (and if smallholders would really pay all costs, including RSPO membership fees themselves). Methodologically, our approach could benefit from a more longitudinal approach in which we do not only calculate real quantities, but also real costs and benefits during the entire life time of a plantation. This approach would then also ask for the inclusion of different scenarios for discount rates as these are inherently uncertain and depend on global and national developments in economy (for example inflation) and politics. Moreover, stricter selection on sampling bias may be applied for example by considering information and knowledge flows about certification, ownership of mixed plantations (scheme and independent smallholders' plantation) to gain better insight in spillover effects. In addition, it might also be important to monetize non-market costs such as opportunity costs of smallholders to actively involve in organization, and non-market benefits of certification such as environmental improvements, and better health and to internalize them in the calculation of economic cost-benefit analysis. By doing so, we approach the potential benefits of certification on a national/public scale instead of solely on an individual scale.

Chapter 4

Livelihood resilience of Indonesian palm oil smallholders: An analysis among different types of smallholders with and without certification

POSITIONING CHAPTER 4

Chapter 4 answers the following research question:

How and to what extent does participation in certification improve the livelihood resilience of different types of palm oil smallholders?

Chapter 4 further extends the sustainable livelihood framework to also include smallholders' resilience to stresses and shocks. This chapter analyses the livelihood resilience of five different types of palm oil smallholders in Indonesia and assesses the correlations between certification and livelihood resilience. This chapter intends to contribute to the development of livelihood resilience studies by empirically applying and verifying a livelihood resilience assessment framework. Our results show that palm oil smallholders are relatively resilient to price declines, haze resulting from forest fires and climate related effects of El Nino. Differences in resilience resulting from different shocks and between the different groups of smallholders are relatively small. Certification and collaboration with companies are identified as favorable conditions for livelihood resilience. The terminated NES system allowed smallholders to meet these favorable conditions. A few new initiatives, such as FAIR company-community partnerships and ISPO may provide similar opportunities for smallholders.

This chapter was written in collaboration with Astrid Offermans and Pieter Glasbergen, and has been submitted to Regional Environmental Change.

4.1. INTRODUCTION

Palm oil smallholders are a vulnerable category of actors in the palm oil value chain. First, because they have limited knowledge about the market they are part of and the price setting mechanisms of their product (Hidayat et al. 2015), resulting in selling at prices below market standards and hence a relatively low income. Second, because palm oil smallholders strongly depend on other actors, such as companies and middlemen, to access the market. This creates dependencies and difficulties in selling their products in good time. Third, because the smallholders have limited resources and access to credit, which hampers investments and improvements in their plantation (Molenaar et al. 2013). Moreover, given unclear (customary) land rights, palm oil smallholders are confronted with, and therefore involved, in land use conflicts (Sheil et al. 2009). Social conflicts between local communities and trans-migrants may also arise from the fact that companies prefer to hire trans-migrants rather than local community members to work on estate plantations (Casson 2000; Marti 2008; Sheil et al. 2009). Further, palm oil smallholders are exposed to external shocks, such as the effects of climate change and unpredictable price fluctuations in the global market (Hidayat et al. 2015; Vermeulen and Goad 2006).

Participation in the certification scheme of the Roundtable on Sustainable Palm Oil (RSPO), was introduced in the early 21st century with the aim of improving the environmental sustainability of palm oil production, while considering and improving the social and economic realities of producers. Certification may – as a side effect – improve the vulnerable position of oil palm smallholders in several ways. Certification reduces smallholder's dependency on middlemen, and creates a better and more secure income through the provision of premium prices. The organization of farmers around miller companies, which can be seen as a side effect of certification, may also improve farmers' market access, especially for independent smallholders. Further, training – provided along with the certification process – also potentially improves farmer's knowledge about farming practices, which may contribute to enhancing the productivity and quality of their palm oil products. Certification may indeed positively contribute to smallholder's livelihoods by decreasing the farmer's vulnerability and strengthening their assets (Hidayat et al. 2015).

Livelihood resilience

Smallholders' livelihood generally refers to the capabilities, assets and activities required for sustaining or improving smallholders' means of living (Hidayat et al. 2015; Scoones 2009; Chambers and Conway 1992; Tang et al. 2013; Tao and Wall 2009). Following from this, livelihoods can be considered sustainable when the farmers can cope with or recover from stresses and shocks. This implies that the farmers – even when confronted

with stresses and shocks – are able to maintain or enhance their capabilities and assets, without undermining their natural resource base. A limitation of current studies on the impact of stresses and shocks on the sustainability of livelihoods is that they only pay attention to the vulnerability context and the coping strategy of farmers (see Hidayat et al. 2015; van Rijn et al. 2012, Swift 2006, Schneider and Niederle 2010). Their recovering ability remains largely neglected although this is an equally important concept explaining the sustainability of farmers' livelihoods (Scoones 2009; Speranza et al. 2014; Marschke and Berkes 2006; Nyamwanza 2012). Farmers who cannot directly cope with stresses and shocks, but who are able to recover from those stresses and shocks in due time, still succeed in maintaining their capabilities and assets. In such cases, the farmers can be considered vulnerable to the stresses and shocks, but also resilient (Cutter 2016; Contas et al. 2014), even though vulnerability and resilience (Cutter 2016) are often interpreted as opposites (for example in Adger 2000). Vulnerability addresses susceptibility to stresses and shocks (Cutter 2016), while resilience refers to the capacity to sustain stresses and shocks in such a way that they do not have long-lasting consequences on the farmers' livelihoods (Contas et al. 2014; Harrison & Chiroro 2016).

Although some studies showed that certification does not significantly improve the vulnerability of smallholders (see van Rijn et al. 2012; Bacon 2005; Hidayat et al. 2015), the effects of certification on livelihood resilience are still unknown. Following the definition of Walker et al. (2006), we refer to a livelihood as resilient if it allows farmers to recover from stresses and shocks, and therefore maintain the functions of having a stable income, fulfil daily needs, and have good environmental quality, health, education and security in the long term.

Speranza et al. (2014) suggest that livelihood resilience is maintained when farmers have a buffer capacity that does not decline, if self-organization exists and is promoted, and if learning occurs. Although this theory offers building blocks to analyze and compare the resilience of farmers' livelihoods, it also has some limitations. First, because the relation they assume to exist between the dimensions of resilience (buffer capacity, self-organization, and learning capacity) and livelihood resilience is purely based on a review of theories and literature and never tested systematically (Speranza et al. 2014). A high score on the dimensions therefore automatically implies a more resilient livelihood. Second, because it does not give any information regarding the relative importance of the dimensions; and third, because it does not inform about potential interrelations between the dimensions. This study aims to enrich knowledge on livelihood resilience by examining these aspects. We are particularly interested in the way in which certification may influence the livelihood resilience of different types of Indonesian palm oil smallholders.

We identify five different groups of smallholders in the Indonesian palm oil sector:

1. Scheme smallholders collaborating with a company under Nucleus Estate Smallholders (NES) and the *Koperasi Kredit Primer Anggota / Members' Primary Credit Cooperative* (KKPA) system under self-management (centralized contract-farming system)

2. Scheme smallholders collaborating with a company under the KKPA system under one- roof management
3. Independent smallholders collaborating with a company
4. Independent smallholders collaborating with an NGO
5. Independent smallholders collaborating with a middleman (informal contract).

Our main question is: How and to what extent does participation in certification improve the livelihood resilience of different types of palm oil smallholders?

The main question will be addressed by answering the following sub-questions:

1. What is the relative importance of buffer capacity, self-organization and learning capacity in contributing to livelihood resilience?
2. How and to what extent do certified and uncertified smallholders differ in their livelihood resilience?
3. If they differ, how, to what extent, and why, can the differences be explained through differences in buffer capacity, self-organization and learning capacity?

This study is expected to provide insights for different actors (e.g. governmental actors, certification schemes, NGOs) to improve smallholders' livelihood resilience. More specifically, it will explain why certain groups of smallholders may be more resilient than others.

In the next section, we introduce an analytical framework to analyze smallholders' livelihood resilience, followed by a description of the study area, methods, smallholders' characteristics, stresses and shocks, and results, and end with a conclusion.

4.2. ANALYTICAL FRAMEWORK

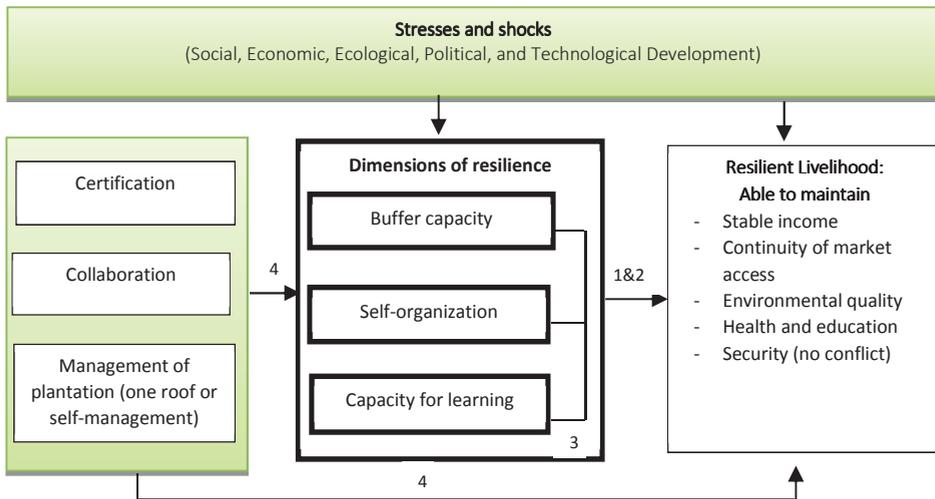
Speranza et al. (2014) developed an indicator framework for assessing farmers' livelihood resilience. They indicate that livelihood resilience is correlated with three dimensions of farmer resilience:

1. The buffer capacity is made up of the possession of, and access to, assets (Speranza 2013, 523). Assets generally comprise of human capital, natural capital, financial capital, social capital and physical capital (Carney et al. 1999; Tao and Wall 2009).
2. Self-organization indicates a level of autonomy, freedom to act, independence, and having power and control over your own actions (Speranza et al. 2014, 113). Attributes of self-organization include membership of institutions, cooperation and existing network structures.
3. Learning capacity refers to the ability to incorporate previous experiences into current actions (Speranza et al. 2014). Indicators include knowledge of threats and po-

tential opportunities, commitment to learning, capability to identify, share and transfer knowledge, and the existence of a well-functioning feedback mechanism between various actors, such as between smallholders, companies' staff and extension officers.

These three dimensions are supposed to create diversity in livelihood strategies and therefore diversity in the ability to recover from stresses and shocks (Speranza et al. 2014).

To address our research questions, we adapted the framework of Speranza et al. (2014) and empirically verified the correlations between the dimensions of resilience and livelihood resilience (number 1 and number 2 in Figure 1). We adapted the framework in two ways: first, by adding potential correlations between the dimensions (number 3 in Figure 1); and second, by adding certification, collaboration and the type of management to the framework (number 4 in Figure 11). These three variables explain the differences between the different types of palm oil smallholders existing in Indonesia (see methods section and Figure 11).



Source: Adapted from Speranza et al. (2014).

Figure 11. Framework to assess livelihood resilience

Regarding the role of certification, some literature presents a positive link between certification and smallholder's buffer capacity through enlargement of their capital, and improvement of access to assets (Ruben and Fort 2012; Donovan and Poole 2014; Ayuya et al. 2015). Smallholders who are not self-managed, but part of a centralized contract-farming system (such as KKPA), may lack autonomy to freely choose how to manage their plantation, especially if this deviates from the practices required by the system they are part of. This potentially results in a lower score for self-organization (see for example Kirsten and Sartorius 2002; Rehber 1998). Moreover, collaborating with companies may

enlarge smallholders' capacity to learn and may give opportunities for smallholders to gain better access to information, technology, technical skills, access to seedlings, fertilizers, and equipment (Vellema 2000; Kirsten and Sartorius 2002; Vermeulen and Goad 2006), and to financial capital (Hudson 2000). In the next sections we will analyze whether these first indications from the literature can be explained by and verified through the framework in Figure 11.

4.3. METHODS

Crucial in selecting our study area was the coverage of different types of oil palm smallholders. In Indonesia, we distinguish five types of smallholders based on 1) whether they work independently or are connected to a scheme system, 2) the actor they collaborate with, and 3) whether they manage their plantation under a one-roof management system or not. Smallholders are made aware of certification by companies and/or NGOs (Hidayat et al. 2015).

Table 13. Respondent selection criteria

No.	Dependency relation	Actor of collaboration	Type of management	Certification status	N
1	Scheme smallholders	a company under Nucleus Estate Smallholders (NES) and KKPA following NES structure	Self-management	Certified and uncertified	45 (NES certified) 45 (NES uncertified) 15 (KKPA certified)
2	Scheme smallholders	a company under KKPA system	one- roof management	Uncertified	36
3	Independent smallholders	Company	Self-management	Certified	45
4	Independent smallholders	NGO	Self-management	Certified	45
5	Independent smallholders	Middlemen (informal contract)	Self-management	Uncertified	44

The fieldwork was conducted in the Province of Riau. Riau is not only the largest palm oil producing region in Indonesia, covering 24% of the total Indonesian palm oil production in 2015 (Directorate General of Estate Crop 2015), but it is also home to more than a quarter of the palm oil smallholders in Indonesia and accommodates all smallholders types distinguished in Table 13. Further, the majority of the oil palm plantations (in terms of area) belongs to smallholders, and much of the oil palm production in this region thus results from them. This amounts to approximately 61 percent of the 2.4 million ha of oil palm plantation areas in Riau and 56 percent of the total production of CPO (4.2 million ton) (Statistics of Riau Province 2016).

We selected our respondents in September and October 2016 via stratified sampling, based on the five categories of smallholders and participation in certification. The survey consisted of two parts: the first on livelihood resilience, questioning the ability of smallholders to recover from stresses and shocks (see Table 14); the second on the three dimensions of resilience, that is, buffer capacity, ability to learn and self-organization (see Appendix 1). As the respondents filled out the questionnaire in the presence of the researcher, the respondents usually gave an explanation on why they chose a particular answer. Although this information was not recorded and transcribed in a structured way, it allowed us to gain greater insight into the correlation patterns resulting from the questionnaires. Before conducting the survey, we selected stresses and shocks based on discussions with three farmer experts from different districts. The discussions focused on the identification and understanding of stresses and shocks that have been experienced by farmers in the last 10 years, and that are likely to occur again in the future. This information was also used to provide an illustration to the farmers during the survey. These illustrations turned out to be helpful in challenging the farmers to think about, and to relive, past situations in which stresses and shocks occurred, and the way in which they responded to, and recovered from these stresses and shocks.

4.3.1. Assessment of livelihood resilience

Livelihood resilience is measured on a five-point Likert scale (see Table 14) representing the extent to which smallholders are able to recover from the identified stresses and shocks. Following our framework, it only makes sense to investigate resilience (ability to recover) when farmers are actually impacted by a stress or shock; if they do not feel any impact, there is also no need to recover. Therefore, we first asked questions on the extent to which farmers would be impacted by the stresses and shocks should they be confronted with them again in the future (column 2, Table 14). If they expect to be impacted, we continued asking questions on the ability to recover (column 3, Table 14).

Table 14. Operationalization of resilient livelihood. We first asked whether farmers would be impacted by a specific stress or shock, and only if they are (namely if they provide a score of 1-4) we asked them to also fill out column three.

Livelihood outcomes	Coping ability/ vulnerability	Recovering ability/ livelihood resilience
Household Income	1=Extremely impacted; 2=Highly impacted; 3=Moderately impacted; 4=Slightly impacted; 5=not impacted	1=could not recover; 2=slightly recover; 3=moderately recover; 4=highly recover; 5=fully recover
Daily needs	1=Extremely impacted; 2=Highly impacted; 3=Moderately impacted; 4=Slightly impacted; 5=not impacted	1=could not recover; 2=slightly recover; 3=moderately recover; 4=highly recover; 5=fully recover
Environmental quality in general (soil fertility, water supply, pest outbreak)	1=Extremely impacted; 2=Highly impacted; 3=Moderately impacted; 4=Slightly impacted; 5=not impacted	1=could not recover; 2=slightly recover; 3=moderately recover; 4=highly recover; 5=fully recover
Health and education	1=Extremely impacted; 2=Highly impacted; 3=Moderately impacted; 4=Slightly impacted; 5=not impacted	1=could not recover; 2=slightly recover; 3=moderately recover; 4=highly recover; 5=fully recover
Security	1=Extremely impacted; 2=Highly impacted; 3=Moderately impacted; 4=Slightly impacted; 5=not impacted	1=could not recover; 2=slightly recover; 3=moderately recover; 4=highly recover; 5=fully recover

4.3.2. *Assessment of dimensions of resilience*

The three dimensions of resilience (buffer capacity, self-organization, and capacity for learning) are operationalized based on indicators that were developed, but not further applied to practice, by Speranza et al. (2014) (see Appendix 1). All answers are phrased according to a five-point Likert scale, where a score of one implies low resilience, and a score of five high resilience. We finally sum up the scores of all indicators belonging to one dimension to determine the smallholders' buffer capacity, self-organization ability and learning capacity. We first asked whether farmers would be impacted by a specific stress or shock, and only if they would be (namely if they provided a score of 1–4), did we ask them to also fill out column three. The higher the total scores, the greater the buffer capacity, self-organization ability and learning capacity.

The Cronbach's Alpha reliability test indicates a strong degree of internal consistency (see Tavakol and Dennick 2011) for the questions on livelihood resilience (0.88) and for the dimensions of resilience (0.73).

4.3.3. *Differences among smallholders and correlation*

Next, we used Pearson Correlation to analyze the existence of potential relations:

1. Between and among the three dimensions of resilience.
2. Between the separate dimensions and livelihood resilience.

3. Between certification (certification vs. uncertified), on the one hand, and livelihood resilience and the three dimensions on the other hand.
4. Between the actor of collaboration (middlemen vs. companies vs. NGOs), on the one hand, and livelihood resilience and the three dimensions on the other hand.
5. Between the type of management (self-management vs. one-roof management), on the one hand, and livelihood resilience and the three dimensions on the other hand.

To analyze the relative importance of the different dimensions of resilience in explaining differences in livelihood resilience, we also used Pearson correlation. In cases where we found a significant effect, we used either an ANOVA or a T-test to gain more insight into the way in which the different smallholder groups differ. We adopted a significance level of 5 percent ($P \leq 0.05$).

4.4. STRESSES AND SHOCKS

The interviews with the three farmer experts revealed three stresses that all farmers had been confronted with in the past and which are likely to occur again in the future: a sudden and sharp decline in palm oil prices, El Niño, and haze problems resulting from forest fires. The first one, price decline, exists because the Indonesian palm oil industry is strongly influenced by fluctuations in the global economy. At the end of 2008, Indonesian palm oil smallholders experienced a sharp decline in Fresh Fruit Bunch (FFB) prices due to the global financial crisis¹⁹. Reductions in price led to a lower income and a decrease in palm oil productivity as smallholders faced difficulties in affording fertilizers.

Oil palms are also sensitive to climate and need an adequate water supply to provide an optimal yield. The water supply may be threatened in the case of El Niño weather patterns. For Indonesia, El Niño implies a reduction in rainfall, leading to lower productivity in terms of palm oil yield (Harun et al. 2010). El Niño occurs every two to seven years and differs in intensity, depending on the exact increase in ocean surface temperatures. In the last decade, Indonesian palm oil smallholders were confronted with an El Niño three times, ranging from a rather weak El Niño (2006–07), to a moderate occurrence (2009–10) and a very strong one (2015–16) (GGWeather 2016). The last occurrence in 2016, affected approximately 30 to 40 percent of the total area of oil palm plantations in Indonesia, including Riau, and reduced the national CPO production by 15 to 20 percent (Bantolo 2015). Our respondents further reported that El Niño may even reduce FFB production by 30 to 50 percent if farmers do not fertilize their plantation properly (low quantity or incorrect timing).

The third stress, haze resulting from forest fires, has become a seasonal phenomenon in Indonesia. The main reason lies in the practice of forest clearance, or 'slash and burn', which is the cheapest way to clear forest for establishing new plantations (Balch

¹⁹ From IDR 1,400–2,000 to approximately IDR 600 for dependent smallholders and from more than IDR 1,000 to IDR 300–500 for independent smallholders.

2015). Planting new oil palms in peat land areas is another trigger for forest fires, as canalization of peat land dehydrates the land and makes it more susceptible to fire, particularly in the dry season (Asurambo et al. 2014). In late October 2015, there were more than 115,000 such fires in Indonesia, with these concentrated in Riau, Jambi and Borneo (CIFOR 2015). The fires caused health and transportation problems, and reduced the UV-radiation intensity by 60 percent. Such a reduction in UV-radiation intensity has a negative effect on agriculture as it leads to problems regarding photosynthesis, thereby disturbing the fruit maturing process, and reducing the palm oil productivity by 5.3 percent.

4.5. RESULTS

4.5.1. *Vulnerability and Livelihood resilience*

Our results show that the majority (78.1%) of palm oil smallholders are indeed vulnerable to price shocks, haze from forest fires and El Niño, with an average score of 2.64 (between highly and moderately impacted). However, they also indicate they are rather resilient, and score, on average, a 4.25 on their livelihood resilience (see Figures 12 and 13). This means that palm oil smallholders are exposed to, and adversely impacted by, these stresses and shocks, but that they also have a high ability to recover. This pattern holds for all three shocks (see Figure 13) and although the average vulnerability to the three shocks does not differ greatly (2.52 for price shocks, 2.54 for haze from forest fire and 2.96 for El Niño), we could identify that farmers are significantly less vulnerable to the effects of El Niño than to those of haze from forest fires and the effects of price shocks ($P=0.00$). Although the recovering ability (resilience) is relatively high for all shocks, we see that farmers have significantly more difficulties in recovering from price shocks compared to haze from forest fires ($P=0.022$). The strong recovering ability can be explained by the farmers' ability to find a job and an income outside their oil palm plantation relatively easily, if there is a crisis.

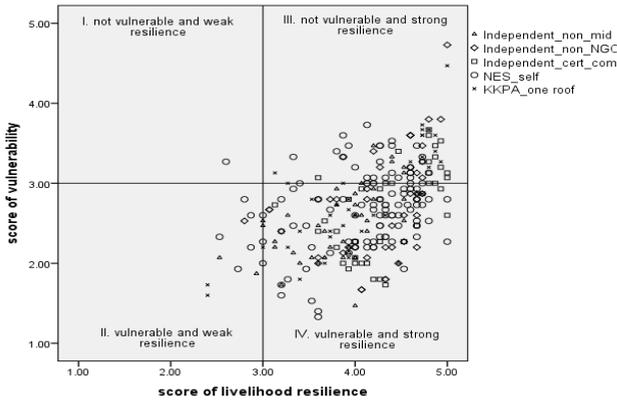
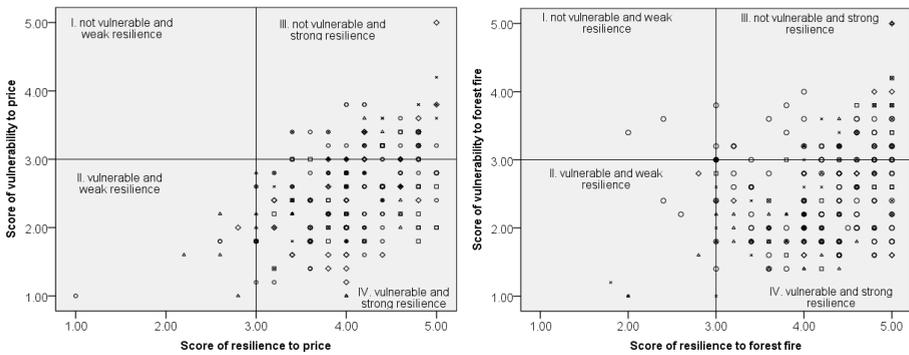
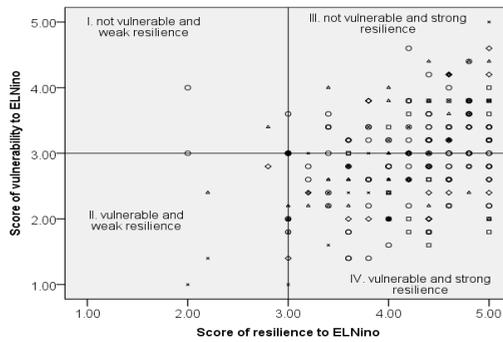


Figure 12. Distribution of palm oil smallholders' vulnerability and livelihood resilience to stresses and shocks (averages for price declines, haze from forest fires and El Nino together)



(a) (b)



(c)

Figure 13. Distribution of palm oil smallholders' vulnerability and livelihood resilience to price shock (a), forest fire (b), and El Nino (c)

4.5.2. *Dimensions of resilience*

4.5.2.1. *Buffer capacity*

In line with the framework of Speranza et al. (2014), we find a positive correlation between the dimension of buffer capacity and livelihood resilience ($r=0.138$). The greater the assets (or access to assets), the higher the capacity of smallholders to cushion stresses and shocks, and to use emerging opportunities to achieve better livelihood outcomes. Our observations in the field show that smallholders with a higher income commonly reinvest this money, for example in buying livestock. Cattle and other animals can be sold again as a strategy to maintain livelihoods in the event of a crisis. Moreover, smallholders who participate in a cooperative tend to have higher scores on social capital and tend to be more resilient. This has several reasons, but in general, organized farmers have a more stable income and easier access to credit compared to unorganized farmers. The stability of income partly results from road maintenance activities performed by the cooperatives, which allows structural, predictable, and rather fast transportation of FFB to the mills. This leads to the creation of a buffer that the farmers may use in the event of a crisis. Further, the relatively easy provision of credits by cooperatives (e.g. to buy fertilizers) also helps farmers in a reactive way after a shock has taken place. This prevents further impacts on livelihood resilience and shortens the recovery period.

4.5.2.2. *Learning capacity*

Learning capacity correlates with livelihood resilience in line with the theory of Speranza et al. (2014); we found a rather weak, but positive correlation ($r=0.166$). Smallholders who have up-to-date information and knowledge regarding palm oil, and who have opportunities to discuss problems and possible solutions, turn out to be more resilient than the more isolated smallholders. We found that informally exchanging knowledge (e.g. in small shops, plantations or the mosque) helped the farmers to more effectively translate information and knowledge into concrete actions. Further, we found that the interaction between learning capacity and buffer capacity also correlates with livelihood resilience ($r=0.173$, see Figure 14).

4.5.2.3. *Self-organization*

Contrary to the framework of Speranza et al. (2014), we could not identify a direct correlation between the dimension of self-organization and livelihood resilience. However, this does not imply that the dimension becomes redundant in the suggested framework. We did indeed find that a high score on self-organization combined with a high score on capacity for learning, correlate with livelihood resilience ($r=0.128$). This correlation is even stronger if smallholders subsequently also score well on buffer capacity ($r=0.129$, see Figure 14). Being self-organized is therefore not enough to explain live-

lihood resilience, but is an important factor strengthening the effect of learning capacity and buffer capacity.

We conclude that buffer capacity, and capacity for learning positively correlate with livelihood resilience, and that self-organization has a positive intermediating effect on livelihood resilience in interaction with learning capacity and buffer capacity. Figure 14 reveals that all correlations between the three dimensions and livelihood resilience are rather weak. If we look at the dimensions separately, we find that learning capacity is the relatively most important dimension for livelihood resilience, while self-organization is the least important. However, if we look at interaction effects between and among the dimensions, and the extent to which these correlate to livelihood resilience, we can conclude that the interaction between buffer capacity and learning capacity have the strongest (and therefore most important) correlation with livelihood resilience.

Table 15 shows that the dimensions of resilience cannot be considered stand-alone domains since they correlate with each other: buffer capacity does not only directly correlate to resilience, but also to learning capacity and self-organization. This implies that strengthening buffer capacity is not only beneficial for improving the smallholders' ability to recover from shocks, but also to improve their learning capacity and self-organization.

Table 15. Correlations between the dimensions of resilience

Person correlation	Buffer capacity	Self-organization	Learning capacity
Buffer capacity	1	.404** (.000)	.470** (.000)
Self-organization		1	.339** (.000)
Learning capacity			1

P-value is in the bracket ** Significant level =.01

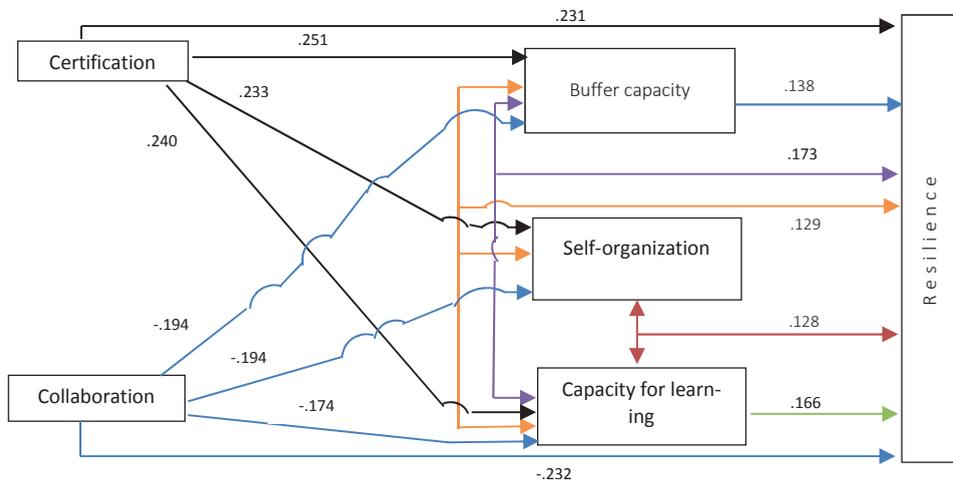


Figure 14. Correlation between dimensions of resilience and livelihood resilience

4.5.3. Effects of certification, management and collaboration on livelihood resilience

4.5.3.1. Certification

We found that certified farmers are significantly more resilient than uncertified farmers ($P=0.00$, see Table 16), and score higher on buffer capacity ($P=0.00$) and learning capacity ($P=0.00$). There is a correlation between certification and livelihood resilience, but it is rather weak (0.231, see Figure 14 and Appendix 2). Although relatively weak, this correlation is stronger than the correlations between the dimensions of resilience and livelihood resilience.

Table 16. T-test: mean difference of livelihood resilience based on participation on certification

	Certification	N	Sig. (2-tailed)	Mean Difference
Score of livelihood resilience	uncertified	170	.000	-.28913
	certified	105		

In addition to a direct correlation between certification and livelihood resilience, we also identified an indirect correlation through the dimensions of resilience (buffer capacity 0.251, self-organization 0.233, and learning capacity 0.240) (see Figure 14 and Appendix 2). It should, of course, be noted that correlations do not provide information about (the direction of) causal relationships. Further research would therefore be required to investigate whether certification causes higher scores on the dimensions of resilience and livelihood resilience, or whether farmers who tend to score well in terms of resilience are more eager to become certified. The information provided by the respondents while filling out the questionnaire, seems to suggest that certification leads to improvements in financial capital and social capital.

Certified smallholders commonly have more financial capital because their productivity and FFB selling prices are generally higher compared to uncertified smallholders (see also Hidayat et al., 2016). Certification standards further require farmer organizations to be more transparent and accountable, which creates and maintains trust among members. This trust is said to smoothen the provision of credits and encourage labor sharing in the event of a crisis. Trainings sessions and periodic meetings that go along with certification may provide farmers with information, thus allowing them to better prepare for stresses and shocks and to diversify their recovering strategies.

4.5.3.2. Management

The type of management a farmer falls under (self-management, one-roof management, or independent) does not correlate with livelihood resilience (see appendices 2 and 4). This may not be fully in line with the framework of Speranza et al. (2014), who suggest that self-organization positively contributes to resilience, but can be explained by the fact that smallholders under one-roof management do not work on their plantation for

most of their time. This implies that they have plenty of time to work outside the palm oil sector, which also allows them to find alternative sources of income when they are confronted with stresses and shocks impacting the oil palm plantation.

4.5.3.3. *Collaboration*

Our results indicate that collaboration correlates with livelihood resilience ($r=-0.232$) (see Figure 14 and Appendix 2). More specifically, we found a significant difference between the livelihood resilience of smallholders collaborating with middlemen, and those collaborating with companies ($P=0.008$) or NGOs ($P=0.005$, see Appendix 5). The former are significantly less resilient. Further, smallholders collaborating with middlemen also tend to have a lower buffer capacity (see Appendix 6a).

The reason is that smallholders collaborating with middlemen are fully independent and cannot participate in farmer organizations. As they are unorganized, they cannot benefit for being organized in terms of costs sharing, road maintenance or labor sharing²⁰. Smallholders collaborating with middlemen also tend to have lower scores on learning capacity than smallholders collaborating with NGOs ($P=0.001$) and companies ($P=0.000$, see Appendix 6c). Smallholders collaborating with middlemen do not have a learning platform and do not have very many opportunities for sharing information and knowledge. We found that middlemen, as external sources of information, are not transparent towards the smallholders, as they only deliver information when it benefits them. Farmers argued, for example, that information about FFB price decreases spreads more quickly than information about price increases. Public extension officers may play a role here, but currently focus on, and prioritize, non-estate crops, such as rice. Besides, they are often not available in palm oil regions due to the extensive working area and the limited amount of staff.

4.5.4. *Implication to different types of smallholders*

Table 17 shows a ranking of the different types of smallholders concerning their livelihood resilience. Certified, independent smallholders collaborating with companies turn out to be the most resilient type of smallholders. NES and KKPA scheme smallholders under self-management may not differ in terms of livelihood resilience from independent or semi-independent smallholders if they are certified, but the decision of scheme smallholders to participate in certification is dependent on their affiliated companies.

Independent smallholders collaborating with NGOs also have a relatively high score in terms of livelihood resilience, although their score on buffer capacity is below average. This can be explained by their plantations being located in a flood-prone area. Capital savings are therefore relatively often needed to cope with the impacts of a flood. Reduced time between different shocks also reduces time to rebuild buffers against a

²⁰ T-test results on social capital: mean difference between INOMAN and INOGO = -1.566 (Sig. 0.000) and mean difference between INOMAN and INCCOM = -3.811 (Sig. 0.000)

next shock. Independent smallholders collaborating with middlemen are the weakest in terms of livelihood resilience. Their scores on the dimensions of resilience are below average. They do not have access to certification and, other than KKPA under one-roof management, independent smallholders collaborating with middlemen lack external supports.

Table 17. Smallholders rank based on resilience

Types of smallholders	Buffer capacity (max. score = 75)	Self-organization (max. score=30)	Learning capacity (max. score = 30)	Certification	Management of plantation	Collaboration	Rank
NES/KKPA self-management	39.69	18.34	15.52	Yes/No	Self-management	Companies	2
KKPA one-roof	29.58	9.86	10.75	No	One roof	Companies	4
Independent smallholders with companies	42.29	18.16	17.22	Yes	Self-management	Companies	1
Independent smallholders with NGOs	34.51	20.09	14.33	Yes	Self-management	NGO	3
Independent smallholders with middlemen	35.32	18.91	11.57	No	Self-management	Middlemen	5
Average	36.28	17.02	13.90				

Note:

Red cell: score below average or positively correlates with resilience

Purple cell: score above average or negatively correlates with resilience

Blue cell: not significantly correlates with livelihood resilience

4.6. CONCLUSION

Most studies about the effects of certification on smallholders' livelihood emphasize the vulnerability component (coping ability), while neglecting the livelihood resilience (recovering ability). This paper contributes to knowledge development in this area by empirically applying and verifying an assessment framework developed by Speranza et al. (2014), and through assessing livelihood resilience for five different palm oil smallholder groups in Indonesia.

Our results show that palm oil smallholders are relatively resilient to price declines, haze resulting from forest fires and El Niño. Differences in resilience resulting from the different shocks and between the different groups of smallholders are small. Regarding the assessment framework, we found that correlations between the dimensions of resil-

ience and resilient livelihood are either rather weak for buffer capacity and learning capacity, or even absent for self-organization. Although self-organization contributes positively to buffer capacity and learning capacity, it does not directly improve the palm oil farmers' resilience. Although this may seem to contradict literature assigning positive implications to self-organization, or to organization in general, this can be explained by the fact that farmers under a one-roof management system (not self-organized) have more opportunities to diversify their income and find a part-time job outside their plantations. This may help them to recover from shocks that impact the palm oil sector.

We also found that certification and collaborative relationships with companies (in comparison to middlemen) positively correlate with livelihood resilience. Following from this, and reflecting on the different institutional settings smallholders may be part of, we conclude that the finalized NES system is one of the few that allowed for – and actively stimulated – certification and collaboration with companies. If we regard these variables as favorable conditions for livelihood resilience, we can view some emerging initiatives in the Indonesian palm oil sector in a rather positive light. First, this relates to the standard for Indonesian Sustainable Palm Oil (ISPO) (Wijaya and Glasbergen 2016; Hospes 2014). The ISPO standard is a public sustainability standard initiated by the Indonesian Government through The Ministry of Agriculture, with the aim of regulating the palm oil sector to achieve a more sustainable production. This initiative is now mandatory for companies, and will become mandatory for smallholders in the future (Suharto 2010). We see that the ISPO certification body explicitly considers the favorable conditions for livelihood resilience as they certify smallholders and promote collaboration between smallholders and companies. Second, this relates to the establishment of so-called FAIR company-community partnerships initiated by Oxfam, aiming to improve economic development, and reduce adverse impacts of palm oil expansion on local communities (Oxfam 2017). Setting up collaborations between smallholders and companies is central to their approach, combined with support for smallholders to become certified. In addition, this model follows a so-called landscape approach, focusing on diversification instead of monoculture, which may provide opportunities for smallholders to improve their recovering ability should shocks impact their oil palms.

Although we could verify most relations between the dimensions of resilience and livelihood resilience as suggested by Speranza et al. (2014), and defined two more variables correlating with livelihood resilience (certification and collaboration), most correlations turned out to be rather weak. This means that there are more variables that play a role in explaining livelihood resilience in the palm oil production sector. One of those variables may include the geographical location of the farmers' plantations in relation to the exposure to risk, particularly regarding climate change and the resulting confrontation to weather extremes and their effects, such as storms and floods. More frequent exposure may imply a shorter time between shocks, and less time to rebuild capital and accumulate savings. Following from this we believe that climate change may pose risks to livelihood resilience in the near future that cannot be overcome by current forms of

certification or collaboration with companies alone. Improving livelihood resilience to climate change may therefore be an important topic to consider in further research. Follow-up research could also further increase our understanding of the magnitude of causal relationships between the dimensions of resilience, certification, collaboration and livelihood resilience through a more advanced statistical analysis (e.g. using simultaneous equation modelling).

Chapter 5

Sustainable palm oil as a public responsibility?
On the governance capacity of Indonesian
standard for sustainable palm oil (ISPO)

POSITIONING CHAPTER 5

Chapter 5 answers the following research questions:

To what extent may ISPO become a viable alternative to private regulation (i.e. RSPO)?

- 1. To what extent will ISPO be able to meet its own objectives?*
- 2. To what extent will ISPO contribute to solving palm-oil related problems if fully implemented?*

While Chapter 2 to 4 focus on private certification initiatives, Chapter 5 analyses a public Indonesian certification initiative, namely Indonesian Sustainable Palm Oil (ISPO). In particular, and through a governance capacity approach, we question the extent to which ISPO may be able to meet its own objectives and the extent to which it may contribute to solve palm oil related problems. ISPO faces a very complicated governance challenge, given the fact that millions of smallholder farmers need to be directed towards a more sustainable production. The limited authority of the ISPO committee is a crucial constraining factor in the process of becoming a viable alternative to private certification schemes under current conditions. We conclude that ISPO, although it has initiated a process of change, has not yet developed its full potential to meet its own targets and solve palm oil related sustainability problems.

This chapter was written in collaboration with Astrid Offermans and Pieter Glasbergen, and has been published in the journal of Agriculture and Human Values. The full reference is:

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5.1. INTRODUCTION

Governments from some developing countries are currently developing their own, public sustainability standards and certifications as a reaction to earlier private standards by businesses and NGOs. The Indonesian government, for example, developed its own, supposed to be mandatory, sustainability standard and certification scheme for palm oil – Indonesian Sustainable Palm Oil (ISPO). Comparable schemes are proceeding for coffee and cocoa (Wijaya and Glasbergen 2016). Given Indonesia's status as largest palm oil producer in the world, we focus on Indonesia's public standard on sustainable palm oil in this paper.

The expansion of oil palm production in developing countries, including Indonesia, is widely debated. Although this expansion contributes positively to the Indonesian economy by generating job opportunities (Sheil et al. 2009), and creating benefits to the wellbeing of farmers (Rist et al. 2010), it is also associated with sustainability problems such as deforestation (Koh and Wilcove 2009; Sheil et al. 2009), the emission of greenhouse gasses (see Fargione et al. 2008; Sheil et al. 2009), biodiversity losses (Fitzherbert et al. 2008), and emerging social conflicts (Rist et al. 2010; Rival and Levang 2014).

Initiatives to overcome the adverse effects of palm oil production have particularly been taken by private actors (Glasbergen and Schouten 2015). An example of such an initiative is the Roundtable on Sustainable Palm Oil (RSPO). However, this Northern-based initiative is debated in terms of its effectiveness (Ruysschaert and Salles 2014; von Geibler 2013), inclusiveness of stakeholders' interests (Bitzer and Glasbergen 2015; Cheyns and Riisgaard 2014; Silva-Castañeda 2012), and its ability to contribute to sustainability changes (Bitzer and Glasbergen 2015). Many studies have also questioned the legitimacy of the RSPO as a multi-stakeholder initiative (see for example Partzsch 2011; Schouten and Glasbergen 2011; Schouten and Glasbergen 2012; von Geibler 2013).

ISPO can be seen as a counter-initiative of the Indonesian government to the RSPO (Wijaya and Glasbergen 2016) and was established with the intention to increase the competitiveness of Indonesian palm oil, while guaranteeing the sustainability of its production, particularly in terms of the prevention of palm oil related problems. ISPO explicitly aims to be more economically viable for producers, while remaining independent from foreign pressures (Schouten and Bitzer 2015).

The ISPO standard is currently compulsory for companies, and will become compulsory for smallholders in 2022 (InPOP 2015). This implies the certification of millions of smallholders, who are geographically spread, culturally and organizational diverse and sometimes difficult to reach, which may challenge ISPO in realizing its objectives. Moreover, weak administrative structures may further challenge the implementation and enforcement of a public regulation in a development context (Schouten and Bitzer 2015) such as ISPO.

Based on a recognition of the potential of public regulations to induce a more sustainable palm oil production, this paper aims to contribute to a better understanding of the challenges Southern public initiatives are confronted with in their attempt to realize a more sustainable agricultural production. Based on the concept of governance capacity, we developed an evaluation tool, operationalized in a policy-driven and a problem-driven analysis, to answer the question whether ISPO may become a viable alternative to private regulation (e.g., RSPO). As a rather new initiative on sustainability, ISPO, and more generally public sustainability initiatives regarding palm oil production in developing countries, are still under investigated in literature. This research further informs about the relationships between private and public certifications regarding palm oil.

First, we will highlight ISPO's principles, and the procedures towards certification. Next, we will introduce our evaluation tool based on the governance capacity approach, followed by a description of the research methods, results and conclusions.

5.2. CHARACTERISTICS OF ISPO

ISPO's objectives are operationalized in 7 principles that need to be fulfilled by certified companies and -in the future- by certified smallholders (the latter only need to comply with the first, second, fourth and seventh principle):

1. Compliance with legal business permits
2. The implementation of plantation management based on Good Agricultural Practices (GAP)
3. Protecting primary forest and peat land
4. Conducting and monitoring environmental management (e.g., protecting biodiversity, waste management, and fire prevention and mitigation)
5. Showing responsibility towards employees
6. Contributing to social and economic empowerment of society
7. Commitment to continuous improvements in sustainable palm oil production

These principles are further elaborated in criteria and more detailed regulations that are collected from existing palm oil regulations from five different Ministries; The Ministries of Agriculture, Environment and Forestry, Agrarian and Spatial Planning, Manpower and Transmigration, and The Ministry of Health. To become certified, producers have to follow a pre-set procedure (see Appendix 7). ISPO's certification process starts with a plantation classification by the local government. In this classification, the local government assesses the extent to which plantations comply with the national regulations and meet the standard regarding plantation management. Only plantations that score well in this assessment (classified as 1st to 3rd class companies) can formally enter the process towards ISPO certification; poor performing plantations can adjust their practices and

start a new classification procedure afterwards. Well-performing companies can request certification by submitting documents to an independent certification body. The latter will then verify the documents, perform field assessments, and report the final evaluation to the ISPO commission²¹ and ISPO's assessment team²². In case of a positive evaluation, the ISPO commission approves the certification body to grant certification to the plantation. ISPO's certificate is valid for 5 years. Certified plantations receive an annual surveillance and can extend their certificate one year before it expires. In case of a negative evaluation, companies will be requested to rectify within 6 months. If they do not succeed, a re-audit should be done with the same certification body. According to regulation of the Ministry of Agriculture No. 11/2015, companies who refuse or forget to request certification will be downgraded to Grade IV automatically. This implies that their license will eventually be revoked (see Appendix 8 for the sanction mechanism and Appendix 9 for the time line).

Several studies compared RSPO and ISPO and concluded that the objectives of the standards are rather comparable, which can be explained by the fact that ISPO officials, when developing the scheme, were strongly inspired by the RSPO and initially even participated in it (Wijaya and Glasbergen 2016). Nonetheless, it is also concluded that the RSPO, compared to ISPO, is more voluntary (Schouten and Bitzer 2015), less complicated in terms of its certification procedure (Wijaya and Glasbergen 2016), stricter in terms of its regulations and criteria, and also more inclusive in terms of regulations and criteria (Hospes 2014). Finally, although using similar vocabulary, the interpretation of concepts differs between the two standards (for example regarding the concept of 'high conservation value' see Suharto et al. 2015). Here again, RSPO's interpretation of concepts can be considered more strict compared to ISPO's interpretations of the same concepts (Hospes 2014; Yaap and Paoli 2014).

5.3. ANALYTICAL FRAMEWORK

This paper aims to analyze the implementation capacity of ISPO given its intentions, and its potential contribution to solve palm-oil related problems. We conceptualize the implementation of ISPO as a governance capacity challenge. This concept has been applied to a wide variety of topics, including the promotion of social innovation (González and Healey 2005), evaluation of policy initiatives regarding forest management (Howlett and Rayner 2006), coastal tourism (Caffyn and Jobbins 2003), and public-private initiatives in the environmental domain (Knill and Lehmkuhl 2002). Governance capacity generally

²¹ The ISPO commission consists of members of the highest level of the central administrative structure (ESELON I) from the Ministries of Agriculture, Environment and Forestry, and Agrarian and Spatial Planning.

²² The ISPO assessment team consists of government officials, ESELON II, which is lower than ESELON I in the organizational structure from the same Ministries as the ISPO commission, an NGO and producer associations.

refers to the ability to induce change (Lancaster and Ras 2012) and -in relation to ISPO-covers 1) the ability to act on available rules and resources as worked-out in ISPO regulations; 2) the ability to direct the interactions of the involved actors to concerted action through authoritative actions; and 3) the ability to navigate within the prevailing market context. Fulfilling these conditions subsequently needs to 4) induce change and contribute to solving palm oil related problems (see also Dang et al. 2015). The first three elements of governance capacity (rules and resources, authoritative actions, and market context) we operationalize in a policy-driven approach, the last element (regarding the problem-solving capacity) we operationalize in a problem-driven approach.

5.3.1. The policy driven approach

The policy-driven approach can be considered a managerial approach that accepts certification as a governance instrument and questions how its governance can be improved. The policy-driven approach refers to ISPO's ability to organize a diversity of actors to work together towards ISPO's objectives and rules (concerted action), or - in other words - the extent to which the intended implementation of new regulations is, or can be, realized in practice. The policy-driven approach, in our case, takes ISPO's objectives and rules as given, and enquires whether these will be materialized and followed by actors in the palm oil sector. In the case of ISPO, we consider concerted action challenging for several reasons, including the foreseen participation of thousands of companies and millions of smallholders, the diversity of actors and interests involved, and the challenge of informing all actors properly. The diversity of actors involved does not only refer to actors from different domains (NGOs, producers, governments, research institutes), but also the involvement of actors from different governmental layers and sectors.

5.3.2. The problem-driven approach

The problem-driven approach is recently suggested by Bitzer and Glasbergen (2015) as an additional evaluative approach and analyzes problems within the embedded context of the needs, interests and preferences of different actors, while seeking an answer to the question of what the new regulation might be able to contribute in this context vis-à-vis other interventions. More specifically, this approach refers to the extent to which ISPO (if implemented successfully) contributes to solving palm oil related problems. In this paper we follow two lines: first, the problem definition as provided by ISPO itself (particularly low competitiveness of Indonesian palm oil in the international market, deforestation and the release of GHGs) and second, a definition resulting from critical accounts in the academic literature on palm oil production (verified through multi-stakeholders interviews), which generally refer to deforestation, the generation of social conflicts, biodiversity loss, and the intensified release of GHGs (see Abood et al. 2015;

Brandi et al. 2013; Casson 2000; Hanu and Sadjli 2013; Koh and Wilcove 2009; Meijaard et al. 2005; Nellemann et al. 2007; Sheil et al. 2009).

5.4. METHODS

ISPO's principles and planning differ for large plantation companies and smallholders. For large scale plantations, an ex-post evaluation is relevant because companies have been under ISPO certification already. Regarding smallholders, only one group is currently under an ISPO certification pilot project; all other smallholders have not yet been certified. Therefore, we use an ex-ante approach to evaluate the extent to which ISPO may meet its objectives regarding smallholders.

Our main research method comprises in-depth interviews for both the policy-driven and the problem-driven approach. We interviewed 45 informants from various stakeholder groups that were purposely selected based on their involvement in palm oil production and/or ISPO certification (Table 18). We performed interviews at the place preferred by the interviewees. We developed a list of open ended questions based on the literature (see below). This list was used for all stakeholders, although not all questions could be answered by them due to differences in their expertise and knowledge. All interviews were recorded and transcribed.

Table 18. List of informants - 2016

Categories	Number of interviewed respondents
Large plantation companies	5
Central government officials	7
Certification bodies	2
Development institute (UNDP)	1
Experts (from university and research institute)	6
Local government officials (Riau and West Kalimantan)	7
NGOs	7
Producer associations	5
Farmer organizations	5
Grand Total	45

In order to construct the list with questions for the respondents on the policy-driven approach, we selected variables from literature on concerted action and governance capacity. These variables include clarity of ISPO's legislations, ISPO's alignment with other rules, clarity in the communication of rules (Dang et al. 2015); availability of resources including people, budget, and knowledge (Börzel 1997; Dang et al. 2015), authority to enforce sanctions (Sabatier and Mazmanian 1979; Schneider and Ingram 1990) and contextual factors such as market acceptance, which may accelerate or hamper the implementation of ISPO's objectives (Dang et al. 2015). Regarding the problem-driven

approach we constructed a cause-effect diagram of sustainability problems based on the literature, which was used in the interviews (see Appendix 10). Next to the factors in the diagram, we paid attention to ISPO's problem definition that also covers deforestation and the release of GHGs, but also the low competitiveness of Indonesian palm oil in the international market. The interviews focused on: 1) the extent to which respondents recognize the presented problems, 2) the extent to which they recognize the identified causes, and 3) how and to what extent they reason that ISPO can contribute to solving these problems.

We employed computer-assisted qualitative data analysis (CAQDA) to transcribe and analyze all interviews in the policy driven approach and the problem-driven approach. Transcriptions regarding the policy-driven approach were labelled based on the element of governance capacity the quote refers to (e.g., clarity of rules, availability of resources, authority, market acceptance), and whether the quote expresses a positive or negative opinion on the governance capacity (see an example of quotation coding in Appendix 11). In the problem-driven approach, the quotations were labelled and grouped based on the problem under discussion and whether the respondent considers ISPO to be (conditionally) able to contribute to solving the problem.

We complemented the interviews with document analysis and participation in events. The document analysis included the official minutes of a diplomatic meeting about palm oil trade in Europe conducted by the Ministry of Trade and the Ministry of Agriculture, InPOP newsletters, The Jakarta Post newspaper, InfoSawit magazine, and communications from the IPOCC. The document analysis mainly enriched our understanding of palm oil related problems from ISPO's perspective and the way in which ISPO intends to solve these problems. Furthermore, we participated in three events; an ISPO evaluation meeting organized by a producer association (Jakarta, February 5th 2016), a socialization event of ISPO for farmer groups, organized by an NGO (Pelalawan-Riau, February 23rd 2016), and a multi-stakeholder workshop organized by UNDP (Jakarta, February 17th 2016). In these meetings we acted as a passive observer and recorded the discussion in notes. These observations allowed us to better understand ISPO's implementation process and the implementation barriers faced by companies.

5.5. GOVERNANCE CAPACITY: THE POLICY-DRIVEN APPROACH

5.5.1. *On the clarity of rules*

We observe that the rules of ISPO, as basic requirements to realize concerted action, are not problem-free. First, some of ISPO's action points are still rather vague. An example can be found in the rule about biodiversity conservation where ISPO touches upon the need for conservation management. However, neither the concept of conservation management, nor the corresponding management practices, or the intensity of these

activities are explicated. Related to this vagueness is the absence of clear and detailed technical instructions, which leads to different interpretations of the PnC by different auditors. Issues such as healthy and safe working conditions, can therefore be seen as a requirement by one auditor but not by others. Therefore, a company may move its audit contract from a strict certification body to a less strict body to get certification in the easiest way. An auditor illustrated this:

“Yes, some rules may be applied in different ways. For example, Government Regulation No. 50/2012 about the Application of a Health and Safety Work Management System/ Sistem Manajemen Keselamatan, dan Kesehatan Kerja (SMK3)²³. According to this regulation, palm oil millers are required to have certification on the SMK3²⁴, because they generally have more than 100 employees and these employees work with high-risk equipment e.g. a boiler. Therefore, millers are categorized as having a high management risk. [Which implies that they should have an approved SMK3 in order to receive a certificate]. This is however discussed in the appendix of the original rule, and therefore some certification bodies believe that the SMK3 certificate is not mandatory for miller companies [in the process towards certification]”.

Second, we observe conflicting rules within ISPO, and between ISPO and other ministerial regulations. Oil palm cultivation in peatland, for example, is explicitly permitted under ISPO point 2.2.1.4²⁵ but not under principle 3²⁶ in the protection of primary forests and peatlands, and neither under the regulation of the Ministry of Environment and Forestry dealing with peatland clearance²⁷. ISPO's regulation about land use management offers another example of conflicting regulations, especially the requirement to use all concession areas for oil palm plantations within 6 years. This regulation conflicts with a regulation from the Ministry of Agrarian and Spatial Planning, that is, *Surat Edaran* no. 10/SE/VII/2015 regarding High Conservation Value Forest (HCVF). The latter regulation suggests conserving High Conservation Value (HCV) areas²⁸ whereas ISPO would proceed to classify non-used land as abandoned. Both vagueness of rules and the existence of conflicting rules between the Ministry of Agriculture and other Ministries, create

²³ Translated as safety management system and occupational health.

²⁴ See Government Regulation No. 50/2012 Appendix 1 about the implementation guidance of SMK3, on page 6 point C, explaining that to implement a safety management system and occupational health planning a company should provide an expert, who has a SMK3 certificate.

²⁵ See PnC ISPO, point 2.2.1.4 which is based on PERMENTAN No. 14/2009: “plantation companies who cultivate palm oil in peat land should pay attention to the characteristic of the peatland to eliminate the environmental damage”.

²⁶ See PnC ISPO, Principle 3 about: “protection to the utilization of primary forest and peat land areas”.

²⁷ See Surat Edaran Ministry of Environment and Forest about moratorium on peat land clearance, 3 November 2015

²⁸ A location permit is a permission letter that is issued by the local regency government, in order to carry out activities involving the acquisition of land.

confusion for palm oil companies. Confusion may either result in passiveness or it may hamper the concertedness of actions and threaten the (univocal nature of) actions in the field.

5.5.2. Availability and distribution of resources

In our research we observed problems related to the availability and distribution of resources that can be expected to seriously hamper concerted action. Lack of resources occurs on different governmental levels, both in terms of money and manpower. First, on the national level, we observe limitations in the availability of certification bodies. Nation-wide, ISPO encompasses 11 Certification Bodies with 800 auditors. Most of the auditors are overloaded with work, bearing the risk of a lower performance of the certification bodies. Reviewers working at ISPO's secretariat are also limited in number (4) and have more work than they can handle. In the best case, this issue may delay the process of ISPO certification, but in the worst case it may prevent and discourage plantations to become certified. An auditor reported:

"We have already handed in the audit report to the ISPO secretariat, but the review in the ISPO commission takes a long time. [...] we submitted a report in September 2014, but we only received back the review by November 2015..."

and:

"... after they heard about the experience from other companies, they [companies] now take indifferent positions... they [companies] say things such as, 'my neighbor's company has been registered for ISPO a long time ago, but ISPO certification has not been issued yet. Why should I make more expenses on the account of ISPO'? I don't know if it will ever be issued".

At the local governmental level, there are not enough people to conduct the compulsory classification. Some trained officers have been reallocated to other divisions, without any appropriate replacements. This means companies cannot even start the process towards certification. Next to a lack of personnel budgets are limited as well. To deal with these limitations, local government officials now often conduct the assessments based on desk studies, without performing field evaluations. This may result in inaccurate classification results, as a company may possibly be classified as an eligible company but formally does not comply with all requirements.

Further, we also see that local governments cannot easily access information about participating companies in ISPO in their region. This results in difficulties in monitoring these companies and in controlling them. Moreover, our research indicates many cases where knowledge about ISPO has not reached the village level or the extension officers yet. A local government official said:

“...We do not know how many companies are currently in the process of certification here. We do not suggest complicated bureaucratic procedures, but in order for us to proceed with our task of supervising this process, we need to be informed about it. We do not have enough budget to go to the field directly. At least, if we would be informed, we would know that Company ‘A’ has reached this process... Company ‘B’ is undergoing that process, then, we can follow up on the difficulties they are faced with”

Facing constraints in budget and manpower may slow down and even negatively influence the initial classification process (i.e. approving companies unjustly). It may also threaten concerted action if different regions are confronted with different intensities of constraints and/or deal with these constraints differently. Together with a lack of communication, limited resources may also harm ISPO’s objectives in the process towards certification, and at the moment companies are certified already. Verification of the extent to which companies meet ISPO’s criteria and whether they are, and remain, compliant is currently put under pressure due to a limited availability of resources on the national and regional governmental levels.

5.5.3. Authority and enforcement

Our research reveals that the authority of ISPO committee is rather limited. However, authority can be considered crucial to motivate companies and smallholders to follow rules and regulations and to enforce sanctions to assure that actions are in line with ISPO’s policy objectives. ISPO’s regulations are an accumulation of (national) rules under various ministries and the execution of each rule, including the right to enforce sanctions, lies fully beyond ISPO’s influence, and belongs to the legal domain of the separate ministries. This leads to a serious lack of authority on behalf of ISPO.

Inadequate coordination between the different Ministries further hampers ISPO’s speed of action and potentially leads to a rather passive or expectant attitude of Ministries and companies.

A spatial planning official on the provincial level illustrates this:

“...Well, we take a passive position. As long as they (producers) do not propose to issue their HGU (land cultivation right), we will not ask them to do so... now, if it becomes an obligation of ISPO, it is not our program... we cannot “pick up the ball” unless our Ministry (The Ministry of Agrarian and Spatial Planning) regulates it”.

The Head of the ISPO commission informed:

“On one hand, we push oil palm plantation companies to get ISPO certification, on the other hand, business actors are still constrained by a lack of coordinated

management between the Ministry of Environment and Forest, and the Ministry of Agrarian and Spatial Planning. Sometimes companies already have a HGU legally issued by the Ministry of Agrarian and Spatial Planning, but [this legally issued HGU is then] contradicted by the ministry of environment and forest because it is claimed to overlap with forest areas. The ISPO commission cannot do anything, as this is the domain of the Ministry of Environment and Forest”.

Second, and in line with the results above, we observe that the ISPO commission lacks authority to enforce sanctions for non-compliance with ISPO standard. Sanctioning (i.e. lowering the Plantation Grade and revocation of the Plantation’s Permit²⁹), belongs to the responsibility of local governments (Governor or *Bupati/Walikota*). Following from this, we can state that Indonesia’s decentralization policies (see for example Hadiz 2004, Firman 2009) increase ISPO’s inability to enforce sanctions as local governments are allowed to make decisions in the domain of agriculture independent from the National government. Patron-client relationships (see Kolstad and Søreide 2009, Varkkey 2013) and economic considerations may further demotivate local governments to execute punishments (Ascher 2000, Tacconi 2007) as this may harm support for their election programs or reduce income from taxes. One respondent illustrates this (Anonymous):

“... but sometimes, we cannot deny that the Bupati³⁰ cannot be ‘hard’ to companies... If the Bupati is a good friend of certain companies, it is difficult to establish instruments for monitoring and controlling. I myself wonder if it is possible to revoke the plantation’s permit by the Bupati, because, he is the one that issued the permit”.

A member of the Provincial Investment Coordinating Board/ *Badan Penanaman Modal Provinsi* (BKPM) said:

“At the local level, it is not easy to revoke a permit. We have to think about it. Because it will create unemployment and increases poverty in our region”

Another issue that complicates enforcement, particularly regarding newly developed plantations in protected areas, is that sanctioning may lead to social conflicts and economic hardship for the farmers who invested a lot of money in the plantations. Punishment may include the closure of plantations, which are farmers’ sources of living. Legalizing these plantation areas, or adopting a passive attitude, like the government is cur-

²⁹ According to The Regulation of Ministry of Agriculture No. 98/Permentan/ OT. 140/9/2013, there are 5 reasons for revocation of a plantation permit: (1) a plantation company having ≥ 250 ha does not establish a plantation for smallholders (2) A miller company who has a partnership with a cooperative, but does not sell at least 5% of the company’s share to the cooperative (3) A company who falsifies information about land holding (4) A company who does not report any changes in the ownership and or management (5) A company who does not fulfil obligations including zero burning and implementing environmental monitoring and control (AMDAL)

³⁰ *Bupati/ Regent*, is the head of a regency and directly elected.

rently doing, however, might create a precedent, which invites other encroachments such as opening new illegal plantations.

In summary, ISPO's lack of authority combined with a lack of incentives for local governments to assure compliance and punish companies or smallholders in the case of non-compliance or encroachments can be considered a serious threat for ISPO in meeting its objectives. Without an effective and well-functioning enforcement principle, implementing ISPO according to its aims and objectives may need to be dismissed as a myth.

5.5.4. Market acceptance

We observe that both the domestic and the global palm oil market do not yet support ISPO. First, certification of palm oil is no prerequisite in the domestic market; demand for uncertified palm oil is equal to the demand for certified palm oil³¹. A division manager in a palm oil company stated that:

“Competitiveness of oil palm products really depends on the market. Let's have a look at the domestic market: let's say I have a margarine or soap factory in Jakarta. For the sake of our company's profit, we will buy the cheapest CPO. This may imply that we buy the CPO from Lampung instead of North Sumatera because of the cheaper transport costs. It doesn't matter whether the CPO is certified or not”.

Second, a vivid black market exists in Indonesia (Dixon 2016; InfoSawit 2016) that makes it difficult to trace the origin of palm oil. So, even if domestic demand for certified palm oil would increase, incentives to produce sustainable palm oil remain low. As long as companies can continue selling palm oil products in the traditional market and if they feel ISPO does not offer benefits, such as tax reliefs, companies may likely postpone their participation in ISPO. Regarding acceptance in the global market, we observe that Western markets, including the European Union, United Kingdom (UK), and the United States, have not recognized ISPO as a sustainability standard yet. Acceptance of ISPO in the global market is crucial for its competitiveness. We particularly observe difficulties to convince the global community about the credibility and trustworthiness of ISPO (see Jong 2016). Promotional efforts from the ISPO commission and the Ministry of Agriculture in the Netherlands, the European commission, and Germany, in 2012 and 2015 (Suharto 2015) have not succeeded to convince the European market about the credibility of ISPO. This is illustrated by a representative of the UK Embassy:

“There are credibility issues: about the development of the standard, the way in which the system runs, and the lack of transparency and independent audits. In

³¹ Based on interviews with a government official and the head of a palm oil company

fact, there is no credible system. SVLK³² shows that Indonesia can do it differently, and now, the European Union has recognized it. I would like to see ISPO in the same position. As a British government representative, I dare to say, we will recognize ISPO when the standard is multi-stakeholder based, when the system is transparent and able to ensure the inclusion of smallholders. A multi-stakeholder approach gives us confidence that the ISPO system works”.

Different from the earlier mentioned variables, that mainly posed a threat to concerted action, a lack of acceptability of ISPO in the global market threatens the extent to which ISPO will be accepted and followed by actors in the palm oil value chain.

5.5.5. Interim conclusions on the policy-driven approach

Our research based on the policy-driven approach indicates that ISPO lacks the ability to organize actors to work together toward concerted action. Most fundamental is the lack of authority to implement and enforce ISPO, which becomes visible in coordination problems related to different policies of different ministries, and in the division of responsibilities between the national government and the local governments. The latter are essential for the implementation of ISPO and verifying compliance. However, their autonomous responsibilities do not necessarily align with the aims and regulations of ISPO. Our results also indicate communication problems between the actors involved. These partly result from a lack of clear and operational rules, budgets, and man-power. Last, there are uncertainties about the acceptance of ISPO in the global palm oil market.

5.6. GOVERNANCE CAPACITY: THE PROBLEM-DRIVEN APPROACH

According to ISPO, the sustainability requirements of the RSPO are driven by ‘western buyers’ requests, they are very strict and imply higher production costs for Indonesian farmers (Suharto 2010). ISPO finds itself torn in two ways: on the one hand, they see that higher costs resulting from private certification may pose barriers to competitiveness in the global market, on the other hand, they see the risk of losing part of the export market when withdrawing from private certification. ISPO aims to improve the competitiveness of Indonesian palm oil in the global market and solve sustainability problems connected to palm oil production, such as deforestation and biodiversity loss, the release of greenhouse gasses (GHGs) and social conflicts. Our interviews indicate that most respondents agree on the identified sustainability problems and recognize the causes presented in Appendix 10. We could however identify differences in the way in which respondents conceptualize deforestation as a problem. Some respondents share ISPO’s interpretation that deforestation is considered a problem if it occurs in protected

³² Timber Legality Verification System/ Sistem Verifikasi Legal Kayu (SVLK)

forests only. Deforestation of un-protected forests is therefore not regarded problematic. In their argumentation, these respondents tend to refer to regional spatial planning documents (*Dokumen Rencana Tata Ruang Wilayah*), stating that unprotected forests are legally categorized as convertible area and therefore allocated to support regional development, including income generation, job creation, and the generation of government revenues. Legal deforestation may even be necessary to meet the target of the Indonesian government to reach 40 million tons of palm oil production annually by 2020. Other respondents however, including representatives from NGOs, conceptualize the problem of deforestation as a general loss of forest cover, independent from the question whether this is protected forest or not. A representative of the Ministry of Environment and Forestry stated:

“Thus far, NGOs define deforestation as the loss of forest cover. We however, [also ISPO] believe that deforestation is only applicable to protected forests. Land-use changes in convertible forests should not be categorized as deforestation. Because forests [based on the Constitution of Indonesia article 33 (3)] shall be used for the greatest benefit of the people, and therefore, forest areas, which are allocated to plantations, are legally [by law] allowed to be converted”.

5.6.1. Prevention of deforestation

Notwithstanding the location, palm oil plantations are often highlighted as driving forces of deforestation (Abood et al. 2015; Casson 2000; Koh and Wilcove 2009; Sheil et al. 2009). Private oil palm plantations were responsible for 88.3% of the deforestation linked to palm oil in Sumatera from 2000 to 2010, smallholder’s plantations follow with 10.7% and government-owned oil palm plantations caused 0.9% of the loss of forest cover³³, both in protected and unprotected forests. However, we observe that the Ministry of Forest and ISPO has a limited ability to enforce laws to prevent or regulate deforestation caused by companies and smallholders, which may further contribute to deforestation in protected forests (Mulyani and Jepson 2013). Moreover, corruption, patron-client relationships, and rent seeking behavior of government officials are also often mentioned in the literature as causes for deforestation (Mulyani and Jepson 2013).

ISPO, as a compulsory standard, is potentially able to reduce deforestation in protected forest areas (37% of the total land area) (FAO 2014) if the scheme can be fully implemented and enforced. However, we also see that the exclusion of plantations that are evaluated as performing poorly in the first classification step of ISPO’s procedure (see Appendix 7) does not only imply that they cannot join the process towards certification, but also that they remain beyond the control of ISPO. They may still commit forest encroachments as long as they can sell their products. Moreover, the absence of a

³³ Interview result with expert (CIFOR)

commitment to zero deforestation, and the strong emphasis on prevention in protected areas only, may lead to an insignificant contribution of ISPO in reducing overall deforestation.

5.6.2. Improving competitiveness

ISPO's aim to increase the competitiveness of Indonesian palm oil in the global market seems difficult to realize. First, because ISPO is not recognized by global market players as a credible sustainability standard yet (see above). Particularly Northern actors such as retailers and consumers still see the RSPO as the only credible standard for sustainable palm oil (Schouten and Bitzer 2015). The negative NGO campaigns against Indonesian palm oil (IPOCC 2014; Lutfi 2014) may reverberate even when Indonesian palm oil producers become ISPO certified.

Second, ISPO also seems to lose the competition with uncertified palm oil on a producer level, as ISPO does not include a premium price or additional fee for certified palm oil (as RSPO does). Even though participation in the RSPO implies additional costs for smallholders, their profits increase because of the premium prices and premium fees (Hidayat et al. 2016).

5.6.3. Protection of biodiversity

The conversion of forests to monoculture plantations destroys wildlife habitat, and with it species including the Sumatran tiger, orang utan, and elephant (Meijaard et al. 2005; Sheil et al. 2009). Biodiversity loss in forests can subsequently be aggravated by forest fires (Nellemann et al. 2007) that are often purposely caused to clear forests to convert them to plantations. Moreover, oil palm plantations are intensively sprayed with pesticides and herbicides, which may create toxic run-offs killing animals and plant species if the waste is not well managed. Waste from the milling process of palm oil fruits is regularly discharged into rivers, being lethal to river biodiversity (Marti 2008).

Based on our interviews we infer that, under current conditions, ISPO will not be able to significantly solve biodiversity problems. First, because ISPO's regulations do not support the protection of biodiversity in convertible (i.e., unprotected) land areas (*Area Penggunaan Lain/APL*). Also, ISPO currently requires companies to cultivate their entire concession area even if this area contains High Conservation Values (HCVs) (see PnC 2.4. based on Decree No. 39/2014)³⁴. Failing to cultivate the entire area, results in cancellation of the concession permit. Currently, initiatives are going on to overcome this problem by formulating new regulations about HCV (*Surat Edaran Menteri Agraria dan Tata Ruang* No. 10/SE/VII/2015) that also recognize HCV in converted areas. However, the

³⁴ See Regulation of Ministry of Agriculture No. 11/2015 Appendix II, PnC ISPO point 2.4:A plantation company granted a location permit after Decree No. 39/2014 is obliged to manage/cultivate all the plantation area that is technically feasible (to be cultivated) by 6 years after receiving the permit".

new and prospective regulation only has a weak legal status³⁵ and can therefore not be adopted by ISPO in the PnC. Second, because ISPO's interpretation of HCV, especially in comparison to RSPO's interpretation of the same concept, can be considered rather free of engagement. Where the RSPO obliges companies to protect all areas containing high conservation values, ISPO only obliges the protection of biodiversity in protection zones (kawasan lindung in Bahasa). As the national government defines these protection zones, areas may contain HCVs without being designated as protected zone.

5.6.4. Reduction of Greenhouse gasses (GHGs)

Expansion of oil palm plantations contributes to GHG emissions (see Fargione et al. 2008, Sheil et al. 2009). Unsustainable agricultural production on peat land furthermore produces Methane gasses, and excessive fertilization, the transport of Fresh Fruit Bunch and CPO, and the fermentation of palm oil mill effluent (POME)³⁶ (Sheil et al. 2009) also contribute to the emission of CO₂, CH₄, and N₂O. Further, palm oil plantations absorb less CO₂ than tropical forests that are usually destroyed to build the oil palm plantations. We observe a lot of confidence among palm oil companies and governmental actors regarding the ability of ISPO to reduce emissions by decreasing the use of chemicals, and adopting better waste management. However, we also found potential pitfalls that may counteract this reduction of greenhouse gasses, and potentially even lead to an increase in emissions.

First, because it is still possible under ISPO to legally convert areas containing high carbon stock³⁷ or HCV³⁸ into plantations, which releases substantial GHG emissions. Second, ISPO's approval to grow oil palm plantations in peat land areas (see Regulation of Ministry of Agriculture No.14/2009), may contribute to further GHG emissions. An employee of an environmental NGO said:

³⁵ *Surat Edaran Menteri Agraria dan Tata Ruang* No. 10/SE/VII/2015 is a new regulation issued by Ministry of Agrarian and Spatial Planning regarding the recognition of HCV in converted land areas (*Area Penggunaan Lain/APL*), and the encouragement to preserve the areas containing HCV. The *Surat Edaran/ Circular Letter* is an official script containing notices, explanation, and instructions on how to carry out issues that are considered important and urgent. The circular letter is not a legal norm as a norm of a law or regulation and it is limited to internal instruction in an institution, therefore the circular letter cannot be used as a legal basis for changing *Peraturan Menteri/Regulation of Ministry*.

³⁶ Palm oil mill effluent (POME) is the waste water discharged from the sterilization process, crude oil clarification process and cracked mixture separation process.

³⁷ The High Carbon Stock (HCS) approach is a methodology to identify areas of land suitable for plantation development, and for forest areas that can be protected (see: [http://www.greenpeace.org/international/Global/international/briefings/forests/2014/HCS%20Approach Brief March2014.pdf](http://www.greenpeace.org/international/Global/international/briefings/forests/2014/HCS%20Approach%20Brief%20March2014.pdf))

³⁸ HCVs have biological, ecological, social or cultural values which are considered to be outstandingly significant or to be critically important, at the national, regional or global levels (see: <https://www.hcvnetwork.org/about-hcvf/what-are-high-conservation-value-forests>). HCV assessment is to identify whether HCVs are present and if so, to discover where they are located.

“...peat land is very important [...] to be conserved because it has a unique characteristic for preventing fire. Peat land contains water or a kind of lake. The function of water is maintaining the humidity level of the land, so that the peat land area is not easily fired. To establish oil palm plantations in peat land, the water must be drained using canalization. It results into soil subsidence: decreasing soil surfaces may increase the risk of flooding... Furthermore, the drainage of water on peat land will also increase the risk of fire and alter the decomposition of organic soil materials in such a way that it will release GHGs. The drainage process of peat lands and the degradation of peat land contributes twice to GHG emissions, which is higher than the emissions resulting from deforestation”.

Third, although the PnC do refer to the aim of emission reduction, they do not specify this aim into a target. This led to confusion among target groups in defining actions, and we seriously question whether actors will take any actions as long as there is no clear target for emission reduction. The same holds for methane capture: although it is specified as an aim it is not clear how much methane ISPO aims to capture and whose responsibility this is. Therefore, medium and small-sized companies will not take actions in the direction of methane recovery. The fact that this would also imply additional costs further contributes to the passive attitude of small and medium sized companies.

5.6.5. Prevention of social conflict

The expansion of oil palm plantations creates social conflicts (Rist et al. 2010, Rival and Levang 2014, Casson 2000). One of the causes is the unclear land right/ tenure system (Sheil et al. 2009, Obidzinski et al. 2012, Austin et al. 1998, Rist, Feintrenie, and Levang 2010) and uncertain customary land rights (Gerber 2011). Communities living in, or nearby, allocated concession areas are in a poor bargaining position to prevent companies to take their land. Corruption and clientelistic behavior commonly occur in the communication process between companies and the local government to get (illegal) concessions (Marti 2008, Wakker 2005). Furthermore, social conflicts between communities around palm oil plantations occur, mostly between migrants and local communities. This happens often as companies prefer migrant labor over local communities to work on estate plantations (Casson 2000, Marti 2008, Sheil et al. 2009). Our research shows that ISPO tries to contribute to solving social conflicts through their obligation for palm oil companies to develop smallholder plantations for surrounding communities with at least 20% of total concession area and to create productive economic activities for surrounding communities. However, a lack of clarity in procedures especially for scheme plantations may not solve conflicts in the future (Gunawan et al. 2015, Hanu 2015). Also the problem resulting from corruption and patron-client relationships will not be tackled through this approach.

Further we observe that ISPO does not recognize FPIC (Free Prior Consent) and does not facilitate a balanced negotiation between large plantation companies and local communities, which often leads to social conflicts. ISPO does not improve the bargaining position of local communities in negotiation processes and an NGO working with small-holders showed examples where it happened that local communities did not actively participate in negotiations with companies at all. This implies that communities become unable to refuse new plantation establishments, and may only be able to accept the company's plantations with negotiated compensation (Suharto et al. 2015). We, however, also observe that this situation does not result from a lack of regulations about negotiation processes, but merely from the way in which companies interpret existing ISPO regulations³⁹ and a difference in the substance of the regulation between FPIC in RSPO and ISPO's social regulation. For example, companies do say they follow the rules by informing local communities, even if they do not give a balanced overview of the situation (e.g., only referring to potential positive effects of establishing a plantation and ignoring potential negative (side-) effects). Moreover, ISPO's strategy only recognizes customary communities if they are supported by the local government may further induce social conflicts.

5.6.6. Interim conclusions on the problem -driven approach

In the problem-driven approach we analyzed whether ISPO, if successfully implemented, contributes to solving palm oil related problems. On the one hand, this analysis results in a rather pessimistic view -that is often shared by the respondents- in which we conclude that ISPO will not be able to solve problems regarding the competitiveness of Indonesian palm oil in the global market, deforestation of protected and unprotected forest, and loss of biodiversity, and will only be partially able to solve problems regarding the release of GHGs and social conflicts. The pessimistic view may even be enforced by the fact that some of the underlying reasons for ISPO not being able to significantly improve these problems, lie beyond the direct control of ISPO. Here again, we see that the existence of patron-client relationships, corruption, decentralized authoritative responsibilities, and ISPO's inability to influence enforcement mechanisms create conditions in which ISPO is not well-equipped to solve palm oil related problems. On the other hand, however, we see that ISPO has some leverage points to improve its capacity to solve palm oil related problems. This mainly regards setting stricter targets and guidelines for GHGs and Methane reductions and negotiation procedures between companies and

³⁹ See Regulation of Ministry of Agriculture No. 11/2015, Appendix II, point 1.3: "Companies whose land concessions originate from customary land rights are required to negotiate an agreement with the people about the land release and its compensation authorized by the Governor/ Bupati/ Walikota".

communities. ISPO could also put more efforts in incentivizing poor performing producers to catch up and meet minimum standards for sustainability.

5.7. ISPO'S GOVERNANCE CAPACITY AND SMALLHOLDERS

Almost half of the oil palm plantation area in Indonesia is managed by smallholders. They are generally considered a vulnerable group of producers. Their plantations are generally too small (approximately two hectares), and the productivity too low (Brandi et al. 2013) to support the smallholder's standards of living. Smallholders further have limited technical knowledge, resulting in the inappropriate use of fertilizers (Brandi et al. 2013), they are not well-organized (they operate individually), and have limited access to the market, credit, and governmental support. Even after becoming RSPO certified, Indonesian palm oil smallholders remain vulnerable and their livelihoods do not seem to become substantially more sustainable (Hidayat et al. 2015). The question is whether ISPO will be able to improve the smallholders' situation for the better.

Most of the governance challenges identified above also apply to smallholders. It can even be considered a more profound challenge to reach millions of smallholders compared to thousands of companies. Especially if certification bodies lack man-power and resources and when a lack of clear and operational rules may open opportunities for a passive attitude. Although ISPO limits the number of criteria for smallholders (compared to the criteria for companies) it does not diversify its strategy for smallholders. This may neglect context specific problems or difficulties the smallholders are confronted with, or existing social relations shaping smallholders' response toward ISPO, further contributing to difficulties in the implementation of ISPO.

One of these issues regards ISPO's PnC for independent smallholders (point 2.2.9) that rule out middlemen from the palm oil supply chain. The procedure says that smallholders' FFB should be sold directly to companies. This goes against traditional, deep rooted traditions in which middlemen play an important role in the palm oil value chain; not only because of existing social relations, but also because middlemen directly pay after transactions and arrange the transport of FFB. Exclusion of middlemen, therefore, may lead to resistance to ISPO on behalf of the smallholders, further challenging the implementation of ISPO.

Moreover, we observe another difficulty for smallholders to comply with ISPO, related to the various forms of farmer organizations existing in Indonesia (see Ibnu et al. 2016), including associations, farmer groups (GAPOKTAN) and cooperatives. ISPO requires smallholders to be organized under a cooperative, which implies that farmers currently belonging to a farmer group (GAPOKTAN) or association have to expand or change their organizational membership. Changing membership from farmer groups and associations to cooperatives implies the determination of social relations. This may also imply an increase in tax payments and more complicated procedures regarding tax pay-

ment and FFB selling contracts. Moreover, cooperatives are (currently) not necessarily available in each region.

Further we learnt that the implementation of ISPO may run the risk of increasing the gap between rich and poor farmers. This follows from the obligation for oil palm companies to buy at least 70% of their FFB from ISPO certified plantations in 2020. Although this may be positive for the certified farmers, who can relatively easily adopt and afford ISPO certification, it may marginalize the non-certified smallholders. The latter may face difficulties in selling their FFB leading to more income insecurity and hardship. Meeting ISPO's objectives for smallholders can therefore be considered even more challenging than meeting the objectives for companies.

5.8. CONCLUSIONS

Indonesia is one of the first Southern countries which developed public standards and certification schemes for agricultural commodities in a reaction to private sustainability standards and certifications. This paper analyzed the potential of the Indonesian standard to bring about a sustainable change in palm oil production. Therefore, we developed an evaluation tool based on the concept of governance capacity. We both looked at the potential of ISPO to realize its own objectives and its potential contribution to solving palm oil-related problems. Both parts of our analysis reveal serious doubts. Although we observe that ISPO set a process of change in motion, it still faces tremendous governance challenges given the fact that thousands of companies and (in the near future) millions of smallholders need to find their way through ISPO's certification process. Compared to private standards (e.g., RSPO), which are voluntary and have low sanction opportunities (e.g., suspension/withdrawal of the RSPO certificate), theoretically ISPO introduces a stronger sanction (e.g., revocation palm oil companies' business permit), which may potentially be more effective to end the unsustainable practices. However, the ISPO committee, who is in charge of the organization and implementation of the ISPO standard, lacks the authority to enforce the standard. ISPO was developed with the aim to bring palm oil related regulations from different ministries together in one regulatory framework. Although this would potentially create a better functioning regulatory framework, we see that the various ministries keep their autonomous responsibilities regarding their own regulations. This does not only lead to conflicting regulations, but also to an impasse on behalf of ISPO when it comes to sanctioning or enforcing regulations. Next to ISPO's weak horizontal coordination at the national level, the decentralization process provides the committee with a weak vertical coordination capacity, as local level governments are rather autonomous in their agricultural policies. Because of different interests this seems to hamper compliance with objectives and rules and a proper sanctioning of palm oil producers if necessary.

Another obstacle is the acceptance of ISPO in the global market in which actors express doubts regarding the credibility of ISPO. Part of this doubt results from ISPO's reluctance to strictly working out the sustainability ambitions regarding palm oil related problems, materialized in the lack of adequate regulations on deforestation and biodiversity loss. Here we identify a tension between formulating stricter regulations on the environmental impacts of the expansion of palm oil plantations and the Indonesian government's main target of economic expansion of the sector.

Indicative of this tension is the Indonesian governments' response to a recent (September 2014) initiative of palm oil companies who formulated their responsibility regarding sustainable development in a stricter way (called Indonesian Palm Oil Pledge; IPOP). Their 'zero deforestation' pledge (a ban on clearing primary, secondary and peat forests) was initially signed by the Indonesian top-four largest palm oil producers (Asia Agri, Cargill Indonesia, Golden Agri-Resources and Wilmar International). Later, Musim Mas and PT Astra Agro Lestari also joined. However, instead of leveraging this initiative in the process of sustainable change, the government claimed that IPOP infringes on the government's authority to set standards and may constitute a cartel dominated by foreign interests. The government also claims that IPOP is not in line with Indonesian laws and too restrictive on smallholders who cannot afford to comply with a zero deforestation commitment (Gokkon 2015). Here again we see that economic considerations hamper a commitment to the environmental target (e.g., zero deforestation commitment).

To become a reliable alternative in the global market, ISPO needs a more convincing balance between sustainability objectives and economic interests, combined with a more authoritative and better equipped implementation- and enforcement mechanism. Thus, in our view ISPO's certification process needs a redesign, particularly if it really aims to include millions of smallholders, who need some recompense to become convinced of the value of the scheme for them.

Considering our results, we formulate some suggestions for improvement of ISPO's performance. First, harmonization of rules regarding palm oil production and the arrangement of a so-called one map policy could be helpful. A one-map policy refers to an overarching meta-governance framework applied by the different ministries. All government agencies should then use this framework when designing sectoral rules and formulating policies. However, an alternative might be the establishment of a meta-governing institution, independent from a specific ministry, and with a direct mandate to the president to manage the palm oil sector in Indonesia. Although very different from the current situation, such an institution is not entirely new. It has existed in Indonesia for corruption eradication (KPK) with the argumentation that eradication of corruption is an important issue for the entire Indonesian society. It may be reasonable to provide ISPO with a similar status because palm oil can be regarded as an important cross-sectoral commodity, proven by the involvement of the Ministry of Agriculture, the Ministry of Forestry, the Ministry of Spatial Planning, and the Ministry of Home Affairs, as well as local governments. Such an independent ISPO commission does not have to be entire-

ly governmental-driven and may also exist of other actors, such as NGOs, and experts, which may increase external legitimacy (see Schouten and Bitzer 2015) and therefore improve recognition particularly from Northern consumers.

Second, we suggest creating learning forums to accommodate different actors' knowledge and experiences with ISPO. A multi-stakeholder forum could be an avenue for private actors, NGOs, experts, local governments, ISPO implementers (i.e., certification bodies, consultants and training institution) and palm oil related ministries to express their views as a feedback for the improvement of the ISPO system and regulations. The additional benefit of such a forum may be that actors engage themselves in a process of social learning, overcome or reduce the lack of shared values and increase concerted actions. This forum also facilitates discussion about rules, regulations and their implementation in the field to minimize conflicting perceptions between auditors.

Third, given that different types of smallholders may deal differently with ISPO. Not all smallholders may be equally vulnerable with regard to the changes requested by ISPO. It may therefore be worthwhile for ISPO to diversify its strategies and implementation for the different types of smallholders. Those who are most vulnerable, such as independent smallholders who own less than 2 ha plantations with unqualified planting material and who are located in an area where a cooperative does not exist, may be given additional support to prevent marginalization. Strengthening their locally based agricultural organization is the most important factor. Provision of planting material, credit for replanting, simultaneously with an income diversification program, seem to be necessary to bring the most vulnerable group in the ISPO scheme.

To conclude, this study is an early attempt to inform about the stakeholders' view on the potential of ISPO to contribute to solving sustainability problems. Collecting and presenting information on such a sensitive topic is challenging, particularly if stakeholders feel that providing information may adversely impact them, for example, because negative campaigns influence the palm oil companies' image. We are fully aware of this and we particularly addressed this issue by performing interviews with, and presenting the results from, a balanced representation of actors involved. In general, public initiatives for sustainability still use the same channels to induce the sustainable changes as private initiatives, therefore we doubt whether they will succeed to bring a quicker systemic change than the private initiatives.

Chapter 6

Conclusion and reflection

6.1. INTRODUCTION

Through sustainability standards and certification attempts are made to eliminate the adverse effects of the expansion of palm oil plantations and the production of palm oil. The Roundtable on Sustainable Palm Oil (RSPO) is at the forefront of these attempts and can be said to follow a value chain approach, as shown by its underlying assumption that sustainability changes can be realized through market mechanisms. Initially, the RSPO concentrated its certification on large estate companies. More recently, however, the RSPO also attempts to bring in, and certify, smallholders. As outlined in the introductory chapter of this dissertation, the effectiveness and legitimacy of private certification, including the RSPO, is still debated. In the meantime, Indonesia as the largest palm oil producer worldwide, reacted to the private regulation of the RSPO and established its own public certification, called Indonesian Sustainable Palm Oil (ISPO). ISPO intends to realize a more socially and environmentally friendly palm oil production, which is economically viable for producers and improves the competitiveness of Indonesian palm oil in the international market, but remains independent from foreign interference. ISPO is mandatory for large estate companies and will also be mandatory for smallholders in the near future. Both certification schemes assume that participation of smallholders in the schemes accelerates a transformation towards a more sustainable palm oil production and improves smallholders' livelihoods.

As we indicated in Chapter 1, impact studies dealing with sustainability certification, particularly related to smallholders, are rather inconclusive and lack consideration of the social context in which smallholders operate. Therefore, this dissertation aimed to provide knowledge on the impacts of sustainability certification on the livelihoods of smallholders within their social contexts and formulated the research question: *In what way and to what extent does sustainability certification contribute to a better livelihood of Indonesian palm oil smallholders?*

In our research, we put smallholders' values and interests at the core of our analyses and asked them to reveal what participation in sustainability certification implies for them, what they value as positive contributions, and what they regard negative effects. We also consciously considered the social context of smallholders, including their socio-economic relationships, cultural beliefs and practices, political realities, and the diverse ways in which smallholders may be embedded in institutional structures.

Central in our study is a sustainable livelihood approach. Following the sustainable livelihood concept, we define farmers' livelihoods as the availability of, and access to, assets that smallholders need to make a living. These assets are further operationalized in terms of human, social, financial, natural, and physical capital. They are influenced by what is known as the vulnerability context (i.e. exposure to stresses and shocks, trans-

forming structures and processes (e.g. policies and regulations, and strategies of smallholders (i.e. activities and choices to improve livelihood outcomes).

Certification can be considered to contribute to a better livelihood if it allows or supports smallholders to durably sustain or enhance the availability of, and access to, assets. In this concluding chapter, we summarize the findings of our empirical research and reflect on potential pathway toward a sustainable future for Indonesian palm oil smallholders. We base this pathway on the insights presented in the empirical chapters and the premise that it is desirable to further enable smallholders' agency and empowerment.

6.2. SMALLHOLDERS' PERSPECTIVES ON LIVELIHOOD

Smallholders frame their livelihood as sustainable if they can durably maintain a high and stable income, if they can afford good quality health care, and if they can provide education to their children. They prioritize economic interests over environmental interests, which indicates that environmental sustainability cannot be achieved if smallholders' economic problems have not been solved first, or if it is unclear to the smallholders that environmental improvements may develop in parallel to economic improvements.

Based on our research we can identify some barriers hampering a more sustainable livelihood for smallholders. First, smallholders often use low-quality planting materials and, second, they often lack up-to-date knowledge on Good Agricultural Practices (GAP). These two challenges result in a relatively low productivity and poor quality of FFB. Third, we see that smallholders do not have much insight into price-setting mechanisms and the fairness of prices they receive for their FFB. Fourth, smallholders often face difficulties in buying good quality fertilizers. The price of unsubsidized fertilizers is higher, while the subsidized ones are often only available for food crop farmers and not for plantation farmers. These challenges generally lead to low FFB prices, and smallholders' income can therefore be considered low. Next, we see that poor road-quality increases the smallholders' costs (i.e. higher fuel consumption and drivers need to be paid per hour for their driving services) and the delivery time of FFB from the plantations to the miller companies. This implies a high risk of depreciation of the quality of FFB, because FFB needs to be delivered to a mill within 24 hours after harvesting to maintain its quality. Further, many smallholders are often un-organized; they manage their plantation individually without joining farmer groups or cooperatives. Lack of participation in such organizations constrains access to subsidized fertilizers and solving infrastructural problems. Moreover, smallholders are often constrained by legality issues as they often do not have land ownership certificates (In Bahasa, called *Surat Hak Milik*/SHMs) or cultivation registration certificates (In Bahasa called *Surat Tanda Daftar Budidaya*/STDBs). SHMs are prerequisites to receive (investment) loans from banks.

Additional, it is also crucial that smallholders are willing to adopt sustainability practices. Smallholders will be able to do so if they obtain information and knowledge which can be applied in their practices and if they also understand how these practices benefit them. It is also important that the knowledge transfer is adapted to the local context. General knowledge on sustainability is abstract and it needs to be translated into practical knowledge that is relevant for and applicable to smallholders. On the other hand, smallholders also have specific customary knowledge gained through experiences that is useful given the context in which they operate. They can use their knowledge effectively if they would be able to exert agency.

6.3. REFLECTION ON THE DIVERSITY OF INDONESIAN PALM OIL SMALLHOLDERS

As described in Chapter 1 and Chapter 4, palm oil smallholders are rather diverse regarding the institutional structures in which they are embedded. More concretely, this diversity results from, and depends on, the actors the smallholders collaborate with (companies, NGOs or middlemen) and the form of management adopted (self-management versus one-roof management). We distinguish five different types of smallholders: (1) (semi) Independent smallholders collaborating with a company; (2) (semi) Independent smallholders collaborating with an NGO; (3) (fully) Independent smallholders collaborating (informally) with middlemen; (4) *Koperasi Kredit Primer untuk Anggota*, or scheme smallholders (under one-roof management); and (5) Nucleus Estate Smallholders and scheme smallholders (under self-management). We have seen that this diversity is crucial to understand differences in farmers' livelihoods and the (different) implications of certification for these livelihoods. The institutional diversity particularly leads to differences in the magnitude of, and access to, assets (see Chapter 2 and 4).

6.4. CONTRIBUTION OF SUSTAINABILITY CERTIFICATIONS TO SMALLHOLDERS' LIVELIHOOD

Based on Chapter 2 that investigates how RSPO certification impacts the livelihoods of Indonesian palm oil smallholders, we conclude that participation in the RSPO positively contributes to smallholders' livelihood. This contribution, however, is indirect and works through organizational changes (allowing for monitoring practices and gaining benefits from economics of scale) and capacity building through training leading to a higher productivity and production quality that may further benefit smallholders financially. In Chapter 3 we found that certified smallholders indeed receive higher financial returns compared to uncertified smallholders. Participation in private certification also improves access to the market, but mainly for independent smallholders and only to a very small

extent for scheme smallholders. Moreover, participation of smallholders in the RSPO contributes to non-monetary benefits, such as safety, better health and better environmental conditions. Certified smallholders are also more resilient to stresses and shocks (see Chapter 4) compared to uncertified smallholders.

However, private certification still leaves smallholders with uncertainties regarding premium fees (i.e. the height of the premium fees to be received, and the way in which it will be distributed by the miller company) and the low uptake of certified palm oil in the global market (see Chapter 2). Therefore, we conclude that private certification does not significantly change the vulnerability of smallholders. Private certification also implies extra costs. Currently these extra costs are borne by the miller companies. If the smallholders had to pay these costs themselves and premium fees remain uncertain, certification would not improve the smallholders' financial situation (see Chapter 3).

The implementation of the public certification scheme of ISPO can, given its objective to certify all palm oil companies and millions of diverse and geographically scattered smallholders, be considered a tremendous governance challenge. Our research shows that most crucial is the lack of authority of the ISPO commission to enforce objectives and rules. Economic considerations of the Indonesian government, such as fearing a loss of government revenues and job opportunities, may further constrain ISPO to enforce sanctions for non-compliance of large plantations. Regarding smallholders, we are even more doubtful whether the sanction mechanism (i.e. closing plantations that do not comply) will ever work, because the government may be very resistant to separate the farmers from their sources of living and risk social conflicts and economic hardship for smallholders. Market developments are also not in favor of ISPO yet. The global market demand for uncertified oil is still significant and, therefore, it will remain attractive for producers to neglect ISPO and continue the production of uncertified palm oil. Furthermore, the exclusion of middlemen in the implementation of ISPO, may lead to resistance on behalf of the smallholders, because trade with middlemen is part of their culture, and middlemen often provide support to smallholders in the form of cash payments and transportation.

Our research also shows that, even if ISPO would be successfully implemented, it will not solve palm oil related problems regarding deforestation of protected and unprotected forest, biodiversity loss, the release of GHGs and social conflicts. We also have doubts about the extent to which ISPO will be able to improve the competitiveness of Indonesian palm oil in the global market (see Chapter 5). Current ISPO rules, particularly concerning deforestation and protection of high conservation value areas (HCV) are not strict enough to fundamentally lead to changes. ISPO may, for example, contribute to preventing deforestation of protected forest, but it will not manage to prevent deforestation of unprotected forest and forest with HCV. Other rules leave too much space for different interpretations. This regards the rules for negotiation processes between companies and communities, including the recognition of customary community rights. A lack of clarity regarding these rules may stimulate, rather than prevent, social conflicts.

Furthermore, as ISPO solely focusses on eligible companies (i.e. that already fulfill some basic requirements as explained in Chapter 5), it excludes poor performing producers, who may continue their unsustainable practices beyond ISPO's horizon. Moreover, bureaucratic challenges including the existence of patron-client relationships, corruption, and unclear decentralized authoritative responsibilities, may negatively influence ISPO's problem solving capacity as they lie outside the direct control of ISPO.

To summarize, we doubt whether public and private sustainability certification, in the way in which they are currently shaped, will be able to substantially improve the livelihood of palm oil smallholders and solve sustainability problems resulting from, and inherent to, the production of palm oil. Our research reveals drawbacks of both private and public certification. For both it remains challenging to find a balance between environmental sustainability and economic interests. To some extent RSPO managed to find a balance between offering a strict environmental standard and providing economic benefits from participation in the scheme, but this goes together with uncertainties, specifically regarding the provision of price premiums. ISPO is expected to be relatively cheap (e.g. no membership fees) and more easily accessible for smallholders compared to private certification. However, the rules are less strict and interspersed with leeway. Combined with the lack of authority and coordination problems, this leads to a rather weak ability to achieve an environmentally sustainable transformation of the palm oil sector.

6.5. POTENTIAL PATHWAYS FOR A SUSTAINABLE FUTURE FOR INDONESIAN PALM OIL SMALLHOLDERS

Existing discrepancies between the current situation and a sustainable future for Indonesian palm oil smallholders can be bridged in different ways. Here we focus on a few of them, including adaptations in the current systems of private and public certification and new approaches that recently have been introduced in palm oil production in Indonesia (landscape approach, jurisdictional approach and FAIR company-community partnerships).

Adapting private or public certification

Private certification can potentially contribute to a pathway for a sustainable future for smallholders, if the system can be re-arranged in such a way that smallholders can be assured of a stable, certain and continuous economic incentive for practicing in a more environmentally friendly way. Moreover, as current private certification works in a top-down manner, it lacks consideration of the local context which becomes problematic when the system is implemented on the ground. Alignment of the sustainability stand-

ards with local knowledge is therefore crucial to make sustainability accepted as the norm and to make it applicable to the Indonesian context.

A way to ensure acceptance of the sustainability norms and applicability to the Indonesian context, is to pursue public certification. However, this strategy will not automatically solve issues on the troublesome acceptance of the public standard by global market players, which may further accelerate the smallholders' difficulties in getting access to the market. To assure acceptance in the global market, the public certification's rules need to be more convincing regarding the environmental aspects of sustainability. The government also needs to better collaborate with non-governmental actors to increase the external legitimacy of the scheme and it needs to solve administrative problems among different governmental levels (national, provincial and district) and different technical ministries to implement and enforce the standards.

If private certification seems to be able to assure the environmental sustainability of the palm oil production and acceptance of the standard in the market, but remains facing difficulties in translating standards in a way that is understandable in, and applicable to, the Indonesian context, a combination or integration of private and public standards may comprise a pathway towards a sustainable future for palm oil smallholders. However, we do not foresee that a parallel existence of private and a public certification may contribute to a more sustainable future for smallholders. Current differences in private and public certification are significant and lead to confusion among stakeholders about what sustainable practices really are and what actions need to be taken by whom. Multiple certifications may also imply higher costs, potentially leading to a further reduction in smallholders' income. Another alternative is the development of a combined, or integrated, certification scheme in which ISPO and RSPO merge into one coherent system. Combined certification is a way to realize one integrated certification management system and a single combined certification audit. Although further studies regarding the feasibility of a combined certification are necessary, we see opportunities in the realm of a more sustainable pathway. First, because it may re-create a -more or less- shared set of sustainability standards, which are more widely accepted than the current public standards and solve the problem of farmer confusion in a situation with parallel certification schemes. Second, and through the involvement of private actors, it may improve the credibility of the current public standard, by involving governmental and non-government stakeholders to ensure independent monitoring of the implementation of, and compliance to, the standard. Third, and through the involvement of the Indonesian government, the applicability of the standards to the local context may be assured as well as acceptance of the standards among farmers. We however also foresee some challenges towards a sustainable future for palm oil smallholders inherent to the idea of a mandatory, combined private-public scheme.

Although it offers opportunities to reach remote and even poor-performing smallholders (instead of only flagship producers), the risk is that poor-performing smallholders simply turn out to be unable to fulfil the required standards. This implies that they

will not become certified, but continue running their plantation with unsustainable practices because they need to make a living. For these smallholders, a sustainable future will not be guaranteed in this pathway.

Reversing certification

Notwithstanding our doubts about the ability of the current certification schemes to contribute to a more sustainable palm oil production and better living conditions for smallholders, we consider a reverse of ongoing trends in sustainability certification no change for the better. Before the rise of private sustainability schemes, the governance of palm oil production, including efforts to improve the sustainability of the production, were under the full control of the (Indonesian) government. In this period however, it became clear that the national Indonesian government did not have enough capacity to realize a transformation towards a more sustainable agricultural production on its own. Underlying causes for this lack of capacity have not been solved during the last decades and issues regarding the absence of well-functioning coordinating mechanisms, conflicting regulations, inadequate enforcement of national regulations, patron-client relationships, corruption and bribing still prevail. However, we do not want to suggest here that government interventions in (sustainable) agriculture are necessarily doomed to fail.

Government-led initiatives may work well if arranged in a specific way and with the involvement of a broad range of stakeholders. In the past, the national government, in collaboration with palm oil companies and financial donors, initiated the Nucleus Estate Scheme (NES) with the aim to promote smallholder-driven palm oil production. We observe that some elements of the NES system may contribute to a sustainable future for smallholders. First, the NES system provided resources including money, knowledge and human resources (in the form of extension officers) and ensured availability of, and access to, inputs for improving the productivity of oil palm plantations. Second, the NES system facilitated the organization of farmer groups and cooperatives and linked them to companies to ensure the acceptance of FFB in the market. As a result, the NES scheme smallholders realized relatively better living conditions than (fully) independent smallholders (see Chapter 3 and Chapter 4). A replication of the NES system, however, may not guarantee an environmentally-friendlier way of production and a more equal power distribution between nucleus companies and smallholders. Attention to the environmental aspects of sustainability (including climate change) can be considered crucial to guarantee a sustainable future for palm oil smallholders. Not only as these aspects may increasingly function as prerequisites to enter the western market, including the European Union, United Kingdom and the United States, but also to enable smallholders to adapt or respond, to extreme weather conditions that will be aggravated by climate change.

The landscape approach

During our research, new approaches were introduced to tackle problems faced by palm oil smallholders and the production of palm oil. The landscape approach is one of these approaches and aims to manage geographical regions where agriculture competes with other land use types (e.g. forest) to achieve social, economic, and environmental objectives (Ros-Tonen et al. 2015, Sayer et al. 2013). This approach is not entirely new and has been given different names since the 1980s, including Agro-landscape ecology, Lifescape, and Eco-agriculture (Reed et al. 2015). In Indonesia, the landscape approach has been applied by NGOs in collaboration with businesses in three regions (West-Kalimantan, Riau and Aceh) to manage forest areas in consideration of human needs, biodiversity, and carbon management. More recently, we see that palm oil production – and particularly the prevention of deforestation for palm oil plantations- starts to play a role in the landscape approach in West- Kalimantan and Aceh. Currently, the landscape approach makes use of certification. One of the main differences with private and public certification, is that conventional certification adopts a single-commodity certification system. This means that a particular product (palm oil, coffee, cocoa) may become certified and that farmers need a separate certificate for every crop they grow. This is not only administratively inefficient, but also leads to high costs, as every certification process needs to be paid separately. The landscape approach does not certify a single crop, but a geographical region (farms, villages, districts). In theory, the government could play a role in this approach, but it rarely happens in practice. This may relate to the fact that the landscape approach has no jurisdictional selection criteria to select the landscape under its management. It may only cover part of a jurisdictional area, or combine different jurisdictions. The disadvantage of the absence of the government in the landscape approach, is that the initiators of the landscape approach only have limited authority to solve issues related to national and regional laws and regulations. A way to guarantee government involvement in the realm of the landscape approach, is via the so-called jurisdictional approach.

Jurisdictional approach

The jurisdictional approach is in its approach and aims essentially the same as the landscape approach. It also tries to integrate different types of land-use in a region in such a way that objectives of different stakeholders can be reached and peacefully co-exist next to each other. Certification is also often used as an instrument, but in theory this approach may also exist without the use of certification⁴⁰. The most important distinguishing feature regards the way in which regions are selected and the way in which the ap-

⁴⁰ Currently, the RSPO is experimenting with integrating their private certification scheme into a jurisdictional approach. Although the RSPO aims to certify all palm oil in a specific region (e.g. South Sumatera, and Seruyan and Kotawaringin Barat districts in Central Kalimantan), they limit their scope to the certification of palm oil.

proach is embedded in the political context. The jurisdictional approach was developed based on the idea that government involvement is vital to assure long term and structural changes in the landscape. The landscape under scrutiny is defined along jurisdictional (i.e. existing political and legal) boundaries which assures commitment from the government by creating and formalizing a framework of incentives, policies, laws, and practices for a more sustainable land use. This framework, including a description of the actors involved, and the way in which these actors work together to achieve the agreed-upon objectives, needs to be formally institutionalized at different governmental levels. The idea is that this institutionalized system helps to assure long-term continuity of the jurisdictional framework. The jurisdictional approach is still rather new in Indonesia's palm oil sector. The first example stems from 2011 in East Kalimantan (*Berau Forest Carbon Program*) followed by other programs in other jurisdictional regions e.g. the *Central Kalimantan Sustainable Palm Oil Production and Protection Program* (see Paoli et al. 2016 for more detail). With regards to a sustainable future for palm oil smallholders in Indonesia, we foresee two challenges inherent to this approach. The first one regards the involvement of smallholder farmers from the beginning of these projects and the available space for smallholders to choose their own strategies and act upon their agentic power. These issues are currently undervalued in the jurisdictional approach. Further, and although the institutionalization of the approach may guarantee longer-term commitment from a diversity of stakeholders, it also leads to less flexibility to adapt to changes. Especially if smallholders may only become involved after the program has been implemented already, it may be impossible to make changes in the program based on smallholders' input. A way to assure smallholder involvement from the early stages of a project, is through the so-called FAIR community-company partnerships.

FAIR company- community partnerships

FAIR company-community partnerships approach was initiated by Oxfam in 2016 and aims to improve regional economic development and reduce the adverse impacts of palm oil production via arranging and institutionalizing collaborative arrangements between smallholders and companies. This approach is also based on the Landscape approach but emphasizes that smallholders need to be actively involved from an early stage of the partnership program. This involvement is shaped through a participatory approach and based on four principles that together form the acronym FAIR; Freedom of choice, Accountability, Improvement of benefits, and Respect for rights (Oxfam 2017). The FAIR company-community partnership approach is very recently initiated and aims to launch pilot projects in Indonesia by 2017. Although we are rather optimistic about the landscape – and participatory approaches underlying the FAIR community-company partnership constellation, we also feel that a lack of government involvement may cause authority challenges and hamper vigor, as explained before.

Summarized, we doubt whether certification in its current shape may structurally and significantly contribute to a more sustainable future for smallholders. Reversing the trend of certification is an undesired option as we cannot expect governments to change their agricultural systems into more sustainable systems on their own. We also have to realize that certification has resulted in minor, but significant improvements in the livelihoods of certified palm oil smallholders, which should not be neglected. It may therefore be possible to adapt existing certification systems, or to integrate public and private certification into one coherent scheme. We however feel that this may contribute to, but not sufficiently guarantee, a sustainable future for smallholders. Based on our research, we feel that an integration of the jurisdictional approach and the FAIR community-company partnership model may enable more significant improvements towards a sustainable future for Indonesian palm oil smallholders. It is the unique combination of government involvement, participatory approaches that guarantee smallholder involvement and allow smallholders to act upon their agency, and the prioritization of a landscape approach over a single-crop approach that make us feel positive about the potential contribution of such an approach towards a more sustainable future for Indonesian palm oil smallholders.

6.6 OUTLOOK ON FUTURE RESEARCH

Based on our research, we consider the sustainable livelihood concept useful in analyzing the impacts of sustainability certification on palm oil smallholders' livelihoods from a smallholders' perspective. The sustainable livelihood concept takes a holistic view on the impacts of certification and the channels through which these impacts may be shaped. This allows to explicitly consider smallholders' social contexts, including their socio-economic relationships, cultural beliefs, practices, and political realities in analyzing the impact of certification on their livelihoods.

Our research shows that the impacts of certification can be considered positive, but very small. Certification in its current form will probably not result in systemic sustainability changes. In this chapter we reflected on several pathways for a more sustainable future for Indonesian palm oil smallholders. An integration of the jurisdictional approach and the FAIR community-company partnership model may provide opportunities to combine smallholder empowerment and participation within a landscape approach, while assuring commitment from public and private actors. Notwithstanding these potential strengths, we also foresee some challenges justifying further research on the implementation, feasibility and prospective impacts of the so-called combined approach.

A first challenge regards the way in which nation-wide unification of this approach can be guaranteed. Currently, the implementation of jurisdictional approaches is strictly delineated by jurisdictional borders (i.e. districts or provinces). Given the decentralized political structure of Indonesia, it is very well possible that each jurisdiction employs its

own rules and regulations that differ from other, neighboring jurisdictions. On the local scale, this is not necessarily a problem given the bottom-up and participatory way in which the FAIR community-company approach works. This allows the combined approach to adapt to rules and regulations in different jurisdictional territories. However, this situation may become a problem if the target is to induce nation-wide systemic sustainability changes in the agricultural sector. Relevant questions that need to be answered regard the way in which the combined approach can be scaled-up to the national level, who will take the lead in this, and how communication and coordination among different levels of the government and among jurisdictions may be shaped. When the approach will be scaled-up to a higher level, the commitment of the local government will be crucial to keep the program running and to assure a reliable monitoring system. This raises questions on how to keep the local government committed and involved, when part of the responsibility and authority shift to the national level, and how to assure alignment of this approach with national programs and regulations. The question on who can best take the lead in the process of upscaling is also far from evident. It may seem obvious to see this as a task for the national or local government, but the involvement of companies and NGOs may also be important to preserve legitimacy towards manufactures, retailers and financial donors.

A second challenge that could be further explored in future studies, regards the role of certification in the combined approach. In the current situation we see that actors in the jurisdictional approach and in the FAIR company-community partnerships seem to be keen on adopting private certification. This is no surprise as the actors behind these relatively new initiatives also played a role in the establishment of the RSPO. The question however is, whether certification is necessary in a combined approach to either enable or speed up a transformation towards a more sustainable agricultural system. Even if it is concluded that certification may be beneficial in the combined approach, one may wonder what kind of certification fits best. Our earlier plea to integrate public and private certification does not seem to add a lot to the integrated approach, as the integrated approach already inherently encompasses the same benefits as integrating public and private certification, assurance of government commitment, and assuring global market acceptance through the adoption of stricter environmental principles.

A third challenge regards a crucial characteristic of the combined approach: early-stage multi-stakeholder participation. It is inherently challenging to ensure long-term commitment among public and private stakeholders. In our view, it is crucial to reveal and explicate a compelling value proposition for all stakeholders to stimulate their willingness to engage in the combined approach and their long-term commitment. This asks for building an assessment tool to analyze the perceived and the expected benefits and costs of the combined approach for all stakeholders and to think about ways to make this knowledge available to, and accessible for them. Further building on this dissertation, the assessment tool should pay attention to the five different types of palm oil

smallholders and the different ways and intensities in which they may benefit from the combined approach.

A fourth challenge that strongly relates to the previous one, deals with the relation between smallholder inclusiveness and smallholder empowerment in the combined approach and beyond. Being part of a process does not automatically imply that your opinion is actually heard and taken into account in making decisions. Therefore, we consider it relevant, to develop a tool to enhance smallholders' inclusiveness in negotiation processes. As a first step, such a tool could focus on issues regarding integrated land use planning and attempts to minimize unintended effects of palm oil production (e.g. social conflict and food insecurity). Given our premise that smallholders' agency and empowerment are crucial for a more sustainable future for smallholders, research on how smallholders can be empowered in relation to other actors e.g. miller companies, governments and NGOs also remains a must. Moreover, given the fact that smallholders, but also the contexts in which they are embedded, are very heterogeneous, their priorities, preferences and strategies for maintaining their livelihoods may also be different. In relation to that, initiatives may only be effective in empowering smallholders and improving their livelihoods, if they are aligned with smallholders' priorities and preferences. In relation to that, we see that a better understanding of smallholders on a micro level, particularly on their preferred strategies, behavior and decision-making processes is necessary to better adapt initiatives to smallholders' livelihoods and the institutional and social context in which the smallholders are embedded. We consider this a gap in current knowledge that may be filled with future research.

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Appendix 1. Indicators and measurements of dimensions of farmer resilience

Variables	Indicators	Measurements
Dimension of buffer capacity		
Human capital (score=4-20)		
Education	year of schooling	1=didn't go to school; 2=1-12 year (SD); 3=13-15 year (SMP); 4=16-18 year (SMA); 5=>18 year (University)
Skill	Skills being practiced	1=don't have any other skill; 2=only have palm oil plantation related skills e.g. harvesting, spraying, fertilizer application; 3=have palm oil plantation related skills and any other agriculture skills; 4=Have agriculture and Non-agriculture (informal) related skills (blue-collar skill); 5=have entrepreneurial skill or white-collar skill
Health condition	Ability to use own (family) labor to work at plantation	1=never/unable to use family labor; 2=seldom; 3=sometime; 4=often ; 5=Almost always
Knowledge	Training attended in the last 12 months	1=never attend training; 2=seldom (1-4); 3=sometime(5-8); 4=often (9-12) ; 5=Almost always (>12) (the value may change dependent on distribution of data in the field)
Financial capital (score=5-25)		
Income	Last month income from selling Fresh Fruit Bunch (FFB)	1=very low; 2=Below average; 3=Average; 4=Above average; 5=very high (dependent on distribution of data in the field)
Yield	Yield per ha last year or (average monthly production per ha*12)	1=very low; 2=Below average; 3=Average; 4=Above average; 5=very high (based on diagnostic study average yield of smallholder is 16-18 ton/year/ha, with OER 18-22%
Saving	Saving: number of livestock	1=don't have saving; 2=Below average; 3=Average; 4=Above average; 5=very high (dependent on distribution of data in the field)
Non-farm income	percentage of non-oil palm plantation income to household income (including remittance)	1=none ; 2=x<25%; 3=50>=x>25%; 4=75>=x>50; 5=100>=x>75
Dependency ratio	percentage of household member who do not earn income (do not work)	1=100>=x>75; 2=75>=x>50; 3=50>=x>25%; 4=x<25%; 5=none
Social capital: any benefits from participation in a group or organization (score=3-15)		

Appendix 1. Indicators and measurements of dimensions of farmer resilience

Variables	Indicators	Measurements
Access to tools/equipment owned by organization	Availability of tools and access	1=not available, 2=available but difficult to access, 3=available and accessible, but poor quality; 4=available, accessible, good quality, but limited time to use; 5=available, accessible, good quality, and free to use anytime
Better infrastructure quality supported by organization	Road built and maintained by group	1=not available; 2=available but in bad condition; 3=available in good condition only in the main road access; 4=available in good condition until plantation road inside group; 5=available in good condition until private road plantation
Labour sharing among farmer group members	Labor provision/ sharing in group	1=not available; 2=available but difficult to access; 3=available, accessible, but often unsatisfactory work; 4=available, accessible, but sometimes unsatisfactory work; 5=available, accessible, and always satisfactory work
Physical capital (score=2-10)		
Availability of private tools/equipment	Availability of own spraying tools and its safety	1=not available; 2=available with poor quality without safety tools; 3= available with good quality but without safety tools; 4=available with good quality but not complete safety tools; 5=available with good quality and complete safety tools
	Availability of own harvesting tools and its safety	1=not available; 2=available with poor quality without safety tools; 3= available with good quality but without safety tools; 4=available with good quality but not complete safety tools; 5=available with good quality and complete safety tools
Natural capital (score=1-5)		
Plantation risk	Plantation risk to erosion/flood	1=extremely risky to flood or erosion; 2=very risky to flood or erosion; 3=moderately risky to flood or erosion; 4=Slightly risky to erosion; 5=not et al
Dimension of self-organization (score=6-30)		
Institutions	Rules, regulation, local norm and government policies may restrict self-organization of farmers	1=there are rules definitely not allow us to manage plantation on his own; 2=there are rules, so probably not able to manage plantation (too difficult to follow the rule); 3=there are rules, but we still possibly able to manage plantation (but with many consequences); 4=there are rules, but we probably able to manage plantation (but with some consequences); 5=there are rules but we definitely able to manage plantation without any consequences

Appendix 1. Indicators and measurements of dimensions of farmer resilience

Variables	Indicators	Measurements
Cooperation and network	membership and participation	1=No organization; 2=Follow at least one organization as passive member (e.g. never follow meeting); 3=Follow one organization as active member (e.g. follow all organization activities); 4=join one organization and active in management; 5=join more than one organization actively as member and/or management
	Trust and reciprocity	1=Definitely not able to borrow money from (or labor exchange with) other farmers (impossible); 2= probably not able; 3=possibly able a; 4=probably able; 5=definitely able
Network structure	Bounding level to actors or organizations	1=one roof management or part of company concession ; 2=tight in formal contract/ scheme; 3=tight informally for input supply and selling FFB ; 4=tight informally to sell FFB ;5=do not tight to any organization/agency
Reliance on own resources	The level of centralization of plantation management	1=all plantation management are conducted by other actor, farmer could not influence et al; 2= all plantation activities are managed by other actor, with farmer groups/cooperative control; 3=partly plantation activities are managed by other actors under farmer groups/cooperative control; 4=partly/all plantation activities are managed by other actors under farmers' control (individually); 5=all plantation activities managed by farmers themselves (managed=application including, input provision, decision when the activities conducted etc)
	Percentage of external input reduction because of internal input substitution	1=none ; 2= $x < 25\%$; 3= $50 > x > 25\%$; 4= $75 > x > 50$; 5= $100 > x > 75$
Dimension of learning capacity (score=6-30)		
Knowledge of threats and opportunities	Ability to get information about ongoing issues around palm oil	1=Very poor (never get information); 2=Poor (Difficult to get information, most of the time no); 3=Fair (sometime get information); 4=Good (often get information, most of the time get); 5=Very good (always)
	How many time in a year regular meetings in organizations are conducted to discuss performance in the last season/ last year	1=None/Never attend such meeting; 2=seldom (1-4); 3=sometime(5-8); 4=often (9-12) ; 5=Almost always (>12) (the value may change dependent on distribution of data in the field)
Commitment to learning		

Appendix 1. Indicators and measurements of dimensions of farmer resilience

Variables	Indicators	Measurements
Functioning feedback mechanism	Frequency discussion between farmers and extension officer (from government or company or NGO) in the last 12 months	1=None/ Never join such discussions; 2=seldom (1-4); 3=sometime(5-8); 4=often (9-12) ; 5=Almost always (>12) (the value may change dependent on distribution of data in the field)
Knowledge identification capability-monitoring	Experimentation	1=Definitely not able to do experiment (no available external support); 2= probably not able (can ask external support but they have done it before); 3=possibly able, (it is done occasionally with external supports); 4=probably able with external support, (it is done continually); 5=definitely able (with own resources and it is done continually)
Knowledge sharing and transfer capability	Sharing information and knowledge among farmers	1=None/ Never join such discussions; 2=seldom (1-4); 3=sometime(5-8); 4=often (9-12) ; 5=Almost always (>12) (the value may change dependent on distribution of data in the field)
	Applicability of new knowledge to practice in plantation	1=Never applicable; 2=seldom applicable; 3=sometime applicable; 4=often applicable; 5=Almost always

Appendix 2. Correlation between dimensions of resilience, its interactions and livelihood resilience

Variables	Correlation coefficient (r)	Sig. 2 tailed
Buffer capacity	.138*	.022
Self-organization	.040	.507
Learning capacity	.166**	.006
Interaction: buffer capacity and self-organization	.077	.204
Interaction: buffer capacity and learning capacity	.173**	.004
Interaction: self-organization and learning capacity	.128*	.034
Interaction: among all dimensions	.129*	.032
Certification*)	.231**	.000
Collaboration 1 (middleman as control)*)	-.232**	.000
Collaboration 2 (company as control) *)	.102	.091
Management 1 (independent as control) *)	.035	.565
Management 2 (one-roof as control) *)	-.030	.616
Interaction: certification and buffer capacity	.251**	.000
Interaction: certification and self-organization	.233**	.000
Interaction: certification and learning capacity	.240**	.000
Interaction: management (one-roof as control) and buffer capacity	-.027	.657
Interaction: management (one-roof as control) and self-organization	-.021	.725
Interaction: management (one-roof as control) and learning capacity	-.036	.552
Interaction: collaboration (middlemen as control) and buffer capacity	-.194**	.001
Interaction: collaboration (middlemen as control) and self-organization	-.194**	.001
Interaction: collaboration (middlemen as control) and learning capacity	-.174**	.004

*. Significant level = .05

** Significant level = .01

Appendix 3. T-test: mean difference dimension of farmer resilience based on participation in certification scheme

A. Buffer capacity

	Certification	N	Mean	Sig-2 tailed	Mean difference
Buffer capacity	certified	105	41.5810	.000**	7.01625
	uncertified	170	34.5647		

B. Self-organization

	Certification	N	Mean	Sig 2-tailed	Mean difference
Self-organization	certified	105	17.8857	.172	.49748
	uncertified	170	17.3882		

C. Learning capacity

	Certification	N	Mean	Sig. (2-tailed)	Mean difference
Learning capacity	certified	105	16.6857	.000**	3.780
	uncertified	170	12.9059		

*. Significant level = .05

** Significant level = .01

Appendix 4. Analysis of variance (ANOVA) test: mean difference of livelihood resilience based on plantation management

Mean difference (H-V)	Independent	NES/KKPA self-management	One roof
Independent		.0513 (.796)	.1133 (.586)
NES/KKPA self-management			.586 (.859)
One roof			
			F=.608, Sig.=.545

P-value is in the bracket

*The mean difference is significant at the .05 level

Appendix 5. Analysis of variance (ANOVA) test: mean difference of livelihood resilience based on partner that smallholders collaborate with

Appendix 5. Analysis of variance (ANOVA) test: mean difference of livelihood resilience based on partner that smallholders collaborate with

Mean difference (H-V)	Middlemen	Company	NGO
Middlemen		-.3015* (.008)	-.3995* (.005)
Company			-.0980 (.587)
NGO			

F=6.360, Sig. = .002

P-value is in the bracket

*The mean difference is significant at the .05 level

Appendix 6. Analysis of variance (ANOVA) test: mean difference of dimensions of farmer resilience based on collaboration

A. Buffer capacity

Mean difference (H-V)	Middlemen	Company	NGO
Middlemen		-3.042* (.006)	-.807 (.795)
Company			3.849* (.000)
NGO			

F=10.523, Sig. = .000

P-value is in the bracket

*The mean difference is significant at the .05 level

B. Self-organization

Mean difference (H-V)	Middlemen	Company	NGO
Middlemen		2.253* (.000)	-1.180* (.007)
Company			-3.433* (.000)
NGO			

F=24.502, Sig. = .000

P-value is in the bracket

*The mean difference is significant at the .05 level

C. Learning capacity

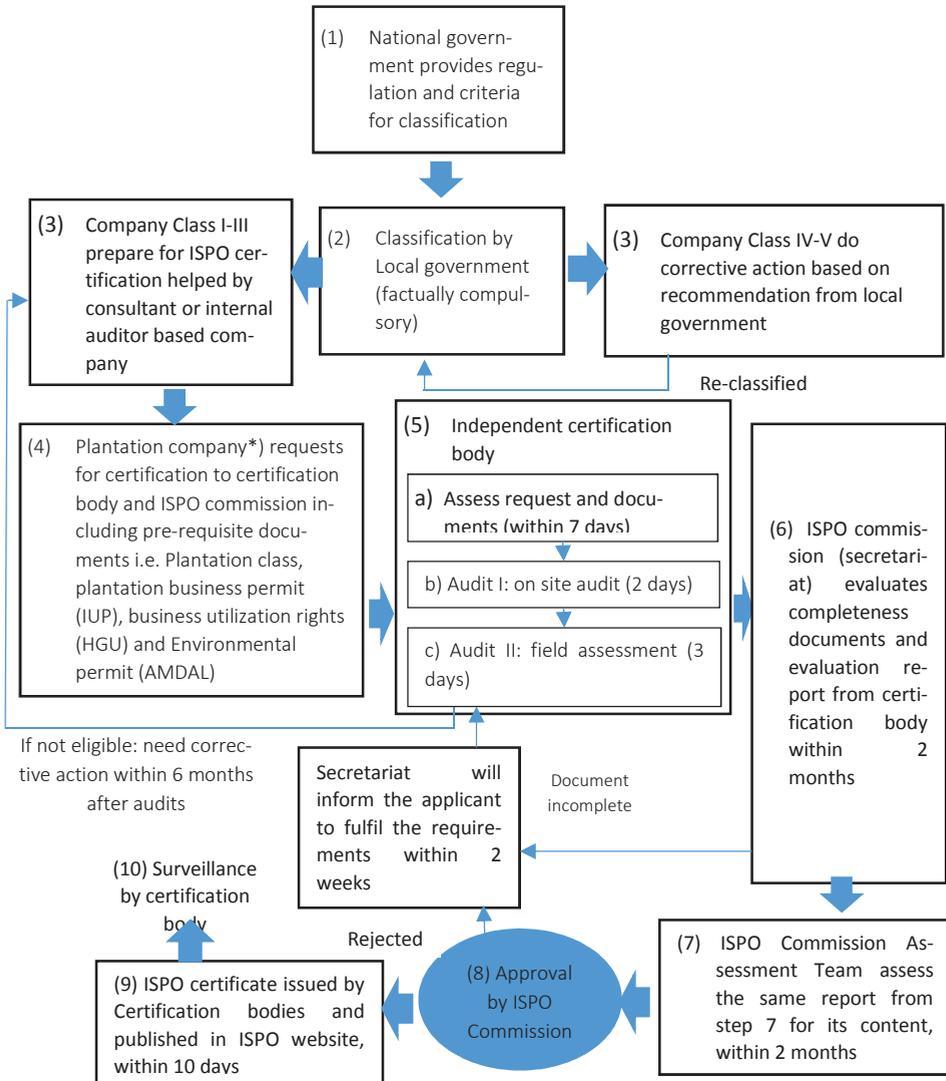
Mean difference (H-V)	Middlemen	Company	NGO
Middlemen		-3.443* (.000)	-2.765* (.001)
Company			.677 (.506)
NGO			

F=15.727, Sig. = .000

P-value is in the bracket

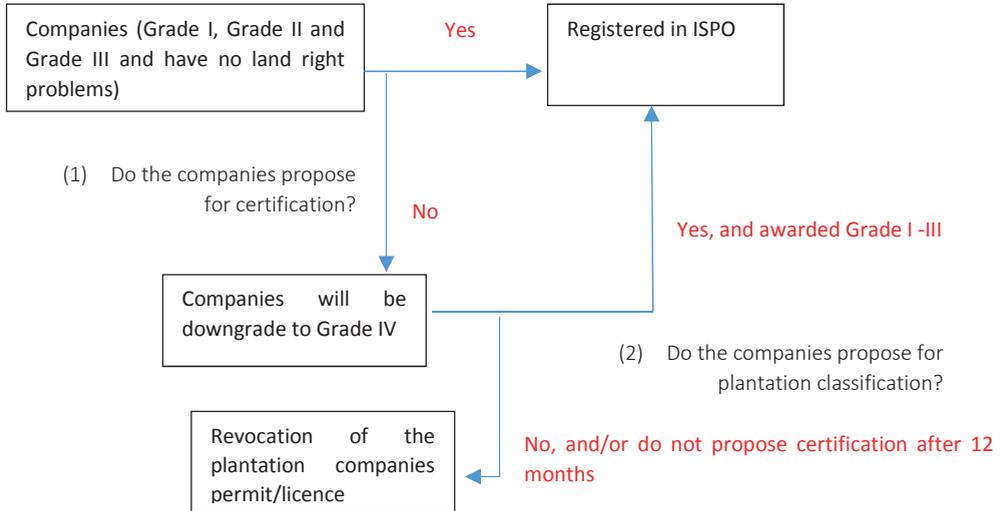
* The mean difference is significant at the .05 level

Appendix 7. Flowchart of ISPO certification process



*) Scheme smallholders: Manager of scheme plantation
Independent smallholders: Cooperative/ farmer groups

Appendix 8. Sanction mechanism of ISPO

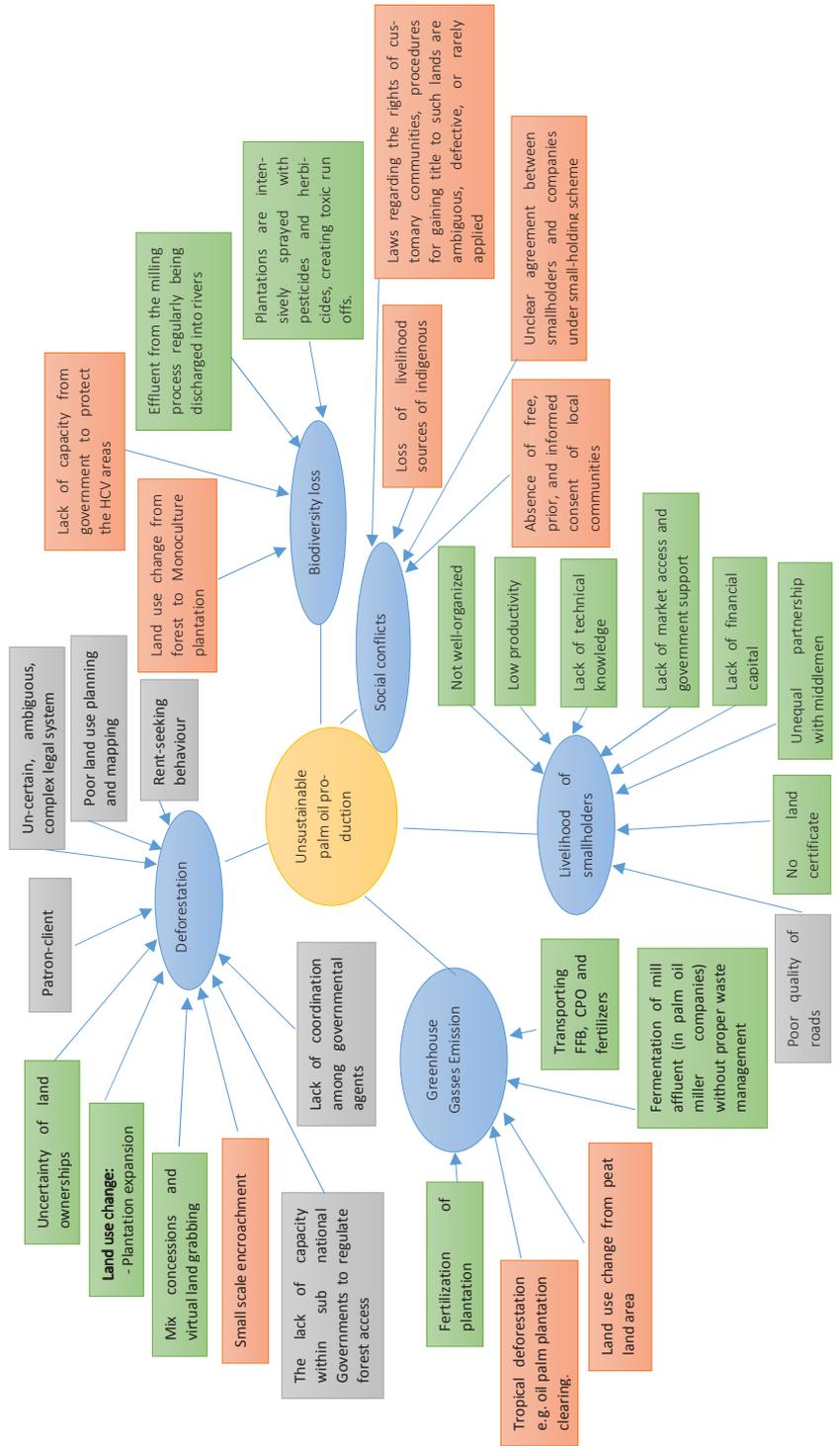


Appendix 9. Time line of ISPO implementation



Appendix 10. Cause-effect diagram of sustainability problems associated with the expansion of palm oil: Adapted to the Indonesian context

Appendix 10. Cause-effect diagram of sustainability problems associated with the expansion of palm oil: Adapted to the Indonesian context



Appendix 11. Example of results of CAQDA analysis

Family 1	Family 2	coding	Quotations	Example of the quotations in English
Availability of resources	right actors quantity	enough people in	4	11 certification bodies are enough already, however, if there are more institutions proposed to be part of ISPO certification body, we (ISPO commission) will accept it as long as the institution has been approved by ISPO evaluation team.
Availability of resources		not enough people in	20, ISPO has too limited auditors, compared to palm oil companies that have to be audited More than one mo.th is needed to audit one palm oil company. That is the reason behind the extended of ISPO's target to certify all Indonesian palm oil companies.....
Availability of resources	Money	enough budget	4 So, there is no budget problem for ISPO ISPO secretariat should have maybe IDR 6-7 billion and up to now government still able to provide that.
Availability of resources		not enough budget	15	We know that the government has a limited budget particularly for estate crop related programs. Only 10 billion is not enough, we need hundreds of billions to implement all those things
market context	Market acceptance	recognized in global market	1	So far, Indonesian palm oil export run well. Especially to India. For India, cheap price is the most important. Although they also aware of sustainability, but price is considered a priority.
market context		not recognized in global market (yet)	23	Up to now, ISPO has not been recognized as much as RSPO. I think that it is a challenge for ISPO to show its credibility as sustainability standard scheme.....
clarity of rules	Clear rules	clear rules	16	Rule and regulations are clear as it is based on national and local rules and regulations .. ISPO rule says if oil palm trees have been planted more than 4 years along a river, we can keep it, later after replanting period, it should not be planted and conserved, it says in both of Agricultural Ministry Regulation No. 19/2011 and, the new one, Agricultural Ministry Regulation No. 11/2015, so from which year is it 4 years, 2011 or 2015.
clarity of rules		not clear rules	22	

Appendix 11. Example of results of CAQDA analysis

Family 1	Family 2	coding	Quotations	Example of the quotations in English
clarity of rules	rules congruence	Conflicted rules	17	<p>..... and in Criteria 2..4. based on Decree No. 39/2014, companies are obliged to cultivate all concessions that technically feasible to be planted. And HCV is technically and economically feasible to be planted. On the other hand Ministry of Spatial Planning enforced <i>Surat Edaran</i> No. 10/2015 recognizes HCV and require companies to conserve HCV</p> <p>Yes the rules are inline with other Ministries, as ISPO is not only a regulation from the Ministry of Agriculture but also a collection of regulations from different ministries including the Ministry of Forestry and Environment and the Ministry of Spatial Planning</p>
clarity of rules		Rules are congruent	5	<p>.... Monitoring and supervision is important for ISPO implementation... but enforcement of sanctions is also important.. ISPO says to revoke the license of there is non-compliance. Which license is that? not ISPO, but Regent or <i>Walikota/Bupati</i> who has the authority to revoke plantation licenses.</p>
Interaction of actor involved	Authority	Lack of authority	83	<p>... well.. With recommendation resulting from monitoring and supervision of provincial or district estate crop plantation office, it is not possible that the sanction can be enforced</p>
Interaction of actor involved		Enough authority	3	

Summary

Participation of smallholders in sustainability certifications is expected to accelerate the transformation towards a more environmentally sustainable production of palm oil while simultaneously improving smallholders' livelihoods. However, studies on the impact of sustainability certification on smallholders are rather inconclusive and lack consideration of the social context in which smallholders operate. The central aim of this dissertation is to investigate the impacts of sustainability certification on the livelihoods of Indonesian palm oil smallholders from a smallholders' perspective. We thereby differentiate between five different types of smallholders based on differences in their social and institutional context of production. The central research question in this dissertation is:

In what way and to what extent does sustainability certification contribute to a better livelihood of Indonesian palm oil smallholders?

This general question is specified in three sub-questions: 1) How does private certification relate to the smallholders' livelihood? 2) To what extent may public certification become a viable alternative to private certification? 3) What might be a potential pathway leaving room for a sustainable livelihood for palm oil smallholders?

To answer these research questions, we adopt, and later on amend, the Sustainable Livelihood concept. This concept comprises the capabilities, assets and activities required for sustaining or improving a means of living. This dissertation exists of four empirical chapters; the first three empirical chapters focus on private sustainability certification: the Roundtable on Sustainable Palm Oil (RSPO), whereas the fourth empirical chapter analyses an example of public sustainability certification: Indonesian Sustainable Palm Oil (ISPO).

Given uncertainties about the implications of sustainability certification for smallholders' livelihood, **Chapter 2** explores the potential of sustainability certification to improve the livelihood of smallholders. To achieve this objective, we develop an amended sustainable livelihood framework that we use to analyze the livelihoods of Indonesian smallholders participating in the Roundtable on Sustainable Palm Oil (RSPO). Although access to markets and vulnerability are not improved through certification, we could find some positive, indirect effects of certification, for example through organizational changes leading to an increase in the productivity of palm oil plantations. Chapter 2 also indicates a discrepancy between certifications' theory of change and the meaning provided to certification by farmers. Where the former sees certification as a tool to create a more sustainable agriculture, the smallholders interpret it as an economic tool in the pursuit of a better livelihood. This implies that non-economic benefits of certifica-

tion (such as social and environmental improvements) are not very highly valued by the smallholders, unless they result in economic benefits. Certification schemes are thus weakly institutionalized, and farmers will easily shift to a more profitable way of production if they get the chance. We therefore conclude that a further analysis of the economic profitability of certification for smallholders is needed.

Chapter 3 analyses the economic profitability of private palm oil certification for smallholders using a Cost-Benefit Analysis (CBA) and the assessment of Net Present Values (NPV). Better understanding the investment value of certification adoption may be relevant to bring in more smallholders and to make certification more beneficial for the generally vulnerable smallholders. Chapter 3 shows that under the actual condition, in which the smallholders do not pay for the certification costs, certification is profitable for all different types of smallholders (scheme smallholders and independent smallholders). The extent to which certification can be considered profitable depends on the smallholder's conditions before they adopt certification. In the self-funded scenario, wherein smallholders pay all certification costs themselves, certification remains profitable for all smallholders except for scheme smallholders who were already better off before certification. For independent smallholders, certification in the self-funded scenario will only remain profitable if they receive premium prices; if premium prices would be abolished, independent smallholders would need unrealistically high premium fees, i.e. double compared to the current premium fees, to make it a profitable route. Considering the current oversupply of sustainable palm oil we consider it unlikely that certification remains profitable for scheme smallholders in the self-funded scenario and for independent smallholders if they do not receive premium prices anymore.

Chapter 4 is inspired by previous studies that generally analyze whether certification affects smallholders' vulnerability (i.e. ability to cope with stresses and shocks), while they seem to neglect the smallholders' resilience (i.e. ability to recover from stresses and shocks). This chapter contributes to knowledge development in this area by empirically applying and verifying an assessment framework developed by Speranza, Wiesmann, and Rist (2014) and through analyzing the livelihood resilience of five different types of palm oil smallholders in Indonesia. Chapter 4 shows that palm oil smallholders are relatively resilient to price declines, haze resulting from forest fires and El Nino. Differences in resilience resulting from the different shocks and between the different groups of smallholders are small. Regarding the assessment framework, this chapter reveals that correlations between the dimensions of resilience and livelihood resilience are rather weak for buffer capacity and learning capacity, and even absent for self-organization. Although self-organization contributes positively to buffer capacity and learning capacity, it does not directly improve the palm oil farmers' resilience. Farmers under a one-roof management system (not self-organized) have more opportunities to diversify their income and find a part-time job outside their plantation, which may help them to recover from shocks that impact the palm oil sector. Chapter 4 also

points out that certification and collaborative relationships with companies (in comparison to middlemen) positively correlate with livelihood resilience.

While Chapter 2, 3 and 4 focused on private certification initiatives, **Chapter 5** analyses the potential of a public Indonesian certification scheme (ISPO) to initiate sustainable change in palm oil production. Through a governance capacity approach, this chapter questions the extent to which ISPO may be able to meet its own objectives and the extent to which it may contribute to solve palm oil related problems. ISPO embraces a tremendous governance challenge as thousands of companies and millions of smallholder farmers are expected to participate. It is concluded that, although ISPO has initiated a process of change, it has not yet developed its full potential. The main reason regards ISPO's rather loose problem definition, weak authority of the implementing organization, and the fact that the reliability of ISPO is still too low to convince (parts) of the global market. ISPO may therefore face difficulties in meeting its own targets and solving palm-oil related problems, such as deforestation, biodiversity loss, greenhouse gas emissions, and social conflicts between big plantations and local communities. The main governance challenge regards combining a more authoritative implementation mechanism with a convincing balance between sustainability objectives and economic interests of the sector. Given these challenges we consider it unlikely that ISPO, in the short term, will become a viable alternative to private certification.

Chapter 6 concludes that private certification has a positive, but rather small effect on smallholders' livelihoods. We further doubt if public or private sustainability certification, in the way in which they are currently shaped, will ever be able to lead to systemic and significant sustainability changes. For both forms of certification, it remains challenging to find a balance between environmental sustainability and economic interests. To some extent, the RSPO managed to find a balance between offering a strict environmental standard and providing economic benefits for participating farmers, but these economic benefits are far from being certain in the long term. Private schemes may further not be able to improve the livelihoods of the most vulnerable smallholders who cannot comply with the standards. Without government involvement, it also remains challenging to unify the standards to the local context, existing regulations and enforcement mechanisms. ISPO is expected to be relatively cheap (e.g. no membership fees) and more easily accessible for smallholders compared to private certification. However, the rules are less strict and interspersed with leeway. Combined with the lack of authority, coordination problems, and problems regarding acceptance of the standard in the global market, it leads to a rather weak ability to achieve an environmentally sustainable transformation of the palm oil sector.

Chapter 6 ends with an exploration of potential pathways toward a more sustainable future for Indonesian palm oil smallholders. We explore different pathways and discuss challenges and weaknesses that go along with them, including a reversal of the trend of certification, parallel existence of public and private certification, the landscape approach, the jurisdictional approach and the FAIR community-company partnership ap-

Summary

proach. After balancing the pros and cons of each pathway we suggest to further explore the possibilities of integrating the FAIR company-community partnership approach with the jurisdictional approach as a way forward towards a more sustainable future for Indonesian palm oil smallholders.

Ringkasan

Partisipasi petani dalam sertifikasi keberlanjutan diharapkan dapat mempercepat transformasi menuju produksi minyak kelapa sawit yang ramah lingkungan dan sekaligus meningkatkan penghidupan petani. Namun, studi tentang dampak sertifikasi keberlanjutan terhadap petani masih terbatas dan tidak mempertimbangkan konteks sosial di mana petani kecil beroperasi. Tujuan utama dari disertasi ini adalah untuk menyelidiki dampak dari sertifikasi keberlanjutan terhadap *livelihood* petani kelapa sawit Indonesia dari perspektif petani. Dengan demikian, kita membedakan antara lima jenis petani kecil berdasarkan perbedaan dalam konteks produksi sosial dan kelembagaan mereka. Pertanyaan penelitian utama dalam disertasi ini adalah:

Dengan cara apa dan sampai sejauh mana sertifikasi keberlanjutan berkontribusi pada livelihood yang lebih baik dari petani kelapa sawit Indonesia?

Pertanyaan umum ini dispesifikasikan dalam tiga sub-pertanyaan: 1) Bagaimana sertifikasi swasta terkait dengan *livelihood* petani? 2) Sejauh mana sertifikasi publik menjadi alternatif untuk sertifikasi swasta? 3) Alternatif pathway seperti apa yang mungkin dapat mendukung livelihood yang berkelanjutan bagi petani kelapa sawit?

Untuk menjawab pertanyaan penelitian ini, kita mengadopsi, dan kemudian di ubah, konsep *Sustainable Livelihood*. Konsep ini terdiri dari kemampuan, aset dan aktivitas yang diperlukan untuk mempertahankan atau memperbaiki sarana hidup. Disertasi ini terdiri dari empat bab empiris; tiga Bab empiris pertama focus terhadap sertifikasi keberlanjutan swasta: Roundtable on Sustainable Palm Oil (RSPO), sedangkan bab empiris ke empat menganalisis contoh sertifikasi public: Indonesian Sustainable Palm Oil (ISPO).

Dengan ketidakpastian mengenai implikasi sertifikasi keberlanjutan bagi *livelihood* petani, Bab 2 mengeksplorasi potensi sertifikasi keberlanjutan untuk memperbaiki taraf hidup petani. Untuk mencapai tujuan ini, kami mengembangkan kerangka kerja *sustainable livelihood* yang telah kami gunakan untuk menganalisis *livelihood* petani kecil Indonesia yang berpartisipasi dalam Roundtable of Sustainable Palm Oil (RSPO). Meskipun akses terhadap pasar dan vulnerabilitas tidak meningkat melalui sertifikasi, kita dapat melihat kontribusi positif dan dampak negative sertifikasi, contohnya melalui perubahan organisasi yang mengarahkan pada peningkatan produktivitas perkebunan kelapa sawit.

Bab 2 juga menunjukkan adanya ketidaksesuaian antara teori perubahan sertifikasi dan makna yang diberikan kepada sertifikasi oleh petani. Yang pertama melihat sertifikasi sebagai alat untuk menciptakan pertanian yang lebih berkelanjutan, petani menafsirkannya sebagai alat ekonomi untuk mencari livelihood yang lebih baik. Ini menyiratkan bahwa manfaat sertifikasi non-ekonomi (seperti perbaikan sosial dan lingkungan) tidak begitu dihargai oleh petani kecil, kecuali jika hal itu mengarah pada

manfaat ekonomi. Oleh karena itu, skema sertifikasi kurang terinstitutionalisasi, dan petani akan mudah beralih ke cara produksi yang lebih menguntungkan jika mereka mendapat kesempatan. Oleh karena itu, kami menyimpulkan bahwa analisis lebih lanjut mengenai profitabilitas ekonomi dari sertifikasi untuk petani kecil sangat dibutuhkan.

Bab 3 menganalisis profitabilitas ekonomi dari sertifikasi minyak sawit swasta untuk petani melalui penggunaan Analisis Manfaat Biaya (Cost-Benefit Analysis / CBA) dan penilaian Net Present Value (NPV). Pemahaman yang lebih baik mengenai nilai investasi dari adopsi sertifikasi mungkin relevan dilakukan untuk mensertifikasi lebih banyak petani dan untuk membuat sertifikasi lebih bermanfaat bagi petani yang secara umum vulnerable. Bab 3 menunjukkan bahwa dalam kondisi aktual, di mana petani tidak membayar biaya sertifikasi, adopsi sertifikasi menguntungkan untuk semua jenis petani (petani kemitraan dan pekebun mandiri). Sejauh mana sertifikasi dapat dianggap menguntungkan tergantung pada kondisi petani kecil sebelum mereka mengadopsi sertifikasi. Dalam skenario yang didanai sendiri dimana petani kecil membayar semua biaya sertifikasi sendiri, sertifikasi tetap menguntungkan bagi semua petani kecil kecuali petani skema kecil yang sudah lebih baik sebelum sertifikasi. Bagi petani mandiri, sertifikasi dalam skenario self-funded hanya akan menguntungkan jika mereka tetap menerima harga premium; Jika harga premium akan dihapuskan, pekebun mandiri akan memerlukan premium fee yang tidak realistis, yaitu dua kali lipat dibandingkan dengan premium fee saat ini untuk sertifikasi agar tetap menguntungkan dalam skenario yang didanai sendiri. Mengingat kelebihan pasokan minyak sawit lestari saat ini, kami menganggap tidak memungkinkan bahwa sertifikasi tetap menguntungkan bagi petani kecil skema dalam skenario yang didanai sendiri dan bagi petani mandiri jika mereka tidak menerima harga premium lagi.

Bab 4 terinspirasi oleh penelitian sebelumnya yang umumnya menganalisis apakah sertifikasi mempengaruhi vulnerabilitas petani (yaitu kemampuan untuk mengatasi tekanan dan guncangan), sementara hal tersebut tampaknya mengabaikan resiliensi petani (yaitu kemampuan untuk pulih dari tekanan dan guncangan). Bab ini berkontribusi terhadap pengembangan pengetahuan di bidang ini dengan menerapkan dan memverifikasi secara empiris kerangka penilaian yang dikembangkan oleh Speranza et al. (2014) dan melalui analisis *livelihood resilience* dari lima jenis petani kelapa sawit di Indonesia. Bab 4 menunjukkan bahwa petani kelapa sawit relatif tahan terhadap penurunan harga, kabut akibat kebakaran hutan dan El Nino. Perbedaan resiliensi antara guncangan dan antara kelompok petani tidak berbeda secara nyata. Terkait dengan kerangka penilaian Speranza et al (2014), bab ini mengungkapkan bahwa dimensi resiliensi berkorelasi lemah dengan *livelihood resilience* agak lemah untuk terutama dimensi *buffer capacity* dan *learning capacity*, dan bahkan tidak ditemukan korelasi antara *livelihood resilience* dengan *self-organization*. Meskipun dimensi *self-organization* berkontribusi secara positif terhadap dimensi *buffer capacity* dan *learning capacity*, namun hal itu tidak secara langsung memperbaiki ketahanan petani kelapa sawit. Petani yang berada di bawah sistem pengelolaan satu atap memiliki lebih banyak kesempatan untuk

melakukan diversifikasi pendapatan mereka dan mencari pekerjaan paruh waktu di luar perkebunan mereka, yang dapat membantu mereka pulih dari guncangan yang berdampak pada sektor kelapa sawit. Bab 4 juga menunjukkan bahwa hubungan sertifikasi dan kolaborasi dengan perusahaan (dibandingkan dengan tengkulak) berkorelasi positif dengan *livelihood resilience*.

Sementara Bab 2, 3 dan 4 berfokus pada inisiatif sertifikasi swasta, Bab 5 menganalisis potensi skema sertifikasi publik Indonesia (ISPO) untuk menginisiasi perubahan produksi kelapa sawit yang berkelanjutan. Melalui pendekatan kapasitas tata kelola, bab ini mempertanyakan sejauh mana ISPO dapat memenuhi tujuannya sendiri dan sejauh mana hal tersebut dapat berkontribusi untuk mengatasi masalah terkait minyak kelapa sawit. ISPO menghadapi tantangan yang sangat besar, mengingat ribuan perusahaan dan jutaan petani kecil diharapkan untuk berpartisipasi dalam skema tersebut. Disimpulkan bahwa, walaupun ISPO telah memulai proses perubahan, namun belum mengembangkan potensi penuhnya. Alasan utama menyangkut definisi masalah ISPO yang agak longgar, lemahnya kewenangan organisasi pelaksana, dan fakta bahwa keandalan ISPO masih terlalu rendah untuk meyakinkan (sebagian) pasar global. ISPO dapat menghadapi kesulitan dalam memenuhi targetnya sendiri dan memecahkan masalah terkait minyak kelapa sawit, seperti penggundulan hutan, kehilangan keanekaragaman hayati, emisi gas rumah kaca, dan konflik sosial antara perkebunan besar dan masyarakat lokal. Tantangan tata kelola utama berkaitan dengan menggabungkan mekanisme pelaksanaan yang lebih otoritatif dengan keseimbangan yang meyakinkan antara tujuan keberlanjutan dan kepentingan ekonomi sektor ini. Dengan tantangan ini, kami mempertimbangkan kemungkinan ISPO, dalam jangka pendek, akan menjadi alternatif yang layak untuk sertifikasi swasta.

Bab 6 menyimpulkan bahwa sertifikasi swasta memiliki pengaruh positif, namun relatif kecil terhadap *livelihood* petani. Kami meragukan bahwa sertifikasi keberlanjutan publik atau swasta, pada saat ini, akan menyebabkan perubahan menuju sustainability secara sistemik dan signifikan. Untuk kedua bentuk sertifikasi tersebut yang menjadi tantangan adalah untuk menemukan keseimbangan antara keberlanjutan lingkungan dan kepentingan ekonomi. Sampai batas tertentu, RSPO berhasil menemukan keseimbangan antara menawarkan standar lingkungan yang ketat dan memberikan keuntungan ekonomi bagi para petani yang berpartisipasi, namun manfaat ekonomi ini tidak dipastikan dalam jangka panjang. Skema swasta mungkin tidak dapat memperbaiki *livelihood* petani yang paling vulnerable dan tidak dapat mematuhi standar tersebut. Tanpa keterlibatan pemerintah, cukup sulit untuk menyelaraskan standar dengan konteks lokal, peraturan dan mekanisme penegakan yang ada. ISPO diharapkan relatif murah (misalnya tidak ada iuran keanggotaan) dan lebih mudah diakses untuk petani dibandingkan dengan sertifikasi swasta. Namun, peraturannya kurang ketat. Dikombinasikan dengan kurangnya kewenangan, masalah koordinasi, dan masalah mengenai penerimaan standar di pasar global, hal ini mengarah pada lemahnya kemampuan ISPO untuk membawa perubahan menuju sektor kelapa sawit yang ramah lingkungan.

Bab 6 diakhiri dengan eksplorasi potensial *pathway* untuk menuju masa depan yang lebih berkelanjutan bagi petani kelapa sawit Indonesia. Kami mengeksplorasi beberapa *pathway* yang berbeda dan mendiskusikan tantangan dan kelemahan yang menyertainya, termasuk trend terbalik pada sertifikasi, eksistensi sertifikasi publik dan swasta secara paralel, pendekatan lansekap, pendekatan yurisdiksi dan pendekatan FAIR Company-Community *partnership*. Setelah mempertimbangkan pro dan kontra dari masing-masing *pathway*, kami menyarankan untuk lebih jauh mengeksplorasi kemungkinan untuk mengintegrasikan pendekatan FAIR Company-Community *partnership* dengan pendekatan yurisdiksi sebagai jalan menuju masa depan yang lebih berkelanjutan bagi petani kelapa sawit Indonesia.

Valorization

Valorization is a process of creating value from knowledge, by making knowledge suitable and available for social and economic use and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities (Promotiereglement 2013). In the Indonesian context, valorization is comparable to one of the Three obligatory Principles of Higher Education known as Tri Dharma Perguruan Tinggi, comprising education and teaching, research, and community services. Valorization has strong linkages with the principle of performing community services, referring to activities by academics in which they use scientific insights and technology to promote the welfare of people. In this part, we elaborate on the way in which our dissertation research can be used in practice and for actors outside academia.

SOCIAL AND ECONOMIC RELEVANCE

This dissertation offers an analysis of the impacts of sustainability certification on the livelihoods of palm oil smallholders in Indonesia from a smallholders' perspective. The research underlying this dissertation was motivated by the existence of uncertainty on the impact of sustainability certification on smallholders' livelihoods. We took the smallholders' point of view as a central focus point in analyzing the impact of certification and developing an amended sustainable livelihood framework applied to Indonesian palm oil smallholders. We argue that this research is not only a contribution to academic insights and literature, but also contributes to a better understanding of the livelihoods of Indonesian smallholders and the challenges they face in their daily practices. With this information, public and private policies and regulations can be better targeted to fit into the realities of the smallholders themselves. Our study also helps to raise awareness on the diversity that exists among Indonesian palm oil smallholders. Given their different characteristics and the different institutional contexts in which they operate, it is unlikely that a "one-size-fits-all" solution to improve farmers' livelihoods will work effectively.

The first empirical study (Chapter 2) focuses on smallholders' perspectives on their participation in certification, what they value and what they regard as long-term effects. In the second empirical study (Chapter 3), we analyze the profitability of certification for various types of smallholders. We used a Cost Benefit Analysis (CBA) and calculated Net Present Values (NPV) for all types of smallholders. The next empirical study, Chapter 4, focuses on different responses from different types of smallholders to stresses and shocks, and analyses how participation in certification correlates with smallholders' livelihood resilience. In, Chapter 5, we analyze the governance capacity of a public certi-

fication standard in Indonesia (ISPO). In this part we focus on challenges and opportunities in the implementation of ISPO. This research provides insights on the ability of ISPO to realize its objectives.

This dissertation, therefore, provides information and leverage points to decision makers in the public (government, ISPO committee) and private domain (RSPO), which is relevant to improve standards and certification systems in such a way that they contribute better to sustainable livelihoods. It also offers insights for organizations including governmental agencies, NGOs and smallholder unions concerned with rural development, smallholder welfare, and poverty alleviation on factors that potentially influence smallholders' livelihoods.

TARGET GROUP

Awareness on sustainability has become prominent in all sectors, including agriculture. Many efforts have been initiated to induce changes toward a more sustainable production. Sustainability certification is one of the governance instruments intended to lead to a more sustainable agricultural production. The palm oil sector in Indonesia is heavily criticized for not being sustainable. Therefore, it is in the benefit of all stakeholders (Indonesian, Western, producers, retailers, millers, exporters and governmental officials) to continue the production of Indonesian palm oil in a more sustainable way. Recently we even seen large Indonesian companies committing themselves to a zero-deforestation target and only buying palm oil planted in legal and non-forest areas. Increasingly it has been realized that to achieve a sustainable palm oil production the involvement of all stakeholders, including smallholders who own almost half of palm oil plantation land area in Indonesia, is necessary. This dissertation provides insights into smallholders' priorities, interests and realities regarding palm oil. Making these realities explicit, as we did in this dissertation, is a first step in identifying common interests among stakeholders and defining a collaborative goal that may be supported by stakeholders involved. Involvement of smallholders in governance processes is important to accelerate the transformation toward a more sustainable palm oil production in parallel with improving the ability of smallholders to deal with livelihood problems. Some attempts have been taken to bring in smallholders in certification schemes through various support programs conducted by large companies, NGOs, development organization (e.g. UNDP) and the Indonesian government. Smallholders were however not part of the negotiation processes from the start, and their interests, priorities and concerns are - at best - taken in consideration after the boundaries of the certification schemes were already set and defined. Therefore, we may even start to doubt whether the current system of (unit) certification is a good pathway to achieve a sustainable future for palm oil smallholders.

Better understanding the relationship between certification and smallholders' livelihood (Chapter 2) may further assist government officials to formulate more effective regulations in their government-led certification system (i.e. ISPO). We also identify barriers hampering ISPO's governance capacity, and provide suggestions on how to overcome these barriers. Information in this thesis also supports decision making on the kind of support that contributes to improvements in farmers' profit

Knowledge regarding smallholders' motivation to participate, and remain involved, in certification (Chapter 2) may subsequently be interesting for large scale palm oil companies to understand how to build partnerships with smallholders and how to create mutual benefits. Related to that, information regarding profitability of certification (Chapter 3) may be useful for companies to attract smallholders to join certification. Information on smallholders' perceptions is relevant as the national government requires palm oil miller companies to support surrounding smallholders (see Agricultural Ministry Regulation No. 98/2013). Next, these companies need continuous supply of FFB, which makes it relevant for them to build relations with smallholders. Finally, supporting smallholders to become certified is one possible strategy for companies to ensure quality control and better access to the market.

This research also connects to development work done by NGOs and development organizations aiming to support farmers through various channels, such as capacity building. The insights in Chapter 2 can be used by these actors to define their approach and way of facilitation to smallholders

Next, as this dissertation concentrates on smallholders, it would be inappropriate if the results would not be useful or salient to them. This thesis allows to share information and experiences from smallholders with smallholders. This information covers experiences from certified smallholders, including their interpretations of the direct and indirect benefits, in the short term and long term (Chapter 2) and their experiences with the profitability of certification (Chapter 3)

This study is also relevant for the scientific research community as the amended livelihood framework can be used for other sustainability certification schemes, for other commodities, and in other countries.

The results are also interesting for consumers who are willing to contribute to sustainability through buying certified products. Knowledge on how sustainability certification contributes to better living conditions for smallholders while reducing negative environmental effects from palm oil production may inspire consumers' decisions to buy certified oil and its derivative products.

Last, the scientific knowledge produced in this dissertation needs to be translated and made accessible to actors outside the scientific community. We consider the role of the Indonesian academic community crucial. Through *Tri Dharma perguruan tinggi* (i.e. the community services program), the academic community can arrange activities to discuss this information with farmers, farmer organizations, palm oil companies,

NGOs and development organizations and government officials. More information about these activities can be found below.

ACTIVITIES AND PRODUCTS

In their obligatory community service programs, Indonesian scientists are rather free in choosing a channel and instrument to convey information to societal actors. Considering the Indonesian culture and habits in information provision, we suggest the following activities: First, the organization of an interactive seminar or workshop to disseminate the results of this dissertation. To increase the impact of this workshop or seminar we suggest to invite a broad variety of stakeholders involved in certification and palm oil production, such as local NGOs (e.g. Setara Jambi, Yayasan Elang, Serikat Petani Kelapa Sawit (SPKS)), international based NGOs (e.g. WWF), Development organizations (e.g. UNDP and SNV), National and Local Government- representatives, certification providers (e.g. RSPO and ISPO commission), auditor institutions (e.g. Sucofindo and Mutu Agung), producer associations (e.g. GAPKI and APKASINDO), representatives of palm oil companies (e.g. PT Hindoli, PT Indo Sawit Subur), and representatives from farmer organizations (e.g. Asosiasi Swadaya Amanah and KUD Karya Bakti). In this workshop, scientists may present the results regarding the impact of certification on smallholders' livelihoods. Feedback from the audience should be stimulated and used to discuss and formulate further action plans to better achieve sustainability targets and improve smallholders' livelihoods.

Second, a separate, interactive discussion can be conducted close to the farmers e.g. in buildings for farmer associations. Besides farmers, it is advisable to also invite farmer representatives, extension officers, employees from the local government and local NGOs and local miller companies to disseminate research results to farmers. The results from the discussion can be used as a starting point for smallholder empowerment through certification or without certification.

Third, the results of this dissertation, specifically Chapter 2 have already been used by an internationally-based NGO and have been translated to a discussion on responsible sourcing for smallholders in Jambi and South Sumatera. We suggest more NGOs to follow this example.

Fourth, and to widen the scope of the valorization of this research, we suggest reproducing information of this dissertation in newsletters, policy briefs and an article in popular palm oil magazines in Indonesia e.g. InfoSAWIT, SAWIT Indonesia, and Media Perkebunan.

Fifth, the results can also be disseminated by posters that can be showcased in palm oil related conferences. A poster based on Chapter 5 has been presented at the Fifth International Conference on Palm Oil and Environment (ICOPE 2016) in Bali Indonesia,

attended by 400 leading international environmental scientists, senior government officials, actors from civil society, and industry representatives.

INNOVATION

Although this dissertation won't lead to technical innovations, it can be considered innovative in its theoretical and empirical elements.

Theoretical

- Development of a conceptual framework on the relationship between sustainability certification and smallholders' livelihood
- The development and application of an evaluation tools based on the concept of governance capacity and decomposed into a policy driven approach and problem driven approach
- Contribution to the theoretical development of the resilient livelihood concept
- Comprehensive analysis on the profitability of certification comparing certified and conventional smallholders, which provided a more realistic range of costs and benefits for the entire lifespan of a palm oil plantation under current conditions and under a self-funded scenario

Empirical

- Explorative study to the first certified scheme and independent smallholders in Indonesia
- We investigated differences in livelihood resilience among five different types of palm oil smallholders in Indonesia. The distinction between five types (instead of only two) is rather innovative.

IMPLEMENTATION (SCHEDULE)

Some dissemination activities already took place. Reproducing the research results in newsletters, policy briefs, and articles in palm oil magazines for the general public can be done in the short term. While dissemination through interactive multi-stakeholder workshops can be done as part of the community services program in Bogor Agricultural University, the place where the author currently works. For that, an annual grant from the Indonesian Ministry of Research and Technology is available solving issues of available funds directly.

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Curriculum Vitae

Nia Kurniawati Hidayat was born in Sukabumi, Indonesia, on February 1, 1988. She holds a Bachelor degree in Agricultural and Resources Economics from Bogor Agricultural University, Indonesia and in 2012, she completed the Master Program Agricultural Economics from the same university. During her study, she developed her passion to inquire relationships between challenges in agriculture and vulnerable people, including farmers. In her bachelor thesis Nia studied the Impact of the Human Development Index on Poverty; whereas in her master thesis, Nia analyzed the Impact of changing



global Rice Prices on Welfare. She is currently a lecturer in the Department of Environmental and Resources Economics, within the Faculty of Economics and Management, at Bogor Agricultural University (IPB). Courses she teaches include Agricultural Economics, Cost Benefit Analysis, Production Economics and Agricultural Trade. She focuses on research topics such as farmer households, farmers livelihood and welfare, and agricultural development and policy.

In 2013, she successfully applied for a DIKTI scholarship that allowed her to join ICIS- Maastricht University (the Netherlands) as a PhD student. Nia's PhD research was part of a collaborative research program (Scientific Program Indonesia- Netherlands - SPIN) in which Dutch (Maastricht University) and Indonesian universities (University of Lampung and Gadjah Mada University) collaborated. This program was funded by DIKTI Indonesia and the Royal Netherlands Academy of Arts and Sciences (KNAW). In her dissertation, Nia focused on the social and economic effects of palm oil certification and on the livelihoods of smallholder farmers.

Participation of smallholders in sustainability certifications is expected to accelerate the transformation towards a more environmentally sustainable production of palm oil while simultaneously improving smallholders' livelihoods. However, studies on the impact of sustainability certification on smallholders are rather inconclusive and lack consideration of the social context in which smallholders operate. The central aim of this dissertation is to investigate the impacts of sustainability certification on the livelihoods of Indonesian palm oil smallholders from a smallholders' perspective. We thereby differentiate between five different types of smallholders based on differences in their social and institutional context of production. To that end, we adopt, and later on amend, the Sustainable Livelihood concept. This concept comprises the capabilities, assets and activities required for sustaining or improving a means of living. This dissertation consists of four empirical chapters; the first three empirical chapters focus on private sustainability certification: the Roundtable on Sustainable Palm Oil (RSPO), and analyze the way in which private certification relates to the smallholders' livelihood, whereas the fourth empirical chapter analyses an example of public sustainability certification: Indonesian Sustainable Palm Oil (ISPO) and investigates to what extent public certification may become a viable alternative for private certification.

This dissertation concludes that private certification has a positive, but rather small effect on smallholders' livelihoods. We further doubt if public or private sustainability certification, in the way in which they are currently shaped, will ever be able to lead to systemic and significant sustainability changes. For both forms of certification, it remains challenging to find a balance between environmental sustainability and economic interests. This dissertation ends with an exploration of potential pathways toward a more sustainable future for Indonesian palm oil smallholders. We suggest the possibilities of integrating the FAIR company-community partnership approach with the jurisdictional approach as a way forward towards a more sustainable future for Indonesian palm oil smallholders. The unique combination of government involvement, participatory approaches that guarantee smallholder involvement and allow smallholders to act upon their agency, and the prioritization of a landscape approach over a single-crop approach may enable more significant improvements towards a sustainable future for Indonesian palm oil smallholders.