



Pre-certification conditions of independent oil palm smallholders in Indonesia. Assessing prospects for RSPO certification

Rosanne E. de Vos^{a,*}, Aritta Suwarno^{b,c,2}, Maja Slingerland^{a,3}, Peter J. van der Meer^{c,4}, Jennifer M. Lucey^{d,5}

^a Plant Production Systems Group, Wageningen University & Research, P.O. Box 430, 6700AK Wageningen, The Netherlands

^b Environmental Systems Analysis Group, Wageningen University & Research, P.O. Box 47, 6700 AA Wageningen, The Netherlands

^c Van Hall Larenstein University of Applied Science, Larensteinselaan 26a, 6880 GB Velp, The Netherlands

^d Department of Biology, University of Oxford, 11a Mansfield Rd, Oxford OX1 3SZ, United Kingdom

ARTICLE INFO

Keywords:

RSPO certification
Smallholders
Legality
Group organization
Sustainability
Indonesia

ABSTRACT

Smallholders, who cultivate $\pm 30\%$ of the global palm oil land, are critical to the realization of a sustainable palm oil sector. However, particularly independent smallholders, untied to mills, lag behind in yields and experience challenges to market their produce. Sustainability certification, such as by the Roundtable on Sustainable Palm Oil (RSPO), is proposed as a way to improve smallholder livelihoods, while protecting the environment. However, independent smallholders experience barriers to obtain certification. Through interviews with 18 RSPO certified independent smallholder groups in Indonesia and 9 certification facilitators, this study examines how pre-certification conditions regarding smallholders' socio-economic backgrounds, legality, group organization, plantation management practices, and local supply chain conditions impact prospects for RSPO certification, and how groups who successfully achieved certification have dealt with challenges during the certification process. We found that the majority (77%) of RSPO certified independent smallholders in Indonesia consists of 'former scheme' smallholders. These smallholders often have clear land legality and are organized in groups prior to certification, which increases their eligibility for RSPO certification. However, due to upfront and recurrent costs for certification, as well as complexities in meeting RSPO standards, access to certification is strongly dependent on external facilitators. To up-scale certification for independent oil palm smallholders, and include more non-scheme smallholders, certification projects should involve more local actors including local governments and certified smallholder groups. In addition, certification should focus on core social and environmental concerns for smallholders, while being flexible with regards to the forms of proof needed to fulfil legality requirements.

1. Introduction

Sustainability certification schemes for tropical commodities, such as palm oil, coffee, or cacao, seek to reconcile sustainable and equitable production, by mitigating negative environmental impacts of production processes, while supporting rural livelihoods (Tayleur et al., 2018;

Meemken et al., 2021). Consumer awareness on risks associated with palm oil production (Dauvergne, 2017) accelerated the establishment of sustainability certification schemes, including the voluntary Roundtable on Sustainable Palm Oil (RSPO), as well as the mandatory national certification schemes Indonesian Sustainable Palm Oil (ISPO), and Malaysian Sustainable palm Oil (MSPO) (Apriani et al., 2020;

Abbreviations: RSPO, Roundtable on Sustainable Palm Oil; ISPO, Indonesian Sustainable Palm Oil; MSPO, Malaysian Sustainable Palm Oil; SHM, Surat Hak Milik; SPPL, Surat Pernyataan Pengelolaan Lingkungan; STD-B, Surat Tanda Daftar Budidaya; FFB, Fresh Fruit Bunches; NGO, Non-Governmental Organization.

* Corresponding author.

E-mail addresses: rosa.devos@wur.nl (R.E. de Vos), aritta.suwarno@wur.nl (A. Suwarno), maja.slingerland@wur.nl (M. Slingerland), peter.vandermeer@hvhl.nl (P.J. van der Meer), jennifer.lucey@biology.ox.ac.uk (J.M. Lucey).

¹ ORCID: 0000-0001-5691-1434

² ORCID: 0000-0002-3918-165X

³ ORCID: 0000-0001-8087-8881

⁴ ORCID: 0000-0003-1273-3116

⁵ ORCID: 0000-0001-5224-091X

<https://doi.org/10.1016/j.landusepol.2023.106660>

Received 9 June 2021; Received in revised form 20 January 2023; Accepted 22 March 2023

Available online 13 April 2023

0264-8377/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Dharmawan et al., 2021). These certification schemes rely on third-party audits to verify if producers comply with standards (Hatanaka and Busch, 2008; Silva-Castañeda, 2012).

However, approximately 30% of the total global palm oil acreage is cultivated by smallholders, who often struggle to implement sustainability principles and criteria on their farm (Saadun et al., 2018; Descals et al., 2021). Literature on certification schemes for diverse tropical crops highlight similar challenges for smallholders to achieve and maintain certification, including complex administrative procedures, strict demands and restrictions regarding farm management, high upfront and recurrent costs, and a lack of direct economic incentives (Brandi, 2015; De Fries et al., 2017). When certification schemes are not adapted to the situation of smallholders, they may be excluded from the global supply chain (Higgins and Richards, 2019). Moreover, research on sustainability certification has raised concern about potential trade-offs between environmental sustainability and achieving socio-economic benefits for smallholders (Vanderhaegen et al., 2018; Ogahara et al., 2022).

This paper assesses prospects for RSPO certification for independent oil palm smallholder groups in Indonesia and explores benefits and challenges experienced by certified groups during and after the certification process. The main objective is to better understand how prospects for achieving certification, in terms of ability to comply with standards, willingness to do so, access to certification programs, and ability to deal with challenges during the certification process, are shaped by pre-certification conditions of different categories of smallholders. Being the largest producer of palm oil, smallholders make up approximately 40% of Indonesia's total oil palm acreage (Badan Pusat Statistik, 2020). However, smallholders' production share remains strikingly low (Euler et al., 2016; Monzon et al., 2021; Woittiez et al., 2017). This is particularly true for independent oil palm smallholders, not engaged in outgrower schemes with plantation companies, accounting for approximately 86% of the oil palm smallholders in Indonesia (Novika, 2020). Independent smallholders often lack access to good quality planting material and fertilizers, reducing yield potential (Corley and Tinker, 2008; Woittiez et al., 2018). Moreover, this group does not have guaranteed access to the market: untied to a mill, fresh fruit bunches (FFB) may be rejected in times of surplus, or achieve low prices (Jelsma et al., 2017). Although independent smallholders may benefit the most from agronomic training, group organization, and improved access to markets through RSPO certification, they are at risk to be excluded from the supply chain when they are not able to comply with sustainability standards (Brandi et al., 2015).

Recognizing the particular challenges for independent smallholders, the RSPO has developed separate certification schemes for independent and scheme oil palm smallholders. The latter are bound by contract to sell their produce to a particular mill in exchange for technical support and credit, referred to as Nucleus-Plasma (NES) schemes in the Indonesian context (McCarthy and Zen, 2016). Independent smallholders are defined as: 'non-scheme smallholders, smaller or equal to 50 ha or to the amount defined in national interpretations (20 ha in Indonesia⁶), with enforceable decision-making power on the operation of the land and production practices; and/or the freedom to choose how to utilize the land, type of crops to plant, and how to manage them' (RSPO Independent Smallholder Standard, 2019). 'Non-scheme' means that smallholders should not be currently engaged in an outgrower scheme, but they may have participated in such a scheme in the past.

Incentives for smallholders to join certification include benefits from RSPO credits sold through the online book-and-claim system Palm Trace, training on good agricultural practices, and assistance with group organization and capacity building (Hidayat et al., 2015). So far, 23,460

independent (63 groups; 41 from Indonesia) and 141,647 scheme smallholders have been RSPO certified (RSPO.org, April 2022). From the total global acreage under smallholder production, only about 8% of the smallholder land is RSPO certified⁷; despite being mandatory, in 2021 only 0.21% of the smallholders in Indonesia was ISPO certified (Soim, 2020; Dharmawan et al., 2021). The low level of smallholder certification reflects several challenges to achieve and maintain certification. Key challenges include the requirements to organize in a group, and to demonstrate clear land legality in order to avoid land conflict and to avoid plantations being established in forest areas or on peat soils (Hidayat et al., 2015). Furthermore, smallholders struggle to implement standardized good agricultural practices on their farms, and trace production by recording yields (Schoneveld et al., 2019). Last, the upfront and recurrent costs of certification are sometimes perceived as exceeding the economic benefits (Rietberg and Slingerland, 2016; Hutabarat et al., 2018; Tey et al., 2020).

To address these challenges, in 2020 the RSPO revised and simplified the RSPO Independent Smallholder Standard, introducing a phased approach to certification in which independent smallholders have to comply with basic eligibility requirements at entry level, and thereafter have three years to achieve full compliance with the standards (Selvaraj and Richards, 2019). During that process they receive already 40–70% of the premium for certified FFB, before being at full compliance, depending on the milestone they achieved.

However, independent oil palm smallholders are a highly heterogeneous group with varying levels of performance in terms of yields, income and wellbeing, and environmental sustainability (McCarthy and Zen, 2016; Jelsma et al., 2019; De Vos et al., 2021). Previous research identified general barriers to certification for oil palm smallholders in Indonesia (e.g. Brandi et al., 2015; Hutabarat et al., 2018; Schoneveld et al., 2019; Watts et al., 2021), and evaluated costs and impacts of certification (e.g. Apriani et al., 2020; Tey et al., 2022). To contribute to these studies, this paper focuses on how barriers manifest in practice by exploring experiences of certified groups and certification facilitators. Novel in our approach is that we conducted interviews with certified groups and their facilitators across Indonesia to provide a baseline overview of characteristics of all RSPO certified independent oil palm smallholder groups in Indonesia. This overview is helpful to assess what kind of smallholders are currently reached by certification programs and what kind of smallholders are still left out, evaluating whether RSPO certification delivers on its promises to contribute to market inclusion for smallholders. Exploring ways forward, we also discussed with our respondents how to scale-up certification in a way that addresses smallholder needs and capabilities. The certified groups in this study achieved certification prior to the implementation of the revised standard in 2020, but since the eligibility criteria have not been extensively revised, we consider this study to still be relevant for the upcoming RSPO standards review in 2023.

2. Analytical framework

2.1. Prospects and barriers to sustainability certification

Sustainability certification is used as a tool both to reward producers for sustainable production practices, as well as to encourage producers to adopt sustainable practices (Nesadurai, 2018). However, eligibility criteria for certification can function as a barrier for smallholders to enter certification schemes (Brandi, 2017). In this study we presume that smallholders' prospects for achieving sustainability certification are conditioned by their *ability* to change production practices to comply with standards, as well as their *willingness* to do so considering expected

⁶ 20 ha in total, including certified and uncertified plots, comprising one area or multiple plots in different locations (RSPO Independent Smallholder Standard Indonesia national interpretation 2022).

⁷ Total palm oil acreage: 21 Mha, approximately 6.3 Mha (30%) is cultivated by smallholders globally (Descals et al., 2021); 473,932 ha is RSPO certified, including independent and scheme smallholder land (RSPO.org, 2022).

costs and benefits (Saadun et al., 2018). Moreover, smallholders need to have actual access to certification, in terms of having knowledge about and connection to certification programs. Previous research on oil palm smallholder certification highlights three main barriers preventing smallholders from achieving certification.

First, like in most certification schemes, oil palm smallholders cannot be certified individually, but have to be organized in a group (Sellare et al., 2020; Watts et al., 2021). However, organizing smallholders into groups can be a complex process when smallholders differ in size and socio-economic background (Hutabarat et al., 2018). Complexities in the local supply chain may further hamper group organization. For example, in Indonesia groups need special licenses to sell FFB to a mill, and smallholders are often engaged in informal contracts with local traders to access credit and agri-inputs, which may prevent them from joining a group (Anggraini and Grundmann, 2013; Martens et al., 2020). Although several studies have highlighted benefits from group organization in terms of strengthen smallholders' negotiation power and reducing transaction costs (e.g. Ibnu et al., 2018), other research points out that smallholders may be reluctant to join a group out of fear to lose autonomy (Bennett et al., 2019).

Second, sustainability standards often prescribe that smallholders have clear land legality, to avoid land conflicts, and to mitigate land conversion in conservation areas (Oosterveer et al., 2014). However, in many producing countries of tropical commodities, including Indonesia, land tenure is characterised by legal plurality and land tenure insecurity, making such requirements difficult to fulfil (e.g. Lucas and Warren, 2013 on Indonesia; Khatun et al., 2020 on Ghana). Indeed, Brandi et al. (2015) observe that the requirement to formally register land is one of the key obstacles to RSPO certification for smallholders in Indonesia (see also Jelsma et al., 2017; Schoneveld et al., 2019). In addition, oil palm smallholders in Indonesia need a plantation license (STD-B)⁸ and statement of environmental monitoring and management (SPPL),⁹ and licenses to store and transport chemical waste. Hutabarat et al. (2019) remark that a major constraint to obtain all required documents is the limited capacity and knowledge of local governments to provide them.

Third, sustainability standards usually include standards for good agricultural practices, to avoid negative environmental impacts from production and raise yield. Hutabarat et al. (2018) found that in Indonesia independent oil palm smallholders have the highest compliance gap in this regard, which is reflected in the relatively low yields obtained by this group (Monzon et al., 2021; Woittiez et al., 2018). Yet, yield gaps in oil palm are not easily redressed, as they are rooted in problems in different phases of plantation development and management (Fairhurst, Griffiths (2014), and there is often a time lag between investing in good agricultural practices and revenue (Rhebergen et al., 2016).

In addition to 'compliance gaps' (Schoneveld et al., 2018), smallholders' willingness to join voluntary certification schemes strongly depends on their expectations regarding financial benefits from higher yields and premium prices (Saadun et al., 2018; Apriani et al., 2020; Furumo et al., 2020). Previous studies found that costs for certification, including costs of auditing and organisational costs, sometimes outweigh the benefits (e.g. Ruysschaert and Salles, 2014), and that benefits are unevenly distributed (Glasbergen, 2018). However, Tey et al. (2022) have calculated that certified independent smallholders are financially better off compared to non-certified smallholders, on the condition that they are financially supported during the process of obtaining certification. Without external support it is often too costly and complex for smallholders to achieve certification (Hutabarat et al., 2018; Khatun et al., 2020). Moreover, Martens et al. (2020) found that

independent smallholders are often unaware of the existence of sustainability standards and certification programs.

2.2. Heterogeneity in the Indonesian oil palm smallholder sector

Barriers to certification manifest differently, and smallholders' ability and willingness to overcome them partly depends on pre-certification conditions. Based on a literature review of oil palm smallholders in Indonesia (Supplementary Material A, Table A.1), we distinguish between three categories of smallholders with different starting positions vis-a-vis RSPO eligibility requirements regarding group organization, land legality and implementation of good agricultural practices.

2.2.1. Former scheme smallholders

Smallholders in Indonesia have started to engage in oil palm from the 1970 s, through so called nucleus estate and plasma schemes (NES, or PIR in Bahasa Indonesia), in which state or private oil palm companies were granted land concessions of which they could develop 20% for their core plantation, designating 80% for smallholder plantations. In this system, smallholders were tied by contract to the nucleus plantation and were assisted with the development of the plantation (land clearing, plantation design and planting material), credit, and agricultural inputs (Cramb and McCarthy, 2016). In the 1990 s, the government developed new outgrower schemes in which smallholdings were to be managed by cooperatives (KKPA¹⁰), who would take over responsibility from the nucleus company after the four year pre-production phase (McCarthy and Zen, 2016.) In both schemes, the initial investments had to be paid back by smallholders through deductions on revenues from their delivered yields, and during the repayment period their land titles were held by the companies as collateral. After paying off their loans to the nucleus company, usually after 4–10 years, scheme smallholders can become independent and receive (back) their land titles (Zen et al., 2016).

After further economic liberalization following the Reformation (1998), new plasma schemes were introduced in which companies control a larger share (70–100%) of the concession area, with less autonomy for smallholders to manage their own oil palm plot (Gillespie, 2011; Li, 2016). Especially in new expansion areas, companies now often use the partnership plantation model (*kemitraan*), which is based on a joint venture system and de facto means that companies manage all aspects of plantation management, and pay plasma participants a dividend (McCarthy et al., 2012). In this system, a much smaller percentage (10–20) of the concession area is designated to smallholders, and the smallholders no longer manage their farms directly. Smallholders in such schemes may also not become independent smallholders after repaying their plasma loans, but continue to leave management to the company (Li, 2016).

At present, former scheme smallholders who have become independent sometimes continue to sell their FFB through the cooperative to the nucleus company or other mills. As their plantations have been established according to company standards, using good quality seeds (Euler et al., 2016), they may have a higher yield potential compared to unsupported smallholders. However, this also depends on the level of support smallholders' in terms of training, and agri-inputs received from the nucleus company (McCarthy and Zen, 2016).

2.2.2. Non-scheme smallholders

A different smallholder category is referred to as 'purely independent farmers' (*petani swadaya murni* in Bahasa Indonesia), also known as non-scheme smallholders, because this category has never participated in an outgrower scheme. The literature distinguishes between relatively

⁸ Surat Tanda Daftar Usaha Perkebunan Untuk Budidaya (Plantation Business Registration Certificate).

⁹ Surat Pernyataan Pengelolaan Lingkungan Hidup (Letter of declaration about management of the environment).

¹⁰ Kredit Kepada Koperasi Primer untuk Anggotanya (Primary Cooperative Credit for Members).

small, capital extensive smallholders, cultivating a maximum of 20 ha, and larger, capital intensive smallholders cultivating multiple plots, possibly registered under different names (e.g. Krishna et al., 2017; Jelsma et al., 2019; Schoneveld et al., 2019). We describe such smallholders under Section 2.2.3.

Non-scheme smallholders often combine oil palm with subsistence and other cash crops, sometimes through intercropping (Slingerland et al., 2019). They may also work as labourers on company or smallholder plantations (McCarthy and Zen, 2016). This category usually received little formal training on oil palm cultivation, and is less likely to be organized in formal groups (Susanti, 2016; Watts et al., 2021). Non-scheme smallholders are often fully dependent on middlemen for agri-inputs (Anggraini and Grundmann, 2013) and their yield potential is relatively low due to their use of inferior quality planting material and limited access to (good) fertilizers (Woittiez et al., 2018).

A key discerning factor among non-scheme smallholders is having a transmigration background or not. Around the 1980 s, in particular Javanese resettled through government transmigration programs to what are now oil palm areas in Sumatra and Kalimantan. These 'transmigrants' were typically allocated 2–3 ha of land, for which they received formal land titles. Moreover, at the start of the transmigration program, participants were organized in farmer groups (Potter, 2012). In contrast, Schoneveld et al. (2019) found that 72.7% of their non-scheme respondents in West and Central Kalimantan were not a member of a group and/or cooperative; 60% of their respondents did not have a land title (SHM),¹¹ and only 3.4% had the necessary business and environmental licenses. This study found that transmigration background was a positive predictor for group organization and land legality.

2.2.3. Entrepreneurial smallholders and absent investors

Although not fitting the popular description of 'smallholders' as small-scale farmers who largely depend on family labour and are directly involved in farming (Chamberlin, 2008), the literature mentions a category of oil palm smallholders defined as 'prosperous farmers' (*petani makmur*) (McCarthy and Zen, 2016), 'large resident farmers' (Jelsma et al., 2017); or 'capital intensive farmer' (Krishna et al., 2017). This category includes resident entrepreneurs: traditional village leaders, government employees, traders, people with transport or contracting businesses, and ex-plantation company staff (Semedi and Bakker, 2014), who are engaged in multiple businesses and/or services, in addition to investing in oil palm (see Jelsma et al., 2017 for Sumatra; Schoneveld et al., 2019 for Kalimantan). This category often has direct links to mills, because they produce enough FFB to meet the quota (Daemeter Consulting, 2015; Jelsma et al., 2017).

Large, prosperous and capital intensive farmers may in fact be absent investors who manage plantations from a distance. Some absent investors manage their land through sub-contractors and labour teams, while others have bought former scheme plots which they leave to be fully managed by a cooperative. McCarthy and Zen (2016) mention that such smallholders are locally known as 'farmers who wear ties' (*petani berdasi*); in our study respondents referred to them as 'investors' (*pemodal*) or 'land lords' (*tuan tanah*).

Both resident entrepreneurs and absent investors are found to invest in high risk areas where land prices are low. When investing in peat areas, the purpose may not be deriving income from oil palm yield, but from land speculation, hence investment in yield intensification measures remain limited (Andrianto et al., 2019; Jelsma et al., 2019).

Although this category can manage large plantations of hundreds of hectares, the land may not be registered as one estate but as multiple plots of less than 20 ha, some still formally owned by smallholders, and possibly managed by different sub-contractors. Therefore, it is possible that they have access to RSPO independent smallholder certification.

3. Methods

3.1. Interviews with RSPO certified smallholder groups and facilitators

We conducted semi-structured telephone interviews with representatives of 18 RSPO certified independent smallholder groups in Indonesia; 13 in Sumatra and 5 in Kalimantan; and three groups that were still in process towards certification. We targeted representatives of all RSPO certified groups in Indonesia. To be able to include as many certified groups as possible, we interviewed one representative per group, mostly 'governing members' (Apriani et al., 2020), such as members of the internal control system for certification (ICS), who are often also oil palm farmers themselves.

We asked open-ended questions based on a list of topics related to pre-certification conditions, including geographic aspects, socio-economic background, migration history, legality, experience with oil palm, local organization of the supply chain, access to inputs, plantation management practices, and environmental conditions. In addition, we asked questions on challenges and opportunities that emerged during the certification process, and perceptions on costs and benefits after certification. Through the use of this methodology, the interviewees had room to share their thoughts and experiences and raise unexpected issues outside of the pre-determined questions (Hollway and Jefferson, 2000). In addition, we interviewed 9 organizations (facilitators), which work in Indonesia to facilitate RSPO certification for independent smallholders to gain an insight in how smallholders are identified and targeted for certification, and which opportunities and challenges are experienced by facilitators (see Supplementary Material for the interview protocol). We organized follow up discussions with 3 facilitators and 5 smallholder groups (one from each province) to reflect on results. We did not interview regular members of the certified groups because this research focused on the phase prior to achieving certification, and during this process regular members were often less involved.

3.2. Data analysis

To categorize RSPO certified smallholder groups we established a baseline overview of certified smallholders group characteristics, using data from the interviews, complemented with data from news items, audit reports, NGO reports, or academic papers (Supplementary Material B, Table B.1-B.2). Then, to explore how barriers are related to pre-certification conditions, we conducted qualitative analysis of the data from the interviews and reports, using software for qualitative data analysis (Atlas TI, see Friesse, 2019). Interview transcripts were coded in two rounds. First, we organized data into sections by assigning a-priori defined general codes reflecting the smallholder characteristics which according to the literature are relevant for access to RSPO certification, including livelihood portfolios; transmigration history; history of engagement with the oil palm sector, level of support, group organization, land legality, plantation management practices, access to the market, as well as perceptions on, knowledge about, and connection to RSPO certification. Then, we coded each section line-by-line assigning codes that reflect the content of the text (Gibbs, 2018). Similar codes were merged into one content code describing a group, smallholder, or plantation characteristic; a practice related to producing and marketing palm oil, an experienced challenge with palm oil production or RSPO certification; or a perception on benefits and challenges from RSPO certification. These content codes were used to compose the storyline for each a-priori defined code (Harding, 2019) (Supplementary Material C, Table C.1-C.5 for the coding scheme). Quotations from the interviews are used to illustrate the analysis process, explaining how particular themes were identified from the data, and to provide more details on what interviewees meant with certain statements (Eldh et al., 2020).

It is important to note that oil palm smallholder groups are often composed of different types of members. For example, a generally non-scheme group may include some former scheme members, resident

¹¹ Surat Hak Milik (SHM), Land title.

entrepreneurs and / or absent investors. Likewise, former scheme groups sometimes have both former scheme and non-scheme members. Moreover, there are differences between members of a group, for example with regards to gender and age, land size, level of education, access to capital and resources, and political connections, impacting yields, access to markets and prospects for certification. However, it is beyond the scope of this research to examine differences within groups. For this study, we categorized the groups based on the background of the majority of the group, as determined by the group manager, or, based on information about the group's history from secondary material.

4. Results

4.1. Smallholders' socio-economic backgrounds and history of engagement with oil palm

At the time of study, there were 31 RSPO certified independent oil palm smallholder groups in Indonesia: 24 in Sumatra and 7 in Kalimantan. According to our study, the majority (77%) of the certified groups are composed of former scheme smallholders; a minority (19%) can be categorized as non-scheme smallholders. There is one resident entrepreneur group (Supplementary Material B, Table B.1.).

All the former scheme groups have a transmigration background, except for one local farmer group in Sumatra. The transmigrants moved from Java to Sumatra or Kalimantan in the 1980 s through a general government transmigration scheme. A decade after their arrival they started to engage in oil palm through the KKPA outgrower scheme. In this scheme, farmer cooperatives which were originally established for selling annual crops, adopted the responsibility to manage the oil palm plasma area. Subsequently, after the smallholders paid off their loans to the nucleus company they got back their land titles and became independent oil palm smallholders. Although plasma plots typically are 2–3 ha, many former scheme smallholders acquired additional land to cultivate oil palm independently. Former scheme smallholders often maintained relations with their former nucleus company, although the content of these relationships varied: some maintained a close relationship and continued to exclusively sell FFB to their former nucleus company, also receiving the price set by the government for scheme smallholders (6 groups in our study). Others obtained the market price similar to non-scheme groups. Moreover, the level of support and training that former scheme smallholders received during the plasma phase differs. This was illustrated by a former scheme group manager from Jambi:

"We have only started to maintain our plantation in the right way after receiving training from an NGO. Before, we just did what we could, based on the knowledge that we had, because in the past, smallholders worked for the company. They did what they were told to do by the supervisor in the plantation. They brought this knowledge home, so they learned a little while working for the company, but they did not learn directly from training."

Six RSPO certified groups (19%) can be categorized as non-scheme groups, including three transmigrant and three local farmer groups. Only one group received assistance from the local plantation extension service at the time of planting; four non-scheme groups had not received any support at the time of planting.

One of the RSPO certified groups can be categorized as a resident entrepreneur group: the group was headed by an ex-plantation company manager who established a small private oil palm company, which also functioned as FFB aggregator and provided services such as selling agri-inputs. On the initiative of a nearby RSPO certified mill, the entrepreneur established a farmer group with 35 members, including some of his relatives and plantation workers, in order to obtain RSPO smallholder certification. The smallholder plots were managed as one estate with the company plantation. Although this was the only group that was not composed of more traditional smallholders, some group managers said

that their groups included resident entrepreneurs or absent investors. For example, one former scheme group had 'outsider' members from urban areas, owning several former scheme plots which were managed by the cooperative. Moreover, at least one former scheme group had members who owned more than 20 ha, but had registered this land under different names. A non-scheme group manager commented on this phenomenon that in his region multiple absent investors owned dozens of hectares, without knowing where their plantations were located. He said that if investors owned more than 20 ha they could not become a member of the farmer association, unless land was registered under multiple names.

4.2. Group organization

Certified independent smallholders were organized in different ways, including 18 former scheme cooperatives (*Koperasi Unit Desa*, KUD); 2 village enterprises (*Badan Usaha Milik Desa*, BUMDES); 9 farmer associations (*Asosiasi*, *GAPOKTAN*, *forum*); one private enterprise (*Usaha Dagang*, UD); and one farmer group (*kelompok tani*). The first three organizations usually included multiple farmer groups typically consisting of 20–30 members. Some larger associations even had several cooperatives under them, located in multiple villages. An UD is a private enterprise for the sale of FFB, which functions as internal control system (ICS) for their RSPO certified smallholder suppliers; it does not consist of farmer groups. The farmer group is the group categorized as resident entrepreneur. Certified smallholder groups varied in size; the farmer group was the smallest with 35 members; the largest, a non-scheme farmer association, had 736 members spread over eight villages.

The certified smallholder groups had a range of functions. Most groups (90%) collected FFB and sold this directly to a mill. Some groups only did this for FFB from former plasma plots, while FFB from independent land was sold through middlemen. Especially cooperatives and village enterprises also had other functions such as: distributing fertilizer (80%), providing credit (75%), and organizing certain plantation management tasks, such as through spraying or harvesting teams (26%). In addition, 50% of the groups had non-oil palm business units. In contrast, newly established associations did not always provide additional services beyond handling matters related to certification.

All cooperatives and village enterprises already existed prior to starting the certification process. In contrast, the non-scheme farmer associations were newly established on the initiative of external facilitators, either in anticipation of RSPO certification, or for another development program. In these cases, small farmer groups already existed but these were often inactive or only for social matters. Group managers of such new associations expressed that it was difficult to organize the oil palm smallholders in their area. For example, a manager of a Sumatran group explained that in his region, local farmers are not used to being organized in groups, except to apply for funding from the government:

"We used to only have 'government style' farmer groups, which are usually not active, except to apply for some kind of government aid and after that the groups are dissolved".

Although former scheme smallholders were typically organized in farmer groups from the start of the transmigration, a manager of a transmigrant former scheme group said that it was difficult to convince people to join RSPO certification. As the cooperative in his village only served former scheme smallholders and a growing number of people also had independent land, a new farmer association was established in order to obtain RSPO certification. However, the majority of the oil palm farmers did not join this association and is not RSPO certified.

"We have five farmer groups, but in the village there are 30 groups. They are still waiting to see the benefit of certification". "When we were first informed about the RSPO, the farmers did not understand and they wondered what the impact would be on their income. It was difficult for

me as a manager, because I was constantly questioned about what would be the exact benefit of RSPO certification."

The manager also explained that RSPO credits were dependent on the volume of palm oil that is produced on RSPO certified land. Hence, the fewer members that joined certification, the less RSPO credits could be sold through Palm Trace, which in turn diminished the appeal of joining RSPO certification.

Despite the difficulties, group managers also mentioned several benefits of group organization. For example, a non-scheme group manager from Jambi stressed that by organizing in a group, smallholders could make better agreements with mills and receive training on good agricultural practices:

"In 2013, we noticed that the rejection rate of our FFB was high, so we asked the mill for an explanation why they rejected our FFB while they had never given us any training on correct harvesting practices. Several years later, the company invited an NGO to organize the farmers in groups. They helped us to make agreements with the mill and facilitated training in plantation management."

The facilitators perceived the organization of smallholders to be one of the key challenges during the certification process. For example, according to Facilitator A, it took a considerable amount of time and resources to build trust in communities, organize farmers in groups of 20–30 members, and establish an organizational structure in accordance with RSPO standards. In the experience of another facilitator, pre-existing farmer groups were usually only for annual and seasonal crops and served to jointly apply for fertilizer, and to organize community activities. However, in the process of oil palm production there was hardly any collaboration:

"Before we started there were about 70 farmer groups in the region, which had been established by the local government plantation service. However, these groups were not really active and usually only established in order to be able to receive subsidized fertilizer. Sometimes, the leader was not even living in the village anymore."

Facilitator C explained that government support for smallholders is minimal, because local governments do not always have the expertise to support farmers that cultivate perennial crops, and they mostly have development programs for annual crops:

"Sometimes groups are formed during short projects, but there is no follow-up to actually support this group. The farmers become frustrated about these groups. The farmers need to experience that a group has a vision and is capable, not just a group for the sake of being a group."

Nevertheless, facilitators stressed that despite the challenges it is essential to organize smallholders in groups before certification, because issues related to legality or market access can better be tackled collectively.

4.3. Legality

We found that at least 27 of the certified groups had formal land rights prior to the start of the certification process. Regardless, 10 out of 16 interviewed group managers mentioned that legality was a challenge in the process of certification.

In the non-scheme smallholder groups in our study, it was often the case that not all members had a formal land title (SHM), but usually did have a land clarification letter from the village office (SKT).¹² Non-scheme groups were either in the process of a government land titling program, or they were expecting such a program. Although an SKT is allowed by the RSPO, such plots need to be verified with government

land status maps to assure that the plots are not located in forest or peat areas. If plots are in forest areas, they first need to go through the Ministry of Forestry to change the status of the land from forest area to agricultural production area (APL).¹³ However, requirements regarding land legality may be flexible in practice, and subject to negotiation between smallholders and their representatives, local governments, facilitators, and auditors. A non-scheme group manager reported that the majority of the oil palm smallholders in his village did not have any formal land rights at the start of the certification process and therefore could not join the certification scheme. In contrast, a non-scheme group manager from Sumatra stated that the members of his group had different kinds of proof of ownership other than a land title, such as 'proof of compensation' (*surat ganti rugi*), or tax papers, and these were accepted by the auditors.

Although former scheme smallholders typically had formal land titles from the start of the transmigration, also group managers of this smallholder group category reported that sometimes not all oil palm smallholders in their area could join RSPO certification, due to diverse legality issues. Smallholders did not always have formal land titles for plots they opened or bought outside of the transmigration or plasma area, sometimes because these plots were located in a forest area. Therefore, some groups decided in advance not to include the non-scheme plots in the certification process to avoid legality problems. Moreover, former scheme group managers explained that some of their members could not join the certification process, because their land titles were held by the bank under mortgage, or were still at the nucleus company because the loan from the plasma scheme had not been fully repaid. Some had not completed the transfer of the name on the title after they bought the plot. Others were reluctant to hand over photocopies of their land titles because they were worried something would happen to their land.

A particularly challenging aspect of legality was obtaining the plantation business licence for farmers with less than 25 ha (STD-B), and an environmental license (SPPL). The first document is intended to complete the government administration on the smallholder plantation sector. It can be obtained after completing a village land survey containing data on land size, land ownership and soil type. This document is also obligatory to be able to sell to ISPO certified mills, and to apply for government aid for replanting. The second document is a declaration by the farmer that he or she will monitor and protect the environment which is affected by his or her business. It can be obtained from the local government environment service.¹⁴ However, group managers said that local government institutions did not always know exactly what smallholders needed. In the words of a non-scheme group manager, obtaining these documents was "extremely difficult" and the process of obtaining these documents is expensive. A former scheme group manager stressed that the complexity and costs for obtaining all documents was a reason for smallholders to opt out of the certification process:

"We tried to convince farmers to join certification, but it was very difficult to convince them. The reason was that people regarded the requirements related to legality to be very difficult. Some people only had identity cards and land titles, but they also had to arrange licenses for storing chemical waste, an STD-B., so when we started to collect the identity cards and land titles it was very difficult and not all joined."

Another former scheme group manager affirmed this, stating that it was too costly especially for smallholders with additional non-scheme plots to register these plots for certification:

"For the smallholders who have non-scheme land, they have problems with their documents such as an STD-B and SPPL, because it takes time to

¹² Surat Keterangan Tanah (SKT).

¹³ Areal Penggunaan Lain (APL).

¹⁴ Badan Lingkungan Hidup (BPD).

sort out their location permit. For the original members of the cooperative it was easier, we could easily collect the documents. But for the new members with non-scheme land, we still need to map their area and the costs are high. They have to pay for this themselves."

Interviewed facilitators confirmed that legality is a major bottleneck for smallholders certification, and stressed that it is vital to closely work together with local governments, as they are responsible for sorting out land rights. However, facilitators said that local governments do not always have capacity and knowledge to support oil palm smallholders, and that smallholders sometimes lack skills (including digital skills) and connections to go through the bureaucratic process of obtaining documents from the government. One facilitator said that they as a facilitator already feel "weary" with assisting smallholders to obtain the required documents and they suspect that smallholders would never manage this on their own.

4.4. Implementing good agricultural practices

Interviewed facilitators indicated that 'their' smallholders, both non-scheme and former scheme, usually had little to no agronomic training on how to cultivate oil palm and manage a plantation sustainably. Therefore, most certification programs started with training on plantation management, focusing especially on nutrient management, good harvesting practices, and responsible and safe handling of chemicals.

4.4.1. Planting material

The majority (55%) of the certified smallholders planted the higher yielding hybrid variety *tenera* seeds, especially in former plasma plots, which are usually planted by the nucleus plantation company. However, independent plots are often planted with *dura* seeds, which have lower yield potential and lower oil extraction rates (OER). Group managers indicated that *tenera* seeds were too expensive, not available, and that smallholders had limited knowledge about seed varieties. One non-scheme group indicated that having palms of the *dura* variety was a problem, because the nearby certified mill did not want to buy their FFB for this reason:

"There is an RSPO certified mill nearby. We have tried to negotiate and we made a proposal. However, the management argues that our FFB cannot meet their FFB standards, so they cannot buy our FFB. They say we have to cut our palms because, according to them, 50% of our palms are dura. We will have to wait until replanting."

4.4.2. Nutrient management and plantation maintenance

Interviewed groups indicated that good quality fertilizers were not always available, or their members did not have the means to buy the recommended type and amount of fertilizer. One former scheme group manager from Jambi explained:

"We supplied standard fertilizers, but the farmers did not have the means to buy them. Eventually they shifted to sub-standard fertilizers. Then, the fertilizers that we stocked were not sold. The farmers buy cheap fertilizer of which the quality cannot be guaranteed. It's not that fertilizer is not available, but the ability to buy them varies per farmer."

A former scheme group manager from Sumatra said that there were so many oil palm growers in the area that subsidized fertilizer was not always available and it took a complex bureaucratic process to secure supplies. Moreover, subsidized fertilizers in Indonesia are intended for paddy and may give a nutrient imbalance for oil palm. This means that nutrient management plans cannot always be implemented in practice.

Then, facilitators stated that it was challenging to change weeding and pest management practices. According to facilitators interviewed, the highly toxic herbicide Paraquat was commonly used by smallholders as this is regarded as the cheapest method to clear out noxious weeds. To

address this, facilitators trained smallholders in handling chemicals safely, using smaller doses, protecting ground cover, and use organic pest management methods. Group managers indicated that it was difficult to obtain all licenses to store and transport chemical waste.

4.4.3. Harvesting and FFB sale

The interviewed certified smallholders on average followed a harvesting rotation of 14 days, which is longer than the recommended 7–10 harvesting interval, but typical for smallholders (Woittiez et al., 2016). However, former scheme group managers explained that there was a difference between FFB produced on former scheme land and FFB produced on non-scheme land. For example, group manager from Jambi explained that independent plots were harvested irregularly:

"The former scheme plots are harvested every 10 days, but for the independent plots it depends on the season: in the low season the plots are harvested every 15 days. For the former scheme plots we make harvesting schedule per farmer group. For the independent plots, it depends on the farmer, when they have time they harvest, because they sell FFB to a different mill."

Moreover, while FFB from former scheme plantations continued to be sold collectively through the cooperative, often to the former parent company, FFB from non-scheme land was sold through middlemen to different mills, depending on preferences of the land owner. A key difference was that independent plots were often planted with seeds of unknown varieties which generate lower oil extraction rates. Therefore, this FFB could not be sold together with FFB from former plasma plots.

4.5. Access to RSPO certification

All certified smallholder groups were assisted by an external facilitator, either an NGO or development institution (5 smallholder groups), a company (3), or both (23), at least until after reaching the status of being RSPO certified. Some groups continued to receive support from their facilitator after achieving certification. The interviewed facilitators said that mills and government institutions played an important role in selecting the areas or the smallholder groups where an RSPO certification program was initiated. When no companies were involved, facilitators were assisted by local plantation extension services to select smallholder groups. For example, one facilitator working in Kalimantan said:

"We initiate a stakeholder meeting and ask the local government which groups are already prioritized by the government, for example for a replanting program. The government will direct us to go here or there, we have to be flexible to obtain support from the government."

Other criteria that were mentioned by interviewed facilitators to select specific areas, villages or groups included: clear legality with regards to land rights and environmental requirements, and organizational capacity and knowledge of aspirant certified smallholders. For example, one facilitator explained that the local government directed them to two areas, however as one area was located on forest land, they decided not to include this area in their program. Another facilitator explained that a large number of smallholders were included in their program for improving plantation management practices. From the participants, they selected groups with the highest scores on aspects like legality and organizational capacity to be included in the certification program.

Interviewed facilitators all agreed that without external facilitator, smallholders cannot achieve RSPO certification. Interviewees mentioned that first, the upfront and recurrent costs are too high, and second, smallholders struggle with the concepts and terminology used in the RSPO standards. Two facilitators pointed out that communication with the RSPO is often in English, which most smallholders do not speak. This means that connection to external facilitators is another

precondition for RSPO certification, and this connection itself often depends on smallholders' connections to RSPO certified mills, as well as local government institutions.

While smallholder groups depend on external support to obtain certification, facilitators are concerned that the current capacity of facilitators working on certification is not enough to achieve large numbers of smallholders being certified. For example, one facilitator, which stated to have substantial budget and capacity, stressed that in one area they have trained about 10,000 smallholders on best management practices. However, after working with them for four years, only 730 of them completed the certification process. Another facilitator stressed that many programs for certification are pilot projects, which are stopped after groups achieve certification.

4.6. Incentives to join certification

Not all smallholders targeted by certification programs actually decided to join RSPO certification. This also depended on smallholders estimation of the costs and benefits of certification. Group managers mentioned that prior to certification, key incentives for their members to join RSPO certification included expectations about: a direct higher price for FFB; additional income from sale of RSPO credits; better relations with mills leading to agreements about uptake, prices and grading; and expectations about increased yields through implementation of better plantation management practices. With regards to the first expectation, only one of the interviewed certified groups obtained a direct higher price for their certified FFB from the mill, in the form of an 'appreciation bonus' (see [Hutabarat et al., 2019](#)). All groups sold RSPO credits for sustainably produced FFB online through Palm Trace. However, group managers stated that prior to certification their members had expected that the price they receive for certified FFB at the mill would be higher after certification. For example, one non-scheme group manager said:

"Our relationship with the mill was good before certification. However, after we obtained certification we hoped that we would receive special treatment for our FFB; we hoped that the price would be higher like it happened for other smallholders. If uncertified smallholders receive IDR 1000, we hoped for IDR 1500."

Facilitators and group managers alike indicated that it was difficult to convince smallholders to opt for certification as there was no direct financial incentive, or some other form of tangible aid (e.g. as smallholders are used to receiving from the government). Therefore, facilitators stressed that cooperation with mills to make agreements about FFB uptake, grading and prices, and providing training is important to ensure that RSPO certification has a positive impact on access to the market and increased and more secure income. One facilitator stressed that mills are increasingly looking for FFB from independent smallholders, because their own plantations and attached plasma plantations are aging. This is an opportunity to improve market access for independent smallholders. However, the extent to which relations with mill improved varied. One group from Sumatra explained that with aid from their facilitator they could make agreements with a mill about prices, grading and FFB uptake. However, eleven other group managers indicated that their relationship with the mill had not changed after certification. Most said that relations with mills were already good prior to certification, but that certification did not lead to new agreements on prices, uptake or grading. Two group managers said that as there were no RSPO certified mills in their area, the mills were not interested in RSPO certified FFB from smallholders. One group from Kalimantan said there was a certified mill nearby, but it rejected FFB from the group because their palms were of the *dura* variety. One reason why relations between smallholders and mills did not always improve after certification was that the companies that facilitated the certification process, were not always the same as to where the smallholders sold their FFB.

Moreover, some mills only bought FFB from smallholders, whereas other mills were more involved in the certification process by, for example, conducting soil and leaf analysis, providing training, or providing financial support.

Although smallholders did not receive a higher price for their FFB from the mill, group managers mentioned two other ways in which RSPO certification impacted their member's income. First, they indicated that training helped them to improve harvesting practices, reducing the rejection rate of FFB at the mill, and to make plantation maintenance more efficient, reducing costs for agri-inputs. Reduced rejection rate of FFB can be a quicker way to increase revenues compared to increased production of FFB, as this takes time to materialize ([Rhebergen et al., 2016](#)). Second, all group managers stated that their group benefitted from the additional income from RSPO credits. This is used to pay for RSPO audits and operational costs of the ICS; as savings for replanting; or invested in side businesses such as farm shops. In some cases it is partly paid out directly to the members, either in cash, or in kind.

A bottleneck that was mentioned by facilitators and group managers were the costs of audits after achieving certification. While some groups were fully supported with start-up and audits costs by facilitators or companies, others only received support the first three years.

5. Discussion

5.1. Characteristics of certified independent smallholders and preconditions for RSPO certification

This study demonstrates that the ability of smallholders to comply with sustainability standards is dependent on pre-certification conditions, as well as support from external facilitators during and after the certification process. We found that the majority (77%) of the certified independent smallholder groups can be categorized as former scheme smallholders, most of whom are transmigrants. Former scheme smallholders have relatively clear land rights: they are located on land with APL status, and received formal land rights after repaying loans. This finding is largely in line with other studies that point out that (former) scheme smallholders have relatively better prospects for certification due to their clear legal position (e.g. [Hidayat et al., 2015](#) for RSPO; [Dharmawan et al., 2021](#) for ISPO). However, we add to this that former scheme smallholders did not always have all legal documents for their additional non-scheme plots, and these plots were sometimes excluded from certification for this reason. Moreover, not all owners of former scheme plots were actually in possession of the relevant documents. [Hutabarat et al. \(2019\)](#) point out that in principle non-compliance of individual members can lead to exclusion of the whole group. However, we found that in practice, non-compliant members may be listed as non-active member so that the group can still be certified. Therefore, incomplete legality may be a reason to exclude individual smallholders, leading to a lower number of smallholders certified per group, but it does not directly lead to exclusion of a group.

Next to having clear land legality, former scheme smallholders are also usually organized in farmer groups under a cooperative. The cooperatives gained experience with coordinating the sale of FFB, recording yields, distributing agri-inputs, and dealing with external parties, such as mills and local government institutions during the plasma period. Moreover, the organizational structure encompassing smaller farmer groups facilitates the distribution of knowledge and information to the level of the farmers. Hence, to bring such cooperatives in line with RSPO standards is relatively easier compared to smaller and more informal farmer groups. However, we found that not all cooperative perform alike; while some cooperatives in this study were highly engaged in the production process by organizing labour, and providing inputs and credit, others only facilitated the sale of FFB and coordinate RSPO certification.

In contrast, only 19% (six groups) of the certified smallholders are

non-scheme, and facilitators regarded it to be more challenging to certify this category, unless smallholders received land titles and were organized in groups as part of a transmigration program. Group managers and facilitators indicated that organizing non-scheme farmers into groups was the first hurdle, as the latter were often not used to this way of organization and sometimes did not see the direct benefit. Pre-existing farmer groups sometimes only existed for the sake of applying for subsidized fertilizer or other government aid programs. This can be explained considering that oil palm plantations are usually managed individually by the plot owners and their workers, rather than communally through a reciprocal labour system (*gotong royong*), which is common in some areas in Indonesia for annual crops (Slikkerveer, 2019). Moreover, we found that newly established farmer associations do not always provide the same services as cooperatives in terms of providing agri-inputs, credit, or other services. It may be difficult for newly established associations to attract new members when they are not yet fully embedded in local village institutions, like the older cooperatives. The performance of both new farmer associations and old cooperatives depends on support from local government institutions and certification facilitators, capacity and knowledge of leaders, relationships with village institutions, and relationships with mills (McCarthy and Zen, 2016).

For non-scheme smallholders as well as former scheme smallholders with non-scheme land, legality was an important bottleneck. Although formally smallholders do not need to have an SHM, which is the highest form of legality in Indonesia, to obtain RSPO certification, in practice some smallholder groups excluded members who did not have this document, because this would complicate the process of obtaining an STD-B and SPPL. The members of the non-scheme groups in our study often already had land titles. Three out of six non-scheme groups were transmigrants, who automatically have land titles, and in the other groups, smallholders obtained titles through a government land titling program. However, in the non-transmigrant non-scheme villages, not all oil palm smallholders obtained titles and therefore not all could join the certification process. Notably, all certified non-scheme groups were from Sumatra. Especially in Kalimantan, where traditional forms of land tenure prevail, non-scheme smallholders often do not have SHM documents, let alone an STD-B or SPPL (Semedi and Bakker, 2014; Watts et al., 2021). As these documents have to be obtained from the local government, the prospects for smallholders to obtain certification is also strongly influenced by their relations with local government institutions, and the capacity of these institutions to provide the required documents (see also Hutabarat et al., 2019). Our finding that individual smallholders who lack full formal land legality are sometimes excluded from a group's certification process calls for more research on whether differentiated access to certification within groups leads to exclusion along lines of class, gender, or ethnicity.

With regards to implementing good agricultural practices, both non-scheme and former scheme smallholders in our study indicated that they had not received formal training on cultivating oil palm prior to planting oil palm. This is in line with Jelsma et al. (2019) and Degli Innocenti and Oosterveer (2020), who found that both independent and scheme smallholders received little agronomic training on oil palm cultivation prior to planting oil palm. In this regard, groups in our study indicated that they particularly benefitted from knowledge about good harvesting practices to avoid rejection of FFB at the mill. Other problems were more difficult to solve. Both non-scheme and former scheme groups indicated that their members did not always have the means to adhere to fertilizer recommendations as smallholders' ability to buy fertilizer depends on the FFB price, and the availability of subsidized fertilizers. Insufficient and incorrect nutrient management leads to lower yields; nutrient deficiencies in the maturing phase of oil palms can lead to lower yields at a later stage (Woittiez et al., 2018). A more stable FFB price may help smallholders to manage their budgets for agri-inputs. However, facilitators also expressed concerns about the costs of implementing GAP standards, as smallholders' investments may not translate directly into

benefits from higher yields. A key reason for this is that when smallholders have used poor quality planting material, this limits the potential impact of improved management practices (Rhebergen et al., 2018). The non-scheme smallholders in our study frequently used seeds of the cheaper and more available *dura* variety. Although former scheme plots were often planted by the nucleus company with hybrid *tenera* seeds, former scheme smallholders indicated that they used *dura* seeds on their plots outside the scheme. Mills sometimes reject FFB from *dura* seeds or pay a lower price because of their lower oil extraction rates (Woittiez et al., 2017), regardless of its certification status. Planting materials were chosen before certification, so it will take until replanting before this can be changed. Especially when oil palm is not the main source of income, smallholders may be reluctant to invest when prices are volatile and increased yield potential is limited.

5.2. Benefits and costs related to certification

Next to smallholders' ability to comply with standards, smallholders' willingness to participate in certification depends on their perception of expected benefits and costs, including money, time and effort. In contrast to what some of our respondents had expected, certification did not lead to a higher price for FFB. However, interviewed group managers mentioned that they appreciated the additional income from selling RSPO credits, although they also said that the prices were unstable and there were not always enough buyers. We reflected on this with five group managers during feedback sessions. All said that they preferred the system in which they can sell certificates for certified FFB online through the book-and-claim system, because they feared that if they would sell their FFB as certified to a mill, they would not always receive the correct premium price, and they would be too dependent on the goodwill of the mill. As many of their plots were planted with *dura* seeds, they were afraid that their FFB would not meet the standard set by the company and they would miss out on the premium price for this reason. Moreover, groups wanted to maintain freedom to choose between mills based on the best price.

Yet, group managers also stated that without direct financial incentives it was difficult to convince new members of the benefits of certification. Even though yields and income may improve over time, smallholders may not be able to absorb the burden in the first years. Although often facilitators support smallholder groups with the initial and recurrent costs during the first year(s), if smallholders perceive that benefits do not exceed costs (including time and effort), some may choose not to join certification. This finding is shared by Apriani et al. (2020), although they found that concerns about the costs were mostly experienced by 'governing members', not regular members as these were often unaware of the costs related to certification. The authors also explain that the highest costs emerged during the preparational phase of certification, indicating that after achieving certification costs would decrease. Yet, during feedback sessions four group managers indicated that the costs for yearly compliance monitoring were a major concern, especially when productivity was temporarily lower (for example due to replanting) and the income from selling RSPO credits declined.

However, certification can have side-effects which may contribute to higher income and better access to the market. In this regard, respondents in our study mentioned that training on good agricultural practices enhanced members' knowledge about plantation management, leading to better harvesting practices and less rejection of FFB by the mill, and more efficient use of fertilizer and herbicides, reducing costs. Second, increased organizational capacity enabled some smallholder groups to make agreements with middlemen and mills about grading and uptake of FFB, and collectively buy agri-inputs. Yet, Sellare et al. (2020) warn that the impact of certification in fact may be the impact of organizing in a cooperative. Indeed, group organization and subsequent benefits can also be achieved without certification, but certification can function as a catalyst for this, bringing together relevant stakeholders to strengthen the group's capacity and relations with

others. However, relations with mills do not necessarily improve after certification. In our study, some groups indicated that their relations with the mill did not change: sometimes relations were already good, but in other cases, non-certified mills were not interested in certified FFB from independent smallholders.

5.3. Policy implications: upscaling opportunities and dilemmas

Various studies have questioned whether sustainability certification for smallholders is the appropriate tool to address the needs and abilities of smallholders (Glasbergen et al., 2018; Ogahara et al., 2022), pointing out that sustainability certification currently does not address the core environmental and social concerns for smallholders, while on the other hand generating limited economic benefits for smallholders. Yet, this study demonstrates that when barriers regarding land legality, group organization, and costs are addressed, smallholders can benefit from joining sustainability certification programs when this provides access to support in terms of agronomic advice, agri-input supply, and uptake and price agreements.

However, smallholders' access to certification is currently strongly dependent on their connection to external facilitators. Without assistance, group managers and facilitators regard smallholder certification to be nearly impossible. This dependency is highly problematic because most oil palm smallholders, in particular in remote areas, are not connected to facilitator organizations. Moreover, budgets, staff and time of facilitators working on certification is limited and facilitators cannot cover all oil palm regions in Indonesia. During interviews, alternative pathways were proposed for up-scaling certification. First, a number of facilitators argued in favour of expanding the jurisdictional approach to increase the involvement of local governments, which is crucial to overcome legality issues, and to help smallholders organize in groups (see Pacheco et al., 2020). Second, several group managers expressed that in the future they were willing to take on a role as facilitator for other oil palm smallholders in their region, on condition that they are supported with finance and receive assistance from the government to sort out legal issues. Using certified groups as facilitators may help to establish trust relations with new aspirant certified smallholders, as they are probably more familiar with the certified group from their region than with the RSPO and external facilitators such as NGOs.

To address core environmental and social concerns for smallholders, interviewees proposed that certification programs should prioritize the implementation of good agricultural practices, while requiring only minimal levels of legality and group organization. Since the initiation of RSPO certification for independent smallholders, requirements regarding group organization and legality have created a bias towards former scheme smallholders, who score relatively better on these aspects (Brandi, 2017). Being more lenient when auditing vis-à-vis legality issues and implementation of standard operational procedures for group organization may help to include more non-scheme smallholders in certification schemes. However, this also depends on the national interpretation of RSPO certification standards, which stipulates compliance with Indonesian law. Moreover, as per 2022, ISPO certification, which is stricter on legality, has become mandatory for oil palm smallholders and it is possible that local governments will be more committed to sort out legality issues for smallholders. However, Dharmanawan et al. (2021) found that both scheme and non-scheme smallholders struggle with complying with ISPO standards. Yet, our study also found that in practice, sometimes legality requirements are subject to negotiation as auditors are sometimes lenient if smallholders demonstrate a serious effort to complete legality requirements. Auditors should develop methods to assess smallholders' compliance with key RSPO principles, such as land acquisition based on Free, Prior and Informed consent, and avoiding oil palm cultivation in conservation areas, whilst accommodating for smallholders' struggles to obtain legal documents. Such methods could include monitoring smallholders' progress in obtaining documents rather than demanding actual

possession of legal documents, and / or, consultation with stakeholders (community members, NGOs, local governments) to assess whether land has been acquired in a fair way. However, to reach non-scheme smallholders in the first place, RSPO certification initiatives could look for opportunities to streamline programs with government programs for smallholder organization, such as establishing village business units as stipulated by the new village law (Vel et al., 2017), or government replanting programs which will be implemented in many oil palm regions in the near future (Ardana et al., 2022).

5.4. Limitations of the research

An important limitation of our research is that we only spoke to one representative of each interviewed group, usually a male 'governing member' (Apriani et al., 2020). Interviewed governing members could not fully represent the experiences and opinions of their regular members, as there may be significant differences in perceptions between governing members and regular members of groups. Moreover, some groups probably represent their members in a more inclusive way than others. However, this study did not aim to assess perceptions of certification but focused on understanding smallholder group characteristics. Second, as we focused on the process of obtaining certification, for this study we only spoke to groups who had achieved certification, or were in the process towards certification. This means that we could not access the views of the vast majority of smallholders who are not certified, or who did not succeed to obtain certification, while their experiences would have contributed to a better understanding of the key bottlenecks in getting access to the process of certification in the first place. Our research indicates that there are more categories of smallholders than scheme and non-scheme smallholders, including absent investors, and it would be interesting to further research their interest in and access to RSPO certification. Moreover, prospects for certification are strongly influenced by targeting strategies of facilitators. Without including non-certified smallholders in this study we have insufficient insight in why certain groups are less likely to be selected for certification projects. Last, for this study we only interviewed non-company facilitators, while it would be interesting to explore the motivations and challenges of RSPO certified companies to facilitate RSPO certification for smallholders in their area.

6. Conclusion

Sustainability certification for smallholders may contribute to a more environmentally sustainably and equitable palm oil sector. However, stringent entry barriers risk to exclude them from the supply chain. This study brings to light three key findings. First, by providing an overview of characteristics of all RSPO certified smallholders, we found that the majority of RSPO certified smallholder groups in Indonesia were former scheme smallholders, mostly transmigrants, who often have land titles and are organized in groups. Second, barriers to certification for smallholders have remained the same over time, with key barriers being requirements regarding legality and group organization. Moreover, both former scheme and non-scheme groups and their facilitators experienced difficulties convincing farmers to join certification, as there are no direct individual financial benefits, while the certification process was considered to be complex, costly, and time consuming. Third, our study demonstrates that independent smallholder groups' ability and willingness to achieve certification and overcome challenges during the certification process strongly depends on access to certification facilitators, including NGOs, mills and local government institutions. If smallholders are sufficiently supported, they can overcome barriers even starting from a relatively disadvantaged position. At the same time, smallholder groups with advanced levels of compliance in terms of legality and group organization still experienced barriers when they lacked support from external facilitators, in particular local government institutions.

We conclude that so far RSPO certification has ineffectually reached smallholders in a more disadvantaged position, missing out on an opportunity to include these smallholders in the sustainable palm oil market. Hence, we argue that when up-scaling RSPO certification it is necessary to address core social concerns for smallholder by focusing needs of smallholders in terms of knowledge, access to inputs, access to markets and resilience to price fluctuations, as well as key environmental issues for smallholders, while being flexible with regards to the forms of proof needed to demonstrate compliance with the standards. This study can serve as baseline to evaluate the accessibility of RSPO certification for different categories of smallholders in Indonesia over time.

Data availability

Data will be made available on request.

Acknowledgements

We are grateful to our respondents for your contribution to this research. Thanks to Akhmad Rifky Setya Anugrah (Tanjung Pura University, Pontianak) and Grace Sibarani (Wageningen University) who conducted fieldwork in certified and non-certified villages contributing to a better understanding of the smallholder landscape in Indonesia. Comments on an earlier version of this manuscript were kindly provided by Prof. Jane K. Hill, Prof. Keith Hamer, Dr. Glen Reynolds. We also thank three anonymous reviewers for their constructive feedback during the review of this manuscript. This research was supported by the Socially and Environmentally Sustainable Palm Oil Research (SEnSOR) programme, which receives funding from the Roundtable on Sustainable Palm Oil (RSPO) and is facilitated by the South East Asia Rainforest Research Partnership (SEARRP).

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.landusepol.2023.106660.

References

- Andrianto, A., Fauzi, A., Falatehan, A.F., 2019. The typologies and the sustainability in oil palm plantation controlled by independent smallholders in Central Kalimantan. *Rural Socio-Economic Transformation: Agrarian, Ecology, Communication and Community, Development Perspectives*. In: Proceedings of the international Conference on Rural Socio-Economic Transformation: Agrarian, Ecology, Communication and Community Development Perspectives (RUSSET 2018), November 14–15, 2018, Bogor, Indonesia.
- Anggraini, E., Grundmann, P., 2013. Transactions in the supply chain of oil palm fruits and their relevance for land conversion in smallholdings in Indonesia. *J. Environ. Dev.* 22 (4), 391–410. <https://doi.org/10.1177/1070496513506225>.
- Apriani, E., Kim, Y.S., Fisher, L.A., Baral, H., 2020. Non-state certification of smallholders for sustainable palm oil in Sumatra, Indonesia. *Land Use Policy* 99, 105112. <https://doi.org/10.1016/j.landusepol.2020.105112>.
- Ardana, I.K., Wulandari, S., Hartati, R.S., 2022. Urgency to accelerate replanting of Indonesian oil palm: A review of the role of seed institutions. In: *IOP Conf. Ser. Earth Environ. Sci.* 974. IOP Publishing, pp. 012–104.
- Badan Pusat Statistik, 2020. Indonesian Oil Palm Statistics 2018. obtained from: <https://www.bps.go.id/publication/2021/11/30/5a3d0448122bc6753c953533/statistik-kelapa-sawit-indonesia-2020.html> (Last accessed: 18–01-2023).
- Bennett, A., Ravikumar, A., McDermott, C., Malhi, Y., 2019. Smallholder oil palm production in the Peruvian Amazon: rethinking the promise of associations and partnerships for economically sustainable livelihoods. *Front. For. Glob. Change* 2, 14. <https://doi.org/10.3389/ffgc.2019.00014>.
- Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., Wiese, H., 2015. Sustainability standards for palm oil: challenges for smallholder certification under the RSPO. *J. Environ. Dev.* 24 (3), 292–314. <https://doi.org/10.1177/1070496515593775>.
- Brandi, C.A., 2017. Sustainability standards and sustainable development—synergies and trade-offs of transnational governance. *Sustain. Dev.* 25 (1), 25–34. <https://doi.org/10.1002/sd.1639>.
- Chamberlin, J., 2008. It's Small World After All: Defining Smallholder Agriculture in Ghana. IFPRI Discussion Paper 00823. (<http://cdm15738.contentdm.oclc.org/utils/getfile/collection/p15738coll2/id/24689/fileName/24690.pdf>).
- Corley, R.H.V., Tinker, P.B., 2008. *The Oil Palm*. John Wiley & Sons, p. 592.
- Cramb, R., McCarthy, J.F., 2016. *The Oil Palm Complex*. Smallholders, agribusinesses and the state in Indonesia and Malaysia. NUS. Press, Singapore, p. 512. <https://doi.org/10.2307/j.ctv1xz0km>.
- Daemeter Consulting, 2015. Indonesian Oil Palm Smallholder Farmers: A Typology of Organizational Models, Needs, and Investment Opportunities. Daemeter Consulting, Bogor, Indonesia.
- Dauvergne, P., 2017. Is the power of brand-focused activism rising? The case of tropical deforestation. *J. Environ. Dev.* 26 (2), 135–155. <https://doi.org/10.1177/1070496517701249>.
- De Fries, R.S., Fanzo, J., Mondal, P., Remans, R., Wood, S.A., 2017. Is voluntary certification of tropical agricultural commodities achieving sustainability goals for small-scale producers? A review of the evidence. *Environ. Res. Lett.* 12 (3), 033001. <https://doi.org/10.1088/1748-9326/aa625e>.
- De Vos, R.E., Suwarno, A., Slingerland, M., Van der Meer, P., Lucey, J.M., 2021. Independent oil palm smallholder management practices and yields. Can RSPO certification make a difference? *Environ. Res. Lett.* <https://doi.org/10.1088/1748-9326/ac018d>.
- Degli Innocenti, E., Oosterveer, P., 2020. Opportunities and bottlenecks for upstream learning within RSPO certified palm oil value chains: A comparative analysis between Indonesia and Thailand. *J. Rural Stud.* 78, 426–437. <https://doi.org/10.1016/j.jrurstud.2020.07.004>.
- Descals, A., Wich, S., Meijaard, E., Gaveau, D.L., Peedell, S., Szantoi, Z., 2021. High-resolution global map of smallholder and industrial closed-canopy oil palm plantations. *Earth Syst. Sci. Data Disc.* 1–22. <https://doi.org/10.5194/essd-13-1211-2021>.
- Dharmawan, A.H., Mardiyansih, D.I., Rahmadian, F., Yulian, B.E., Komarudin, H., Pacheco, P., Ghaziel, J., Amalia, R., 2021. The Agrarian, Structural and Cultural Constraints of Smallholders' Readiness for Sustainability Standards Implementation: The Case of Indonesian Sustainable Palm Oil in East Kalimantan. *Sustainability* 13 (5), 2611. <https://doi.org/10.3390/su13052611>.
- Eldh, A.C., Årstedt, L., Bertero, C., 2020. Quotations in qualitative studies: Reflections on constituents, custom, and purpose. *Int. J. Qual. Methods* 19. <https://doi.org/10.1177/1609406920969268>.
- Euler, M., Hoffmann, M.P., Fathoni, Z., Schwarze, S., 2016. Exploring yield gaps in smallholder oil palm production systems in eastern Sumatra, Indonesia. *Agr. Syst.* 146, 111–119. <https://doi.org/10.1016/j.agsy.2016.04.007>.
- Fairhurst, T., Griffiths, W., 2014. *Oil Palm: Best Management Practices for Yield Intensification*. International Plant Nutrition Institute (IPNI), Singapore.
- Friese, S., 2019. *Qualitative Data Analysis with ATLAS.TI*. Sage, Los Angeles, p. 303.
- Furumo, P.R., Rueda, X., Rodríguez, J.S., Ramos, I.K.P., 2020. Field evidence for positive certification outcomes on oil palm smallholder management practices in Colombia. *J. Clean. Prod.* 245, 118–891. <https://doi.org/10.1016/j.jclepro.2019.118891>.
- Gibbs, G.R., 2018. Analyzing qualitative data (Vol. 6). Sage. <https://dx.doi.org/10.4135/9781526441867>.
- Gillespie, P., 2011. How does legislation affect oil palm smallholders in the Sanggau district of Kalimantan, Indonesia? *Australas. J. Nat. Resour. Law Policy* 14 (1), 1–37.
- Glasbergen, P., 2018. Smallholders do not eat certificates. *Ecol. Econ.* 147, 243–252. <https://doi.org/10.1016/j.ecolecon.2018.01.023>.
- Harding, J., 2019. *Qualitative Data Analysis from Start to Finish*. Sage, London, p. 301.
- Hatanaka, M., Busch, L., 2008. Third-party certification in the global agrifood system: an objective or socially mediated governance mechanism? *Sociol. Rural.* 48 (1), 73–91. <https://doi.org/10.1111/j.1467-9523.2008.00453.x>.
- Hidayat, N.K., Glasbergen, P., Offermans, A., 2015. Sustainability Certification and Palm Oil Smallholders' Livelihood: A Comparison between Scheme Smallholders and Independent Smallholders in Indonesia. *Int. Food Agribus. Man.* 18 (3) <https://doi.org/10.22004/ag.econ.208400>.
- Higgins, V., Richards, C., 2019. Framing sustainability: Alternative standards schemes for sustainable palm oil and South-South trade. *J. Rural Stud.* 65, 126–134. <https://doi.org/10.1016/j.jrurstud.2018.11.001>.
- Hollway, W., Jefferson, T., 2000. *Doing Qualitative Research Differently: Free Association, Narrative and the Interview Method*. Sage.
- Hutabarat, S., Slingerland, M., Dries, L., 2019. Explaining the “Certification Gap” for different types of oil palm smallholders in Riau Province, Indonesia. *J. Environ. Dev.* 28 (3), 253–281. <https://doi.org/10.1177/1070496519854505>.
- Hutabarat, S., Slingerland, M., Dries, L., Rietberg, P., 2018. Cost and Benefit of Certification for Independent Oil Palm Smallholders. *Int. Food Agribus. Man.* 19 (4), 681–700. <https://doi.org/10.22004/ag.econ.274984>.
- Ibnu, M., Offermans, A., Glasbergen, P., 2018. Certification and farmer organization: Indonesian smallholder perceptions of benefits. *Bull. Indon. Econ. Stud.* 54 (3), 387–415. <https://doi.org/10.1080/00074918.2018.1506093>.
- Jelsma, I., Schoneveld, G.C., Zoomers, A., Van Westen, A.C.M., 2017. Unpacking Indonesia's independent oil palm smallholders: An actor-disaggregated approach to identifying environmental and social performance challenges. *Land Use Policy* 69, 281–297. <https://doi.org/10.1016/j.landusepol.2017.08.012>.
- Jelsma, I., Woittiez, L.S., Ollivier, J., Dharmawan, A.H., 2019. Do wealthy farmers implement better agricultural practices? An assessment of implementation of Good Agricultural Practices among different types of independent oil palm smallholders in Riau, Indonesia. *Agric. Syst.* 170, 63–76. <https://doi.org/10.1016/j.agsy.2018.11.004>.
- Khatun, K., Maguire-Rajpaul, V.A., Asante, E.A., McDermott, C.L., 2020. From agroforestry to agroindustry: Smallholder access to benefits from oil palm in Ghana and the implications for sustainability certification. *Front. Sustain. Food Syst.* 4 (29) <https://doi.org/10.3389/fsufs.2020.00029>.
- Krishna, V., Euler, M., Siregar, H., Qaim, M., 2017. Differential livelihood impacts of oil palm expansion in Indonesia. *Agric. Econ.* 48 (5), 639–653. <https://doi.org/10.1111/agec.12363>.

- Li, T.M., 2016. 'Situating transmigration in Indonesia's oil palm labour regime'. In: Cramb, R., McCarthy, J.F. (Eds.), *The Oil Palm Complex. Smallholders, agribusinesses and the state in Indonesia and Malaysia*. NUS Press, Singapore, p. 470.
- Lucas, A., Warren, C., 2013. *Land for the People: The State and Agrarian Conflict in Indonesia*. Ohio University Press, p. 405.
- Martens, K., Kunz, Y., Rosyani, I., Faust, H., 2020. Environmental governance meets reality: A micro-scale perspective on sustainability certification schemes for oil palm smallholders in Jambi, Sumatra. *Soc. Nat. Res.* 33 (5), 634–650. <https://doi.org/10.1080/08941920.2019.1674436>.
- McCarthy, J.F., Zen, Z., 2016. 'Agribusiness, agrarian change, and the fate of oil palm smallholders in Jambi'. In: Cramb, R., McCarthy, J.F. (Eds.), *The Oil Palm Complex. Smallholders, agribusinesses and the state in Indonesia and Malaysia*. NUS Press, Singapore, p. 470.
- McCarthy, J.F., Gillespie, P., Zen, Z., 2012. Swimming upstream: local Indonesian production networks in "globalized" palm oil production. *World Dev.* 40 (3), 555–569. <https://doi.org/10.1016/j.worlddev.2011.07.012>.
- Meemken, E.M., Barrett, C.B., Michelson, H.C., Qaim, M., Reardon, T., Sellare, J., 2021. Sustainability standards in global agrifood supply chains. *Nat. Food* 2 (10), 758–765. <https://doi.org/10.1038/s43016-021-00360-3>.
- Monzon, J.P., Slingerland, M.A., Rahutomo, S., Agus, F., Oberthür, T., Andrade, J.F., Couëdel, A., Edreira, J.I.R., Hekman, W., van den Beuken, R., Hidayat, F., Pradiko, I., Purwantomo, D.K.G., Donough, C.R., Sugianto, H., Lim, Y.L., Farrell, T., Grassini, P., 2021. Fostering a climate-smart intensification for oil palm. *Nat. Sustain.* 1–7.
- Nesadurai, H.E., 2018. New constellations of social power: States and transnational private governance of palm oil sustainability in Southeast Asia. *J. Contemp. Asia* 48 (2), 204–229.
- Novika, S., 2020. 'Banyak petani sawit belum sertifikasi ISPO, ini penyebabnya'. Published in detik.finance.com on 13–05-2020. <https://finance.detik.com/industri/d-5013791/banyak-petani-sawit-belum-sertifikasi-ispo-ini-penyebabnya>. (Last accessed: 20–01-2021).
- Ogahara, Z., Jespersen, K., Theilade, I., Nielsen, M.R., 2022. Review of smallholder palm oil sustainability reveals limited positive impacts and identifies key implementation and knowledge gaps. *Land Use Policy* 120, 106258. <https://doi.org/10.1016/j.landusepol.2022.106258>.
- Oosterveer, P., Adjei, B.E., Vellema, S., Slingerland, M., 2014. Global sustainability standards and food security: Exploring unintended effects of voluntary certification in palm oil. *Section 3 Glob. Food* (3–4), 220–226. <https://doi.org/10.1016/j.gfs.2014.09.006>.
- Pacheco, P., Schoneveld, G., Dermawan, A., Komarudin, H., Djama, M., 2020. Governing sustainable palm oil supply: Disconnects, complementarities, and antagonisms between state regulations and private standards. *Regul. Gov.* 14 (3), 568–598. <https://doi.org/10.1111/rego.12220>.
- Potter, L., 2012. New transmigration 'paradigm' in Indonesia: Examples from Kalimantan. *Asia Pac. Viewp.* 53 (3), 272–287. <https://doi.org/10.1111/j.1467-8373.2012.01492.x>.
- Rhebergen, T., Fairhurst, T., Zingore, S., Fisher, M., Oberthür, T., Whitbread, A., 2016. Climate, soil and land-use based land suitability evaluation for oil palm production in Ghana. *Eur. J. Agron.* 81, 1–14. <https://doi.org/10.1016/j.eja.2016.08.004>.
- Rietberg, P., Slingerland, M., 2016. 'Cost and benefits of certification for independent smallholders'. A science for policy paper for the RSPO. Wageningen University output for SenSor Programme led by SEARRP.
- RSPO Independent Smallholder Standard, 2019. Obtained from: rsपो.org/resources/smallholders-documents/smallholders-key-documents/rsपो-ish-standard-2019.
- RSPO.org, 2022. <https://rsपो.org/smallholders/sh-cert-numbers>. (Last accessed: 18–01-2023).
- Ruysschaert, D., Salles, D., 2014. Towards global voluntary standards: Questioning the effectiveness in attaining conservation goals: The case of the Roundtable on Sustainable Palm Oil (RSPO). *Ecol. Econ.* 107, 438–446. <https://doi.org/10.1016/j.ecolecon.2014.09.016>.
- Saadun, N., Lim, E.A.L., Esa, S.M., Ngu, F., Awang, F., Gimin, A., Johari, I.H., Firdaus, M. A., Wagimin, N.I., Azhar, B., 2018. Socio-ecological perspectives of engaging smallholders in environmental-friendly palm oil certification schemes. *Land Use Policy* 72, 333–340. <https://doi.org/10.1016/j.landusepol.2017.12.057>.
- Schoneveld, G.C., Ekowati, D., Andrianto, A., van der Haar, S., 2018. Modelling peat-and forestland conversion by oil palm smallholders in Indonesian Borneo. *Environ. Res. Lett.* 14 (11), 014006 <https://doi.org/10.1088/1748-9326/aaf044/pdf>.
- Schoneveld, G.C., van der Haar, S., Ekowati, D., Andrianto, A., Komarudin, H., Okarda, B., Jelsma, I., Pacheco, P., 2019. Certification, good agricultural practice and smallholder heterogeneity: Differentiated pathways for resolving compliance gaps in the Indonesian oil palm sector. *Glob. Environ. Chang.* 57, 101933 <https://doi.org/10.1016/j.gloenvcha.2019.101933>.
- Sellare, J., Meemken, E.M., Kouamé, C., Qaim, M., 2020. Do sustainability standards benefit smallholder farmers also when accounting for cooperative effects? Evidence from Côte d'Ivoire. *Am. J. Agr. Econ.* 102 (2), 681–695. <https://doi.org/10.1002/ajae.12015>.
- Semedi, P., Bakker, L., 2014. Between land grabbing and farmers' benefits: land transfers in West Kalimantan, Indonesia. *Asian Pac. J. Anthr.* 15 (4), 376–390. <https://doi.org/10.1080/14442213.2014.928741>.
- Silva-Castañeda, L., 2012. A forest of evidence: third-party certification and multiple forms of proof—a case study of oil palm plantations in Indonesia. *Agric. Hum. Values* 29 (3), 361–370. <https://doi.org/10.1007/s10460-012-9358-x>.
- Slikkerveer, L.J., 2019. Gotong royong: An indigenous institution of communality and mutual assistance in Indonesia. In *Integrated Community-Managed Development*. Springer, Cham, pp. 307–320 (pp.).
- Slingerland, M.A., Khasanah, N.M., van Noordwijk, M., Susanti, A., Meilantina, M., 2019. Improving smallholder inclusivity through integrating oil palm with crops. In: *Exploring inclusive palm oil production*, No. 59. ETRN and Tropenbos International, Wageningen, pp. 147–154.
- Soim, A., 2020. 'Pemerintah patut bantu petani sawit dapatkan sertifikat ISPO'. Published in Tabloid Sinartani on 16–08-2020. <https://tabloidsinartani.com/detail/index/kebun/14090-Pemerintah-Patut-Bantu-Petani-Sawit-Dapatkan-Sertifikat-ISPO> (Accessed: 20–01-2021).
- Susanti, A., 2016. Oil palm expansion in Indonesia: serving people, planet and profit? PhD dissertation, Utrecht University, Faculty of Geosciences, Department of Human Geography and Spatial Planning. International Development Studies Group. Eburon Academic Publishers.
- Taylor, C., Balmford, A., Buchanan, G.M., Butchart, S.H., Walker, C.C., Ducharme, H., Green, R.E., Milder, J.C., Sanderson, F.J., Thomas, D.H.L., Tracewski, L., Vickery, J., Phalan, B., 2018. Where are commodity crops certified, and what does it mean for conservation and poverty alleviation? *Biol. Conserv.* 217, 36–46. <https://doi.org/10.1016/j.biocon.2017.09.024>.
- Tey, Y.S., Brindal, M., Hadi, A.H.I.A., Darham, S., 2022. Financial costs and benefits of the Roundtable on Sustainable Palm Oil certification among independent smallholders: A probabilistic view of the Monte Carlo approach. *Sustain. Prod. Consum.* 30, 377–386. <https://doi.org/10.1016/j.spc.2021.12.020>.
- Tey, Y.S., Brindal, M., Djama, M., Hadi, A.H.I.A., Darham, S., 2020. A review of the financial costs and benefits of the Roundtable on Sustainable Palm Oil certification: Implications for future research. *Sustain. Prod. Consum.* 26, 824–837. <https://doi.org/10.1016/j.spc.2020.12.040>.
- Vanderhaegen, K., Akoyi, K.T., Dekoninck, W., Jocqué, R., Muys, B., Verbist, B., Maertens, M., 2018. Do private coffee standards 'walk the talk' in improving socio-economic and environmental sustainability? *Glob. Environ. Change* 51, 1–9. <https://doi.org/10.1016/j.gloenvcha.2018.04.014>.
- Vel, J., Zakaria, Y., Bedner, A., 2017. Law-making as a strategy for change: Indonesia's new Village Law. *Asian J. Law Soc.* 4 (2), 447–471. <https://doi.org/10.1017/als.2017.21>.
- Watts, J.D., Pasaribu, K., Irawan, S., Tacconi, L., Martanila, H., Wiratama, C.G.W., Musthofa, F.K., Sugiarto, B.S., Manvi, U.P., 2021. Challenges faced by smallholders in achieving sustainable palm oil certification in Indonesia. *World Dev.* 146, 105565 <https://doi.org/10.1016/j.worlddev.2021.105565>.
- Woittiez, L., Wijk, M., van, Slingerland, M., Noordwijk, M., van, Giller, K.E., 2017. Yield gaps in oil palm: a quantitative review of contributing factors. *Eur. J. Agron.* 83, 57–77. <https://doi.org/10.1016/j.eja.2016.11.002>.
- Woittiez, L., Turhina, S., Decy, D., Slingerland, M., Noordwijk, M., van, Giller, K.E., 2018. Fertilizer application practices and nutrient deficiencies in smallholder oil palm plantations in Indonesia. *Exp. Agr.* 55 (4), 543–559. <https://doi.org/10.1017/S0014479718000182>.
- Woittiez, L.S., Haryono, S., Turhina, S., Dani, H., Dukan, T.P., Smit, H.H., 2016. *Smallholder Oil Palm Handbook*. Wageningen University and SNV International Development Organisation, Wageningen. (http://akvopedia.org/wiki/Sustainable_Oil_Palm_Farming) (Last accessed: 18-01-2023).
- Zen, Z., Barlow, C., Gondowarsito, R., McCarthy, J.F. (Eds.), 2016. Interventions to promote smallholder oil palm and socio-economic improvement in Indonesia', in *The Oil Palm Complex. Smallholders, agribusinesses and the state in Indonesia and Malaysia*. NUS Press, Singapore.