

A Profile of Small-scale Oil Palm Farmers and The Challenges of Farming Independently

The Case of Seruyan and Kotawaringin Barat Districts in Central Kalimantan, Indonesia

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INOBU
INSTITUT PENELITIAN INOVASI BUMI

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Opening Remarks

It is a pleasure to see the completion of this report. This study presents only a portion of the data on independent smallholders that was collected in Central Kalimantan by Institut Penelitian Inovasi Bumi (INOBU), the provincial government and the governments of the districts of Seruyan and Kotawaringin Barat as well as other partners. It presents the data on 1,229 of the 2,660 independent smallholders INOBUs has mapped in Kotawaringin Barat and Seruyan districts as of July 2016. As the activities are ongoing, this report will be updated periodically until the local governments have their own instruments for reporting on independent, small-scale oil palm farmers.

In addition, data collected on independent smallholders is now integrated into Central Kalimantan's Plantation Monitoring System. The Provincial Plantation Office is hosting the system, which is administered together with the District Plantation Offices in Kotawaringin Barat, Seruyan and Gunung Mas. The monitoring system enables the provincial government to produce regular reports on agricultural production, especially related to oil palm. The system can be used to monitor environmental performance as it also combines small-scale farmer and plantation data with spatial and remote sensing data, including fire and deforestation.

This report is the first in a series of publications on independent smallholders. INOBUs is currently also preparing other reports, including:

- Baseline studies at the village level that include data on small-scale farmer agricultural practices, household income and institutions, among other data;
- Challenges for obtaining sustainability certification at the group or village level.

This report was prepared collaboratively by INOBUs in-house researchers. The lead authors are John Daniel Watts and Silvia Irawan. Aklan Huda led the overall data analysis for the report. Shofia Saleh wrote the section on agricultural practices, while Bernadinus Steni contributed to the report's legal analysis. Triyoga Widiastomo prepared the maps and conducted spatial analysis. Other research support was provided by Benita Nathania. Data collection was carried out by surveyors in Kotawaringin Barat and Seruyan and led by Fadly Fadhillah.

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Warm Regards,

Joko Arif
Managing Director, INOBUs

Executive Summary



The sustainability of global palm oil supply chains depends on being able to determine who is producing palm oil, where they are cultivating it and how it is being cultivated. The traceability of palm oil supply chains is complicated when they involve independent, small-scale oil palm farmers. In contrast to plantations, or plasma farmers, little is known about independent oil palm farmers, including where their farms are, how they farm and to whom they sell their produce. Independent farmers cultivate oil palm mostly without support from the government or companies, which affects the quality and quantity of the fresh fruit bunches they produce. Ensuring that independent, small-scale oil palm farmers cultivate oil palm sustainably and productively is an integral step in reducing the environmental harm caused by oil palm cultivation. To achieve that goal, we need to study these farmers and where they are. This study aims to contribute to improving the understanding of independent, small-scale oil palm farmers in Indonesia. For consistency, we refer to independent, small-scale oil palm farmers as independent smallholders in this report.

The study reports on the findings of ongoing surveying and mapping activities of independent, small-scale oil palm farmers in two districts in Central Kalimantan, Indonesia: Kotawaringin Barat and Seruyan. From 2014 to the end of 2015, 1,229 farmers were surveyed and had their lands mapped

in the two districts. This included eight villages in Kotawaringin Barat District covering 1,671.61 hectares, and another eight villages in Seruyan District covering 2,182.75 hectares. The figures represent around 6 percent of the total number of oil palm farmers in Kotawaringin Barat District and 9 percent of the total number of oil palm farmers in Seruyan. In Kotawaringin Barat, the farmers were generally from transmigrant communities (87 percent), with a smaller proportion consisting of local farmers (12 percent). In Seruyan District, however, the majority of farmers surveyed were indigenous farmers (81 percent).

The report analyzes the main challenges that prevent independent farmers from cultivating oil palm productively and sustainably. Building on previous studies on independent smallholders, we anticipated that the main constraints keeping farmers from benefitting from oil palm cultivation were:

- Legal recognition of their land rights;
- Access to credit, planting material, fertilizers and training; and
- Fair terms and prices for the sale of harvested fresh fruit bunches.

Where the two districts differed was in the predominant form of land titles held by farmers. In Kotawaringin Barat District, due to the high

proportion of transmigrant farmers, the majority of farmers (60 percent) held land certificates (*Surat Hak Milik*), the strongest form of land title in Indonesia. These certificates were issued to farmers as part of the government-sponsored transmigration scheme. These titles are transferrable and can be used as collateral in banks. In Seruyan District, however, where the majority of the farmers are indigenous, only 11 percent held land titles. The majority of farmers either held land ownership letters (*Surat Keterangan Tanah or SKT*) or customary land statement letters (*Surat Keterangan Tanah Adat or SKTA*). SKTs are issued by village heads, verified by sub-district heads and then recorded in village land record books. In contrast, SKTAs, which are a form of land ownership in Central Kalimantan, are issued by local customary institutions. While SKTs can be used as the basis for obtaining land certificates, SKTA cannot as the National Land Agency only recognizes land reference letters that have been signed by a village head.

Access to credit, agricultural inputs and training affected how farmers cultivated oil palm. The possession of land certificates as well as the proximity of banks determined the ability of farmers to get access to bank credit. Based on the comprehensive survey, in Kotawaringin Barat District, only 13.8 percent of farmers had bank accounts and just 7.7 percent had access to bank loans, many of which used SKTs as collateral. In Seruyan District, however, no farmers reported having bank loans. From the case study in Pangkalan Tiga, land certificates have been used as collateral for bank loans to finance investments in oil palm plantations. Meanwhile, only 15 farmers in the entire survey reported receiving some form of training. For most farmers in both districts, traders were the main source of fertilizers, followed by village farm equipment stores. The majority of farmers in both districts either grew their own seedlings or obtained planting materials from friends, neighbors or relatives. Only 26.2 percent of farmers in Seruyan District obtained such materials from companies or mills whereas in Kotawaringin Barat, that figure was only 9.22 percent. Very few farmers — only 3.1 percent in Kotawaringin Barat and 1.7 percent in Seruyan — were members of farmer organizations. However, these farmer organizations were generally not directly related to independent oil palm plantations but mostly other farming activities, such as food crop cultivation or oil palm plantation schemes.

The productivity of farmers seems to correlate with ethnicity, although many other factors such as tree age, soil types, and fertilizer also influence productivity. In Kotawaringin Barat, the average productivity of local farmers was 12.69 tonnes per hectare per year during the yield stabilizing period (4-10 years), while the productivity of transmigrant farmers during the same period was 15.8 tonnes per hectare per year. Within the same period, farmers in Seruyan produced up to 16.7 tonnes per hectare per year. The higher productivity may be a result of higher quality seedlings that were available for farmers who established plantations in the late 2000s as compared with those who started planting in the late 1990s and early 2000s. The soil types and quality was however ignored in this study.

We also analyzed data on the main challenges of ensuring the sustainability and traceability of palm oil supply chains. These were:

- The location of the oil palm plots of independent smallholders; and
- The supply chain between farmers and mills.

The locations of independent farmer plots were compared against the provincial spatial plan (*Rencana Tata Ruang Wilayah Propinsi or RTRWP*) and official land use classifications. We found that no farmers had plots within conservation forests. In Seruyan District, 559 hectares of oil palm plots were in production and limited production forests, whereas in Kotawaringin Barat, no plots were found in these areas. Across both districts, farmers had plots in areas classified as conversion forests, with 226 hectares in Seruyan and 344 hectares in Kotawaringin Barat. The remaining plots were in areas classified as land for other uses (*Areal Pengunaan Lain or APL*) or in lands allocated to oil palm concessions. The presence or absence of plots in forest areas does not necessarily indicate a link between farmers and deforestation or encroachment as land classification may not recognize existing land claims. At the same time, many lands in forest areas have already been degraded.

Farmers rarely sold directly to mills. In both districts, the majority of farmers with productive farms reported selling their fresh fruit bunches to traders known as *pengepul*. In Seruyan District, around 14 percent of farmers reported selling directly to mills, however, this figure may reflect a misunderstanding of the survey question rather

than the actual situation. Traders buy fresh fruit bunches from farmers and transport the harvested fruit to mills. Traders are either individuals who have official delivery orders with mills or are able to sell the fresh fruit bunches to mills using the names of individuals with actual delivery orders. Traders, however, are more than just buyers and transporters of products. In the absence of government services, they also provide credit, fertilizers and other inputs. While a small number of farmers sold to multiple traders, the majority would only sell to a single trader, normally without a contract. The relationships between individual farmers and traders were built on trust, with farmers usually trying out several traders before settling on one. Once farmers had established a relationship with a trader, they would remain loyal to them.

Based on the findings of the study, we make several recommendations:

- **Formalizing the participation of traders in oil palm supply chains.** To ensure the sustainability and traceability of the oil palm supply chain, traders should be registered as individuals or incorporated entities. As part of the registration process, traders should fulfill certain requirements, such as recording the name, cultivation certificate (STD-B) and

quantity purchased from individual farmers. This information should be provided to mills. The extension functions provided by traders should also be regulated to ensure that inputs and other services are being provided fairly.

- **Supporting the establishment of farmer groups and cooperatives.** Farmer groups have the potential to be viable institutions that support independent smallholders and improve their market access. There is a need for clear incentives for farmers to participate in farmer groups as well as mechanisms to ensure that farmer groups are properly managed. Cooperatives and farmer groups, however, are not complete solutions. Policies and interventions designed to support independent smallholders should include provisions for those farmers not integrated into cooperatives.
- **Mapping the lands of independent smallholders and providing them with support.** Mapping the lands of independent smallholders is a first and necessary step towards the sustainability and traceability of palm oil supply chains. Maps of farmers' small-scale plots and cultivation certificates should be required for the sale and transportation of fresh fruit bunches. Issuing cultivation certificates to independent smallholders should be considered as proof of the sustainability of cultivated fresh fruit bunches. As independent smallholders in jurisdictions lacking large-scale mapping initiatives will be disadvantaged under this system, effort should be made to support affected farmers. Independent smallholders will also require support over inputs, such as planting materials, fertilizers, pesticides and market access.



Background



As vast amounts of Indonesia's forests have been cleared for oil palm plantations, small-scale farmers, who are often called smallholders, have been a part of these changes. In 2013, there were 26,130,000 small-scale farmer households across Indonesia.¹ Independent small-scale farmers are also at the center of debates on the sustainability of oil palm cultivation in Indonesia. In 2014, as agribusinesses began to declare their commitment to zero deforestation palm oil supply chains - most notably the Indonesian Palm Oil Pledge (IPOP) -, the government, civil society and other actors rejected these commitments. They argued that zero deforestation commitments would unfairly disadvantage small-scale farmers, particularly independent farmers. Unlike agribusinesses, small-scale farmers lack the means to meet the requirements of sustainability certification. Consequently, zero deforestation commitments would exclude small-scale farmers from sustainable supply chains, affecting the mills that purchase fruit from those farmers. Despite these claims, there is limited information available on small-scale, especially independent, oil palm farmers.²

Small-scale oil palm farmers in Indonesia account for 44 percent of the total area under oil palm cultivation, equivalent to 4.4 million hectares in 2014 (Directorate General of Estate Crops, 2014). Despite this presence, they account for only 27 to 38 percent of the country's total palm oil production. The productivity of small-scale oil palm farmers in Indonesia is low, with independent farmers generally having lower productivity than schemed farmers, or farmers who are tied to plantation companies (International Finance Corporation, 2013). Schemed farmers are farmers who have some form of contractual arrangement with companies for the production or sale of oil palm. These arrangements can be parts of schemes, including Nucleus Estate-Smallholder Schemes, joint-venture schemes or assisted models of smallholder production (Cramb and Curry, 2012). In these arrangements, companies provide support to farmers that includes training and agricultural inputs, such as fertilizers. This direct support ensures that schemed farmers are more productive than independent farmers, who have little or no support from the government or agribusinesses.

¹ Badan Pusat Statistik, 2013, Sensus Pertanian. <http://st2013.bps.go.id/dev2/index.php>

² IPOP signatories later decided to phase out of IPOP as an entity. The signatories will continue to implement their sustainability commitments independently. Read more in the following article: <http://www.palmoilpledge.id/en/2016/07/ipop-signatories-support-government-of-indonesias-efforts-to-transform-palm-oil-sector-towards-sustainability>

In Central Kalimantan, small-scale oil palm farmers account for a small proportion of oil palm plantations in the province. In 2013, the Provincial Plantation Office reported that small-scale oil palm farmers made up only around 11 percent of the total oil palm plantation area in Central Kalimantan (Directorate General of Estate Crops, 2014). The province's former governor, Teras Narang, was committed to increasing the proportion of small-scale farmers producing sustainable palm oil to 20 percent of total production.³ This meant prioritizing small-scale farmers in future expansions of oil palm plantations, particularly sustainable production and the consideration of social and environmental criteria. This paper will contribute to the discussion on the baseline situation of small-scale farmers in Central Kalimantan and propose necessary steps in order to achieve the commitments outlined by the provincial government.

This paper focuses on independent, small-scale oil palm farmers in Central Kalimantan. For consistency, we refer to independent, small-scale, oil palm farmers as independent smallholders in this report. Currently, limited information is available about this farmer group. We report the results of the surveying and mapping of the lands of 1,229 farmers in 16 villages in Kotawaringin Barat and Seruyan districts. Kotawaringin Barat has among the highest number of independent oil palm smallholders in Central Kalimantan with a total of 12,436 farmers in 2013 (Directorate General of Estate Crops, 2014). It is second to Kotawaringin Timur, based on 2013 data from the Ministry of Agriculture. In Seruyan District, which is located in between Kotawaringin Timur and Kotawaringin Barat, there were 5,376 small-scale oil palm farmers.

Kotawaringin Barat is a palm oil producing district with established plantations and supporting infrastructure, including ports, roads and mills. Independent smallholders in Kotawaringin Barat

mostly began cultivating oil palm between 2005 and 2010. These farmers were usually transmigrants who first began cultivating oil palm as schemed farmers before 2000. While they continued to maintain their schemed oil palm plots, other plots originally allocated to grow food crops began being converted to oil palm. In contrast, farmers in Seruyan were mostly indigenous people who began cultivating oil palm between 2010 and 2015. These farmers were not previously schemed farmers, and so they have limited knowledge on oil palm cultivation.

In order to help farmers cultivate oil palm more sustainably, productively and legally, intervention pathways should be identified. These changes will invariably disrupt existing practices and institutional arrangements in the cultivation and trade of oil palm. The focus of this study is to identify the existing practices of independent small-scale, oil palm farmers in Central Kalimantan and the institutional arrangements that farmers enter into for the cultivation and sale of oil palm. We draw particular focus on the palm oil supply chains between small-scale farmers and mills. We then examine the interventions and institutional reforms that are needed to transform the production of independent smallholders. Finally, we explore the potential effects of these interventions as local governments take on the roles formerly held by companies and other intermediaries.

³ Government of Central Kalimantan (2013) Central Kalimantan Roadmap to Low-Deforestation Rural Development: Developing a sustainable plan which increases production and reduces poverty. Available online at: <http://earthinnovation.org/publications/central-kalimantan-roadmap-to-low-deforestation-rural-development/>

The Legal Definition of Indonesian Smallholders



Small-scale farmers are defined in Indonesia by the terms *petani* or *pekebun* (UU 29/2014). Petani refers to farmers engaged in irrigated rice farming whereas *pekebun* refers to farmers producing annual or seasonal crops, including tree crops, on an undefined small scale.

Legally, the scale of small-scale farming depends on the total area, type of crop, technology, number of laborers, capital or manufacturing capacity. Ministerial Decree 98/Permentan/OT.140/9/2013 (often referred as Ministerial Decree 98/2013) only regulates the different permits that are required for different types of operations and differentiates between individuals and corporations. The decree refers to the Basic Agrarian Law, which limits the amount of land an individual can own to 25 hectares. This amount, consequently, is also the upper limit of what constitutes a small-scale farmer. Other regulations, such as Law 19/2013 on the Protection and Empowerment of Farmers, sets the limit for the small-scale farmer plots at 2 hectares. In this study, we refer to small-scale farmers as those who own lands less than 25 hectares, as significant numbers of our respondents have more than two hectares of land.

There are generally two types of small-scale farmers:

- Schemed and assisted farmers; and
- Independent farmers

Schemed and assisted farmers have some form of contractual arrangement with companies for the sale and production of oil palm. The dominant form of schemed farming was the Nucleus Estate-Smallholder Scheme (NES) (*Perkebunan Inti Rakyat* or *PIR*) (Cramb and Curry, 2012; Rist et al., 2010; Zen et al., 2016). Within these schemes, there would be a large concession (*inti*) surrounded by small-scale plots of around 2 to 3 hectares (*plasma*). Companies in these arrangements would be responsible for clearing, planting and managing small-scale farms for the first four years as well as offering some form of employment to farmers during unproductive phases. These schemes commenced in 1978, and moved through several stages with the first focusing on local farmers before gradually shifting to transmigrant farmers. In 1995, these schemes were replaced with Primary Cooperative Credit Schemes (*Kredit kepada Koperasi Primer untuk Anggotanya* or *KKPA*) that focused on providing indigenous and local farmers with productive lands and extending support in exchange for giving large tracks of land to estates. These initiatives were supported by low interest loans from Bank Indonesia. Other plantation

schemes have included the Plantation Revitalization Scheme (*Revitalisasi Perkebunan*), which began in 2006 and provided subsidies for replanting old small-scale plasma areas.

The NES model was replaced by the partnership model (*kemitraan*), which was more advantageous to companies (Rival and Levang, 2014; Zen et al., 2016). Whereas in the past, companies would need to allocate the majority of concessions to smallholders, the new model meant that companies controlled up to 80 percent of lands. Smallholders could be compensated through profit dividends rather than just being allocated plots. A subsequent ministerial regulation in 2013 further eased the requirements for concessionaires.⁴ The regulation stipulated that the 20 percent of lands that should be allocated to smallholders could be located outside of concession boundaries. The regulation also stated that communities should receive shares in the estate, reaching 30 percent by the fifteenth year. This model has further eroded the direct participation of smallholders in oil palm development in favor of promoting large-scale investments.

Agricultural Ministerial Regulation 98/2013 gives district governments the authority to register plantations, a process that is shaped by local government regulations. In the Central Kalimantan, Provincial Regulation 5/2011 on Sustainable Plantations shapes the registration of land. It classifies land smaller than 25 hectares as community plantations (*perkebunan rakyat*), which are owned and operated by farmers (*pekebun*). Smallholders or individuals with a plantation area of less than 25 hectares should have their plantation registered under the authority of the mayor or district head. To register, farmers need what is referred to as a cultivation registration letter (*Surat Tanda Daftar Budidaya* or *STD-B*), which requires the following information: identity, location, land status, total area, crop, total production, seedling source, total trees, cropping pattern, fertilizer, partnership, soil type and planting year. For land holdings above 25 hectares, a business permit is required. To obtain an *STD-B*, farmers must have proof of land ownership, but as the Ministry of Agriculture currently does not offer clear guidance on the type of documentation required, this could include SKTs,

SKTAs, and land ownership certificates (*Surat Hak Milik* or *SHM*). The Ministry of Agriculture had previously stated in a meeting that SHMs were not necessary, so any evidence of land ownership would be sufficient provided that plantations were located outside state forests.⁵

The authority to issue *STD-B* has been devolved to the district level. Some districts further delegate this responsibility to sub-district administrations, while others have tasked district plantation offices to issue *STD-Bs*. The Ministry of Agriculture requires that local governments report the results of this registration process every six months. The registration of independent smallholders so far has been limited. This is largely due to local governments having limited knowledge on *STD-Bs*, their use and the ability of local governments to issue them. Local governments should also be able to map the lands of independent smallholders and produce maps of those plots. Most local governments in Indonesia, however, do not have this capacity.

Independent smallholders are eligible for government support, however, only through their participation in farmer organizations. According to regulations from the Ministry of Trade (07/2/2009) and Ministry of Agriculture (82/Ot140/8/2013), farmers should be members of farmer groups (*kelompok tanil*) or cooperatives in order to receive government support. The government of Central Kalimantan had also issued Government Regulation 2/2013 that stipulates the price of fresh fruit bunches should be determined through contracts or invoices between producers and mills. Farmers should have contracts for trading fresh fruit bunches through their farmer group via a partnership system with mills.

⁴ Agricultural Ministerial Regulation No. 98/Permentan/OT.140/9/2013

⁵ Minutes of Coordination Meeting between Ministry of Agriculture, ISPO, Central Kalimantan Plantation Office and INOBU, on 19 December 2015 in Bali

The State of the Art: Oil Palm Smallholders in Indonesia



Oil palm (*Elaeis guineensis*), a tropical forest palm, is a highly effective producer of oils for use in cooking, cosmetics and biofuels among other uses. The palm can produce two to three years after planting and reaches full maturity at nine years. After 25 to 30 years, the trees should be replanted as they are too tall to harvest (Sheil et al., 2009).

The fruit of oil palms have to be processed within 48 hours of harvesting or the quality of the crude palm oil generated will be compromised. The productivity of oil palm, in addition to the age of the palms, is contingent on access to high quality cultivars, fertilizers, credit and market prices (International Finance Corporation, 2013). Small-scale farmers who wish to cultivate oil palm must either enter into institutional arrangements that provide them with access to credit, cultivars and fertilizers necessary to cultivate oil palm, or source them independently. They must also have access to a processing mill to ensure their fresh fruit bunches are processed within 48 hours after harvest. Farmers who are able to overcome these obstacles find that the benefits

of cultivating oil palm outweigh the cultivation of other common crops (Belcher et al., 2004), with comparative high returns to land and low labor requirements (Feintrenie et al., 2010a).

In Indonesia, the most common form of small-scale farmer cultivation of oil palm occurred through plantation schemes, known as plasma or inti schemes. From the early 1980s, many of these schemes were linked to transmigration programs that moved people from Java and other more densely populated islands to Indonesia's outer islands. The schemes operated on the concept that small-scale farmers would be allocated lands on the periphery of main estates, or inti, where they could cultivate smaller plots of oil palm (Rival and Levang, 2014). Small-scale farmers were responsible for repaying the costs associated with establishing their plots. In other scenarios, local small-scale farmers could either exchange a large parcel of land for a small, 2-hectare oil palm plantation, enter into a debt arrangement with the company, or sell their land directly to the estate (Rist et al., 2010). Farmers in these arrangements would have access to seeds and fertilizers provided by the company, and sell their produce directly to the company. By the early 2000s, this model of plantation development had virtually disappeared, as large-scale land allocations were no longer possible (Rival and Levang, 2014). In their

place, independent smallholders have emerged in areas with pre-existing palm oil processing infrastructure.

Independent smallholders, within the required distance of a processing mill, have several options available to them if they want to cultivate oil palm. Farmers and other local people may, at one extreme, simply sell their land to companies or other small-scale investors, who then cultivate oil palm on the land (Rival and Levang, 2014). Other independent smallholders must enter into various institutional arrangements in order to obtain the planting materials needed to establish an oil palm farm. Among the challenges faced is a lack of income from the land in the two to three years before a farm becomes productive. Only after the palms become fully mature do farmers begin receiving the full benefits of cultivating oil palm (Feintrenie et al., 2010b). Those unable to survive these early years may find themselves financially worse off than before they tried to cultivate oil palm.

Independent smallholders cultivating 2 hectares of oil palm have been shown to allocate around eight days of work per month to managing and harvesting their palms (Li, 2015). The lower labor requirements of oil palm make it more desirable than other common crops (Feintrenie et al., 2010b), giving farmers more time to cultivate other crops (Li, 2015). However, the low productivity of these plots means that 2 hectares of land is insufficient to meet the needs of households. As such, independent smallholders need other sources of income or larger oil palm plots in order to stave off financial pressures (Li, 2015). Improving the productivity of independent smallholders through the increased use of fertilizers or improved palm varieties are pathways for ensuring the wellbeing of independent oil palm smallholders (International Finance Corporation, 2013).

The types of institutional arrangements that independent smallholders enter into when they commence farming oil palm will determine whether or not they can benefit from oil palm cultivation (McCarthy, 2010). The processes by which they negotiate access to seeds, fertilizers and credit will determine their ability to survive the early years of cultivation as well as the quality of the palms later on. Farmers will also need to negotiate arrangements with intermediaries on either buying

directly or transporting fresh fruit bunches to mills (Belcher et al., 2004). Rather than having a strict division between independent and scheme farmers, these institutional arrangements exist in a broader gradient. In between estates and independent smallholders, are NES, joint-venture schemes and assisted independent smallholders (Cramb and Curry, 2012). The independence of farmers in these intermediate arrangements depend on the terms by which inputs and support are provided, and how land is distributed or used as collateral for loans. The complexity and risk of these arrangements may deter farmers from cultivating oil palm, resulting in many choosing instead to cultivate other commodities, such as rubber, which preserve their independence (Belcher et al., 2004).

For independent smallholders, their engagement and contractual arrangements with intermediaries shape their ability to benefit from oil palm cultivation. Intermediaries can have the dual role of providing inputs and credit, as well as purchasing fresh fruit bunches and transportation. In situations where the intermediary is both the supplier of inputs and the buyer, a monopsony can arise that impacts the prices available to farmers, similar to other plantation estate arrangements (McCarthy and Cramb, 2009). In the context of oil palm cultivation in Indonesia, intermediaries will be characterized as people who either hold a delivery order license from a mill, are involved in transportation, purchase fresh fruit bunches from farmers or a combination of these factors. A delivery order license is an exclusive right granted to traders to deliver fresh fruit bunches to a mill (Anggraini and Grundmann, 2013). Farmers are unable to sell directly to a mill without a delivery order license, meaning that they are dependent on license-holding traders. The agreements between farmers and intermediaries are often informal and unwritten, and traders are often not registered companies (Anggraini and Grundmann, 2013). If a trader acts as the provider of seeds and fertilizers in return for the farmer selling to that trader only, that trader in turn will need to have access to significant finance. Traders who hold delivery orders face the pressure of meeting those orders, and potentially face sanctions or the loss of licenses if those obligations are not met. To relieve some of the pressure, holders of delivery orders may be willing to compromise the quality of fresh fruit bunches to achieve the desired quantity (Anggraini and Grundmann, 2013). Different mills, however, may

enforce different quality standards or oil quantity for the fresh fruit bunches delivered.

Another important concern arises from the type of land that small-scale farmers convert for cultivating oil palm, and any subsequent environmental impacts. Such lands can include: primary and secondary forests, peatland, diverse forest gardens and farmland for food and other commodities. The conversion of forests, peatland and diverse forest gardens has led to a loss in biological diversity and higher greenhouse gas emissions, among other impacts (Carlson et al., 2013). Meanwhile, the conversion of food and subsistence crops can damage food security and increase the vulnerability of small-scale farmers to market price fluctuations. Forest and peatlands can be converted upon legally, illegally or through unrecognized customary claims. Similarly, forest gardens can be cultivated under private property regimes, customary claims, unclear or illegal claims.

As greater emphasis is placed on ensuring the sustainability of palm oil supply chains, the unique conditions of small-scale farmers, in particular independent smallholders, should be recognized. Sustainable palm oil supply chains require that all fresh fruit bunches entering the supply chain are legal, sustainable and of a high quality. Meeting these requirements places burdens on independent smallholders that they are often unable to meet

by themselves. Local governments, possibly with external support, should assist independent smallholders to meet these requirements. This support will ensure that the plots of independent smallholders are registered and the fresh fruit bunches harvested there are traceable. Farmers will also be supported in adopting good agricultural practices, such as the use of high-quality seeds and proper fertilizers. Moving to good agricultural practices will also require the provision of credit on terms that are suitable to the needs and capability of independent smallholders. Ensuring traceability will also require that the identity and practices of intermediaries, such as traders and transporters, are understood and monitored.



Methods



The study was undertaken in the districts of Kotawaringan Barat and Seruyan, which are major palm oil producing districts in Central Kalimantan, and focused on independent, small-scale oil palm farmers. We chose these subjects as they represent the least understood and least monitored producers in the palm oil supply chain.

By focusing on this subset of oil palm farmers, we chose to exclude farmers who do not have oil palm plots and farmers who are part of plantation schemes. During the mapping process, farm plots where oil palm was not produced independently were not mapped. The farmers in our study could potentially also have plots that belong to plantation schemes or plots with other crops, however, those have not been included in the study. The focus of our study was to understand the practices of these independent smallholders, from cultivating the crop to its sale and transportation to mills. The traceability of palm oil from mills is far clearer and easier to monitor as it enters the palm oil supply chain. A further subset of our study included interviews with intermediaries involved in the trade and transportation of fresh fruit bunches from the farm to the mill.

The study was carried out together with district governments and village administrations. It involved several steps:

1. Meeting with village heads to discuss the study and socialize the mapping process;
2. Identifying independent smallholders in each village;
3. Interviewing independent smallholders who have planted oil palm and mapping their farms;
4. Geo-referencing data and uploading it into the monitoring system;
5. Interviewing middlemen who buy from farmers and sell to those who have delivery orders from mills; and
6. Conducting in-depth interviews with selected farmers, village heads, local facilitators and other relevant respondents.

Two separate questionnaires were used when interviewing and mapping the lands of oil palm independent smallholders. The first comprised a comprehensive survey of all aspects of oil palm farming as well as social and economic information of households. In total, 345 households

were interviewed using this method. The second questionnaire was far shorter and aimed to collect the minimum data required to certify independent smallholders according to certification standards. In total, 884 households were surveyed using this method (Tables 1 and 2). This paper reports the analysis of data on 1,229 farmers collected between June 2014 and December 2015. In Kotawaringin Barat District, we surveyed 748 farmers from eight

villages covering a total area of 1,671.61 hectares. In Seruyan District, about 481 farmers were surveyed in eight villages covering 2,182.75 hectares. In Kotawaringin Barat and Seruyan districts, an estimated 12,436 and 5,376 oil palm farmers were reported in 2013, respectively.⁶ Data on the farmers presented in this report represents around 6 percent of the total population of oil palm farmers in Kotawaringin Barat and around 9 percent in Seruyan.

Table 1: Total number of farmers interviewed by village in Kotawaringin Barat

Village	Number of Respondents Interviewed	Population ⁷
Bumiharjo	195	4,820
Pangkalan Tiga	208	2,907
Pangkalan Satu	117	2,124
Sei Bedaun	126	4,524
Sei Kapitan	90	5,387
Sei Sekonyer	7	489
Teluk Pulai	3	292
Sei Cabang	3	1,121
Total	748	21,664

Note: profiles of independent smallholders in some villages are provided in Annex 1

Table 2: Total number of farmers interviewed in Seruyan District by village

Village	Number of Respondents Interviewed	Population ⁸
Bangkal	29	3,546
Tabiku	29	4,629
Telaga Pulang	24	1,622
Sembuluh II	51	2,113
Sembuluh I	73	5,776

⁶ Direktorat Jenderal Perkebunan 2014, Statistik Perkebunan Indonesia 2013-2015 Kelapa Sawit, Direktorat Jenderal Perkebunan, Kementerian Pertanian.

⁷ Pusat Statistik, B. (2015). Statistik Daerah Kecamatan Kumai 2015 (2015 ed., p. 3). Kumai, Kalimantan Tengah: BPS

⁸ Pusat Statistik, B. (2015). Statistik Daerah Kecamatan Kumai 2015 (2015 ed., p. 3). Kumai, Kalimantan Tengah: BPS

Village	Number of Respondents Interviewed	Population ⁸
Pembuang Hulu I	128	7,742
Pembuang Hulu II	67	5,665
Selunuk	80	3,746
TOTAL	481	34,839

The plots of independent, small-scale oil palm farmers were also mapped. The plots were mapped either before or after the surveys were conducted, depending on the availability of landowners. The plots were mapped using handheld Global Positioning System (GPS) devices, with a minimum of four points taken to map the boundaries of plots. A landowner's entire plot was mapped rather than just the portion where oil palm was being cultivated. These points were then used to create polygons of the boundaries of the land using ArcMap software.

We also report the information collected from interviewing 70 farmers in Pangkalan Tiga Village in Kotawaringin Barat, who were selected based on their readiness to pursue sustainability certification. These farmers, who are former plasma or tied farmers, were generally more organized and had adopted better agricultural practices than farmers in other villages. These farmers also received more technical support and other assistance than those in other villages. Consequently, these farmers have been treated as a unique case study rather than as a representative sample of independent smallholders in Central Kalimantan.

The combination of socio-economic data and plot boundaries were intended not only for research purposes, but also to serve as the basis for monitoring the production and supply chains of independent smallholders and assist them in meeting the requirements for certification. Beyond the adoption of good agricultural practices, independent smallholders face two significant obstacles in certification: obtaining certificates of land ownership and STD-B. Ultimately, the data aims to assist with the development of a comprehensive online monitoring system for plantations. With this additional geo-referenced socio-economic data, decision-makers will be able to know where independent smallholders are located, who they sell to and what assistance they need to improve their productivity. Complemented by biophysical data, decision-makers will also be able to mitigate any environmentally harmful practices by identifying their location and causal factors.



Profile of Independent Smallholders in Kotawaringin Barat and Seruyan Districts



Independent oil palm smallholders differ across the two districts in terms of ethnicity and the average size of farmed plots.

Oil palm farmers in Kotawaringin Barat (Table 3) are predominantly transmigrants (87 percent) from Java along with Madurese and Sundanese. The rest include Melayu (8 percent) and indigenous Dayak or Banjar. In Seruyan District, however, Javanese transmigrants make up only around 16 percent of the total farmers surveyed, while indigenous Dayak and Banjar farmers account for 81 percent. There is a correlation between the ethnicity of land owners and the average area of small-scale farmer plots (Table 4). Transmigrants typically own oil palm plots with an average area of 1 to 2 hectares, whereas for indigenous farmers, this figure averages at 3 to 4 hectares. Small-scale farmer plots in Kotawaringin Barat are typically smaller than in Seruyan where farmers are predominantly indigenous. The average area of small-scale farmer plots is 2.23 hectares in Kotawaringin Barat and 4.53 hectares in Seruyan.

Table 3: Farmer ethnicity in Kotawaringin Barat and Seruyan districts

Ethnicity	Kotawaringin Barat Percentage (%)	Seruyan Percentage (%)
Transmigrant		
Javanese	76	16
Madurese	8	N/A
Sunda	3	0.5
Others	1	1
Local & Indigenous		
Melayu	8	0.5
Dayak	1	55
Banjar	1	26
Mendawai	1	N/A
Bugis	0	1
No answer	1	N/A

Table 4: Independent smallholders according to ethnicity both in Seruyan and Kotawaringin Barat

	Indigenous	Transmigrant
Small-scale farmer population	37%	63%
Average productivity (ton/ha/year)	12.69 (tree age of 4-10 years in Kotawaringin Barat)	15.8 (tree age of 4-10 years in Kotawaringin Barat)
	16.7 (tree age of 4-10 years in Seruyan)	16.5 (tree age of 4-10 years in Seruyan)
Most common form of land tenure	SKTA or Inheritance	SHM
Average area of oil palm plots	2-4 Ha	1-2 Ha
Planting year of oil palm plantation	2010-2014	2008-2011
Education	Elementary Schools	Junior High School
Age (median)	31-58	26-52
Farmer Group Involvement	None	34% Cooperatives

Oil palm farmers in Kotawaringin Barat and Seruyan districts specialize in farming oil palm but also work in non-farming sectors. In Kotawaringin Barat, only a small proportion of oil palm farmers reported cultivating rubber (4.81 percent) or rubber with other crops (6.55 percent). In Seruyan, around 5.8 percent of farmers harvested commodities other than oil palm, such as rice and rubber. Both in Seruyan and Kotawaringin Barat, half of the farmers surveyed have alternative jobs, including at private companies, as civil servants or in semi-skilled work, such as brick makers.

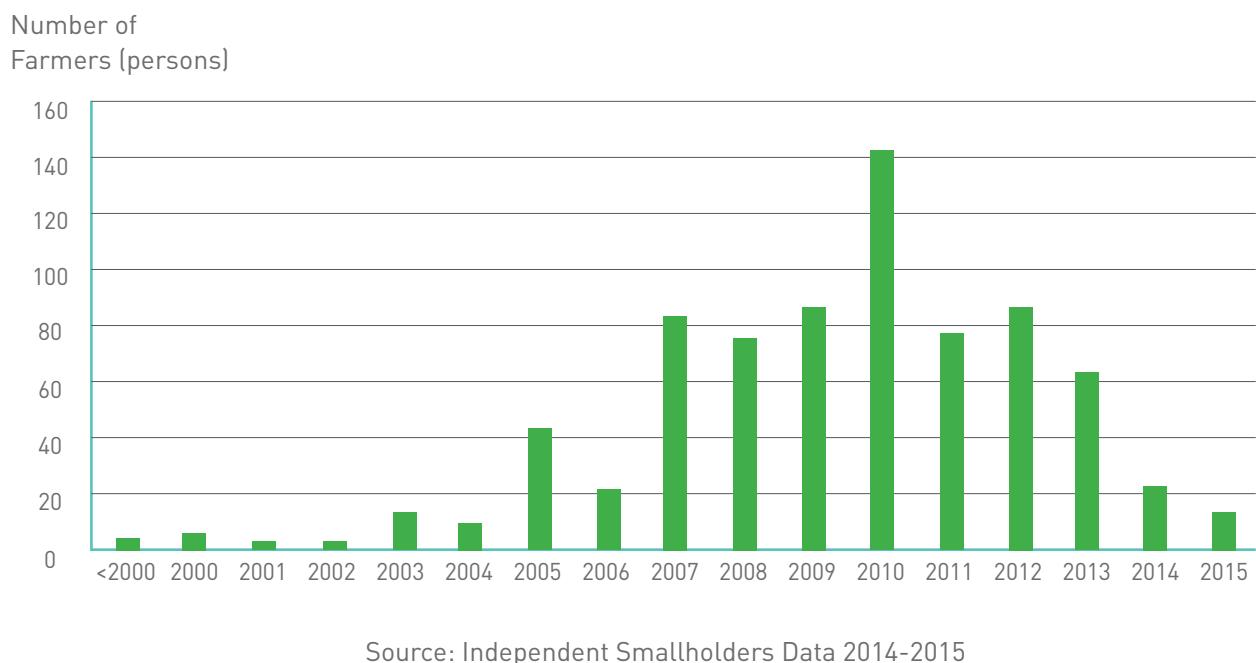
The productivity of independent smallholders is generally much lower compared to large-scale companies. For commercial oil palm plantations, yields can be as high as 30 tonnes per hectare per year, particularly on mineral soil. In contrast, the average output of independent transmigrant and local farmers in Kotawaringin Barat during the yield ascending period (4-10 years) is 15.8 and 12.69 tonnes per hectare per year, respectively. During the same period, farmers in Seruyan produced up to 16.7 tonnes per hectare per year. The higher productivity may result from higher quality of seedlings that were available to farmers who established plantations in the late 2000s as compared with those who started planting in the

late 1990s and early 2000s. The productivity of the yield ascending period in Seruyan, however, declined to only 12.9 tonnes per hectare per year, while generally the productivity should have increased during this period. Soil types and quality were not examined in this study.

These findings, however, should be treated with caution as farmers often had difficulty in answering questions on productivity. The median value of productivity among independent smallholders in Kotawaringin Barat and Seruyan is around 12 and 11.3 tonnes per hectare per year, respectively, with most harvesting fresh fruit bunches twice a month.

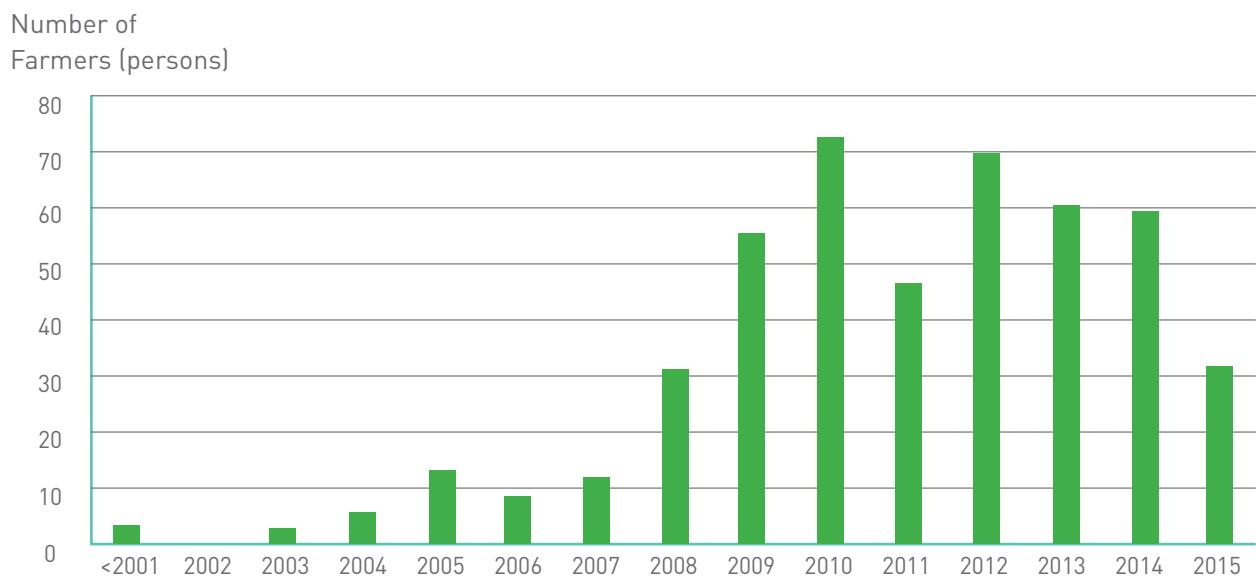
Most independent smallholders in both districts began cultivating their oil palm plots no earlier than 2005. In Kotawaringin Barat, this process began between 2007 and 2013, generally peaking in 2010 (Figure 1). In Seruyan, independent smallholders began cultivating oil palm between 2010 and 2015, generally peaking in 2012. Compared to Kotawaringin Barat, oil palm plots were relatively new, which meant that many plots were not productive at the time of the survey (Figure 2).

Figure 1: Year of small-scale farmer plantation establishment in Kotawaringin Barat district



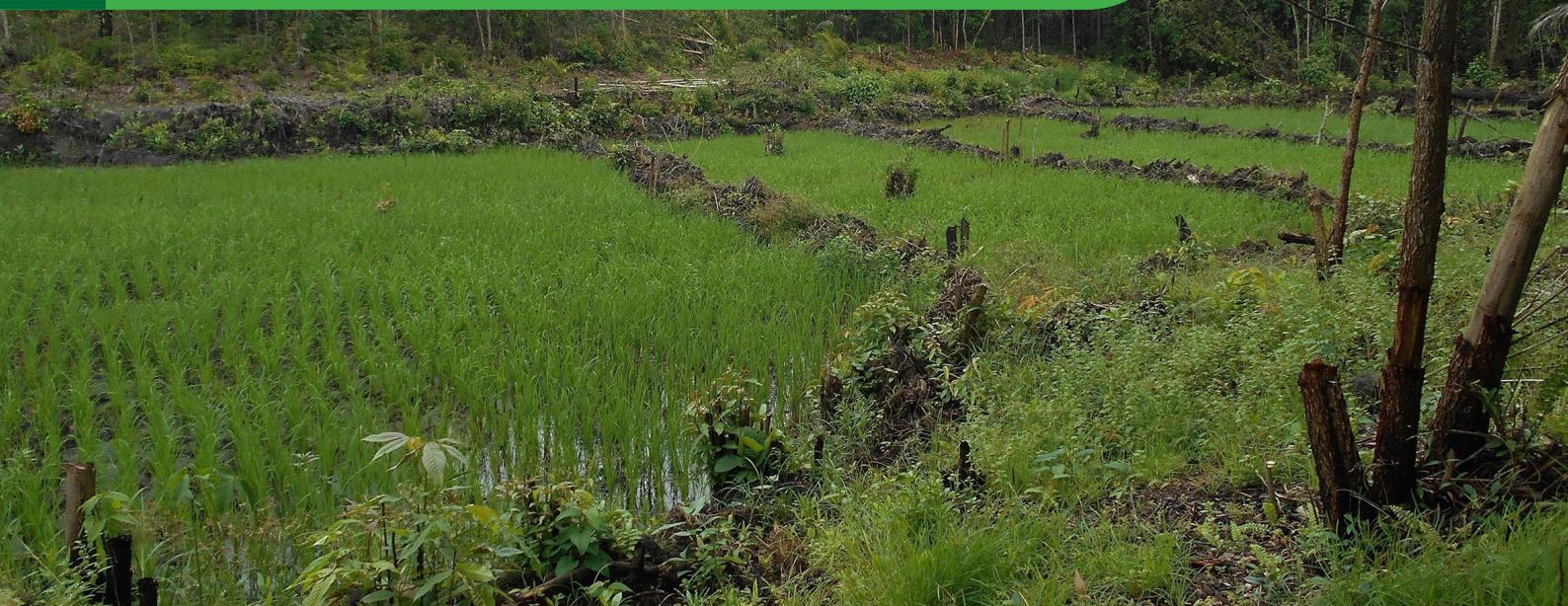
Source: Independent Smallholders Data 2014-2015

Figure 2: Year of small-scale farmer plantation establishment in Seruyan district



Source: Independent Smallholders Data 2014 - 2015

Land Tenure of Oil Palm Independent Smallholders



In Indonesia, independent smallholders generally have insecure land tenures. Farmers without land titles will have difficulties in obtaining bank loans and face major challenges in achieving sustainability certification. A land ownership certificate (SHM), considered the most recognized proof of land ownership, are issued by the Land Agency and can be used as collateral for bank loans. To obtain a land ownership certificate, a farmer should have land ownership letter (*Surat Keterangan Tanah* or SKT) from their village head (*lurah* or *kepala desa*). An alternative to the SKT is the letter of land ownership (*Surat Pernyataan Tanah* or SPT) from the village head. The subdistrict head (*camat*) should

also approve the SKT or SPT. The granting of an SKT/SPT is recorded manually in the book of land records at the village level. In Central Kalimantan, the local government has also introduced an additional form of land ownership recognition called the customary land statement letter (*Surat Keterangan Tanah Adat* or SKTA). SKTAs are issued by the Damang or Mantir, which are local customary institutions. According to the National Land Agency, SKTAs cannot be used as the basis to obtain a land certificate because the Land Agency can only recognize a land reference letter signed by a village head, not by a *Damang* or *Mantir*.¹⁰

	SKT	SKTA
Basis of claim	Proof of how a land owner obtained land (proof of transaction i.e. purchase of land, inheritance).	Traditional or customary claim. No proof of transaction is required. Even oral expression of historical occupancy is sufficient.
Requirements	<ul style="list-style-type: none"> • Only individually owned land; and • Total area is less than 5 hectares. 	<ul style="list-style-type: none"> • Can be communal and individually owned land; and • No limits on the total area.

⁹ SKTA were regulated in Central Kalimantan Provincial Regulation No. 13/2009.

¹⁰ Circular of the Head of the National Land Agency No. 9/SE/VI/2013 on Land Reference Letters for Former Customary Land.

	SKT	SKTA
Authority	Head of village	Head of customary institution (known as <i>Damang/Mantir</i>)
Process	Conduct inventory, measurement and setting boundaries	Conduct inventory measurement, and setting boundaries
Benefit	After getting SKT, farmers can process SHM	After getting SKTA, farmers can process SKT, if lands are individually owned and less than 5 hectares

Some farmers reported being reluctant to obtain SHMs for two reasons. First, they were afraid of the tax implications of SHM. After getting an SHM, farmers must pay land and building tax. Second, limited funds deterred farmers from paying the SHM processing fee, unless they saw the benefits of having the certificate.

Forms of land ownership recognition vary within and across districts. In Kotawaringin Barat, around 60 percent of farmers possess ownership certificates,

a figure that drops to only 1 percent in Seruyan (Table 5). In Kotawaringin Barat, 27 percent of farmers have SKTs while 2 percent have SKTAs. In Seruyan, 32 and 48 percent of farmers reported that they have SKTs and SKTAs, respectively. These figures generally reflect the division between transmigrant and local and indigenous farmers, with transmigrant farmers more likely to have land certificates provided by the government. In contrast, indigenous farmers do not see the benefit of processing SHMs due to the reasons mentioned above.

Table 5: Land titles of oil palm independent smallholders in Kotawaringin Barat and Seruyan

	Kotawaringin Barat	Seruyan
SKT	27%	32%
SHM	60%	11%
SKTA	2%	48%
Others	1%	1%
No answer	10%	8%

Spatial plans determine land use in Indonesia. Generally, land is divided into state forests and non-state forests (see Box 1). State forests are further classified into production, protection and conservation forests, while non-state forest areas are referred to as land for other uses (*Area Penggunaan Lain* or APL). Commercial land uses can only take place in production forests, specifically for timber production, or in APL for commodities

other than timber. The classification of forests poses challenges to land use management in Indonesia. While several criteria are supposed to be used to classify forest areas, reliable land cover information is largely unavailable or difficult to verify. Therefore, the margin of error has been significant. As a result, some areas classified as forests have been known not to contain forests, while mature primary forests can be found in areas classified as non-forests.

Box 1. Forest classification in Indonesia

According to Forestry Law 41/1999, forested lands are classified into production, protection, and conservation forests.

- The main function of production forests is to produce forest commodities, mainly timber. Some production forests are also classified as conversion forests, which can be legally converted to other non-forest land-use activities.
- Protection forests provide environmental services such as hydrological regulation, flood prevention, erosion control, preventing seawater intrusion and maintenance of soil fertility.
- Conservation forests, which include national parks and nature reserves, are intended to conserve biodiversity. Legally, land use change from forests to non-forests can occur in areas classified as conversion forests and areas classified for other purposes.
- Conversion forests can be allocated for a number of non-forest purposes, including infrastructure and other land uses such as agriculture, tree crop plantations and mining.
- Areas for other purposes are areas classified as non-forests where productive activities can be carried out.

Following the mapping process, we carried out a spatial analysis to understand where independent smallholders cultivate oil palm (Table 6). In Kotawaringin Barat, around 20.1 percent of small-scale farmer plots were located in the concession areas of plantation companies. Based on a new spatial plan¹¹, 16.01 percent of small-scale farmer plots were located in conversion forests. None

were found in conservation forests. In Seruyan, 35.68 percent of small-scale farmer plots were found within the concession areas of plantation companies, with a further 8.41 percent in conversion forests and 20.85 percent in production forests. No independent smallholders were found to be farming in conservation forests.

Table 6: Small-scale farmer oil palm farmers estimated location in Kotawaringin Barat and Seruyan (based on the Central Kalimantan Provincial Spatial Plan 2015-2035)

Location of small-scale farmer farms	Kotawaringin Barat Area (Ha)	Seruyan Area (Ha)
Independent smallholders in large concession areas	460.9	1,127
Independent smallholders in areas designated for other uses	1,398.85	1,107.04
Independent smallholders in conversion forests	354.71	265.56
Independent smallholders in production and limited production forests	-	658.65
Independent smallholders in conservation forests	-	-

¹¹ Central Kalimantan Provincial Spatial Plan 2015-2035 (Rencana Tata Ruang Wilayah Provinsi Kalimantan Tengah Tahun 2015-2035)

Institutional Setting: Farmer Organizations

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Farmer organizations offer a way for farmers to organize, improve their bargaining power and have access to inputs and technical support. They are independent of other village-level institutions, such as village enterprises (*Badan Usaha Milik Desa*). In the two districts surveyed, there were three main types of farmer organizations: farmer groups, farmer group associations and cooperatives. A farmer group is usually a small association of farmers, and can be either informal or a legal entity. Such groups are usually the smallest type of farmer organization. Farmer group associations (*Gabungan Kelompok Tani -Gapoktan*) are legal umbrella organizations made up of around five farmer groups. Cooperatives are larger legal entities with business functions that provide benefits to their members. Both farmer groups and farmer group associations can be part of cooperatives. Among the many benefits of being part of a farmer group or cooperative are: (1) access to fertilizers and other agricultural inputs at discounted prices, and (2) access to government support and loans. The rules governing cooperatives state that farmers need to be members for at least three months and that profits and interest must be distributed equally.

From the results of the interviews, it was found that only around 3.1 percent of independent oil palm farmers belonged to a farmer group in Kotawaringin Barat. A similar trend was also found in Seruan

where only 1.7 percent of the farmers surveyed were members of cooperatives or farmer groups. Even then, these farmer organizations were generally not directly related to farmers' independent oil palm plantations but mostly to other farming activities, such as food crop cultivation or oil palm plantation schemes. Farmers reported that the main constraints preventing them from participating in cooperatives or farmer groups were:

- Limited knowledge about the benefits of cooperatives and how cooperatives work; and
- Poor governance and administration of cooperatives due to limited organizational knowledge and skills.

To provide more information about farmer organizations, we present the case of Pangkalan Tiga Village. Pangkalan Tiga, located in Pangkalan Lada Subdistrict in Kotawaringin Barat, is a transmigration village where indigenous communities comprise less than 4 percent of the population. It is home to one of the best cooperatives in Indonesia and has witnessed numerous innovations, including the integration of cattle and oil palm. There are three farmer organizations in Pangkalan Tiga Village: Koperasi Unit Desa (KUD) Tani Subur, Koperasi Berkat Maju Bersama and Gabungan Kelompok Tani (Gapoktan). The cooperatives were established for plasma farmers.

Gapoktan was first established for food crop farming but was later converted for oil palm farmers. Despite this change, Gapoktan is still registered as an organization for food crop producers. Consequently, the practices described below only refer to members of both cooperatives or the plasma farmers. Although plasma farmers also have independent plots, they farm differently in those plots.

Koperasi Unit Desa Tani Subur

Koperasi Unit Desa (KUD) Tani Subur was founded in 1984, originally to market nutmeg. Since 1996, the function of the cooperative has shifted to organizing the 547 small-scale oil palm farmers tied to the Medco estate, each owning 2 hectares of oil palm. The cooperative now includes 803 members within 18 farmer groups, of which 435 members are now independent, ex-plasma farmers owning 870 hectares of oil palm. Most of these oil palm farms are now around 18 years old, and replanting is scheduled for 2022. The monthly membership fee is IDR 5,000 and members are charged IDR 6.5 per kilogram fresh fruit bunches (FFB) for transport to the mill. The cooperative also takes a percentage of the FFB sales to help farmers save for replanting. It is one of Indonesia's leading cooperatives and acts as a parent cooperative to eight other cooperatives in neighboring villages.

Around 200 people work on the oil palm plantations. Harvesters are usually from outside the village, as smallholders tend to be older and harvesting is a physically challenging task. Those involved in plantation maintenance are often cooperative members. Workers do not have a contract and are paid on a daily basis.

All fresh fruit bunches are sold to several mills belonging to two major groups: Astra Agro Lestari and Citra Borneo Indah (see Box 3). The price a mill pays is based on the K Index price (Box 1). The K Index is issued by governors based on advice from the head of provincial estate crops and set by the provincial government. Mills pay for the fresh fruit bunches one month after they have been received. The fruits arrive at a mill within 24 hours of harvesting. Empty bunches are then taken back to the cooperative where they are composted before being applied to small-scale farmer plantations. Smallholders are charged cost price for the transportation and labor involved in transporting the empty fruit bunches. The cooperative pays its members in cash for the fresh fruit bunches through the head of the farmers group. Any receipts are stored at the cooperative and can be copied by farmers if required. The farmers paid off their loans in 2010, yet their land ownership certificates continue to be held by PT Medco.

Box 2. The K index¹²

$$K = \frac{P_{FFB}}{(P_{CPO} \times R_{CPO}) + ((P_{CPO} \times R_{CPO}) \times 100\%)}$$

- K = K index > Proportion between the smallholders and mills
 P_{FFB} = Price of FFB in mills
 P_{CPO} = Weighted Average of Price of CPO from Exports and Domestic Trade
 R_{CPO} = Yield of CPO
 P_{CPKO} = Weighted Average of Price of CPKO from Exports and Domestic Trade
 R_{CPKO} = Yield of CPKO (kernels)

¹² Based on Ministry of Agriculture Regulation No. 395/Kpts/OT. 140/11/2005

KUD Tani Subur has a livestock project in which cows consume the waste vegetative material from oil palm plantations. The resulting manure is used as an organic fertilizer, while the cows are also consumed for their meat. The cows are currently kept in two enclosed areas. The projects aims to breed more cows for distribution to a greater number of members, and for the cows to eventually graze inside plantations. The cooperative has won awards for this project, which has become an example of a successful livestock initiative. KUD Tani Subur is also currently developing ponds to breed fish.

Koperasi Berkat Maju Bersama

Koperasi Berkat Maju Bersama (BMB) was established in 2006, after it separated from KUD Tani Subur. It initially represented six oil palm farmers groups with 224 hectares of farmland and 119 members, but now 10 percent of members' farmland is made up of rubber plantations. All members have paid off their loans to Medco, yet their land titles are still held by the company. The cooperative offers a saving plan and credit, and manages the plantations of its members. Monthly membership fee is IDR 10,000, and members are asked to pay a one-off registration fee of IDR 50,000. A contribution of 0.5 percent is taken from fresh fruit bunch sales to cover transportation costs. Most plantations are 19 years old and replanting is scheduled for 2021. As of two years ago, members have managed to save IDR 200,000 each month for replanting.

The cooperative employs 24 harvesters who work in pairs. There are also 25 farm maintenance workers, two drivers and two truck loaders. Most of the workers used to work at Astra plantations prior to working for the cooperative. Fresh fruit bunches are also sold to PT Sabut Mas Abadi under the same terms as KUD Tani Subur. The fresh fruit bunches arrive at the mill within 24 hours, and empty fruit bunches are taken back to the cooperative for use as natural fertilizer on small-scale plantations. It costs the cooperative IDR 180,000 to return empty fruit bunches from the mill to plantations. The cooperative owns two trucks to transport the fruit to the mill.

Gabungan Kelompok Tani

Gabungan Kelompok Tani (Gapoktan) is the newest organization. It consists of 12 farmer groups and has been officially recognized by the local Department of Agriculture. Some of the members of Gapoktan are also members of KUD Tani Subur and Cooperative Berkat Maju Bersama for the purpose of managing their ex-plasma plantations. Gapoktan has received funds from the Ministry of Agriculture's Rural Agribusiness Development Programme (*Pengembangan Usaha Agribisnis Perdesaan or PUAP*). From these funds, IDR 100 million was used to develop a savings and loans program that has current assets of around IDR 320 million. Gapoktan is not involved in the trade or sale of small-scale farmer produce.

By looking at these three entities, we can see that the role of organizations are usually to:

- Organize workers and standardize agricultural practices (through training and enforcing standardized farming techniques for laborers) used in their plantations during pre-harvest, harvesting and post-harvesting periods. Laborers are trained by cooperative members in good agricultural practices and are expected to farm according to those standards while working in plantations belonging to cooperative members.
- Organize the sale of fresh fruit bunches to mills. Cooperatives have delivery orders (DO) from mills, and are able to obtain higher prices for FFB as they can remove traders from the supply chain.
- Provide agricultural inputs and opportunities for farmers to participate in innovative schemes such as the integrated cattle and oil palm project. Cooperatives were able to source fertilizers from the company's distributors, while seedlings were sourced from companies and traders. Cooperative members were more likely to trust agricultural inputs provided by cooperatives than traders.



Across the two districts, the practices of indigenous, local and transmigrant farmers differed.

Transmigrant farmers were usually more organized, having obtained knowledge of farming practices by actively being involved in farmer organizations or cooperatives. Furthermore, they were often former members of oil palm schemes (plasma) who had since opened up new oil palm plots that were independent of companies. As such, they had acquired additional agricultural skills from being plasma farmers. Through cooperatives, transmigrant farmers also had access to inputs, including certified seedlings and pesticides, as well as subsidized inorganic fertilizer, such as urea. These farmers also used organic fertilizers to improve soil fertility. Land clearing was carried out manually.

In contrast, indigenous farmers were usually not well-organized. In the case of Umpang Village, Kotawaringin Barat, indigenous farmers learned about oil palm cultivation by imitating company practices and through trial and error. As land in Umpang Village was usually forest or paddy fields before conversion into oil palm plantations, land clearing was carried out using excavators. For those unable to afford renting heavy machine, land could also be cleared by fire. In general, farmers purchased oil palm seedlings from companies that could not be used on their own plantations,

and so were typically of a lower quality. In addition, farmers often took wild seedlings, or often known as volunteer oil palm seedling (VOPS), from commercial plantation areas, which normally would be disposed of, and then planted them on their own plots. Inorganic fertilizers were bought from fertilizer agents located in Pangkalan Bun City, Kotawaringin Barat.

Transmigrant farmers routinely managed their farms by applying fertilizers and pruning palm leaves frequently to ensure good productivity and minimize fruit losses. Pests and diseases were also monitored regularly when the farmers visit the plantation. In a disease outbreak, the infected parts of plants were cut and pesticides or fungicides applied. In contrast, indigenous farmers did not frequently tend to their farms. After planting seedlings, trees were left until harvesting. The farmers did not typically apply fertilizers, as inorganic fertilizers are considered as expensive investments. Pest and disease management as well as frond pruning were not carried out. The productivity of indigenous farmers is hence lower than the productivity of transmigrant farmers.

Access to Inputs and Training

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Farmers generally reported having poor access to agricultural inputs. Currently, most farmers in Kotawaringin Barat use seedlings that they grow themselves (24.46 percent). Others (16.84 percent) obtain seedlings from traders to whom they sell their fruits (Table 7). Other sources of agricultural inputs include the government (9.6 percent), plantation companies or mills (9.22 percent) as well as cooperatives and farmer groups (0.8 percent). The rest reported that getting their inputs from neighbors and friends (21.6 percent) or other villages (7.2 percent). About 13.1 percent did not answer

about where they received their agriculture inputs. In the case of Seruyan, farmers obtained agricultural materials mostly from growing wild seedlings (64.24 percent), plantation companies (26.2 percent), their friends, neighbors or relatives (6.1 percent) or the government, cooperatives and farmer groups (1 percent). Traders, in turn, reported purchasing one-year-old seedlings from Medan, while companies reported their source as PT Asian Agri's nursery. There are few guarantees for farmers about the origin and varieties of seedlings they purchase.

Table 7: Source of Seeds in Kotawaringin Barat and Seruyan

Source	Kotawaringin Barat Percentage (%)	Seruyan Percentage (%)
Traders	16	-
Grow wild seedlings	22	64.2
Company/Mills	9.2	26.2
Plantation Office (Central Kalimantan)	9.6	-
Friends, neighbors and relatives	21.6	6.1

Source	Kotawaringin Barat Percentage (%)	Seruyan Percentage (%)
Cooperatives, farmer groups and farmer shops	0.8	0.9
Other villages/cities/islands	7.2	1.4
Not answered / Don't know	13.6	1.2

For fertilizers, most farmers in Kotawaringin Barat purchased their supplies either from traders (*pengepul*) or from shops (Table 8). Around 7.6 percent reported purchasing fertilizer through cooperatives where they are members, or from other cooperatives that sell agricultural inputs to the

public. In the case of Seruyan, farmers purchased fertilizers mostly from traders (35.9 percent), plantation companies or the government (0.4 percent), farmer groups (5.8 percent) and farm shops (26.8 percent).

Table 8: Fertilizer Source in Kotawaringin Barat and Seruyan

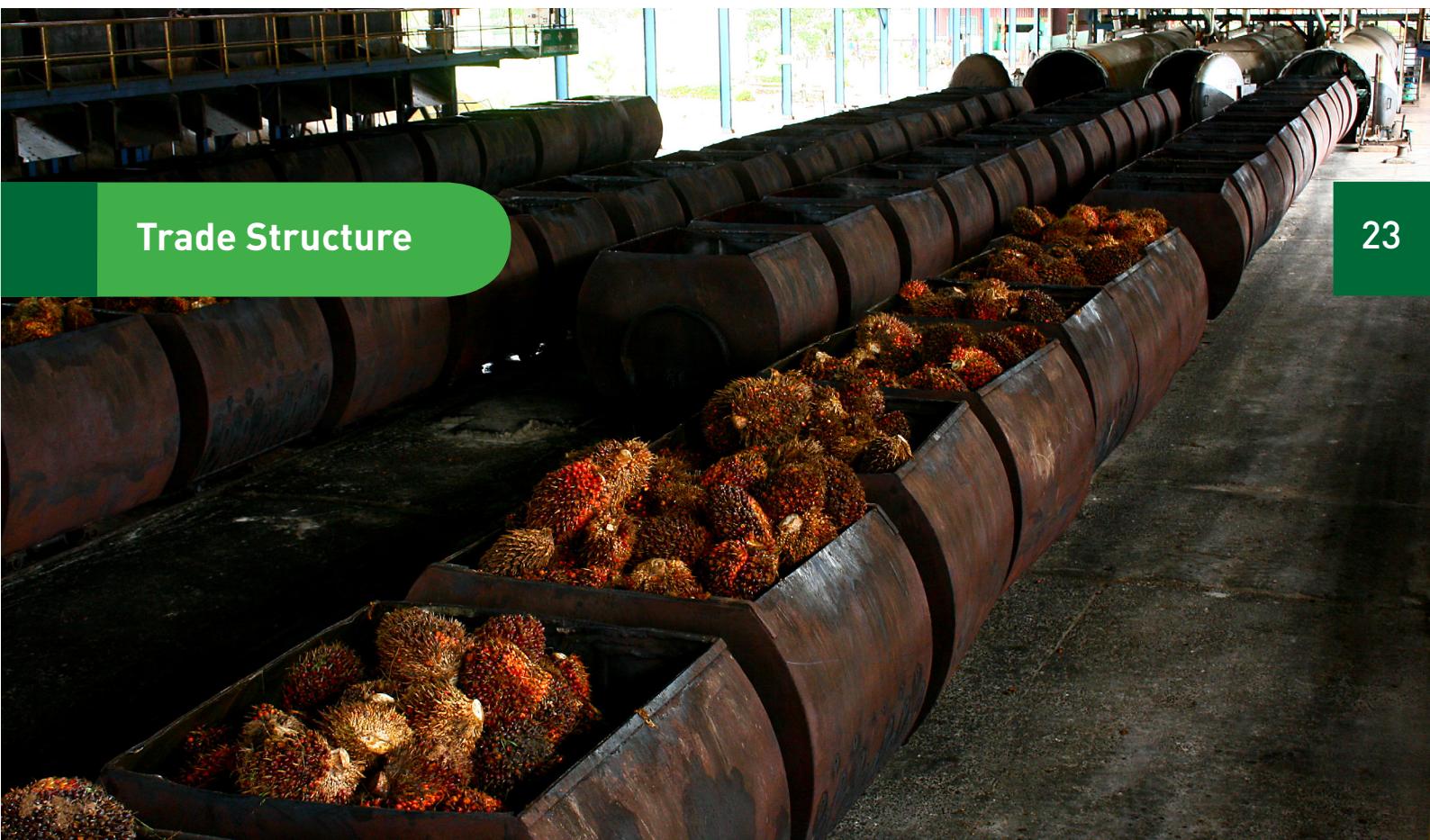
Source	Kotawaringin Barat Percentage (%)	Seruyan Percentage (%)
Traders	48.3	35.9
Farm equipment Shop Kiosk	18.8	26.8
Farmer Group	8.5	5.8
Outside of village	7.6	9.9
Cooperative	7.4	-
Companies/Government	1.4	0.4
Not answered	6.8	21.2
Others	1.2	-

Some 15 farmers — all transmigrants — reported receiving some form of training on the cultivation of oil palm, which had been provided by plantation offices, agricultural extension workers and at the village level. Even so, only 20 farmers stated that they were able to differentiate seedlings varieties, such as those considered more or less productive. Finally, just 13 farmers reported having access to information regarding oil palm cultivation through extension workers, other farmers or their relatives.

In Kotawaringin Barat, only 13.8 percent of farmers had access to a bank account and a further 7.7 percent to bank loans. Most of the farmers with bank loans used their SKT titles as collateral. Three main banks that were mentioned by respondents: Bank Rakyat Indonesia, Bank Mandiri and Bank Mega. In Seruyan district, no farmers reported having access to banks or bank loans.

Trade Structure

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In the study, independent smallholders rarely sold directly to palm oil mills (Table 9). Farmers instead usually sold their fresh fruit bunches to an intermediary, known as a *pengepul* (literally translated as collectors) or trader. Traders would often provide support, such as fertilizers, to farmers as well as loans that farmers could not usually obtain from other sources. A trader may or may not have a direct agreement with a palm oil mill (Figure 3). Those who lack direct agreements usually use other traders' names who have direct agreements with mills (often called the Delivery Order Owner). The names of Delivery Order Owners are used for legitimacy when transporting fruit to mills. Traders buy harvested fruit directly from farmers and

transport these goods directly to mills. The owners of delivery orders are typically close relatives of mill owners who issue travel permits or letters (*surat jalan*) to traders. Although a higher proportion of independent smallholders reported selling fresh fruit bunches directly to mills in Seruan District, this could have been the result of respondents not understanding the survey questions. After including the 2016 data, less than 10 percent of farmers reported selling FFB directly to mills. Typically, farmers must develop their own arrangements for selling fresh fruit bunches to mills. In Kotawaringin Barat District, a greater number of traders meant that farmers were freer to select more favorable trade agreements.

Table 9: Fresh fruit bunch supply chain from farmers to mills

FFB Buyer	Kotawaringin Barat Percentage (%)	Seruan Percentage (%)
Traders (<i>Pengepul</i>)	92.8	72
Mills	4.3	27
Cooperative/BUMDES	2.7	1
No answer	0.2	0

In Kotawaringin Barat and Seruyan, around 92.8 and 72 percent of farmers reported selling their fruit to traders, respectively (Table 9). Only a small proportion of farmers sold through cooperatives or village business units. In Kotawaringin Barat, only 2.7 percent sold through these entities while in Seruyan, the figure is 1 percent. Only two farmers interviewed had some form of contract with a trader. Here, it was agreed that the trader would take 15 percent of a harvest. The majority of farmers, however, did not mention having any specific contracts. While most farmers sold to a single buyer, a further 27 had alternative buyers. Generally, a farmer may initially try different traders until they find a suitable fit. Afterwards, they are unlikely to change traders. Personal relationships play an important role among smallholders when selecting a trader to whom they will sell their produce. In some cases, it is more important than price or location.

For example, one of the independent smallholders we interviewed in Pangkalan Tiga sold to a trader in another village because he personally knew the trader, even if it cost him extra to transport the fresh fruit bunches.

From the interviews, *penegepul* reported that there were no specific regulations governing the trade of fresh fruit bunches with the exception of schemed farmers, who have standard operating procedures within their cooperatives. Other regulations exist regarding transporting or selling fresh fruit bunches to other islands in Indonesia. According to government regulations, only 20 percent of the raw materials destined for palm oil mills should be supplied by its own plantation. The remaining amount should be sourced from farmers in surrounding mills.

Box 3: Supply chains in Pangkalan Tiga

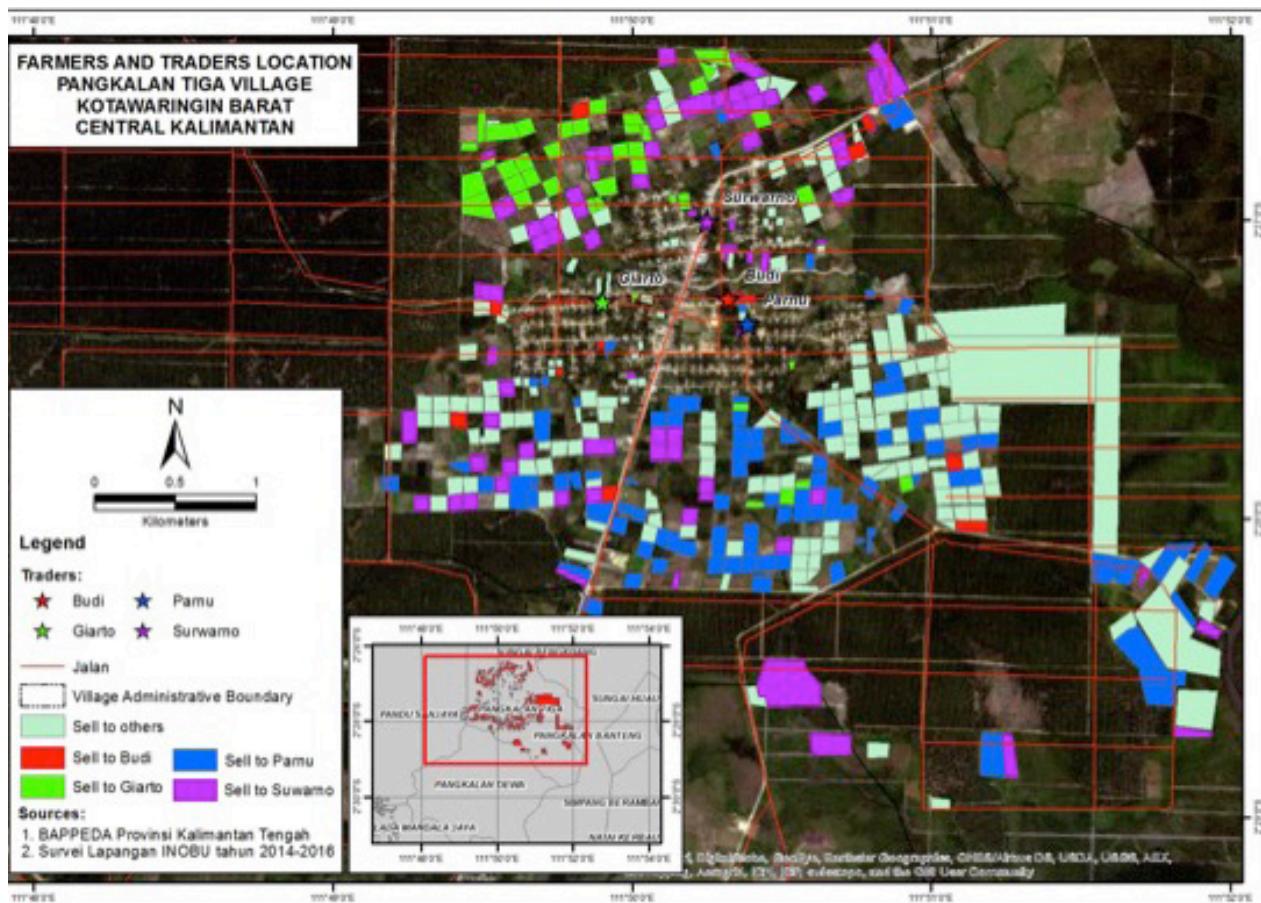
In Pangkalan Tiga there are four traders and one village enterprise (*Badan Usaha Milik Desa* or *BUMDes*) that buy from independent smallholder plots. The BUMDes was established in December 2015 to market the produce of independent oil palm independent smallholders. It currently sells around 15 percent of harvested fresh fruit bunches. It is a very young organization that is focused more on the sale of harvested fruit than on providing services to its members. The institutional structure is still unclear and dependent on village heads. BUMDes only has an agreement with PT Gunung Sejahtera Ibu Pertiwi (PT GSIP). Independent smallholders often harvest unripe fruits that do not pass the grading standards of PT GSIP. To avoid receiving the immature fruit back, BUMDes now sells the product to other traders.

Four traders — Parnu, Suwarno, Giarto and Budi — control the remaining 85 percent of the trade of fresh fruit bunches in Pangkalan Tiga. Traders currently have work agreements (*Surat Perjanjian Kerja* or *SPK*) with or sell through other traders to the following mills:

- PT Gunung Sejahtera Ibu Pertiwi (GSIP) - Astra Agro Lestari
- PT Gunung Sejahtera Puti Pesona (GSSP) – Astra Agro Lestari
- PT Citra Borneo Indah (CBI)

Parnu has an agreement with all three of these mills, but prefers to sell to PT GSIP and PT GSSP because their grading is more favorable than PT CBI. Although his agreement with Astra includes a minimum volume, no required volumes are stated in his agreement with PT CBI. Parnu also used to occasionally sell to PT Surya Sawit Sejati (United Plantations). Suwarno, Giarto and Budi sell to PT GSIP and GSSP using the work agreements (SPK) of other traders. The price a trader normally pays includes deductions for transport. Farmers, including cooperative members, sell to these traders over the BUMDes as they often have personal connections with the traders. Maps of smallholders selling to traders are presented in Figure 3.

Figure 3: Fresh fruit bunch supply chain: farmers to mills



Although cooperatives help structure the farming practices of members and hired labor, deals involving fresh fruit bunches remain largely based on relationships between traders and farmers. Only a small proportion of harvested fruit (15 percent) are traded through formal cooperatives. There are two possible explanations for this. First, as the BUMDes is relatively new, farmers may not see the benefits of changing the buyer of their harvested fruits.

Second, farmers may have reciprocal relationships with traders who, in turn, could provide additional support, including agricultural input or credit. Relationships — with an emphasis on trust — are a central determinant in how farmers choose to whom they sell their harvested fruits. Traders who have Delivery Orders will more likely purchase at a higher price than traders who do not have Delivery Orders with mills.



26 Discussion and Recommendations

This section provides a summary of the challenges faced by independent farmers and suggests how to address them. We also present innovations that have been or could be implemented by all stakeholders in supporting independent smallholders overcome the challenges. Several policy recommendations to improve the welfare of small-scale oil palm farmers while improving the traceability of palm oil supply chains are also discussed.

The profile of farmers in the two districts differs largely according to ethnicity, or, more generally, indigenous versus migrant or transmigrant households. Despite these differences, certain commonalities shape the productivity levels of groups and, consequently, the welfare of farming households. Consistent across all groups and districts is the informality of independent smallholders, including how they access inputs and markets. Ex-plasma farmers usually have better access to mills, farmer groups and inputs as well as better agricultural practices than strictly independent farmers. This informality affects the productivity of small-scale independent farmers and the quality of their fresh fruit bunches, as well as the traceability of palm oil supply chains. It also, however, reflects a desire to participate in palm oil

supply chains independently. With few government mechanisms to support independent farmers, they need to negotiate their own institutional arrangements.

Legality: Land Title and Registration

Legality is one of the most important requirements for independent smallholders to participate formally in the palm oil supply chain. As discussed previously, farmers should have a proof of land ownership. Not all farmers see the need to obtain land titles (SHM) as they see an SKT or SKTA as sufficient. In Kotawaringin Barat, the majority of oil palm independent smallholders are transmigrants. As transmigration was a government-sponsored scheme, the resulting settlements were located within areas classified according to actual, or intended, land uses. These farmers were also more likely to possess official land certificates. In Seruyan District, however, farmers were predominately indigenous who obtained their lands through inheritance or customary claims that are recognized by indigenous land certificates (*Surat Keterangan Tanah Adat*). The claims of indigenous farmers to these lands generally predate the government's official classification scheme, as well as the allocation of commercial oil palm estate concessions.

The location of small-scale farms shapes the legality of their production, and can also affect the sustainability of their production. Based on Law 18/2013 on Forest Crime, produce harvested in areas classified as state forests are illegal. In Kotawaringin Barat District, the majority of farmers had plots in areas classified as lands for other uses. Fewer had plots in lands classified as conversion forests or plantation concessions. In contrast, only 36 percent of farmers in Seruyan District had plots in lands for other uses, with the remaining in plantation concessions and production, limited production and conversion forests. These figures, however, do not necessarily mean that independent smallholders are encroaching into plantations or forest areas. Generally, these figures demonstrate failings in the land classification system and process for issuing commercial concessions.

For independent smallholders operating in forest areas, it is possible to relinquish a farmer's plots from forest areas through a process called "Cataloging the Control, Ownership, Use and Utilization of Land (*Inventarisasi Penggunaan, Pemilikan, Penggunaan dan Pemanfaatan Tanah* or IP4T)". IP4T was formalized through a joint ministerial decree signed between the Ministries of Environment and Forestry, Land Agency, Home Affairs and Public Works. The aim of the program is to provide a non-cadastral map and issue letters of authorization of land ownership. However, the implementation of IP4T was put on hold after the Ministry of Environment and Forestry (MoEF) requested that the joint Ministerial Decree be replaced by a Presidential Decree. This process can be resumed only after the Presidential Decree is finalized.

Farmers should also register their plots with their district government in order to obtain a registration letter, known as an STD-B. While the Ministry of Agriculture does not require SHMs on the provision that other evidence is available, district governments has differing understandings of the process and requirements for issuing STD-Bs. Several issues hindering local governments from issuing STD-Bs mainly relate to their capacity, including a limited

understanding, lack of personnel and skills. In some districts, the governments have devolved the role of issuing STD-Bs to subdistrict administrations, who later charge significant fees to issue an STD-B. This registration process should be carried out free of charge. INOBU has been assisting local governments to address a number of obstacles, including by mapping smallholders' plots, issuing instructions to ensure that STD-Bs are issued free of charge, and facilitating the learnings of local government from other districts.

Both land titles and registration letters are important for obtaining sustainability certification, including RSPO and ISPO. Mapping the lands of independent smallholders is a first and necessary step to ensure the legality of smallholders, which can later be used in traceability mechanisms for sustainable palm oil supply chains. While the mapping of independent smallholders requires significant financial investment, some private companies have expressed keen interest in providing support for this process. In Seruyan and Kotawaringin Barat, the district governments have begun mapping all farmers in their jurisdictions. The governments have also committed to issuing STD-Bs using the maps produced in the mapping process. Such commitments have helped prompt other stakeholders, such as private companies and non-governmental organizations, to support the mapping process. Following the mapping process, Kotawaringin Barat District initiated a collaboration with the National Land Agency to upgrade SKTs to SHMs. Table 10 provides a summary on the recommendations for improving the legality of smallholders.

¹³ IP4T was based on a collective law issued by Ministry of Home affairs, Ministry of Forestry, Ministry of Public Works, and Head of National Defense Department Republic of Indonesia Law No 79/2013, PB.3/MENHUT-II/2014, 17.PRT/M/2014, 8/SKB/X/2014 about the settlement act of land ownership in forest areas.

Table 10: Recommendations for improving the legality of smallholders

Recommendation	Responsible Party	Example
Smallholder Mapping	Agribusinesses, commodity buyers and processors with the support of local governments.	Seruyan District supported by companies belonging to the Indonesian Palm Oil Pledge (IPOP), while Kotawaringin Barat is supported by Unilever.
Issuing STD-B	District governments should ensure sub-districts process STD-B for free and have the capacity to do so.	A subdistrict government in Kotawaringin Barat District refused to process STD-Bs without payment until instructed by the district government.
Expediting IP4T Process	Local governments should work with higher-level agencies and offices to expedite the IP4T process.	-
Upgrading land certificates	Local governments with the land agency.	Kotawaringin Barat district works closely with the land agency to upgrade SKTs to SHMs, taking advantage of national programs that aim to provide free land certificates to farmers.

Farmer Organizations

Farmers should belong to farmer organizations if they wish to gain access to agricultural inputs and training as well as achieve certification. The distribution of subsidized agricultural inputs in Indonesia, particularly fertilizers, although also involving other farming support, is contingent on membership in a farmer group or cooperative. Improving the productivity of independent smallholders requires that farmers have improved access to inputs, credit, technical training and markets. The distribution of government support, especially fertilizers, is a complicated process that is subject to delays, insufficient supplies and illegal misappropriation of supplies (Kariyasa and Yusdja, 2005). Farmer groups, however, have the potential to act as viable institutions that support independent smallholders and boost their market access. There needs to be clear incentives for farmers to participate in farmer groups as well as mechanisms to ensure that farmer groups are properly managed.

There needs to be clear incentives for farmers to participate in these groups. Incentives could include the provision of inputs, such as fertilizers, or access to technology, such as tractors, which they cannot access through other means or afford. Cooperatives can also facilitate the sale of fresh fruit bunches

and increase the bargaining power of independent smallholders, which can help lift sales prices. These type of cooperatives fall under the definition of agricultural service cooperatives with supply or marketing functions.

Within our study, we discussed two cooperatives for schemed smallholders in Pangkalan Tiga: Koperasi Unit Desa Tani Subur and Koperasi Berkah Maju Bersama. These two cases, which use nested structures of farmer groups and cooperatives, could be enhanced and then replicated elsewhere. There would be challenges in directly replicating these cooperative models as they emerged out of transmigration programs and would need to be modified according to local contexts. In Pangkalan Tiga Village, INOBU facilitated the creation of a unit under KUD Tani Subur, which catered specifically independent farmers in the village. In the villages of Derangga and Umpang, the models of farmer organizations for independent, oil palm farmers have already been replicated. In Derangga Village, farmers have already created an independent oil palm farmers group, which plans to collect all of the fresh fruit bunches harvested by independent farmers in the village. The ultimate aim is for the farmer group to become a cooperative. Meanwhile, farmers in Umpang Village have created a combined farmers group (*Gabungan Kelompok Tani*) for

gathering fresh fruit bunches from independent oil palm farmers. These models differ from the traditional model of cooperatives in Kotawaringin Barat, which historically were established by plantation companies and did not receive fresh fruit bunches from independent farmers.

However, cooperatives and farmer groups are not complete solutions. Even if models of successful cooperatives can be replicated in other villages, there will be challenges for ensuring their effectiveness. These challenges include internal governance, participation and exclusion and free-rider problems. A single cooperative, as was the case in Pangkalan Tiga, may not be adequate for farmers. Instead, a range of farmer institutions may be needed. And, finally, some farmers may be excluded from cooperatives or voluntarily chose not to participate. Policies and interventions designed to support independent smallholders should include

provisions for those farmers not integrated into cooperatives. Village-level entities, such as village enterprises, could provide alternative avenues for providing support to independent smallholders.

Farmer groups and cooperatives should be the focus of improving small-scale farmer farming of oil palm in Central Kalimantan. Most regulations refer to farmer groups or cooperatives as institutions that provide support and access to credit, and as mechanisms for forming contracts. Even so, the results of the study revealed that only a tiny fraction of farmers were actually members of cooperatives or farmer groups. Without membership to these groups, it will be difficult to provide oil palm farmers with support that improves their livelihoods. Table 11 provides a summary of recommendations for strengthening or establishing farmer organizations.

Table 11: Recommendations for strengthening or establishing farmer organizations

Recommendation	Responsible Party	Example
Raising awareness on the importance of cooperatives and providing incentives for farmers to join, including training and STD-Bs	Local governments and/or non-government organizations through facilitators and/or extension workers	-
Support cooperatives to obtain certification	Local governments, with the support of companies and non-government organizations to implement training in good agricultural practices and capacity building of farmer groups and cooperatives	In Kotawaringin Barat, the local government with the support of Unilever, RSPO and INOBU has begun an initiative for supporting KUD Tani Subur to achieve RSPO sustainability certification.
Establishing cooperatives or farmer groups in villages where currently there are none	Local governments and/or non-government organizations through facilitators and/or extension workers	In Derangga Village, Seruyan District, the local administration with the support of INOBU has established a cooperative for independent smallholders.
Improving the capacity of farmer groups or cooperatives in areas such as registering farmers and their lands, administering contracts, distributing government inputs and facilitating training	Local governments, companies and/or non-government organizations through facilitators and/or extension workers	In Pangkalan Tiga Village, Kotawaringin Barat district, INOBU provides technical support for KUD Tani Subur to organize the independent farmers.

Further research and activities should focus on how to support farmer groups or cooperatives in accessing inputs, credit, training and information regarding cultivating oil palm.

Agricultural Inputs and Training

Independent smallholders face challenges in accessing agricultural inputs as well as credit and training. Government distribution systems for fertilizers as well as extension services have functioned imperfectly at best. In the absence of accessible markets for agricultural inputs, farmers have largely relied on traders or their own social networks to access agricultural inputs. These sources of agricultural inputs, however, do not come with guarantees on the quality of the inputs. Across all groups, most farmers obtained their agricultural inputs through growing wild seedlings (volunteered oil palm seedling) or from friends or relatives. Fewer farmers reported obtaining cultivars from traders and even less from companies or the government. Seedlings from traders, however, reported came from commercial nurseries in North Sumatra — mainly the nursery owned by PT Asian Agri. Some farmers purchased seedlings from companies, which were generally of a lower quality. The findings reveal several things. First, higher quality cultivars are more difficult for independent smallholders to access and that there are no clear distribution mechanisms or markets for these planting materials. Farmers who wish to cultivate oil palm do so with assistance from limited sources, including friends, relatives or traders. The effects of this are that farmers are mostly unaware of the variety of oil palm they are cultivating, and that these varieties will be highly clustered as they are the only types of planting material available. This will affect the productivity of independent smallholders over a large area. There are limited avenues available for identifying and improving the varieties of oil palms that are currently being farmed. Even so, dominant planting materials may only reflect plant varieties initially provided by plantation companies and may not have a significant effect on the productivity of farmers. Mechanisms for distributing planting materials have a large-scale effect on the cultivation of oil palm by independent smallholders.

Fertilizers, in both districts, were largely distributed by traders or through village kiosks. Traders formed reciprocal relationships with independent smallholders where they were both the purchaser of fresh fruit bunches and the provider of inputs, such as fertilizer. To a lesser extent, local businesses were also involved in the sale of fertilizer to farmers. Formal farming organizations, such

as farmer groups and cooperatives, have only a limited role in the distribution of fertilizers. The government had virtually no role in providing fertilizers to farmers. Fertilizer distribution and sales mechanisms have several effects on the productivity of independent smallholders. The first is their access to government-subsidized fertilizers. As farmers do not have direct access to fertilizers, these are instead provided through intermediaries, in particular small businesses, with the exception of a small percentage of cooperatives and farmer groups. As a consequence, farmers are unable to access government-subsidized fertilizers directly, which has implications on the price and quality of fertilizers. Farmers may be sold poor quality or counterfeit fertilizers and without any way of tracing their origin. The productivity of oil palms are heavily contingent on the frequency by which they are fertilized. Current distribution mechanisms for fertilizers make implementing those good agricultural practices more challenging.

As oil palm plantations age, their productivity declines. Eventually, palms will need to be replaced. Farmers will require financial support to replace these palms and to ensure that they have high-quality planting materials as well as sufficient savings during unproductive phases. Appropriate credit arrangements will need to be created to support farmers. Former plasma farmers, who have already repaid their loans, still have their land certificates held by banks. Farmers, such as these, need support from an independent body to ensure the fairness of their agreements with companies and banks.

How independent smallholders cultivated oil palm was often related to their ethnicity. Transmigrants were generally more organized, and more likely to regularly fertilize and prune their oil palm plantations. Indigenous farmers, in contrast, were less likely to manage and fertilize their farms, and generally have less or no training at all on agricultural practices. There are several reasons for this. Transmigrants were historically part of supported farming schemes, including oil palm smallholder schemes (plasma), where they were organized, trained and provided with agricultural inputs. Indigenous farmers, in contrast, have added oil palm to their traditional farming systems, often involving swidden farming and collecting wild products. The level of government and company

support for transmigrants was much higher than for indigenous farmers, although the farmers entered these schemes on unfair terms. The consequence of retaining independence for indigenous farmers was less training and access to agricultural inputs, including fertilizers.

Compounding these challenges is that independent smallholders are overwhelmingly self-taught. Out of the total number of independent smallholders surveyed, only 15 respondents had received some form of training. Although farmers were capable of successfully cultivating oil palm, they were unable to apply best practices to the cultivation of oil palm. Company-run plantations, in contrast, apply a wide range of scientific methods to ensure that their plantations achieve the highest possible levels of productivity. Through self-learning and social exchanges, farmers may be able to learn sufficient practices for cultivating oil palm at a basic level, although they will most likely be unable to apply more comprehensive farming methods that require both scientific testing and access to inputs. Training will likely improve the knowledge and practices of farmers. Without more comprehensive institutional support and access to inputs, they are unlikely to match the productivity of larger plantations.

The size of farms affects whether farmers can survive by cultivating oil palm alone. Generally, oil palm farms of 2 hectares or more are seen as sufficient for meeting the living costs of independent smallholders. However, if the size of a farm is below 2 hectares, farmers will struggle to survive without alternative sources of income. Transmigrant farmers, who generally only have 1 to 2 hectares of land, supplement their income through farming or non-farm work, such as brickmaking, employment in the civil service or at mills. Indigenous farmers, in contrast, owned on average of 3 to 4 hectares of land across the two districts. If provided with access to the right inputs, technical support and markets, indigenous farmers appear better positioned to specialize in oil palm cultivation. In contrast, transmigrant farmers, whose access to land was regulated through the terms of transmigrant schemes, seem to be more dependent on diversified livelihoods.

Although oil palm is a major commodity in Indonesia, little support has been provided to oil palm smallholders. The Indonesian government, as its main focus, provides support to achieve self-sufficiency in food crop production, especially rice. Consequently, the government provides limited support to farmers engaged in the production of other commodities, including oil palm. Oil palm smallholders need support. Poor agricultural practices and limited access to agricultural inputs have resulted in comparatively low productivity and poorer quality harvested bunches. The unsustainable practices of smallholders, such as forest encroachment or using fire for clearing, can also affect the sustainability of the entire supply chain. Companies, ranging from mills to buyers, have a vested interest in ensuring that smallholders receive support to farm sustainably and productively. There are, however, few mechanisms that companies can use to directly support smallholder farmers. To address this problem, the district governments of Seruyan and Kotawaringin Barat, with the support of INOBU, are in the process of establishing an agricultural facility for supporting smallholders. The facility will provide training and agricultural inputs for smallholders, including certified seedlings, fertilizers and pesticides. It will also recruit trainers for smallholder farmers who will also facilitate the establishment of cooperatives and farmer groups. The facility will partner companies and local governments, while also involving civil society organizations. It would charge at-cost fees for goods and services, and also be capable of receiving grants from third parties and local governments. Table 12 provides recommendations for increasing access to agricultural inputs and training.



Table 12: Recommendations for increasing access to agricultural inputs and training

Recommendation	Responsible Party	Example
Farmers should be encouraged to join farmer organizations, in particular cooperatives to access subsidized agricultural inputs.	Local governments and/or non-government organizations through facilitators and/or extension workers.	Cooperative members in Pangkalan Tiga received subsidized agricultural inputs including fertilizer. Fertilizers are provided by distributors and mills where they have a Delivery Order.
Partnerships with companies	Companies, supported by local governments.	Unilever, in conjunction with RSPO, supports farmers to achieve sustainability certification.
Agricultural Facility	A cooperative entity supported by local governments, companies, non-government organizations and farmers.	INOBU currently assist Kotawaringin Barat and Seruyan to establish an Agricultural Facility to assist independent smallholders.

Oil Palm Trading

FFB trade for independent smallholders uses a different system compared to schemed farmers that usually depends on actors, such as traders, cooperatives, village business units. Traders play an important role in the palm oil supply chain by linking independent smallholders to mills. The informality of independent smallholders means that the sale of fresh fruit bunches into palm oil supply chains are contingent on small-scale traders. These traders have several shared characteristics: they are generally informal (unregistered or unincorporated), act as both buyers, provide transport to mills and have reciprocal relationships with farmers. Traders, in contrast to independent smallholders, have access to capital, transportation as well as the ability — formal or otherwise — to sell to mills through delivery orders. These traders must form reciprocal relationships with farmers to ensure that they can obtain fresh fruit bunches, which may involve providing credit or inputs to farmers. Where there are multiple traders, a farmer can choose a trader who provides them with the best terms in a relationship that is based on trust rather than contracts. Less common alternatives to these arrangements involve selling through a cooperative or directly to a mill. Although palm oil prices are determined according to the K Index, independent smallholders have little information regarding prices, and often sell below the standard price.

As a consequence, traders are among the most influential actors in terms of the traceability and quality of palm oil produced by independent smallholders. Traders are held accountable by mills for the quality of fresh fruit bunches that they sell. However, they are not responsible for demonstrating how or where these fresh fruit bunches were produced. Addressing this stage in the palm oil supply chain is necessary to ensure the traceability and sustainability of palm oil. In the absence of extended government support, traders have taken on the role of providing support to farmers, including credit and fertilizers. This enables farmers to cultivate oil palm, however, does not lead to good agricultural practices. Without the involvement of government or non-government organizations, there will continue to be a need for traders.

Traders or *pengepul* have an essential function for independent smallholders in terms of accessing markets and inputs. In the absence of plantation schemes, or contractual arrangements between farmer groups and mills, farmers must rely on traders for the sale and transportation of fresh fruit bunches. Like farmers, traders are generally informal, unregistered and unincorporated actors who rely on a mixture of formal and informal contracts to operate. They form these agreements with buyers at mills and sellers from farms, with each of actor imposing their own terms on the

trader. The informality of the traders, and how they purchase and transport fresh fruit bunches affects the traceability and sustainability of palm oil supply chains.

Without having functioning alternatives to the trade and extension functions of traders (see components on *co-operatives* and *government* below), efforts should be made to formalize the role of traders. As a first step, traders should become registered either individually or as part of an incorporated company. These traders then should be officially licensed by district authorities to trade in fresh fruit bunches. To improve the traceability of fresh fruit bunches, traders should fulfill certain requirements. Upon the purchase of fresh fruit bunches, traders should be required to record the name, cultivation certificate (STD-B) and quantity purchased from an individual. When a trader purchases from a cooperative or farmer group, that farmer group should be able to provide details both on the individuals who sold fresh fruit bunches and of their cultivation certificate. The traders should be required to present this information to mills upon sale of the fresh fruit bunches to mills. If other intermediaries are involved in the supply chain, this information needs to be transferred up until the point of sale at the mill. Traders and mills should be periodically audited to ensure that they are in compliance with these requirements.

With governments, non-government organizations and companies unable or unwilling to provide extended support services to independent smallholders, efforts should be made to ensure the quality and fairness of any support provided. Farmers have few avenues for accessing high-quality planting materials and fertilizers, and rely on their social networks or traders for these inputs. To improve the quality of inputs used by farmers, traders who distribute these inputs should be regulated. First, traders should be required to provide planting materials only from certified sources and farmers should be provided with written evidence of the quality and origin. At present, traders purchase seedlings in cities, or alternatively, they order them through distributors who will deliver the seedlings to them. Farmers can also purchase seedlings from other villages. To improve the quality of the planting materials in circulation, local governments can assist in increasing farmers' access to seedling producers and audit the sale of planting materials

to verify quality. The distribution of fertilizers can be conducted using similar conditions.

To ensure that farmers are treated fairly, the distribution of subsidized fertilizers should be monitored to enforce compliance with government laws and regulations that are designed to ensure the equitable distribution of fertilizers to farmers with the greatest needs. The provision of credit to farmers by traders should also be regulated. Without access to rural finance or willing banks, farmers often turn to traders for credit. Traders, in turn, benefit by other guaranteeing their supply of fresh fruit bunches or reducing the power of farmers to negotiate selling prices. Several potential options are available for regulating these relationships. Among them, licensed traders could be prohibited from lending money or other inputs to farmers to avoid the emergence of dependent relationships. Traders found to be in violation of these agreements could have their licenses suspended. Alternatively, traders could act only as intermediaries for licensed lending agencies, such as rural banks, and their roles strictly limited to sources of information. They would benefit from these transactions by building trust with potential farmers and ensuring future supplies of fresh fruit bunches. Local governments could also support the regulation of standardized contracts between traders and farmers to ensure fairness to both parties.

Maps of small-scale farmer plots and cultivation certificates must become mandatory for the sale and transportation of fresh fruit bunches. Issuing cultivation certificates to independent smallholders should be considered as proof of the sustainability of cultivated fresh fruit bunches. Transactions involving fresh fruit bunches and crude palm oil should include information that enables the purchaser to trace where the palm was cultivated. In addition to STD-B, the types of information that could be collected include: transactions per semester, delivery orders, record books (*buku timbang*) and receipts from mills. All actors in the supply chain should be required to provide evidence regarding the origin of fresh fruit bunches and palm oil, a move that should be supported by an online monitoring system. Ideally, this system will see traceability will equal sustainability. This system should be supported through local regulations that enforce the traceability of supply chains.

Jurisdictional Initiative for Sustainable Smallholders

Improving the sustainability, productivity and traceability of independent, small-scale farmer oil palm farmers addresses a central challenge facing palm oil supply chains. There are, however, limits as to how far these initiatives will resolve the larger challenges of deforestation, environmental degradation and greenhouse gas emissions.

Commercial land concessions are the main driver of deforestation in Indonesia, with small-scale farmers only responsible for a fraction of the destruction. Unless subnational governments make significant efforts to ensure that commercial land use concessions are only allocated on degraded lands, initiatives to improve the sustainability of palm oil supply chains will have limited impacts. One area where small-scale farmers have a disproportionate effect on the natural environment is through their use of fire. Reducing or eliminating the use of fire during droughts or periods of high fire risk may significantly reduce the incidence of fires and haze.

This report highlights the collective efforts that can support smallholders to achieve sustainability at the jurisdiction level. Companies need a strong business case for supporting independent smallholders. Often, however, it is not economically feasible for companies to interact with smallholders unless they are organized into farmer groups. Government agencies should assist smallholders so that they are prepared to partner directly with private companies. In return, companies can share knowledge on good agricultural practices, provide agricultural inputs at cost and buy produce from farmers. In order to prepare smallholders to partner with companies, local governments should assist farmers to obtain

legal documents and organize them into farmer groups. Only after farmers are organized will it be feasible for companies to partner with farmers. Grants from third parties and local government contributions can be used for financing activities that are not economically feasible, such as organizing farmers into farmer groups and providing training in organizational skills.

The collective efforts for assisting smallholders within a jurisdiction should be well coordinated. We expect that an agriculture facility administered by a multi-stakeholder platform can potentially act as a mechanism for coordinating all efforts to support independent smallholders in making the transition towards sustainability.



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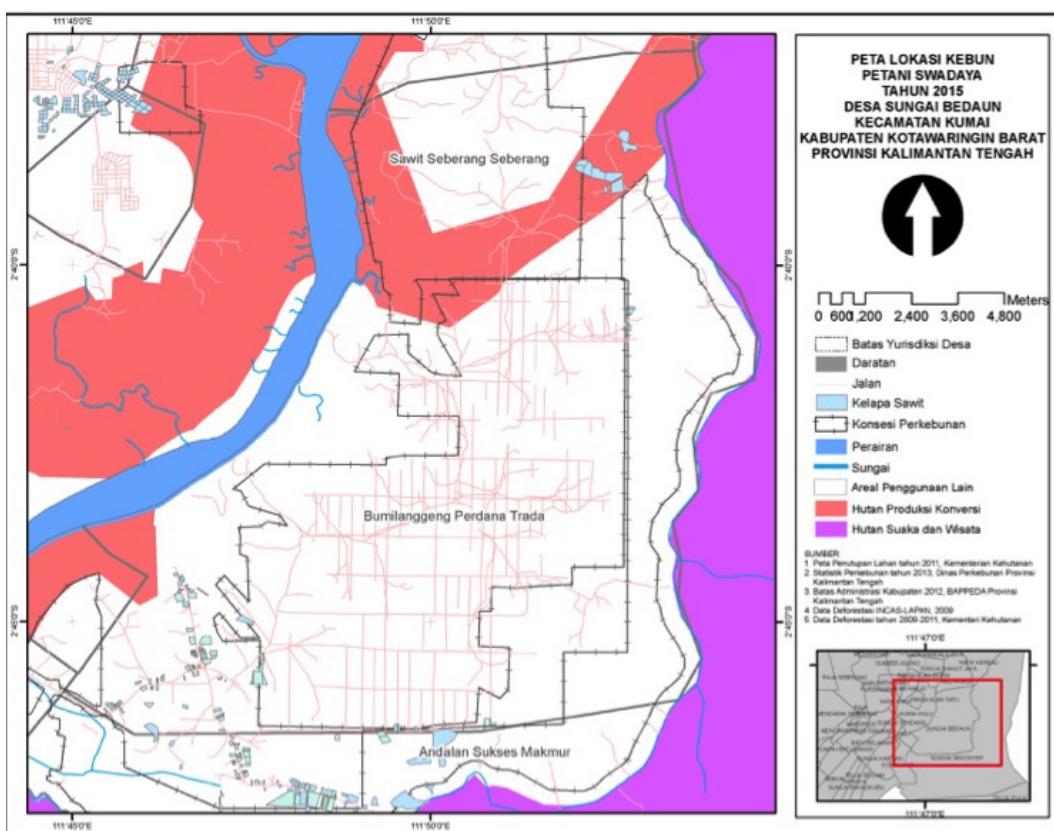
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Annex 1: Villages in Kotawaringin Barat District

VILLAGE	SUNGAI BEDAUN	
Farmers surveyed	126 farmers	
Area mapped	345.94 ha	
Average area of oil palm plots owned	2.75 ha	
Ethnicity	Indigenous and local 21.5%	Transmigrant 78.5%
Land tenure	4 % have untitled land	
Farming systems	5 of 126 farmers practice mixed farming	
Year planted	1998 – 2015, mostly after 2010	
Fresh fruit bunches (FFB) market	66.9% sell their FFB to traders, 5% sell to the company, and the rest have unclear answers	



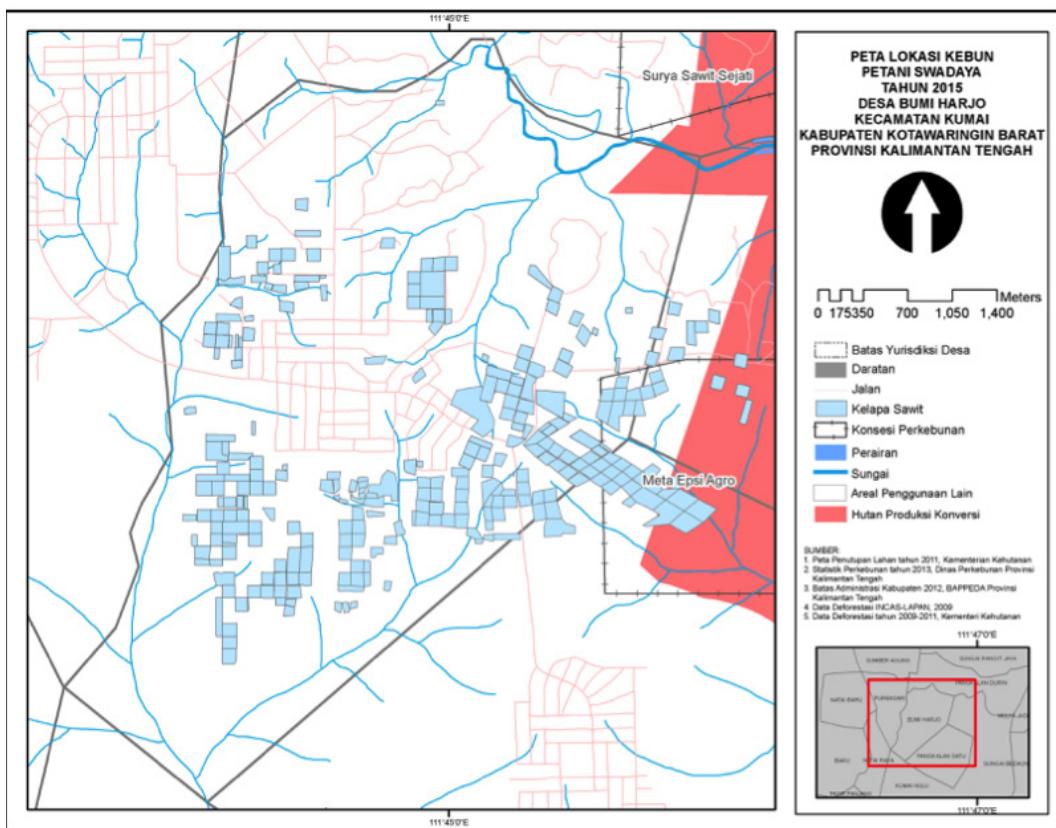
FARMING INPUTS

SOURCE OF SEEDS	
Traders	29%
Own plantation	38%
Company/Mills	13%
Plantation Office (Central Kalimantan)	0.5%
Friends, Neighbors, and relatives	17%
Cooperatives, farmer groups and farmer shops	0.5%
Other villages/cities/island	2%
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	84.2%
Farm equipment Shop/Kiosk	2%
Farmer Group	-
Outside village	-
Cooperative	7%
Companies/Government	-
Not answered	6.8%
Others	-

VILLAGE

BUMI HARJO

Farmers surveyed	195 farmers	
Area mapped	276.02 ha	
Average area of oil palm plots owned	1.41 ha	
Ethnicity	Indigenous and local 1.5%	Transmigrant 98.5%
Land tenure	27.14% do not have land titles	
Farming systems	24 of 195 farmer practice mixed farming	
Year planted	Year of establishment ranging from 1995 – 2015, mostly before 2010	
Fresh fruit bunches (FFB) market	90.7% sell their FFB to traders, 3% sell to the company, and the rest have unclear answers	



FARMING INPUTS

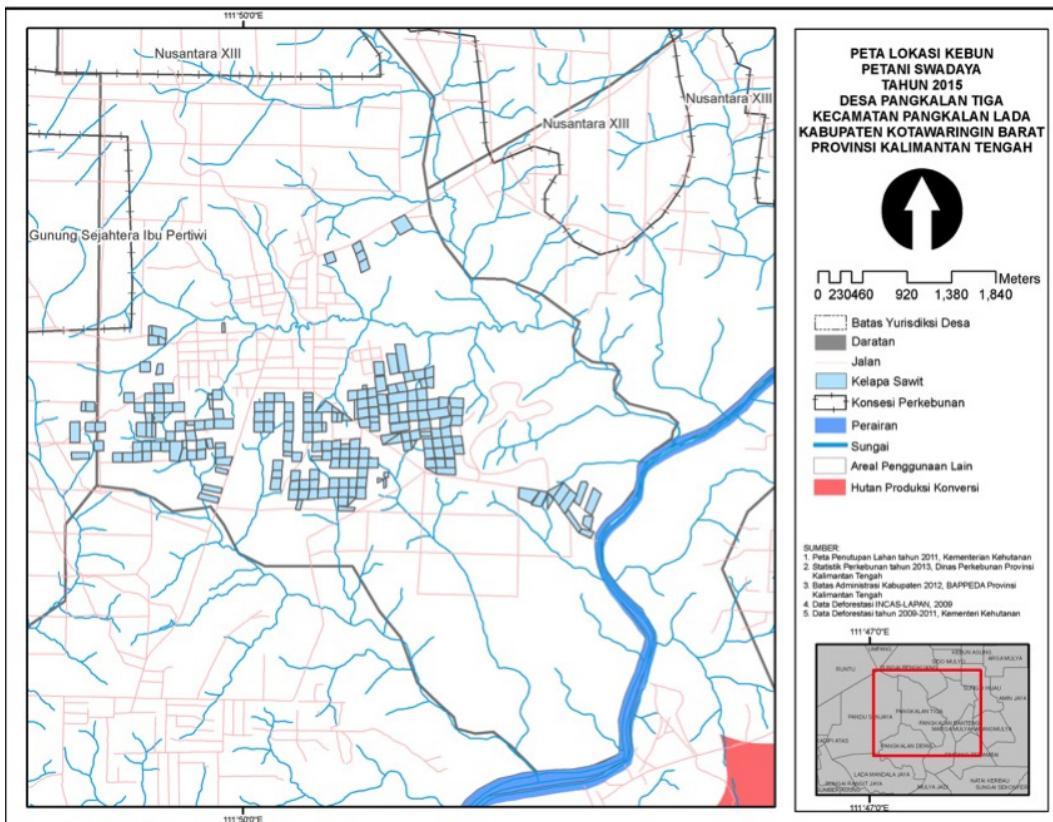
SOURCE OF SEEDS	
Traders	36%
Own plantation	9%
Company/Mills	8%
Plantation Office (Central Kalimantan)	9%
Friends, Neighbors, and relatives	8%
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	2%
Not answered / Do not know	28%

SOURCE OF FERTILIZER	
Traders	56.95%
Farm equipment Shop/Kiosk	24.4%
Farmer Group	-
Outside village	-
Cooperative	2%
Companies/Government	2%
Not answered	13.65%
Others	1%

VILLAGE

PANGKALAN TIGA

Farmers surveyed	127 farmers	
Area mapped	295 ha	
Average area of oil palm plots owned	2.32 ha	
Ethnicity	Indigenous and local 3.94%	Transmigrant 96.06%
Land tenure	Only 1% (1 farmer) have untitled land	
Farming systems	All monoculture	
Year planted	Year of establishment ranging from 1996 – 2014, mostly after 2010	
Fresh fruit bunches (FFB) market	88.8% sell their FFB to traders, 8% sells to BUMDES, and the rest sell to a company	



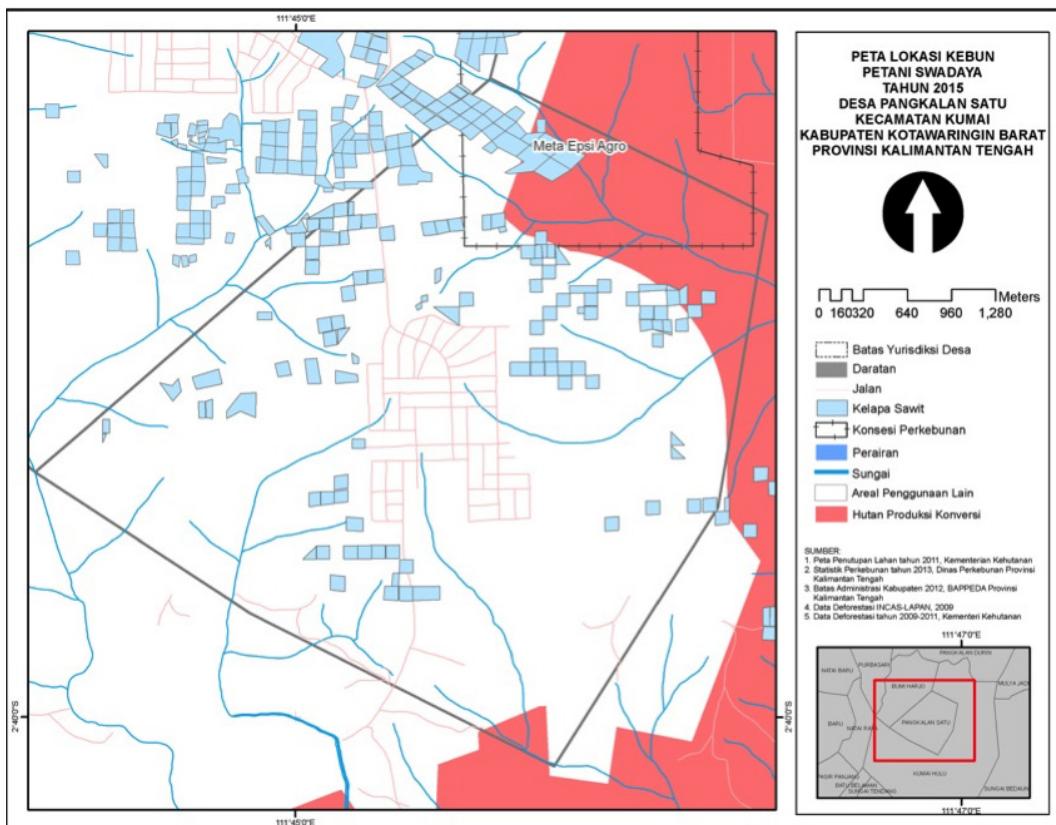
FARMING INPUTS

SOURCE OF SEEDS	
Traders	13%
Own plantation	34%
Company/Mills	5%
Plantation Office (Central Kalimantan)	22%
Friends, Neighbors, and relatives	7%
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	19%
Not answered / Do not know	-

SOURCE OF FERTILIZER	
Traders	28%
Farm equipment Shop/Kiosk	30%
Farmer Group	31%
Outside village	4%
Cooperative	2%
Companies/Government	3%
Not answered	1%
Others	1%

VILLAGE **PANGKALAN SATU**

Farmers surveyed	117 farmers		
Area mapped	308.5 ha		
Average area of oil palm plots owned	2.63 ha		
Ethnicity	Indigenous and local	0.77%	Transmigrant 99.23%
Land tenure	None have untitled land		
Farming systems	11 farmers practice mixed farming, mostly rubber		
Year planted	Year of establishment ranging from 2005 – 2014, mostly around 2008-2011		
Fresh fruit bunches (FFB) market	83.4% sell their FFB to traders, 8 % sell to companies and 8.6% of farmers did not answer		

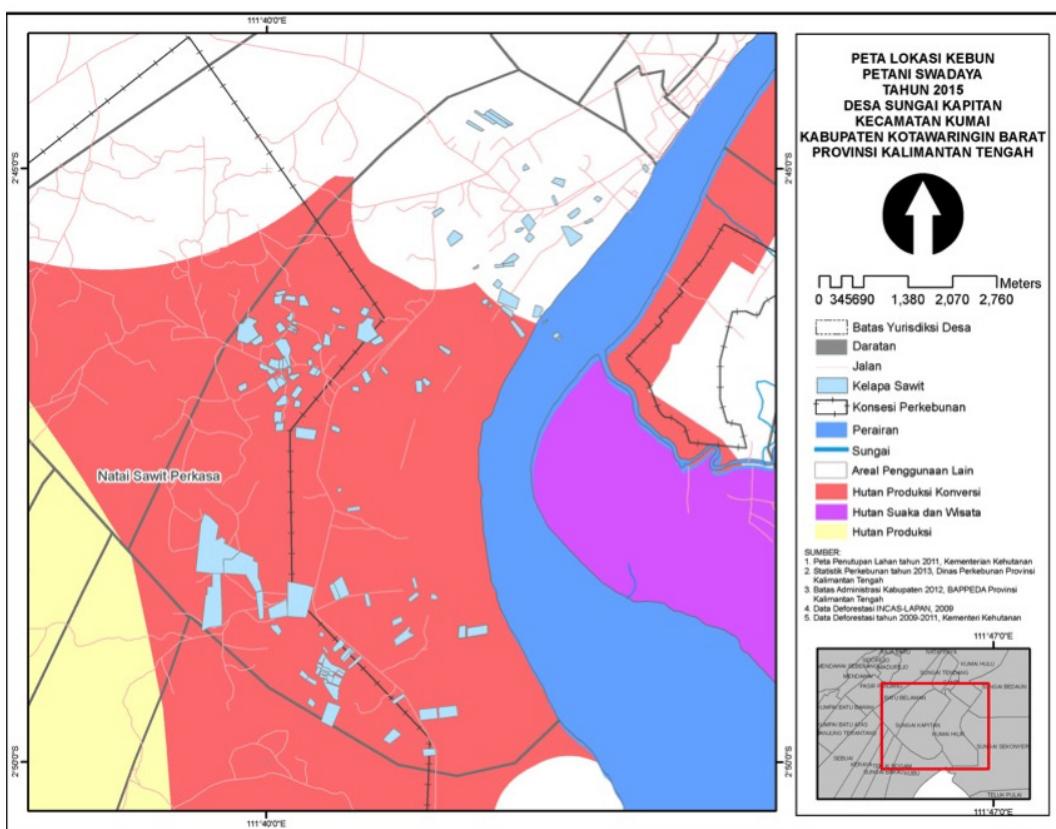


FARMING INPUTS

SOURCE OF SEEDS	
Traders	5%
Own plantation	44%
Company/Mills	8%
Plantation Office (Central Kalimantan)	9%
Friends, Neighbors, and relatives	7%
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	10 %
Not answered / Do not know	17%

SOURCE OF FERTILIZER	
Traders	71%
Farm equipment Shop/Kiosk	5%
Farmer Group	6%
Outside village	2%
Cooperative	3.5%
Companies/Government	3%
Not answered	9.5%
Others	-

VILLAGE	SEI KAPITAN
Farmers surveyed	86 farmers
Area mapped	261.5 ha
Average area of oil palm plots owned	3.04 ha
Ethnicity	Indigenous and local 75.6% Transmigrant 24.4%
Land tenure	35% of farmers have untitled land
Farming systems	All of them have monocultures
Year planted	Year of establishment ranging from 2005 – 2015, mostly around 2010- 2011
Fresh fruit bunches (FFB) market	Traders



FARMING INPUTS

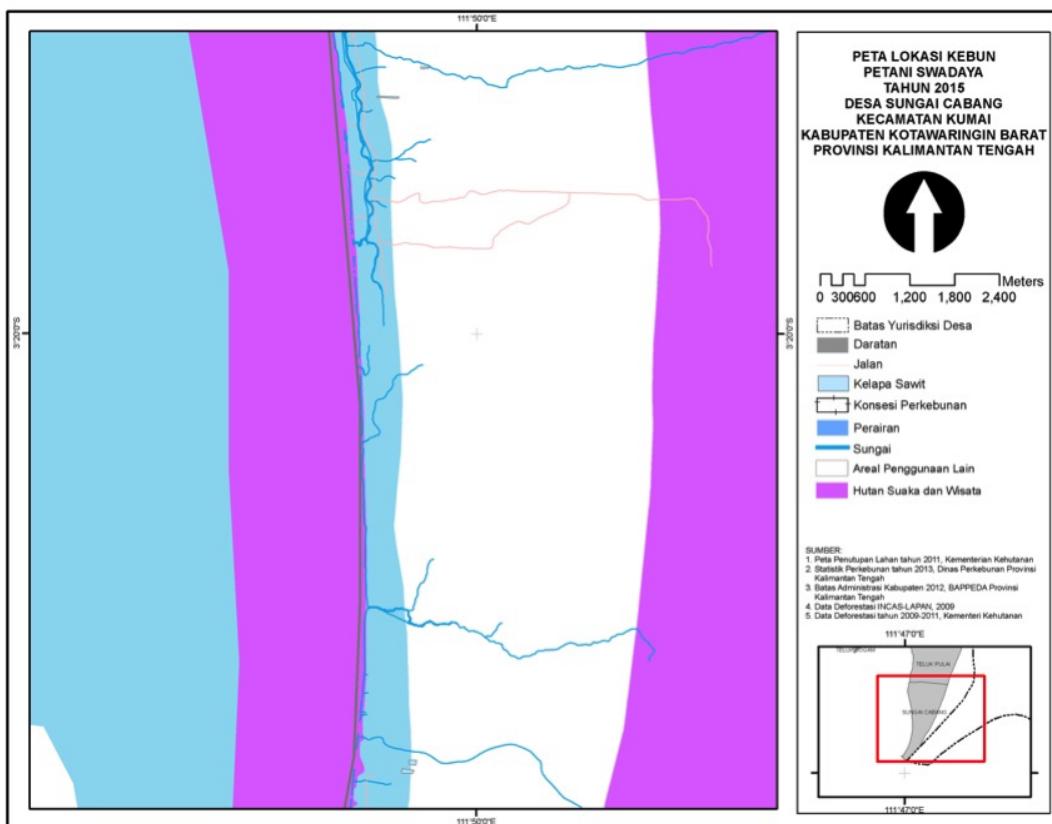
SOURCE OF SEEDS	
Traders	11%
Own plantation	-
Company/Mills	16.5%
Plantation Office (Central Kalimantan)	1%
Friends, Neighbors, and relatives	33%
Cooperatives, farmer groups and farmer shops	2%
Other villages/cities/island	12.5%
Not answered / Do not know	24%

SOURCE OF FERTILIZER	
Traders	8%
Farm equipment Shop/Kiosk	42%
Farmer Group	2%
Outside village	-
Cooperative	40%
Companies/Government	-
Not answered	6%
Others	2%

VILLAGE

SEI CABANG

Farmers surveyed	3 farmers	
Area mapped	6 ha	
Average area of oil palm plots owned	2 ha	
Ethnicity	Indigenous and local 100%	Transmigrant -
Land tenure	1 farmer has untitled land	
Farming systems	All of them have monocultures	
Year planted	2013-2014	
Fresh fruit bunches (FFB) market	N/A	



FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	-
Company/Mills	-
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	-
Not answered / Do not know	100%

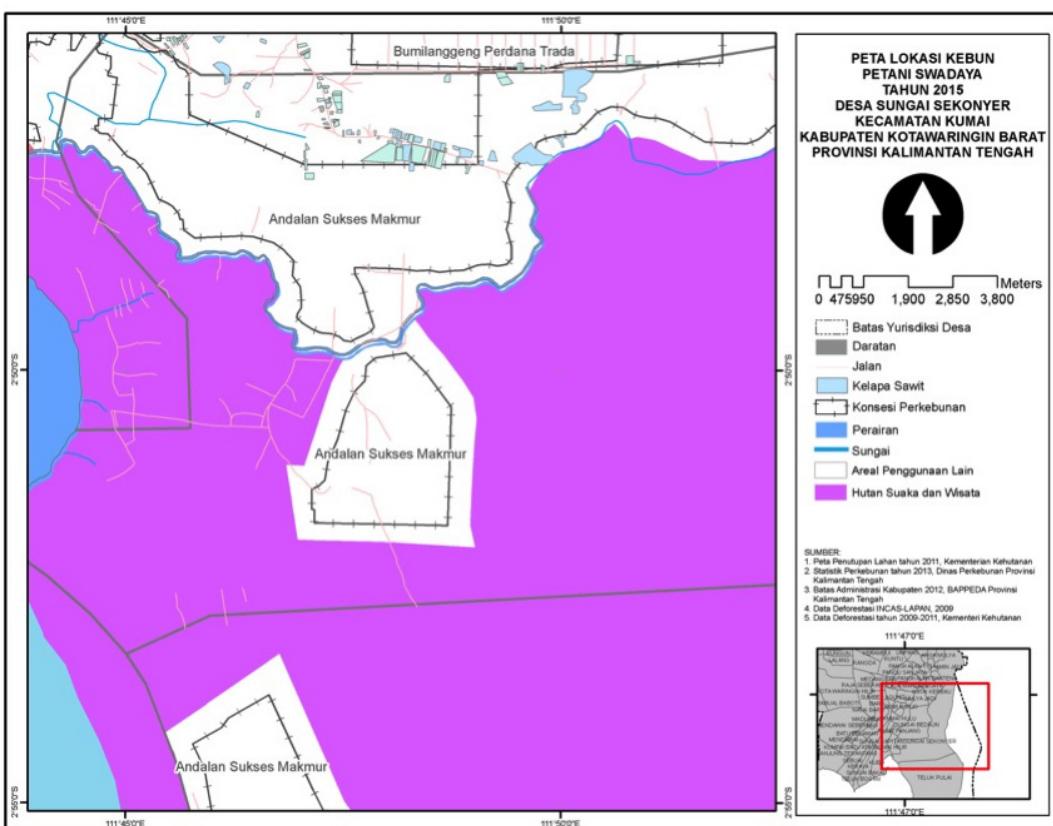
SOURCE OF FERTILIZER

SOURCE OF FERTILIZER	
Traders	-
Farm equipment Shop/Kiosk	-
Farmer Group	-
Outside village	-
Cooperative	-
Companies/Government	-
Not answered	-
Others	Do not use fertilizer

VILLAGE

SEI SEKONYER

Farmers surveyed	8 farmers	
Area mapped	50.5 ha	
Average area of oil palm plots owned	8.41 ha	
Ethnicity	Indigenous and local 62.5%	Transmigrant 37.5%
Land tenure	12.5% (1 farmer) have untitled land	
Farming systems	4 practice mixed farming (rice fields)	
Year planted	2011-2015	
Fresh fruit bunches (FFB) market	Traders	



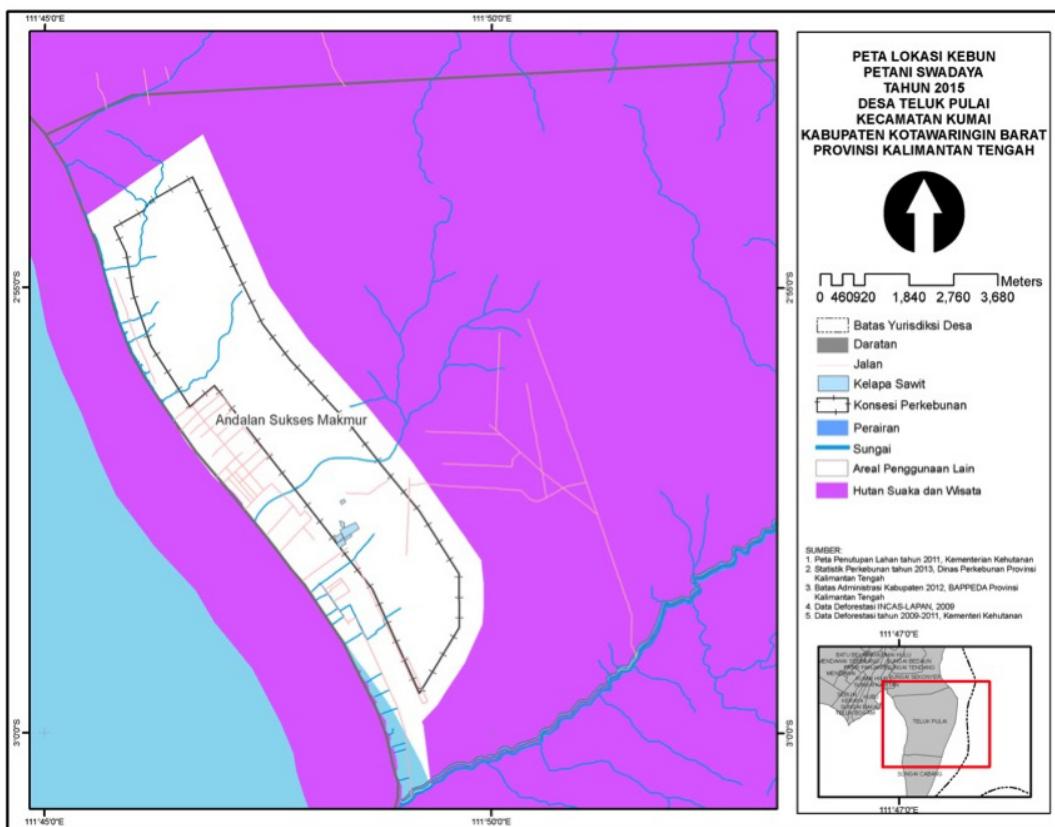
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	-
Company/Mills	-
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	100%
Other villages/cities/island	-
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	-
Farm equipment Shop/Kiosk	-
Farmer Group	-
Outside village	-
Cooperative	-
Companies/Government	25%
Not answered	-
Others	75%

VILLAGE

TELUK PULAI

Farmers surveyed	3 farmers	
Area mapped	14 ha	
Average area of oil palm plots owned	6.2 ha	
Ethnicity	Indigenous and local 100%	Transmigrant -
Land tenure	All have land titles	
Farming systems	All have monocultures	
Year planted	2013-2015	
Fresh fruit bunches (FFB) market	NA	



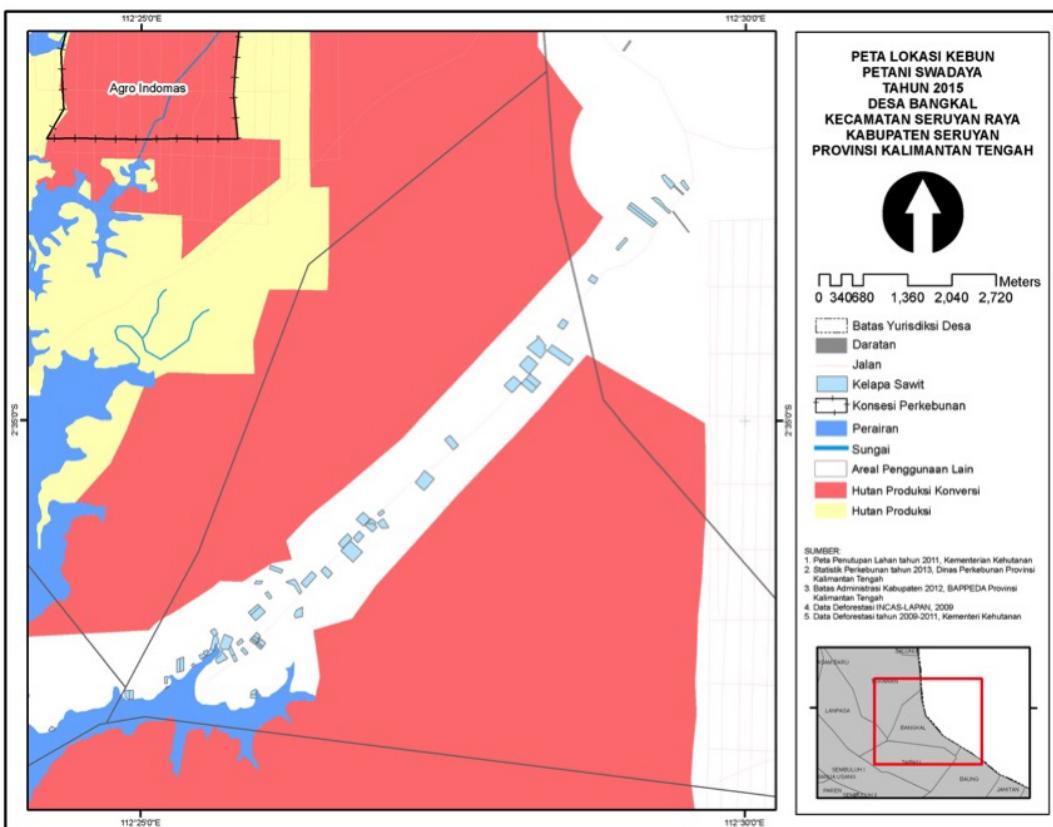
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	-
Company/Mills	-
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	100%
Other villages/cities/island	-
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	-
Farm equipment Shop/Kiosk	-
Farmer Group	-
Outside village	-
Cooperative	100%
Companies/Government	-
Not answered	-
Others	-

VILLAGE

BANGKAL

Farmers surveyed	29 farmers		
Area mapped	36.8 ha		
Average area of oil palm plots owned	1.29 ha		
Ethnicity	Indigenous and local	86.2%	Transmigrant 13.8%
Land tenure	59% do not have titles		
Farming systems	All have monocultures		
Year planted	2013-2015		
Fresh fruit bunches (FFB) market	NA		



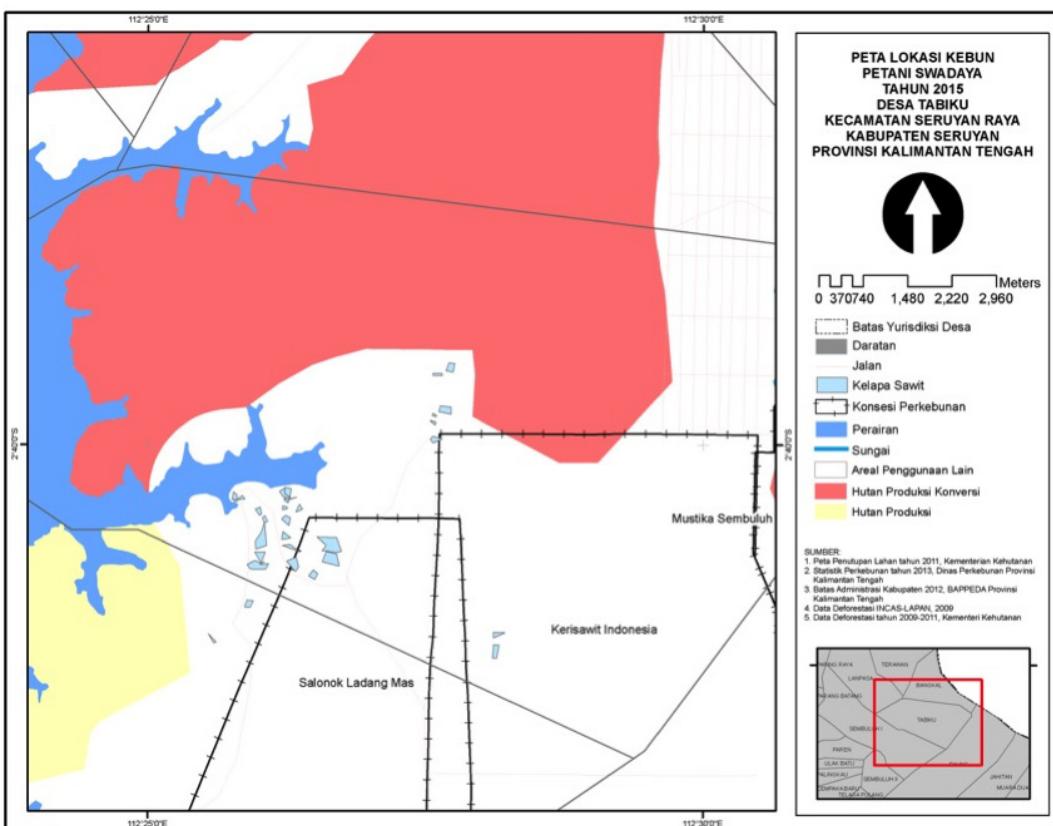
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	21%
Company/Mills	45%
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	10%
Cooperatives, farmer groups and farmer shops	7%
Other villages/cities/island	14%
Not answered / Do not know	3%

SOURCE OF FERTILIZER	
Traders	3.5%
Farm equipment Shop/Kiosk	52%
Farmer Group	-
Outside village	34.5%
Cooperative	-
Companies/Government	-
Not answered	10%
Others	-

56 Annex 2: Villages in Seruyan District

VILLAGE	Tabiku	
Farmers surveyed	29 farmers	
Area mapped	128.9 ha	
Average area of oil palm plots owned	4.44 ha	
Ethnicity	Indigenous and local 93.5%	Transmigrant 6.5%
Land tenure	14% have untitled land	
Farming systems	21% practice mixed farming	
Year planted	2010 – 2015, mostly after 2010	
Fresh fruit bunches (FFB) market	All farmers sell to traders although 41% did not answer the question	



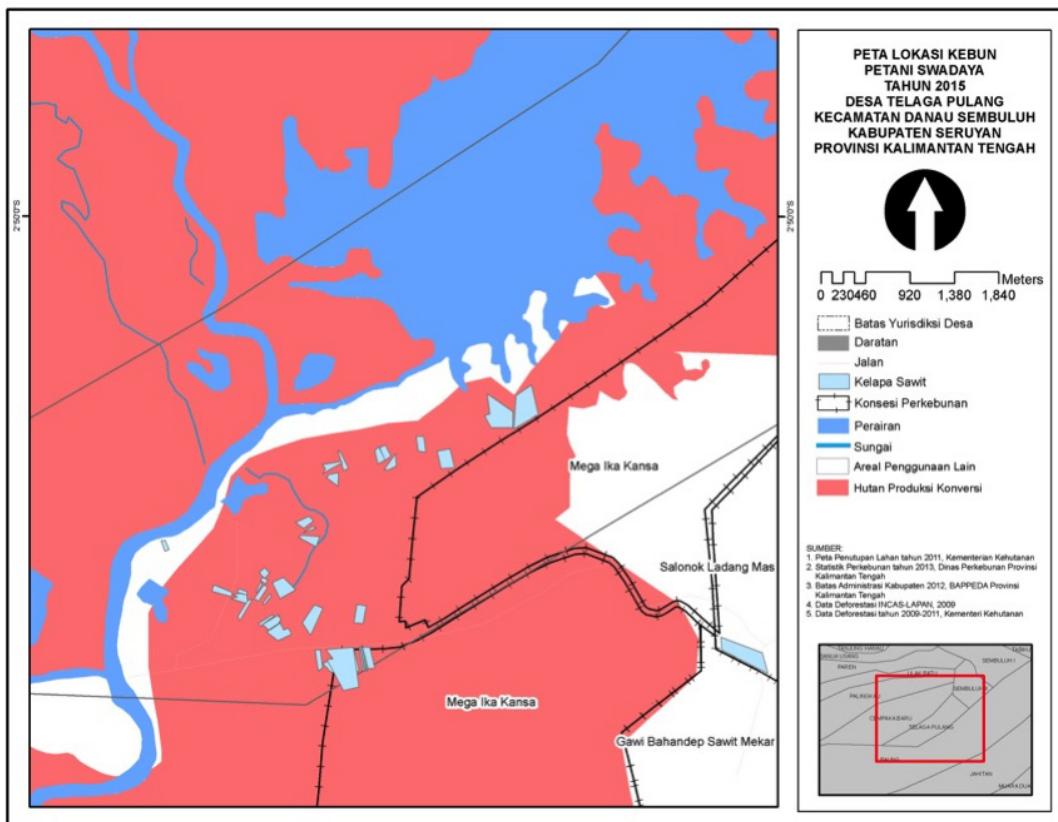
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	100%
Company/Mills	-
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	-
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	-
Farm equipment Shop/Kiosk	-
Farmer Group	-
Outside village	62%
Cooperative	-
Companies/Government	-
Not answered	38%
Others	-

VILLAGE

TELAGA PULANG

Farmers surveyed	24 farmers			
Area mapped	136.3 ha			
Average area of oil palm plots owned	3.03 ha			
Ethnicity	Indigenous and local	70.80%	Transmigrant	29.20%
Land tenure	25% have untitled land			
Farming systems	17% practice mixed farming			
Year planted	2009 – 2015, mostly before 2010			
Fresh fruit bunches (FFB) market	50% sell their FFB to trader, 8% sell to the company, and the rest have unclear answers			



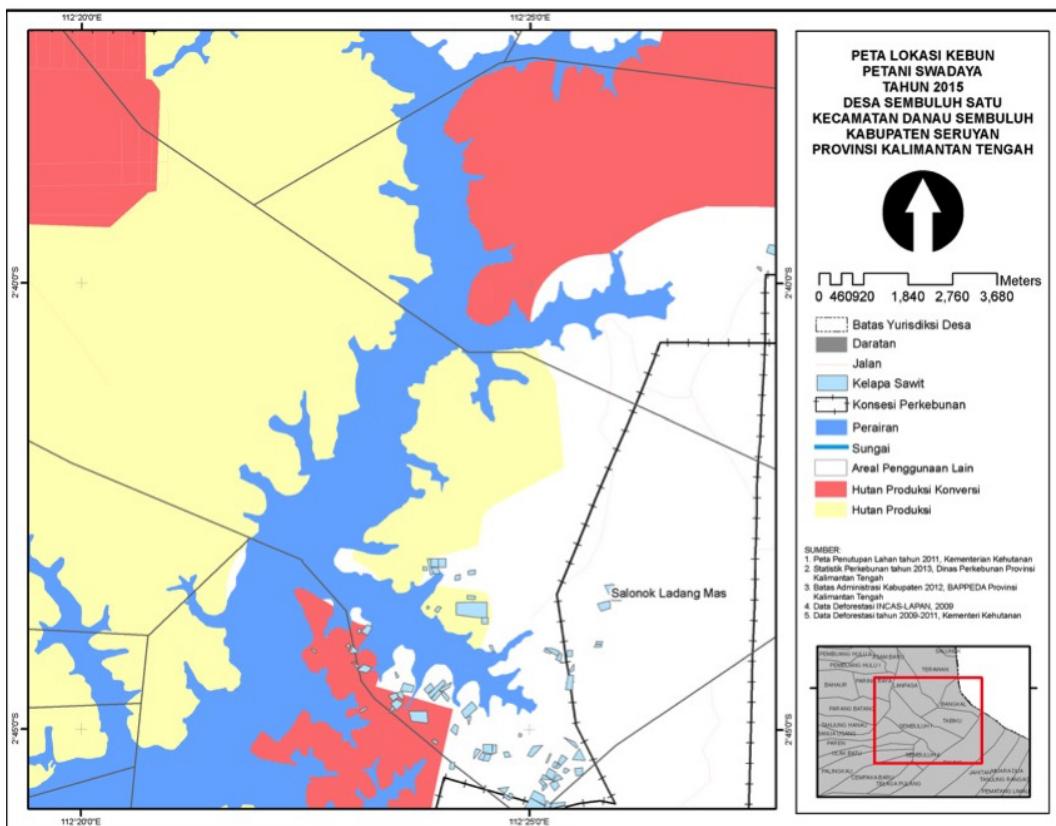
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	75%
Company/Mills	21%
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	4%
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	12.5%
Farm equipment Shop/Kiosk	-
Farmer Group	75%
Outside village	12.5%
Cooperative	-
Companies/Government	-
Not answered	-
Others	-

VILLAGE

SEMBULUH I

Farmers surveyed	73 farmers	
Area mapped	440.4 ha	
Average area of oil palm plots owned	3.84 ha	
Ethnicity	Indigenous and local 92.75%	Transmigrant 7.25%
Land tenure	All have land titles	
Farming systems	8% practice mixed farming	
Year planted	2003 – 2014, mostly after 2010	
Fresh fruit bunches (FFB) market	No answer	



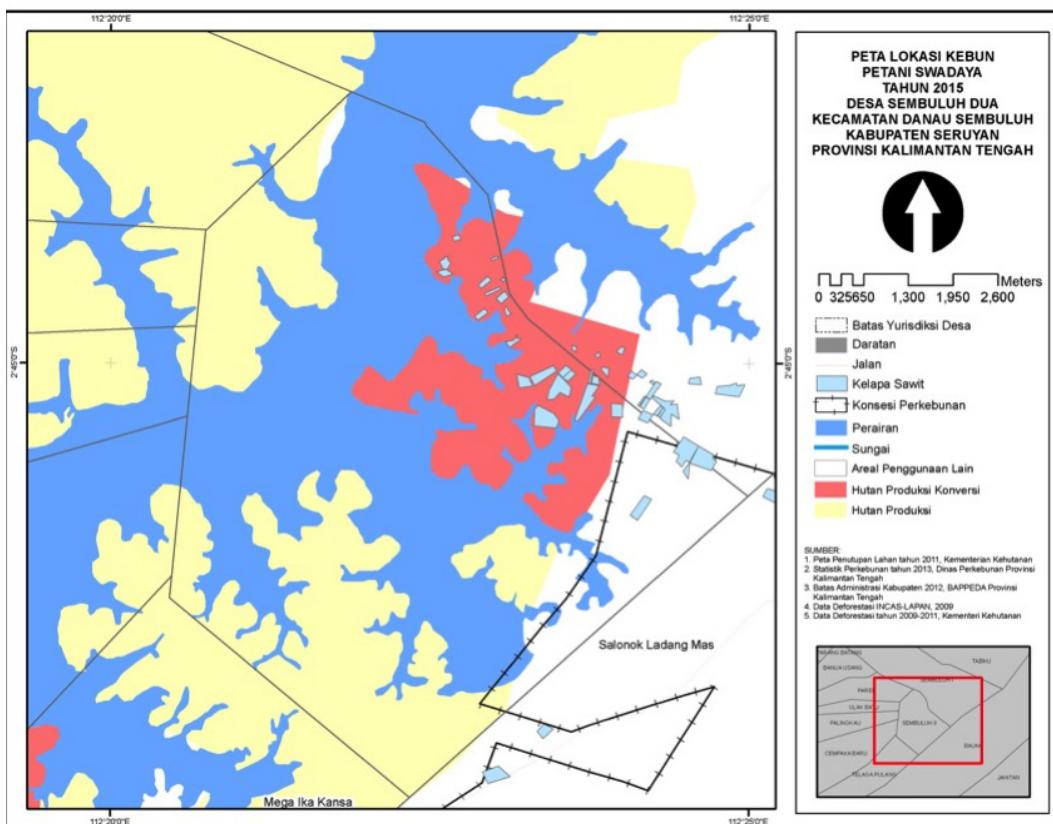
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	85%
Company/Mills	11%
Plantation Office (Central Kalimantan)	1.3%
Friends, Neighbors, and relatives	1.3%
Cooperatives, farmer groups and farmer shops	1.4%
Other villages/cities/island	-
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	1.4%
Farm equipment Shop/Kiosk	12.3%
Farmer Group	-
Outside village	1.4%
Cooperative	-
Companies/Government	-
Not answered	84.9%
Others	-

VILLAGE

SEMBULUH II

Farmers surveyed	51 farmers	
Area mapped	403.6 ha	
Average area of oil palm plots owned	7.91 ha	
Ethnicity	Indigenous and local 92.15%	Transmigrant 7.85%
Land tenure	None have untitled land	
Farming systems	8% practice mixed farming	
Year planted	2005 - 2015, mostly after 2010	
Fresh fruit bunches (FFB) market	Most sell to traders while 16% sell to mills or companies	



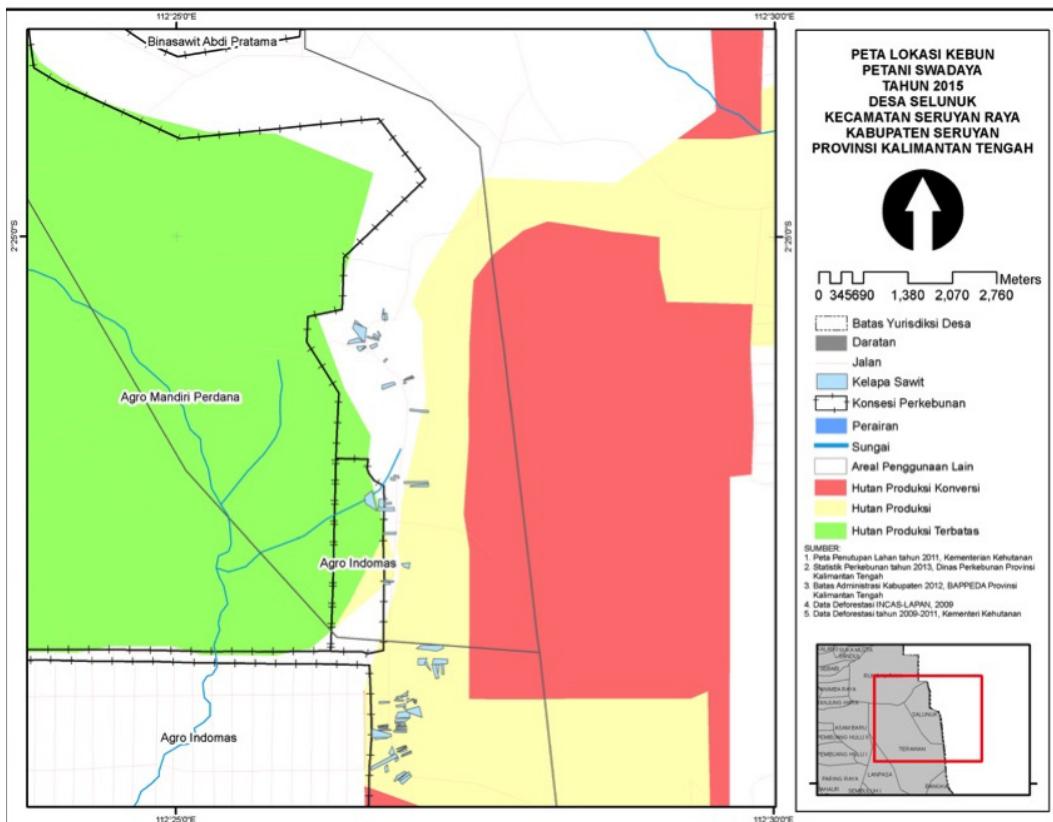
FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	69%
Company/Mills	25%
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	4%
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	2%
Not answered / Do not know	-
SOURCE OF FERTILIZER	
Traders	2%
Farm equipment Shop/Kiosk	-
Farmer Group	2%
Outside village	-
Cooperative	67%
Companies/Government	2%
Not answered	25%
Others	2%

VILLAGE

SELNUK

Farmers surveyed	86 farmers			
Area mapped	281.25 ha			
Average area of oil palm plots owned	3.51 ha			
Ethnicity	Indigenous and local	3.75%	Transmigrant	96.25%
Land tenure	All farmer have land titles			
Farming systems	2% practice mixed farming			
Year planted	2005 – 2014, mostly around 2008- 2011			
Fresh fruit bunches (FFB) market	55% sell to traders, 6% to mills and 39% did not answer			



FARMING INPUTS

SOURCE OF SEEDS	
Traders	-
Own plantation	96.25%
Company/Mills	-
Plantation Office (Central Kalimantan)	-
Friends, Neighbors, and relatives	-
Cooperatives, farmer groups and farmer shops	-
Other villages/cities/island	-
Not answered / Do not know	3.75%
SOURCE OF FERTILIZER	
Traders	2.5%
Farm equipment Shop/Kiosk	71.25%
Farmer Group	3.75%
Outside village	10%
Cooperative	-
Companies/Government	-
Not answered	12.5%
Others	-



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