



# SDM Analysis Private Report

## PT PAS plasma smallholder service delivery model West-Kalimantan

*Final version  
July 2022*

# Introduction

## About Service Delivery Models

### Importance of Service Delivery

Agriculture plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to climate change, which threatens the long-term viability of global food supply. To earn adequate livelihoods without contributing to environmental degradation, farmers need access to affordable high-quality goods, services and technologies.

Service Delivery Models (SDMs) are supply chain structures which provide farmers with services such as training, access to inputs, finance and information. SDMs can sustainably increase the performance of farms while providing a business opportunity for the service provider.

A solid understanding of the relation between impact on the farmer and impact on the service provider's business brings new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable.

### About this study

To accelerate this process, IDH is leveraging its strength as a convener of key public-private partnerships to gain better insight into the effectiveness of SDMs. IDH developed a systematic, data-driven approach to understand and improve these models. The approach makes the business case for service delivery to investors, service providers, and farmers. By further prototyping efficiency improvements in service delivery, IDH aims to catalyze innovations in service delivery that positively impact people, planet, and profit.

### Thanks

IDH would like to express its sincere thanks to PT PAS for their openness and willingness to partner through this study. By providing insight into their model and critical feedback on our approach, PT PAS is helping to pave the way for service delivery that is beneficial and sustainable for smallholders and providers.

# Report outline

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## 1. Executive Summary

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## Executive Summary | About the context

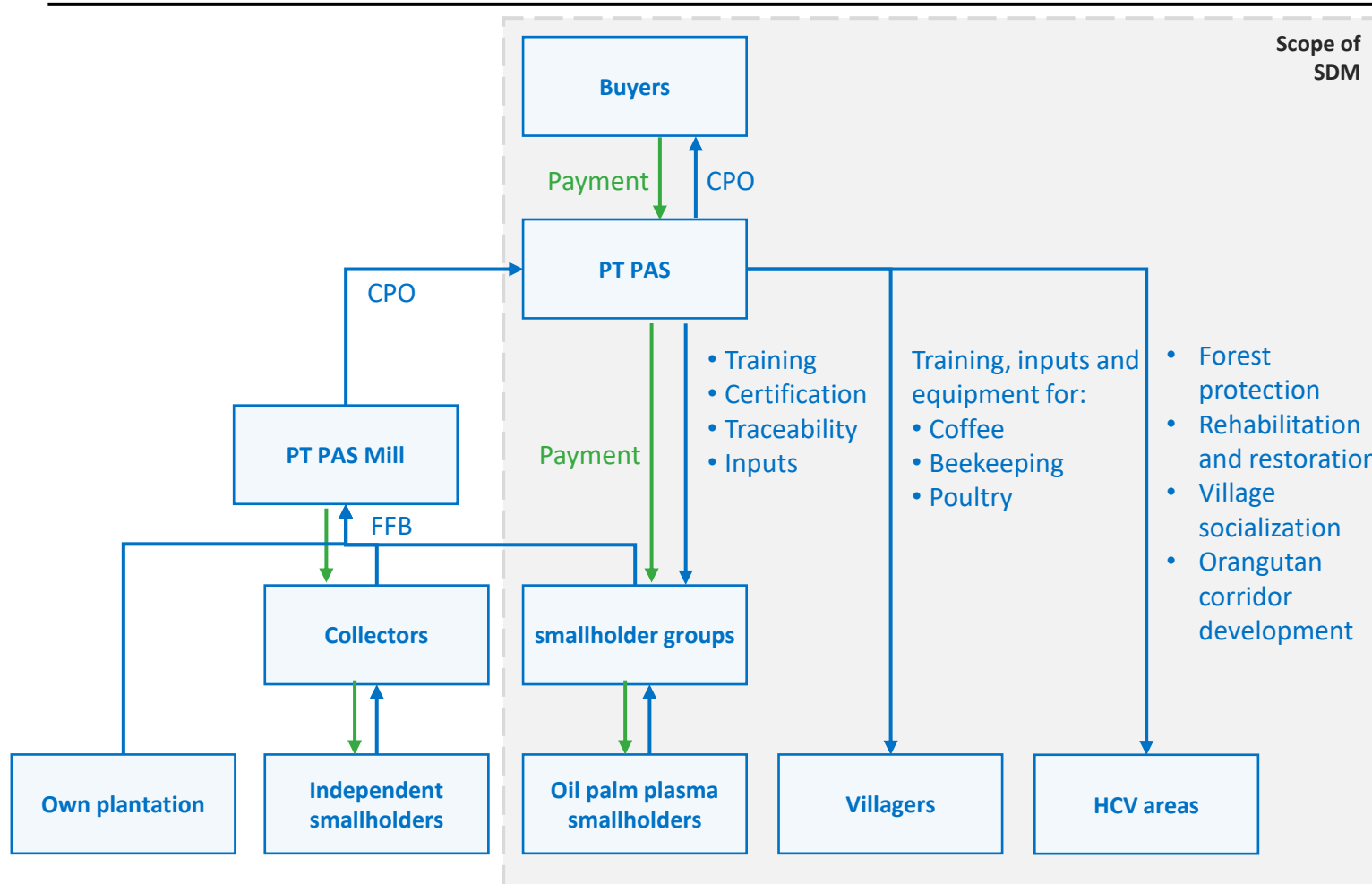
Palm oil is both a major contributor to Indonesia's economy and driver of deforestation and biodiversity loss. Investment in sustainable smallholder production and conservation is critical

- **Indonesia is the world's largest producer of palm oil**, producing ~60% of the total output in 2019. Recent increases in demand and a shortfall in production has been pushing prices back up in 2019-2020, creating positive tailwinds for producers.
- **The value chain is complex** as there is a wide range of producers and actors from high-yielding private estates with own mills and plasma smallholders to low-yielding, low-earning independent smallholders. Indonesian palm oil production is characterised by distinct producer types that vary primarily by size, land ownership and access to services. While a striking 2.67 million smallholders are employed in the oil palm industry, they account for only 35% of the total production as their limited resources constrain their yield potential.
- Palm oil production, particularly small-scale clearing, has been a **significant driver of deforestation**, endangering biodiversity and making it a top carbon emitter. Estimates based on remote sensing show that 15–20% of Indonesian oil palms are located within the forest zone. Governmental policies designed to curb deforestation appear to be lacking enforcement and often send out contrasting signals
- A thought-through and **strategic approach to smallholder inclusion** and participation can drive success for certification-sponsoring plantations. Producers can start their smallholder certification journey can with low-investment book and claim methods, and build towards segregated systems as capacity and financing for sustainable sourcing increases. Broadly speaking, the benefits of these systems outweigh the costs; in optimal settings, RSPO system can become financially sustainable
- **Smallholders face a range of challenges:** (i) lack the knowledge and training to upgrade production practices that meet the criteria set by the dominant certification standard, RSPO, (ii) lack finance to invest in inputs and improved agronomic practices, and (iii) have limited market access to take advantage of certification schemes. As a result yields of smallholder farmers are half of those of private estates (2.7mt/ha vs. 4.4mt/ha), due to aforementioned reasons, but also due to the ageing trees that are due for replanting.
- Combined, these lead to **unsustainable social, economic, and environmental outcomes:** (i) suboptimal incomes of smallholder farmers, (ii) uncertain and risky sourcing by PT PAS and related players who seek consistency in quality and yields from smallholders, and (iii) local deforestation and forest fires caused by agriculturalists

# Executive Summary | About PT PAS

PT PAS aims to sustainably source certified palm oil from smallholders, support nearby villages diversifying into non-timber forest products, and protect, restore and rehabilitate the HCV areas on its concessions.

## Visual representation of the SDM



- PT PAS produces, processes, and sells palm oil and derivative products to regional, national and global markets. They control palm oil production from a network of concessions that it owns and operates across Indonesia.
- This includes concessions of PT JV, PT CUS, and PT MAR on the island of West Kalimantan. These three concessions combined cover nearly 45,000 ha and employ and engage with inhabitants of 13 villages.
- As it looks ahead to its 3-year strategy, the company is looking to source certified palm oil from 1,000 plasma smallholders and provide a range of services to produce high-quality palm oil. Alongside, it wants to deepen its economic engagement with smallholders and their communities by helping them diversify into non-timber forest products.
- Finally, it seeks to improve the ecological impacts of its activities by investing in conservation of ~20k ha of forests across the three concessions.

# Executive Summary | Business & Impact case

PT PAS can easily absorb the costs of smallholder service delivery, NTFPs and conservation efforts. Oil palm smallholders can greatly benefit from PT PAS services. Villagers benefit most from coffee and beekeeping services

## Business case for PT PAS

- **PT PAS runs a profitable oil palm business** which allows for financing of their social and environmental activities. The plasma smallholder SDM, NTFP services and conservation efforts make up 0.5% total expenses.
- As of 2020, **direct sourcing from plasma smallholders accounts for only 3% of total volumes**, of which 63% is RSPO certified, yet comes at a net loss per MT sourced.
- **The combined plasma smallholder sourcing and service delivery model is generally loss-making**, ranging between a one-off profit of X M USD in 2022 to a loss of Y M USD in 2018.
- **Service provision is seen as a cost, not a business**, generating no direct revenues, but rather indirect benefits such as increased productivity and quality and ultimately higher CPO margins. Subsidies cover only a fraction (1%) of total costs, ranging from X to Y M USD per year.
- **NTFP services cost PT PAS between 350,000 and 470,000 USD per year**, generating indirect benefits for communities. PT PAS aims to exit the program by end of 2023 and ensure community self-sufficiency.
- **Conservation activities are costing PT PAS between 700,000 and 1,000,000 USD per year**, mainly driven by overhead. At this moment no revenues are generated other than some grant-funding.

## Impact case for smallholders and villages

- **Working with PT PAS, plasma smallholders can earn 3.5 times more than independent smallholders.** Improved yields and higher prices drive up sales revenues while agro-chemical expenses decrease drastically.
- **Higher yields, higher prices and a reduced input expenses are the primary drivers of increased smallholder income.** Plasma smallholders can substantially increase their yield with more than 50% through PT PAS training on GAP, path maintenance and agro-chemical application.
- Assuming relatively stable productivity as trees age, **plasma smallholders can increase their income by 86% in two years time**, earning more than five times above the poverty line.
- **Plasma smallholders have a more spread out and stable cashflow** pattern than Independent smallholders due to their higher monthly earnings and delayed payment plan for inputs.
- **While all NTFP are profitable for the village, beekeeping has the largest potential** in terms of highest and most timely revenue and its nutritional value
- **Given current plans coffee, beekeeping and poultry can earn an average village 1,500 USD, 2,700 USD and 41 USD per year**

# Executive Summary | Recommendations

PT PAS would benefit from continued investments in their data infrastructure and sustainability efforts

## Data infrastructure

**PT PAS would benefit from integrating into their data infrastructure the following data modules:**

- *Certification cost-benefit analysis:* add a module that allows tracking and providing insights into the costs and benefits of RSPO certification to better understand impact on their own and farmers' operations.
- *Oil palm traceability monitoring:* implement a structure which allows PT PAS to digitize data on traceability of oil palm from the plasma smallholders, collectors and own plantation from the farm to mill to produce ready for export.
- *Farmer performance management:* in order to make informed business decisions PT PAS should collect more granular, higher-quality farm-level data. Better insight into application of good agricultural practices and inputs, yields (over time), farm sizes, other crops grown and total household income, would allow PT PAS to tailor their services to the farmer's needs. In turn this could make service provision more effective and improve PT PAS' cost-benefit ratio.
- *NTFP performance management:* implement an integrated approach for roll-out and scale-up per community of NTFP services. This must include an approach to track desired benefits of the NTFP services, such as adoption of services and community incomes.
- *Deforestation monitoring:* track deforestation trends with geospatial data within the concessions to understand to what extent oil palm services and NTFP services can reduce the need for farmer and communities to encroach on HCV areas.

## Sustainability

**PT PAS could further step up their game if they would like to become a leader in sustainability.**

- Their actions and investments seem to lag behind their ambitions. For example: their relative share of certified oil palm is expected to increase only from 10% to 11% in 8 years time.
- In addition, their sustainability expenses on plasma smallholder farmers, NTFP services and conservation efforts only make up 0.5% of total expenses. It seems those are still seen as a cost (or CSR activity), not as a viable business or investment.
- Moreover, their sustainability team is too small to handle all community-level efforts and guarantee effective outcomes across all concessions.



# Executive Summary | Recommendations

PT PAS can generate high impact at smallholder and village level and could benefit from further exploring possibilities for scale up and optimization of current service packages

## Plasma smallholders

- **From an impact case perspective, PT PAS could scale up the number of plasma farmers** as the currently offered service package is significantly improving their yields and generating value at farm-level.
- **It is essential to continue providing inputs on credit** as this allows farmers to invest upfront in their farms and obtain desired yields and quality, and potentially reinvest in future years
- As sourcing and servicing plasma farmers is more expensive (albeit slightly) compared to sourcing through middlemen and their own plantation, **PT PAS could consider charging plasma farmers for the cost of services** as expected Plasma smallholder income goes up to 5,562 USD annually. One could think of charging for training, inputs provision and/or interests incurred on input prefinancing loans

## NFTP services

- **It is recommended to keep rolling out currently planned NFTP services** and expand into additional communities. Especially for coffee and beekeeping there seems to be a solid business case. Early-stage subsidies provided by PT PAS covering necessary investments are critical to get these activities started. Subsidies can be phased out as planned as communities seem to be able to sustain these activities by themselves.
- **PT PAS could redesign the poultry service package to improve the business for communities before further scaling up.** Currently profit margins are very slim due to relatively high expenses (chicks, vaccines, feed) and profits are barely sufficient to cover bi-annually recurring investments of poultry sheds. This means communities need to save their profits for reinvestment and cannot use it as a contribution to their community or household income.
- **While conservation costs do not seem to be significant it is worthwhile exploring ways to capitalize on this.** Potential revenues are not explored or estimated as part of this analysis.

# Executive Summary | Innovations

Below overview presents the most notable innovations PT PAS is piloting to improve the sustainability of the SDM

## NTFP services

**PT PAS is providing services beyond their own value chain.** Next to oil palm services, they provide NTFP inputs with the aim to have communities cultivate those independently and sustainably. This would reduce tensions with the communities and alleviate some of the pressure on nearby forests.

## Diversify revenue mix

**PT PAS is exploring ways to monetize climate mitigation and conservation efforts to offset some of those expenses.** A carbon financing strategy is developed with the support of Southpole. Early-stage plans for ecotourism are made to exploit the waterfall on their concession.

## Smart-subsidies

**PT PAS is providing smart, multi-year subsidies enabling communities to overcome the upfront investment required to start producing coffee, bee and poultry.** Most services are phased out timely to reduce cost to PT PAS. The poultry service package would require some tweaking to make economic sense for the communities.

## Direct farmer relationships

**PT PAS is expanding rapidly in direct service relationships with farmers to cut out middlemen.** The middlemen charge relatively high interest rates, pay low farm-gate prices and provide low quality inputs that jeopardize plasma smallholders' ability to invest in their farms, community livelihoods, and ultimately the forest.

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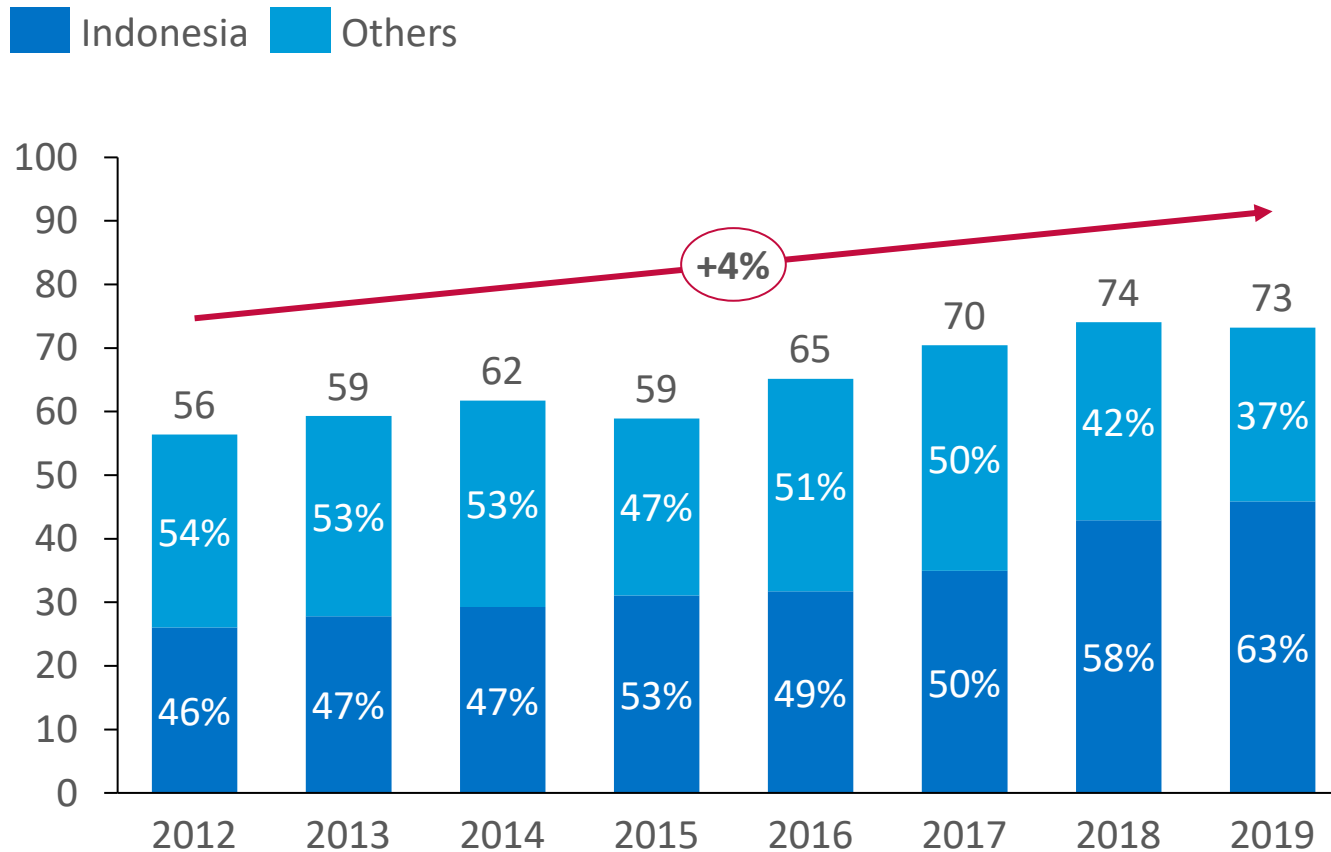
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# Context | Global palm oil production

Indonesia is the world's largest producer of palm oil, producing ~60% of the total output in 2019

## Annual global palm oil production CPO and PKO<sup>1</sup>, in million MT per year



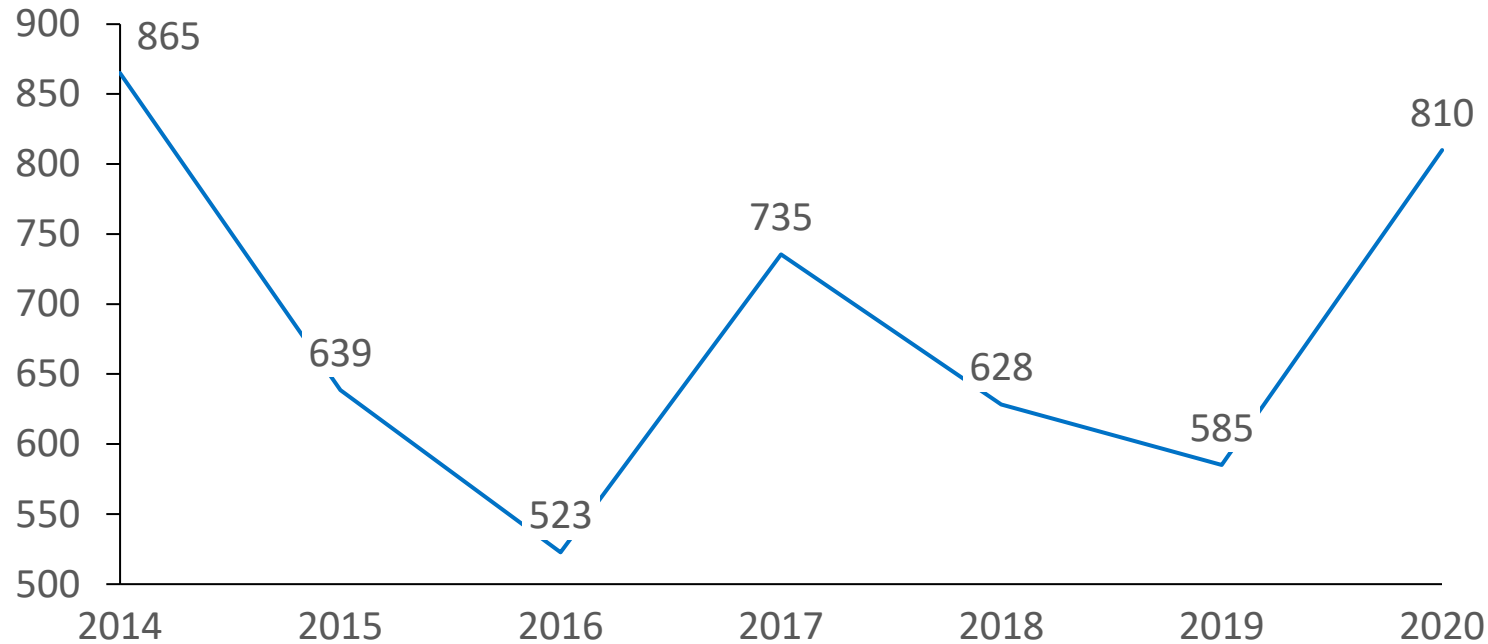
- The global palm oil industry is large: its retail value was estimated at USD 65 billion in 2016<sup>2</sup> and is expected to grow at a 5.7% CAGR between 2019-2024<sup>3</sup>
- The product is primarily an export commodity: ~75% is exported<sup>3</sup>, and is primarily used as cooking oil (72% of all consumption), followed by beauty and cleaning products (18%)<sup>3</sup>
- Asia is the largest consumer of palm oil, with India, China and Indonesia consuming a bulk of palm oil destined for the food industry
- Indonesia and Malaysia produce nearly all global palm oil by volume, with Indonesia capturing 63% of global production in 2019<sup>4</sup>

Sources: 1Statista. 2 Palm Oil Market size, Grand View Research, 2020. 3 Global Market Report: Palm Oil, IISD 2019. 4Indonesia Investments, Palm Oil (2017). 5.CIFOR, Indonesia Fact File Palm Oil Production, 2013. 6. UNDP, Sustainable Palm Oil for all, 2017. 5. Rabobank, Palm's perfect storm, 2020

## Context | Global prices

Recent increases in demand and a shortfall in production has been pushing prices back up in 2019-2020, creating positive tailwinds for producers

### Global palm oil prices in USD per MT for January of each year



- Palm oil prices peaked in 2014 and have steadily declined since, as supply outstripped demand, hurting incomes of producers, especially smallholders
- Looking ahead, recent increases in demand and a shortfall in production has been pushing prices back up in 2019-2020, creating positive tailwinds for producers
- Adoption of voluntary sustainability standards (VSS) is the most critical driver of future growth in the industry: VSS produce grew at a CAGR of 110% in the decade between 2008-2016 compared to 1.86% for conventional production<sup>3</sup>

Sources: 1Statista. 2 Palm Oil Market size, Grand View Research, 2020. 3 Global Market Report: Palm Oil, IISD 2019. 4Indonesia Investments, Palm Oil (2017). 5.CIFOR, Indonesia Fact File Palm Oil Production, 2013. 6. UNDP, Sustainable Palm Oil for all, 2017. 5. Rabobank, Palm's perfect storm, 2020

## Context | Indonesian palm oil producers

Indonesian palm oil production is characterised by distinct producer types that vary primarily by size, land ownership and access to services

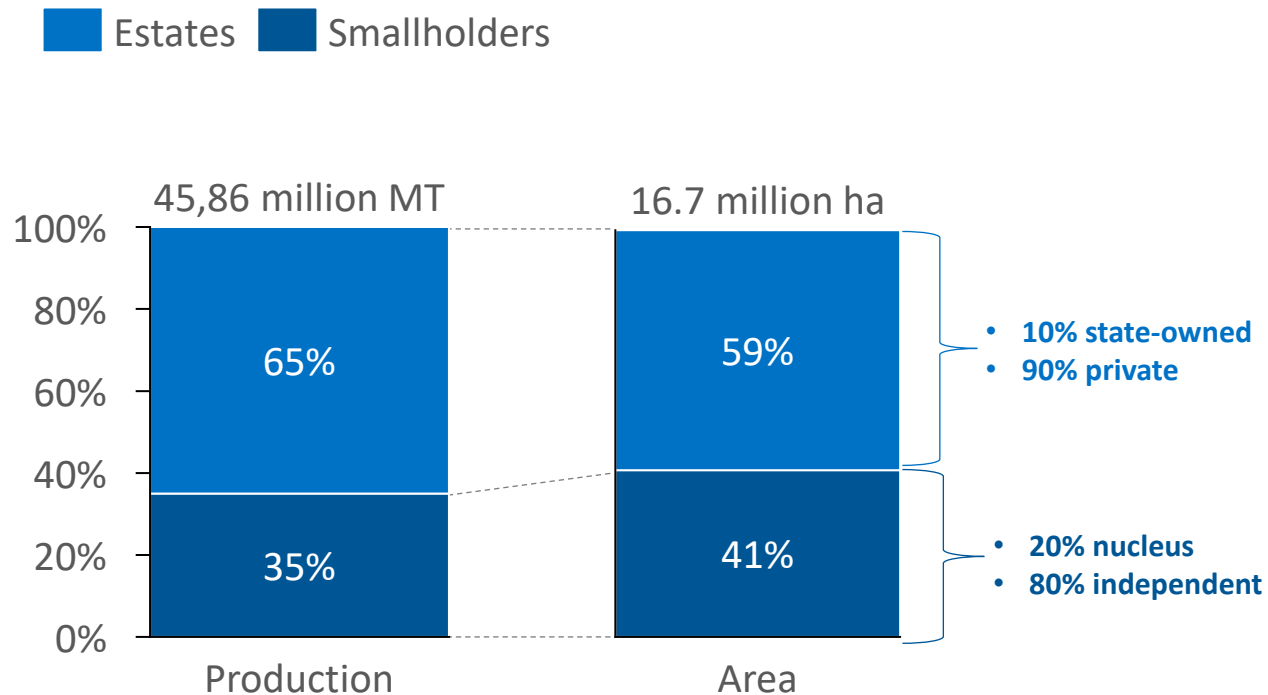
	State-owned estates	Private estates	Plasma smallholder	Scheme smallholder	Independent smallholder
Structure	<ul style="list-style-type: none"> <li>Land owned and managed by the government</li> </ul>	<ul style="list-style-type: none"> <li>Land owned and managed by private company</li> </ul>	<ul style="list-style-type: none"> <li>Developed around a nucleus plantation</li> <li>Land is owned by the government for 3-4 years until smallholder can repay land through sales</li> </ul>	<ul style="list-style-type: none"> <li>Tied to private company by various schemes (contract, credit, etc..)</li> <li>Land is owned by the smallholder but company supervises crop management</li> </ul>	<ul style="list-style-type: none"> <li>Land owned and managed by smallholder</li> </ul>
Yield (CPO) <sup>9</sup>	4.48 MT/ha	4.41 MT/ha	3.8 MT/ha	3.8 MT/ha	2.7 MT/ha
Average Area (ha)	3,900 ha	3,500 ha	2 ha	2 ha	1 ha
GAP	✓ Good access	✓ Good access	✓ Good access	✓ Good access	– Limited access
Inputs	✓ Good access	✓ Good access	✓ Good access	✓ Good access	– Limited access
Finance	✓ Good access	✓ Good access	✓ Good access	✓ Good access	– Limited access
Offtake			<ul style="list-style-type: none"> <li>✓ Guaranteed offtake</li> <li>– Up-front contractually agreed price</li> </ul>	<ul style="list-style-type: none"> <li>✓ Guaranteed offtake</li> <li>– Up-front contractually agreed price</li> </ul>	<ul style="list-style-type: none"> <li>✓ Can sell to highest bidder</li> <li>– No guaranteed offtake</li> </ul>

Sources: 1Estate Crops More Attractive than Community Forests in West Kalimantan, Indonesia (2017). 2Raising the bar through sustainable production, environmental protection and social inclusion (IDH, 2020). 3Future Smallholder Deforestation: Possible Palm Oil Risk (Chain reaction research, 2019). 4BPS – Statistics Indonesia. 5Palm's perfect storm (Rabobank, 2020). 6Unpacking Indonesia's independent oil palm smallholders (2017). 7Indonesia Investments, Palm Oil. 8CIFOR, Indonesia Fact File Palm Oil Production, 2013. 9PT PAS discussions

## Context | Distribution of palm oil producers

While a striking 2.67 million smallholders are employed in the oil palm industry, they account for only 35% of the total production as their limited resources constrain their yield potential

### Indonesian palm oil production and area per producer type

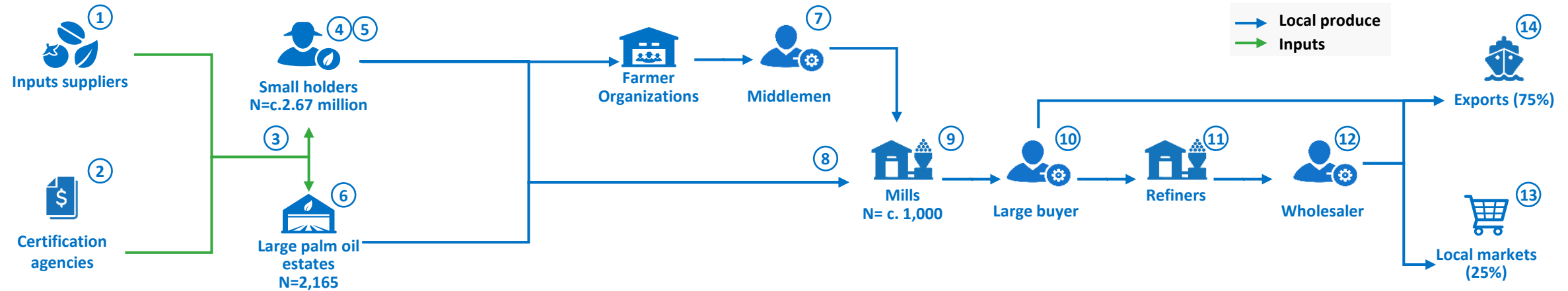


- The industry is economically significant for Indonesia, contributing nearly 1.5-2.5% to its GDP and employing 16 million people directly and indirectly in its supply chains<sup>7</sup>.
- Private corporations drive most of the production and produce more than half of the total Indonesian palm oil output from their vast concessions spread across Kalimantan and Sumatra, which together account for 75% of palm oil hectareage<sup>8</sup>.
- In Indonesia, 2.67 million oil palm smallholders account for about 35% of the total production. Thereby also representing a very important part of Indonesia's oil palm production base<sup>2</sup>.
- 20% these smallholders are nucleus smallholders, while around 80% operate independently<sup>2</sup>.
- Independent smallholders have very limited resources at their disposal compared to other producer types. These constraints result into a productivity that can be 30-40% lower than other plantations<sup>5</sup>.

Sources: 1) Estate Crops More Attractive than Community Forests in West Kalimantan, Indonesia (2017). 2) Raising the bar through sustainable production, environmental protection and social inclusion (IDH, 2020). 3) Future Smallholder Deforestation: Possible Palm Oil Risk (Chain reaction research, 2019). 4) BPS – Statistics Indonesia. 5) Palm's perfect storm (Rabobank, 2020). 6) Unpacking Indonesia's independent oil palm smallholders (2017). 7) Indonesia Investments, Palm Oil. 8) CIFOR, Indonesia Fact File Palm Oil Production, 2013. 9) PT PAS discussions

# Context | Value chain challenges

The value chain is complex as there is a wide range of producers and actors from high-yielding private estates with own mills and plasma smallholders to low-yielding, low-earning independent smallholders



## Production

1. Limited availability and affordability of fertilizer and agrochemicals hinder independent smallholders to use these inputs<sup>3,5</sup>.
2. Only 17% of palm oil produced in Indonesia is RSPO certified, while all is mandatory ISPO certified<sup>5</sup>.
3. Palm oil is cultivated by smallholders or large private estates<sup>1,5</sup>.
4. Plasma smallholders have fixed offtake agreements and sell directly to a mill, while individual smallholders mostly sell their produce through middlemen.
5. As finance is hard to come by for independent smallholders, they take informal loans from middlemen to buy inputs, which can only be repaid by selling their harvest<sup>3,5</sup>.

## Aggregation

6. Large scale oil palm estates are in control of their own aggregation and often have their own mill<sup>1,5</sup>.
7. It is common practice for independent smallholders or cooperatives to link up with middlemen who aggregate oil palm and bring it to the mill<sup>1,5</sup>. The middlemen often charge a price that is 20% higher to compensate for transportation<sup>3</sup>.
8. Plasma smallholders sell to the company they have a fixed offtake agreement with, who in turn manages the aggregation and transport of oil palm to the mill<sup>1,5</sup>.

## Processing

9. The Fresh Fruit Bunches (FFB) need to be milled within 24-48h after harvest to maintain the quality of the processed palm<sup>6</sup>.
10. In the mills oil palm is processed into palm kernel oil (PKO) and crude palm oil (CPO). After which it is sold and transported to large buyers domestically or exported<sup>3,6</sup>.
11. In the large refineries CPO and CKO is processed and packaged into marketable goods. After which it is sold to wholesalers<sup>3</sup>.
12. Wholesalers distribute the marketable goods to retailers in large quantity domestically or via export<sup>3</sup>.

## Markets

13. Although oil palm is seen as an export crop, the local market consumption is between 25-30%<sup>6</sup>.
14. Oil palm qualified for export markets needs to be certified sustainable palm oil and comply with sustainability standards such as for RSPO and ISCC certification. Especially the EU, as the third largest importer of palm oil globally, has been enforcing these criteria to its traders in recent years<sup>7</sup>.

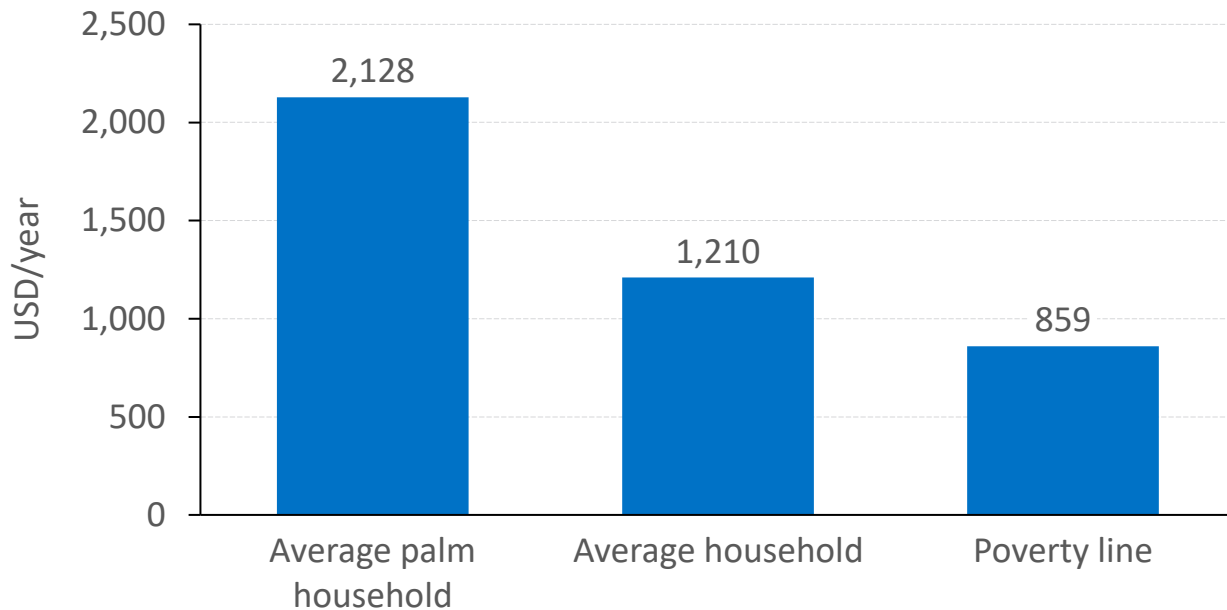
Source: <sup>1</sup>Estate Crops More Attractive than Community Forests in West Kalimantan, Indonesia (2017). <sup>2</sup>Raising the bar through sustainable production, environmental protection and social inclusion (IDH, 2020). <sup>3</sup>Unmet needs report Kopernik (2018). <sup>4</sup>BPS – Statistics Indonesia. <sup>5</sup>IDH Indonesian Palm Oil Smallholders briefing (2021). <sup>6</sup>An Investor's Guide to Palm Oil (TOPTAL finance, 2018). <sup>7</sup>Palm's perfect storm (Rabobank, 2020)



## Context | Living Income benchmark

Oil palm households in West Kalimantan seem to earn more than the average household in the region and the poverty line. They are well on their way to earn a living income.

### Household incomes and poverty line in West Kalimantan (USD/year)



- Despite relatively high prices, SHFs still earn below the living income. This is due to limited access to finance which prevents smallholders invest in their oil palm farm to improve yields and their lack of other income sources to help diversify the smallholder's overall income.
- Due to the high level of manual labor and low level of mechanization, cost of production is high for the smallholders in West Kalimantan.<sup>2</sup>
- Risks exist that they will continue to exert pressure on natural resources with negative conservation outcomes<sup>6</sup>.
- To satisfy demand without deforestation, SHFs need to replant and improve productivity on existing plots<sup>5</sup>, while simultaneously investing in non-timber food crops that support SHFs in moving towards an improved household income.<sup>4</sup>

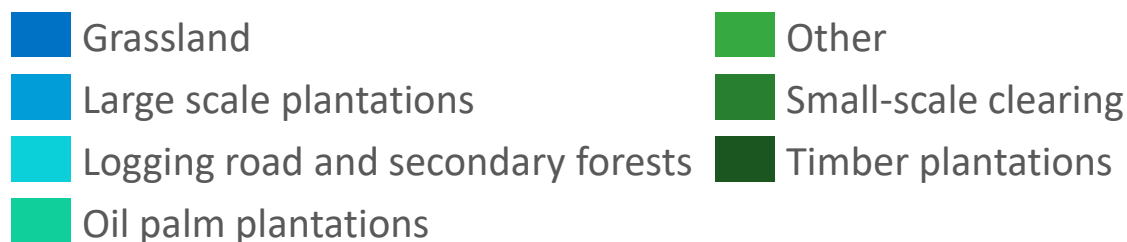
*Assumptions:* In rural Indonesia, the average household consists of 4 persons<sup>1</sup>. The annual average household income is USD 1,210, which is above the extreme poverty line of USD 859 per year<sup>7</sup>. PT PAS independent smallholders have an observed annual HH-income between 1,702 and 2,553 USD<sup>7</sup>. An average independent smallholder in West-Kalimantan has a farm area of 1-5 Ha. The average tree density is 140 trees/Ha, with a total average annual yield of 15 MT FFB/Ha<sup>7</sup>. Due to the competitive market in West Kalimantan, the oil palm smallholders can capture a relatively higher price compared to other Indonesian smallholders (1,200 IDR per kg in West Kalimantan vs 900 IDR per kg in West Borneo). However, middlemen currently still capture on average 20% of the value for FFB<sup>2</sup>.

Source: <sup>1</sup>DHS, Indonesia (2017). <sup>2</sup>Unmet needs report Kopernik (2018). <sup>3</sup>WageIndicator (2018) <sup>4</sup>Raising the bar through sustainable production, environmental protection and social inclusion (IDH, 2020). <sup>5</sup>Future Smallholder Deforestation: Possible Palm Oil Risk (Chain reaction research, 2019). <sup>6</sup>Estate Crops More Attractive than Community Forests in West Kalimantan, Indonesia (2017). <sup>7</sup>PT PAS discussions

## Context | Drivers of deforestation

Palm oil production, particularly small-scale clearing, has been a significant driver of deforestation, endangering biodiversity and making it a top carbon emitter

### Deforested area in Indonesia by driver between 2001-2016, in ha



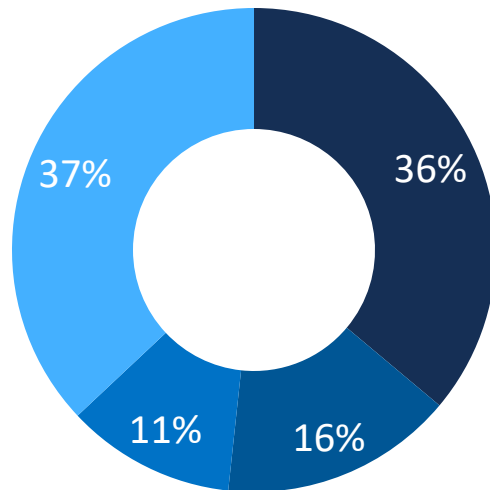
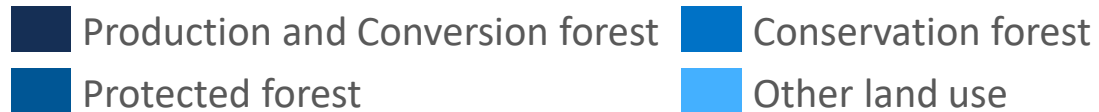
- Small-scale clearing by locals is a key issue: The Indonesia forest frontier is home to approx. 26,000 forest villages and more than 37 million people. After a logging phase in Production forest, people (often poor) tend to follow and expand deeper into the forest zones clearing more land.<sup>8</sup>
- Also, industrial scale palm oil production has been a leading driver of deforestation: the industrial scale of oil palm agriculture in Indonesia historically derived from converting large swathes of natural areas into large scale monoculture plantations.
- In the decade between 2005-2015, the expansion of industrial oil palm plantation mainly in Kalimantan was responsible for 50% of all of Borneo's loss of old growth forest, equaling ~4.2 million hectares.<sup>5</sup>
- Most lowland rainforest in West Kalimantan, a key palm oil production region, has already been cleared for agriculture, and the remaining allotted to landowners and production concessions. Less than 10% is designated as "protected".

Sources: <sup>1</sup> Scientific American, *Deforestation in Indonesia*, 2014. <sup>2</sup> CIFOR. <sup>3</sup> Carbon Brief, *Indonesia Profile*, 2019. <sup>4</sup> WWF, *The environmental status of Borneo*, 2015. <sup>5</sup> Reuters 2020. <sup>6</sup> Climate Scorecard, *Indonesia's NDCs*, 2018. <sup>7</sup> *What causes deforestation in Indonesia?* (2019). <sup>8</sup> *Agroforestry as policy option for forest-zone oil palm production in Indonesia* (2020).

# Context | The issue of deforestation

Estimates based on remote sensing show that 15–20% of Indonesian oil palms are located within the forest zone

## Land use size by type of forest as of 2018



### Definitions

- *Production forest: forest which is designated for the production of timber and other forest products*
- *Conversion forest: forest in which the holders of a Wood Utilization Permit (IPK) are granted the right to cut natural forest for settlement, agriculture (i.e. oil palm and other estate crops plantations) and other non-forestry uses*
- *Protected forest: forests that are maintained because of its function of protecting water systems and preventing flooding, preventing soil erosion, and maintaining soil fertility*
- *Conservation forest: forests where biodiversity of fauna and flora and their ecosystems are preserved*

Sources: <sup>1</sup>Indonesia Investments, Palm Oil (2017). <sup>2</sup>Mongabay, Indonesian Forests (2020). <sup>3</sup>Agroforestry as policy option for forest-zone oil palm production in Indonesia (2020). <sup>4</sup>Indonesia Forestry Law 41 (1999)

- Indonesia and its archipelago of 17,000 islands hosts some of the most biodiverse tropical rainforests in the world, which are also the most threatened globally.
- However, it became the world leader in deforestation this century<sup>2</sup>, even surpassing Brazil as the country with the highest rate of deforestation in the world in 2012.<sup>1</sup>
- In the early 1900s, ~85% of Indonesia was covered in forests. By 2010, this had fallen to 50%<sup>1</sup>, pushing the country into the top 5 carbon emitters in the world.
- The hotspots of deforestation coincide with the country's most critical biodiverse habitats in Borneo and Sumatra, threatening the survival of endemic and endangered species like Orangutans, Javan Rhinos, and Sumatran tigers.
- Estimates based on remote sensing, show that 15–20% of Indonesian oil palms are located within the forest zone (Kawasan hutan), for which 14% is within Production and Conversion forests and around 3% in Protected and Conservation forests<sup>3</sup>.

## Context | Government policies to prevent deforestation

Governmental policies designed to curb deforestation appear to be lacking enforcement and often send out contrasting signals

Policy	Relevance
<b>Forest moratorium</b>	<ul style="list-style-type: none"> <li>In 2011, the Indonesian government signed a two-year primary forest moratorium, which since has been extended several times<sup>1,2</sup>.</li> <li>The moratorium, which implies a temporary stop to the granting of new permits to clear rain forests and peat lands, has been criticised on its effectiveness and enforcement as prior to its implementation concessions for millions of hectares for new crops were granted, large palm oil companies possess wide land banks with ample room for expansion, and several cases are recorded where regulations appear to have been circumvented to obtain new permits and concessions<sup>1,2</sup>.</li> </ul>
<b>Certification</b>	<ul style="list-style-type: none"> <li>In 2011, the Indonesian government launched the Indonesian Sustainable Palm Oil (ISPO) initiative which at first was only mandatory for company palm oil plantations, but with the latest update in 2020 it is obligatory for smallholders as well.</li> </ul>
<b>REDD+ and forest frontier areas</b>	<ul style="list-style-type: none"> <li>The villages surrounding the forest are mostly unregistered with no clear and defined boundary and are located in the forest zone, with formal restrictions to use for crops to generate food or income<sup>3</sup>.</li> <li>Many forest villages have traditionally cultivated and protected these forest zones through agroforestry<sup>3</sup>.</li> <li>However, increased attention for forest protection in the context of REDD+ may have increased pressure on converting agroforests in the forest zone to become oil palm monocultures<sup>3</sup>.</li> </ul>
<b>Omnibus law</b>	<ul style="list-style-type: none"> <li>In 2020, the Indonesian parliament adopted an ‘omnibus’ law that, to facilitate business development and job creation, removes legal obligations for environmental impact assessment, simplifies procedures for obtaining permits, and removes the requirement for plantations to support smallholder producers as part of their land concessions<sup>2</sup>.</li> </ul>

Sources: <sup>1</sup>Indonesia Investments, *Palm Oil (2017)*. <sup>2</sup>Mongabay, *Indonesian Forests (2020)*. <sup>3</sup>Agroforestry as policy option for forest-zone oil palm production in Indonesia (2020). <sup>4</sup>Indonesia Forestry Law 41 (1999)

# Context | Potential for certification

A thought-through and strategic approach to smallholder inclusion and participation can drive success for certification-sponsoring plantations

## Context and need

- Certification standards are an industry move to reduce the environmental and carbon footprint of its supply chains
- North American and EU end-buyers have strong interest in ramping up the share of certified sustainable palm oil (CSPO) in their sourcing
- As of 2014, 19% of global palm oil production came from RSPO certified growers<sup>1</sup>, a fast growing figure (palm oil adhering to voluntary standards grew at a CAFR of 110% between 2008-2016<sup>1</sup>)
- There are three key standards for the palm oil industry in Indonesia<sup>2</sup>:
  - Roundtable on Sustainable Palm Oil (RSPO), a international voluntary certification standard
  - Indonesia Sustainable Palm Oil (ISPO), mandatory government-led certification scheme in Indonesia; integration with RSPO likely<sup>2</sup>
  - International Sustainability and Carbon Certification (ISSC), a voluntary international standard focused on biofuels

## Process and results

- RSPO certification is an outcome of strict verification of the palm oil production process, which must adhere to the RSPO Principles and Criteria for Sustainable Palm Oil Production set by the body
- While the Principles and Criteria defined by RSPO are globally applicable, they are customized in each nation
- Smallholders can apply for RSPO directly or through offtakers, and have the option of applying for financing through the Smallholder Support Fund<sup>2</sup>
- Benefits can include improved yields for smallholders, better operational performance of plantations, and increased market access for both
- The principal costs are capital outlay in upgrading practices on farm, followed by audit and staffing costs borne by the supply chain actor seeking certification<sup>3</sup>

## Challenges in smallholder implementation

- Land titles: smallholder land titles are often absent either due to lack of formal paperwork or due to illegality underlying an operation<sup>2</sup>
- Agrochemicals: smallholders lack access to inputs and knowledge on how to use them properly, to be able to meet RSPO standards of quality and safe pesticide use
- Documentation: certification processes require careful documentation and reporting of production practices, which can be time consuming and expensive for smallholders
- Access to finance: upfront costs of implementation, unless subsidized, is a barrier for smallholders entry
- Information and capacity: GAP and process monitoring requires additional knowledge, skills and expertise that may not be innate to SHF of a region
- Motivation: disconnect between smallholders and end-buyers; unless tangible financial gains are clear, SHF don't see certification as being valuable

Sources: <sup>1</sup> Global Market Report: Palm Oil, IISD 2019. <sup>2</sup> Sustainability Certification in the Indonesian Palm Oil Sector, German Development Institute, 2013 <sup>3</sup> RSPO 2014. <sup>3</sup> Profitability and Sustainability in Palm Oil Production, WWF CDC FMO, 2012

## Context | Types of certification

Producers can start their smallholder certification journey can with low-investment book and claim methods, and build towards segregated systems as capacity and financing for sustainable sourcing increases

System	Definition	Process
<b>1. Segregated &amp; identity preserved</b>	CSPO that has been separated and directly tracked throughout the supply chain. Involves heavy coordination of all actors	<ul style="list-style-type: none"> <li>CSPO collected from farms is preserved in separate tanks. End user receives 100% certified produce.</li> <li>In a more advanced version, the oil palm is identified and traceable to the original smallholder plantation</li> <li>In some cases, end-user willing to pay price premium for 100% certified produce</li> <li>Segregated traceability systems are managed by UTZ-Certified</li> <li>Expensive to implement and trace: can cost ~USD 0.3/ha to segregate and trace</li> </ul>
<b>2. Mass balance</b>	CSPO mixed with regular palm oil but proportion is noted and guaranteed to end-user. Involves some coordination of entire supply chain	<ul style="list-style-type: none"> <li>Certified palm oil mixed with noncertified, but a record of how much CSPO was added in the tank is made</li> <li>No real premiums available for this, but certification can be traded for companies looking for offsets</li> <li>Also managed by UTZ-certified</li> <li>Implementation and traceability cheaper than segregated systems</li> </ul>
<b>3. Book and claim</b>	No material, tangible CSPO is purchased by end-user. Instead, users offset non-certified palm oil with RSPO certificates that are generated by producers, and are traded on a platform. No coordination amongst supply chain actors needed	<ul style="list-style-type: none"> <li>Sale of CSPO certificates is separate from sale of the actual physical palm oil</li> <li>Certified plantation can sell this to any buyers – even those not interested in CSPO – so they can get market access</li> <li>They can then sell certificates to more conscious brands looking to offset their consumption of non-certified produce</li> <li>Very cheap and easy to undertake - helps rapid uptake of RSPO</li> <li>Certification and trading system managed by Green Palm</li> </ul>

Sources: WWF, FMO and CDC, Profitability and Sustainability in Palm Oil Production, 2012

## Context | Costs and benefits of certification

Broadly speaking, the benefits of these systems outweigh the costs; in optimal settings, RSPO system can become financially sustainable

	Category	Description	Indicative numbers
Benefits	Productivity gains	Increase in yields due to improved agronomic practices; pesticide and herbicide annual cost	<ul style="list-style-type: none"> <li>186% MT FFB/ha/year</li> </ul>
	Operational improvements	Streamlining of operations due to better process management and paperwork; reduction in accidents; reduction in staff turnover	<ul style="list-style-type: none"> <li>42% decline in accidents</li> <li>6% decline in turnover</li> </ul>
	Access to capital	Increase PE and M&A attraction; increase DFI and impact investment attraction	<ul style="list-style-type: none"> <li>No data available</li> </ul>
	Revenues and market access	Access to new premium markets in EU and North America. Possible revenues from three RSPO systems: book and claim, mass balance, and segregated	<ul style="list-style-type: none"> <li>USD 0-10/MT for book and claim</li> <li>USD 10-25/MT for mass balance</li> <li>USD 15-50/MT for segregated</li> </ul>
	Community relations	Reduction in social conflicts and improved community relations leads to reduced shutdowns of operations, fewer delays, etc.	<ul style="list-style-type: none"> <li>USD 10 million – 15 million over 10 years per estate</li> </ul>
Costs	Land assessment	Study and audit of high-conservation value (HCV) areas, setting aside land for conservation, and impact assessment surveys	<ul style="list-style-type: none"> <li>USD 0.8–5/ha for HCV assessment</li> <li>USD 0-13.4/ha for keeping land aside</li> <li>USD 1-11.67/ha for impact surveys</li> </ul>
	Certification	Certification costs; training of staff; corrective actions on plantation; ongoing certification and maintenance	<ul style="list-style-type: none"> <li>USD 2-3.5/ha for certification</li> <li>USD 0.0.9-23/ha for training</li> <li>USD 3.7-11/ha for correction actions</li> <li>USD 2.4-13/ha as ongoing costs</li> </ul>
	Segregation	Costs of supply chain infrastructure and processes to get CSPO from farmgate to buyer, depending on chosen market strategy	<ul style="list-style-type: none"> <li>USD 0.3/ha</li> </ul>
	Training and monitoring	Costs of smallholders keeping their own knowledge and practices up-to-date; monitoring their plantation for adherence to certification standards	<ul style="list-style-type: none"> <li>USD 2.8-11.5/ha</li> </ul>

Sources: WWF, FMO and CDC, Profitability and Sustainability in Palm Oil Production, 2012

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# SDM overview | Strategy

PT PAS strategizes to create a sustainable smallholder engagement model where oil palm smallholders are certified and increase their income through the cultivation of NTFPs, while conserving forests and ecosystems



## Objectives

### Become a leader in certified sustainable palm oil production (CSPO):

- It aims to make 1,000 smallholders RSPO certified by 2024 and aims to increase the share of its CSPO certified palm oil total palm oil sourced from 10 to 11%.
- Through this, it aims to improve SHF productivity and incomes, and therefore loyalty and sourcing from smallholders around its concessions

### Conserve forest and improve environmental performance: PT PAS aspires to:

- Diversify farm incomes from activities that do not degrade the forest
- By improving smallholder incomes, reduce incentives to deforest
- Conserve and reforest degraded forest through CCAs and other conservation projects
- Reduce carbon footprint and create revenue channels through carbon offsets



## Outputs

### A sustainable smallholder engagement model to serve and procure from smallholders efficiently:

- Collectivize smallholders into groups for smoother engagement and efficient service delivery
- Provision of training and access to improved inputs to improve productivity and loyalty

### Direct sourcing of CSPO through linkages within the smallholder training programs:

- PT PAS supports smallholders in obtaining permits and certification and improving agri practices
- Certified smallholders sell directly to PT PAS instead of to millers

### Demonstrated income and social benefits of conservation in the community: PT PAS,

- Improves smallholder productivity for individual oil palm smallholders
- Supports smallholders in increasing incomes from oil palm and cultivation of NTFP
- Builds smallholder capacity in fire control
- Invests in afforestation and conservation of protected forests



## Approach

### Invest in service delivery and sourcing:

- Integrate sustainability division's work with sourcing and supply team, to increase capacity to work at farm-gate level and engage with smallholders
- And/or set up a separate service delivery subsidiary that has its own P&L and can attract financing from donors or DFIs

### Diversify pools of financing

- Build out revenue generating services that can finance part of the costs of smallholder training and certification (such as access to finance)
- Seek out market channels and buyers looking to increase % of CSPO palm oil, and pay premiums for segregated supply

### Invest in sustainable conservation businesses

- Replicate NTFP successes into other community owned conservation enterprises like trails, hikes, and home stays in the region to increase share of revenue-generating activities vs. purely grant-based work

# SDM overview | Enabling Environment

Managing conservation goals and providing value-added services to smallholders are key challenges for PT PAS

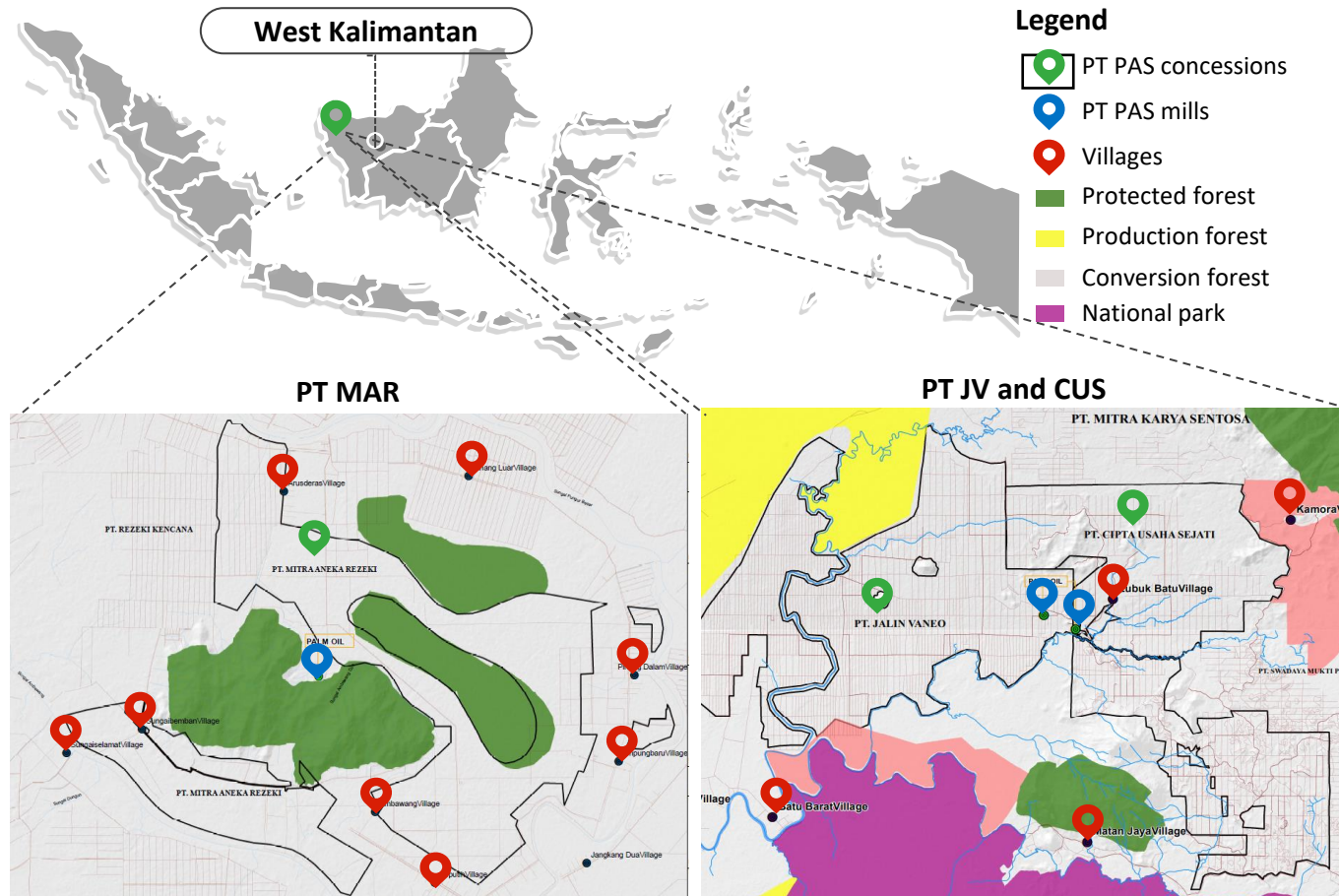


Definition	Situation	Impact on SDM
<b>Technology</b>	Penetration of mobile phones amongst SHF has increased substantially in recent years, and PT PAS is bullish about the potential use cases this enables	Cell phones are being leveraged by PT PAS to enable SHF to capture data on input use and harvesting. This information will feed into the new traceability system, as well as generate insights on productivity, yields, and input use to better guide agronomic services for the smallholder
<b>Environment</b>	The production area is dominated by peatland which is a big carbon-store and difficult to farm. Climate change has increased incidence of extreme weather events	Conversion of peatland into plantations by SHF runs counter to sustainability objectives and makes certification difficult to achieve. Land that has already been converted is difficult to plant and expensive to manage, increasing the cost of production for smallholders. For existing plantations, extreme weather events and longer dry spells are lowering yields and smallholder incomes
<b>Infrastructure</b>	SHF plantations have decent road connectivity to markets but lack shared storage and administrative infrastructure	While paved roads have enabled SHF to access cities and markets easily, more value-added activities such as certification, and input/output aggregation lack necessary infrastructure like warehousing, storerooms, meetings rooms, etc. These are not imminent issues but likely to be barriers as SDM scales up
<b>Labor</b>	Farm labor is accessible and available for most on-farm activities, and no indication of shortages	RSPO certification has helped PT PAS set and maintain high labor standards regarding work conditions, non-use of child labor, etc.
<b>Inputs &amp; Financing</b>	SHF do not have necessary documentation, assets and credit history to access to formal finance	There is a substantial unmet need for formal finance both by smallholders as well as the SDM. Lack of land titles, collateral, credit history are some of the constraints to increasing supply of finance to smallholders, which probably curtails their ability to invest in production or value-added activities (certification)
<b>Trading System</b>	Competitive landscape of buyers of FFB in the region and no binding contracts for SHF	Smallholders can independently discover the best price and are free to sell to the highest bidder in the region. Folding SHF into a traceability and certification system (by PT PAS) promises greater loyalty in the future
<b>Pricing &amp; Competition</b>	Price discovery is open and fair in the region, with multiple bidders for SHF produce at any time	PT PAS has to compete with other bidders on price alone, and there is strong competition with other millers in the region
<b>Institutional Stability</b>	Most smallholders are independent and not part of stable mature farmer groups	Smooth engagement with smallholders is predicated on them being organized efficiently, which is not the case locally. Trust and loyalty has been difficult to achieve for the SDM. This is likely a challenge for recent interventions in traceability and certification by the SDM
<b>Land Tenure</b>	Land titles and tenure are not a major problem in PT PAS concessions	Titles and tenure are critical preconditions to accessing finance, government policies, etc., and most of SHF in PT PAS concessions have stable, legal status of landholdings
<b>Social Norms</b>	No significant cultural or social barrier to economic participation of women or other groups	Social norms are enabling of women to participate in economic functions, and there are limited/no conflicts of note in the community

# SDM overview | PT PAS concessions

The investment in smallholders, communities and conservation as part of this SDM is focused on three of PT PAS' concessions in West Kalimantan

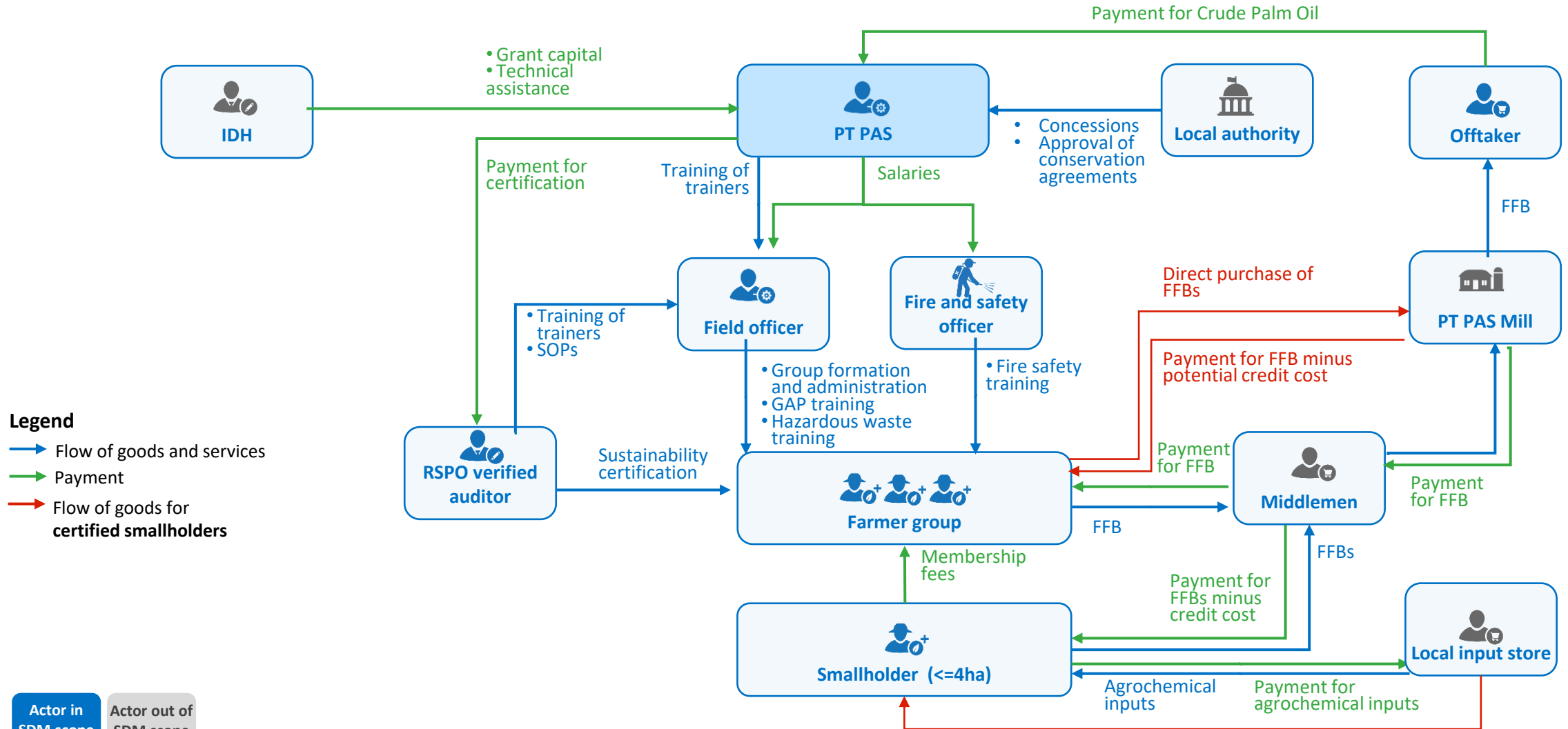
## Map of Indonesia and West Kalimantan with PT PAS concessions



- PT PAS consists of multiple concessions of which three are located on West Kalimantan and focused on oil palm production: PT MAR, PT JV and PT CUS.
- PT MAR covers 12,090 hectares of oil palm plantations and one oil palm mill. It is located near 7,000 hectares of protected forest (green) and is linked to eight villages located near the concession. PT MAR is surrounded by private concessions held by other private companies.
- PT JV and PT CUS are neighbouring concessions of 15,669 ha and 15,110 ha of oil palm plantations respectively, with its own mills. Both are surrounded by protected, production and conversion production forest (green, yellow and pink respectively) combining to an area of 12,500 ha marked for conservation. These two concessions are linked to a total of five villages.

# SDM overview | Flow of goods and services

PT PAS's oil palm SDM model is centred around certifying and training their plasma smallholders, while also sourcing from them



**Legend**

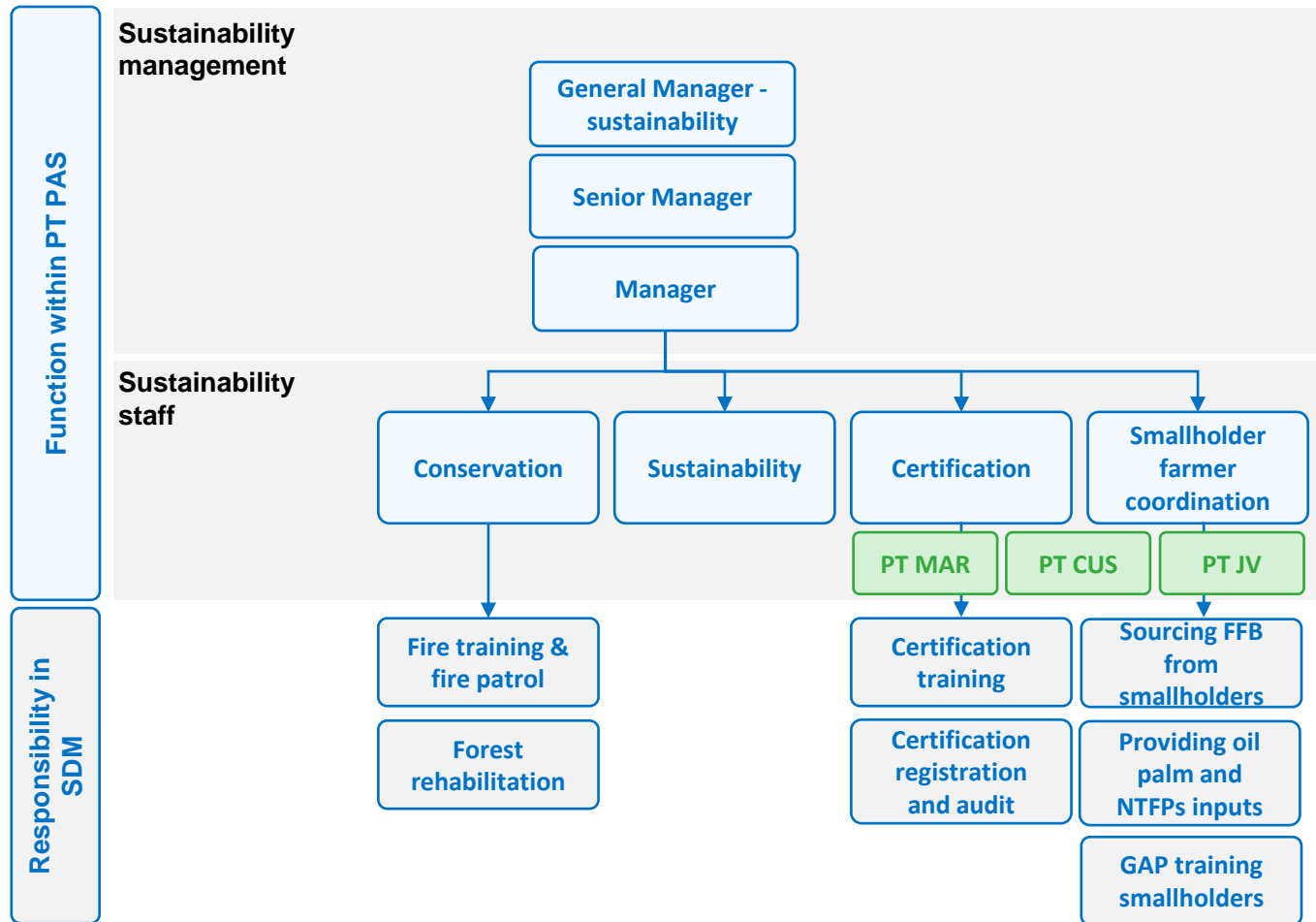
- Flow of goods and services
- Payment
- Flow of goods for certified smallholders

Actor in SDM scope | Actor out of SDM scope

# SDM overview | PT PAS organization

The PT PAS sustainability department is part of the larger organization but has their own budget and a level of autonomy on its day-to-day operations with plasma smallholders and the villages in the three concessions

## PT PAS sustainability department organogram



- The sustainability department is part of the larger company which focuses on sourcing through own plantations and through collectors on top of from plasma and the management of the PT PAS mills.
- The sustainability staff encompasses around 10% of the business and can be subdivided into four divisions: Conservation, Sustainability, Certification and Smallholder farmer coordination.
- While Conservation and Sustainability staff remain at the HQ, the Certification and Smallholder farmer coordination staff are responsible for the fieldwork and cooperate with the smallholders and villages across the three concessions.

Sources: 1) PT PAS sustainability organogram 2020

## SDM overview | List of stakeholders (1/2)

Global buyers and RSPO play a crucial role in enabling the sustainable sourcing from smallholders as part of this SDM

Name	Organization type	Function (within this SDM)	Revenue model (within this SDM)	Incentive for participation (within this SDM)
<b>IFFCO</b>	Palm oil buyer	<ul style="list-style-type: none"> <li>• Buys crude palm oil from PT MAR</li> <li>• Investing in traceability system for all suppliers to PT MAR</li> </ul>	<ul style="list-style-type: none"> <li>• Sourcing from PT MAR and selling to clients</li> <li>• Investment from World Bank for traceability system</li> </ul>	<ul style="list-style-type: none"> <li>• Increased supply of palm oil</li> <li>• Improved quality and associated premiums</li> <li>• Development of the sector</li> </ul>
<b>Unilever</b>	Palm oil buyer	<ul style="list-style-type: none"> <li>• Buys crude palm oil from PT MAR</li> <li>• Unclear but possible investor in REDD project along with PT PAS</li> </ul>	<ul style="list-style-type: none"> <li>• Palm oil sourcing and selling</li> </ul>	<ul style="list-style-type: none"> <li>• Increased supply of palm oil</li> <li>• Improved quality and associated premiums</li> <li>• Development of the sector</li> </ul>
<b>IOI</b>	Palm oil buyer	<ul style="list-style-type: none"> <li>• Buys crude palm oil from PT MAR</li> </ul>	<ul style="list-style-type: none"> <li>• Palm oil sourcing and selling</li> </ul>	<ul style="list-style-type: none"> <li>• Increased supply of palm oil</li> <li>• Improved quality and associated premiums</li> <li>• Development of the sector</li> </ul>
<b>RSPO</b>	Certification agency	<ul style="list-style-type: none"> <li>• Certifies farms for sustainability</li> <li>• Co-finances cost of certification for smallholders through RSSF Fund</li> </ul>	<ul style="list-style-type: none"> <li>• Charges for certification from smallholders and SDM operator</li> </ul>	<ul style="list-style-type: none"> <li>• Expansion of certification program</li> <li>• Revenues from certification program</li> </ul>

## SDM overview | List of stakeholders (2/2)

The effective implementation relies on a range of value chain and related actors, such as government agencies, consultants, funders, collectors and farmer groups

Name	Organization type	Function (within this SDM)	Revenue model (within this SDM)	Incentive for participation (within this SDM)
IAR	NGO	<ul style="list-style-type: none"> <li>• TA for conservation projects, particularly animal corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Payment from PT PAS for services</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced man-animal conflict</li> <li>• Improved regional biodiversity</li> </ul>
BPDPKS	Government funding agency	<ul style="list-style-type: none"> <li>• Finances replanting of trees for smallholders up to 25 million/ha</li> </ul>	<ul style="list-style-type: none"> <li>• Publicly funded agency</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of livelihoods and incomes</li> </ul>
CER	Consultant	<ul style="list-style-type: none"> <li>• Research and analysis for carbon capture project</li> </ul>	<ul style="list-style-type: none"> <li>• Consulting fees from SDM operator</li> </ul>	<ul style="list-style-type: none"> <li>• Service provider – receives ongoing business from successful carbon/conservation projects</li> </ul>
BKSDA	Government agency on natural resources conservation	<ul style="list-style-type: none"> <li>• Legal and policy support for conservation projects</li> </ul>	<ul style="list-style-type: none"> <li>• Self-funded</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced man-animal conflict</li> <li>• Improved regional biodiversity</li> </ul>
IDH	PMU and funder	<ul style="list-style-type: none"> <li>• Finances conservation of forest land</li> <li>• Technical assistance to SDM</li> </ul>	<ul style="list-style-type: none"> <li>• Program funder</li> </ul>	<ul style="list-style-type: none"> <li>• Achievement of development impact goals around better incomes, jobs, environment, etc.</li> </ul>
Collectors	FFB aggregator	<ul style="list-style-type: none"> <li>• Source FFB from smallholders or farmer groups and sell to PT PAS</li> <li>• Provide credit to smallholders</li> </ul>	<ul style="list-style-type: none"> <li>• FFB margin on aggregation</li> <li>• Interest on credit</li> </ul>	<ul style="list-style-type: none"> <li>• Increased supply of FFB</li> </ul>
Farmer groups	FFB aggregator	<ul style="list-style-type: none"> <li>• Aggregate FFB from smallholders</li> </ul>	<ul style="list-style-type: none"> <li>• Membership fee</li> </ul>	<ul style="list-style-type: none"> <li>• Increased membership</li> </ul>

# SDM overview | Smallholder farmer segments

PT PAS provides services to two types of smallholder segments: plasma smallholders producing FFB and households in villages cultivating NTFPs. PT PAS has no working relationship with independent smallholders



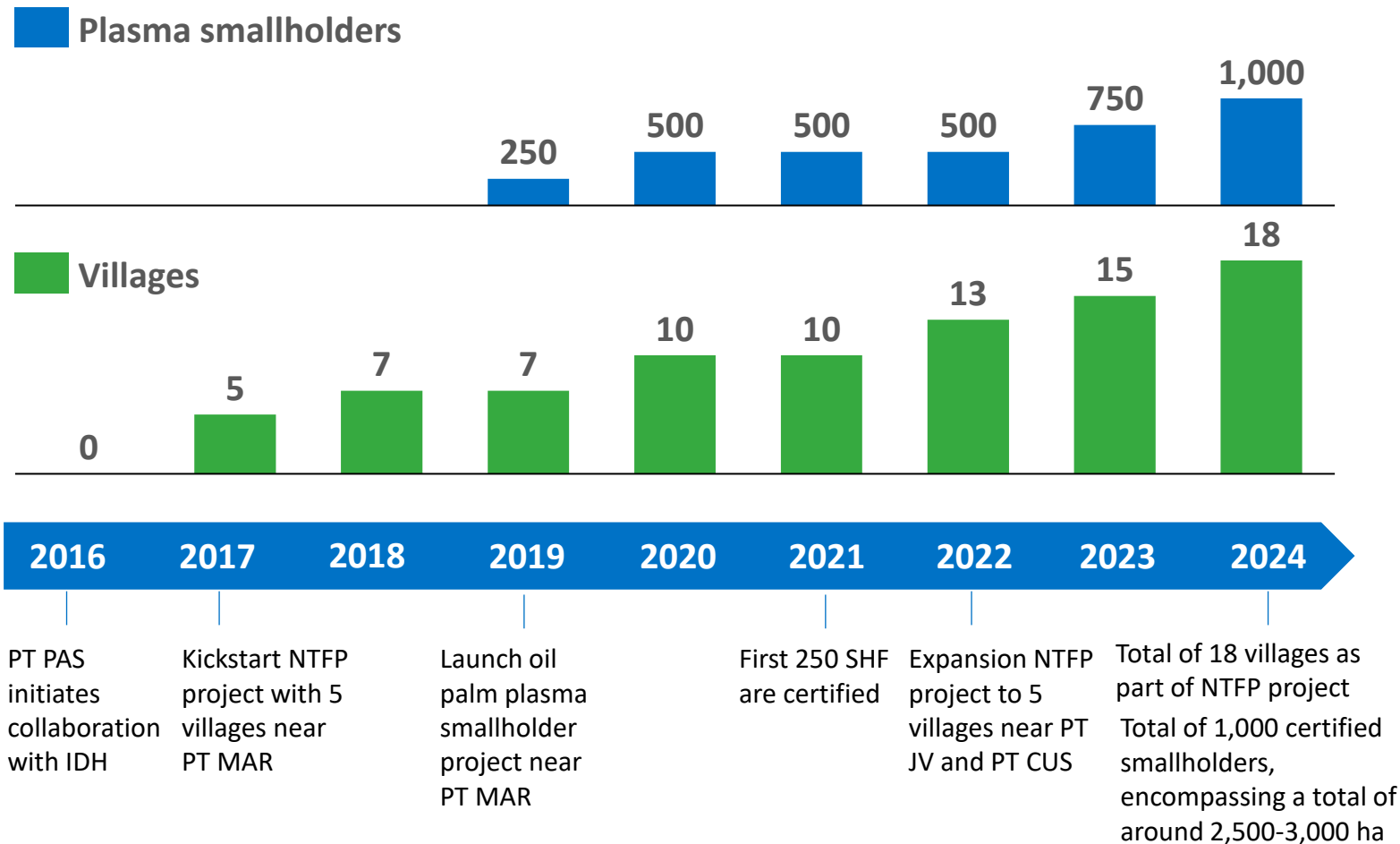
Criteria	Independent smallholder	Plasma smallholder	Villages
<b>Description</b>	An average SHF in West-Kalimantan that sells directly to middlemen through their farmer group, but not to PT PAS	An average SHF located near PT JV/CUS concessions, selling FFB directly to PT PAS through their farmer group	Participating households in villages near PT PAS concessions
<b>Land use</b>	Community lands designated to palm oil production		Village land and production forests
<b>Farming system</b>	Average yield of 11 MT FFB/ha ~ 2.7 MT CPO/ha Very low input application Noncertified	Average yield of 15 MT FFB/ha Higher level of input application Certified	Various activities. As part of this SDM: small coffee plots, bee boxes and chickens
<b>Services and package</b>	Middlemen provide expensive low-quality services and off taking	PT PAS provides full-service oil palm package (see next slide) and off taking	Provision of training, inputs, equipment and market access for beekeeping, coffee and/or poultry farming



# SDM overview | Scale

In collaboration with IDH, PT PAS has since 2017 gradually increased the scale of their NTFP and sustainable oil palm projects

## Number of smallholders and villages served



- PT PAS and IDH started their collaboration in 2016 with the aim to support oil palm smallholder and households nearby the concessions.
- Since 2017, PT PAS has gradually increased the scope of villages which benefit from their NTFP project. This project provides the households within the villages to get the inputs and know-how needed to generate and maintain a stable additional income source aside from oil palm.
- Since 2019, PT PAS supports plasma smallholders near the concessions in their process to certification and to creating a more profitable oil palm farm.

## SDM overview | Plasma smallholder farmer services

PT PAS is gradually scaling up proven productivity-, sustainability- and transparency- enhancing services provided to a growing number of plasma smallholders in PT MAR

Service		Delivery mode	Farm-level impact	Revenue model <i>for PT PAS</i>	Operational <i>since / by</i>
Training	Smallholder farmer training	Trainings on GAP, plantation management, fire safety, certification standards, waste management, health and safety, land fire control, and document and record control	Improved operational performance for sourcing division of PT PAS Better yields and quality for smallholders Access to new sales markets and pools of financing	Covered by net margin of PT PAS oil palm sales	2018
	RSPO certification	Co-financing sustainability certification for smallholders; inspection	Opportunity to create segregated CSPO product for advanced markets Improved bookkeeping	Co-funded by PT PAS and buyers	2022
	Traceability	Setting up and providing monitoring infrastructure and tools to smallholders			
Inputs	Input provision	Provision of fertilizer, pesticides and herbicides on credit	Improved yields for smallholders Reduction in costs by more targeted use of inputs	Smallholders receive FFB revenues minus material, transport and interest expenses at time of harvest	2019
Market access	Direct sourcing	Collection and sourcing CSPO directly from smallholders and farmer groups	Cutting out of middleman potentially increases margin smallholders	Covered as Cost of Goods Sold of PT PAS oil palm sales	2019

## SDM overview | Non Timber Forest Product services

PT PAS provides a wide range of NTFP services to the villages on and near concessions PT MAR, PT CUS and PT JV

Service		Delivery mode	Farm-level impact	Revenue model <i>for PT PAS</i>	Operational <small>since / by</small>
Training	Coffee GAP training	Annual training on coffee GAP for four years	Additional income stream	N/A	2019 in PT MAR and PT JV 2020 in PT CUS
	Beekeeping training	Annual training on good beekeeping practices for three years	Additional income stream Food security	N/A	2017 in PT MAR 2018 in PT JV and PT CUS
	Poultry farming training	One-time training on good poultry farming practices	Additional income stream Food security	N/A	2019 in PT MAR 2020 in PT CUS
Inputs	Coffee seedlings & Agrochemicals	Provision of coffee seedlings in the first year and agrochemicals during the first 4 years	Additional income stream	N/A	2019 in PT MAR and PT JV 2020 in PT CUS
	Beehive & Beekeeping equipment set	Provision of beehives and the beekeeping equipment in the first year	Additional income stream Food security	N/A	2017 in PT MAR 2018 in PT JV and PT CUS
	Chicks, Vaccinations & Animal feed	Provision of chicks, vaccinations and animal feed during the first 3 years	Additional income stream Food security	N/A	2019 in PT MAR 2020 in PT CUS

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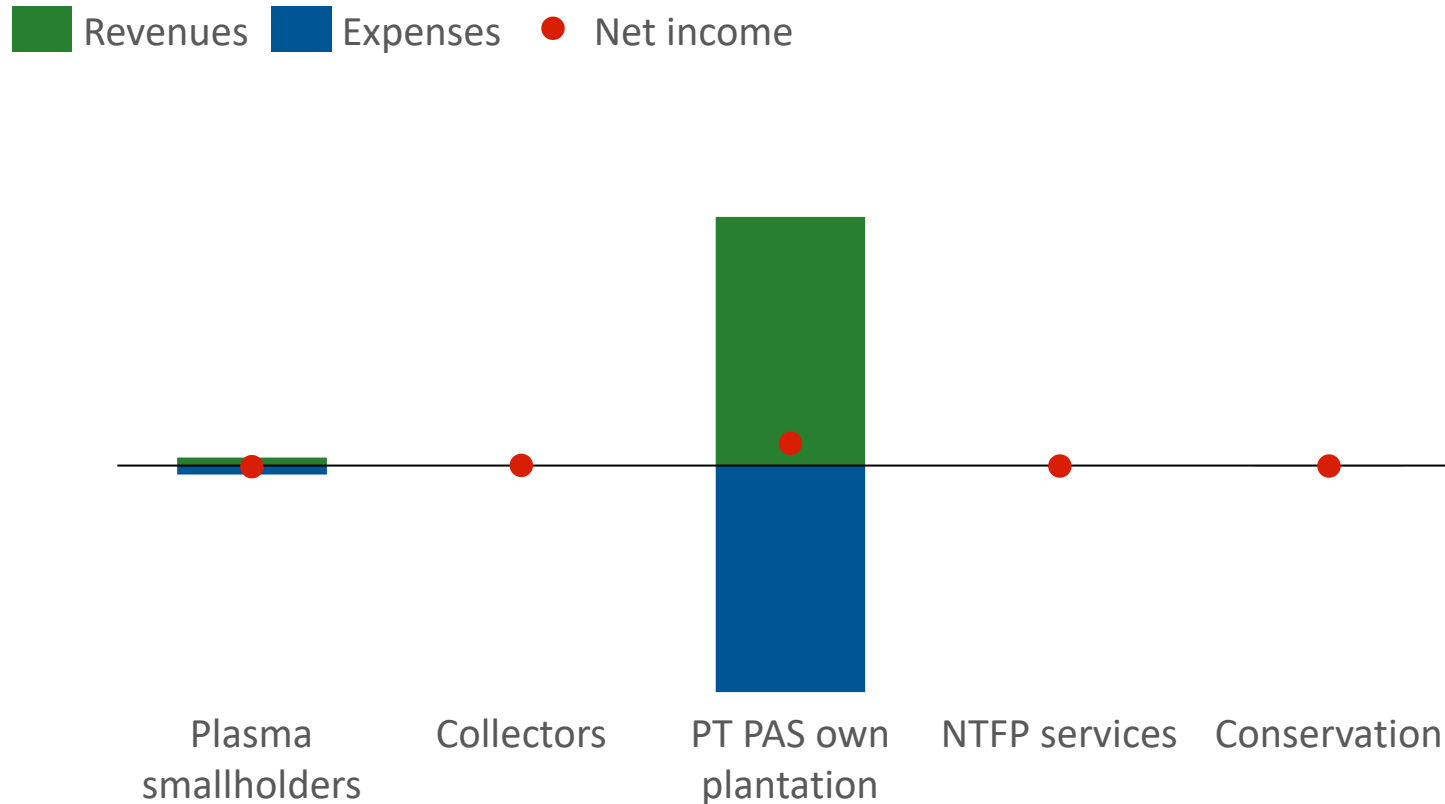
5. Impact case

6. Annex

## Business case | PT PAS profitability

PT PAS runs a profitable oil palm business which allows for financing of their social and environmental activities. The plasma smallholder SDM, NTFP services and conservation efforts make up 0.5% total expenses

### Annual average profitability in M USD by activity, for 2017-2019



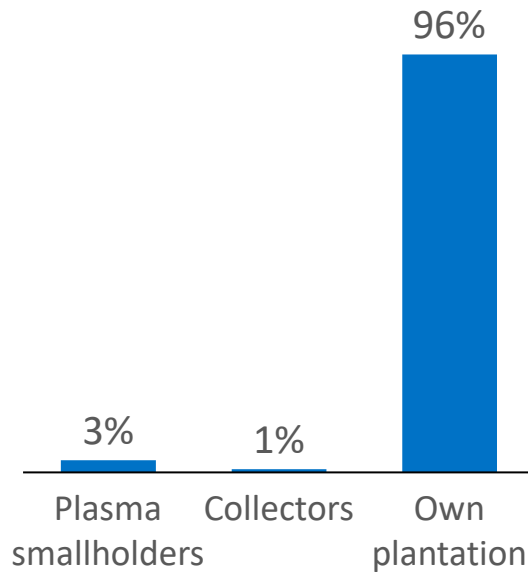
- PT PAS runs a profitable business with an overall net income growing from X M USD in 2017 to a projected Y M USD by 2024.
- Sourcing from the own plantation and through collectors appears to be more profitable than sourcing from plasma smallholders, which is due to the higher expenses per MT FFB caused by the training and certification costs.
- The provision of NTFP services and conservation efforts are also cost drivers for PT PAS. However, it weighs little on the overall profitability of the company – representing a mere 0.1% and 0.3% of the total expenses.

*Note: The margin per FFB sourced has the same value for Plasma smallholders, Collectors and PT Pas own plantation FFB due to a lack of more detailed information on commercial margins. Therefore, the sourcing revenues from Plasma smallholders do not include the additionality of a certification premium.*

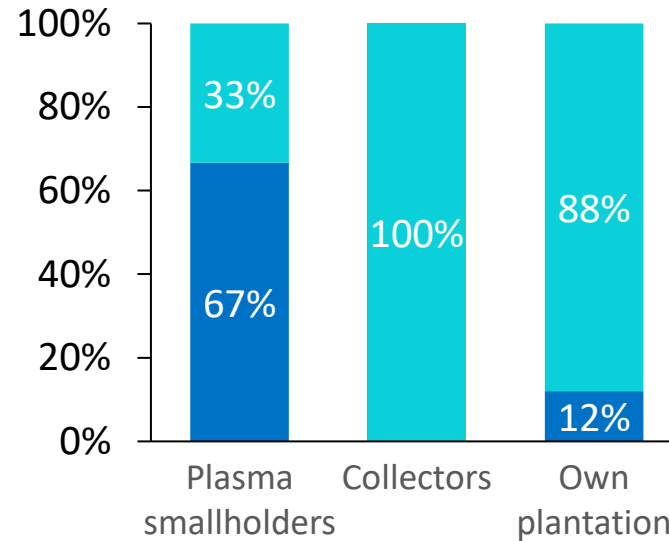
# PT PAS sourcing volumes and margins

As of 2020, direct sourcing from plasma smallholders accounts for only 3% of total volumes, has the highest share of RSPO certification, yet comes at a net loss per MT sourced\*.

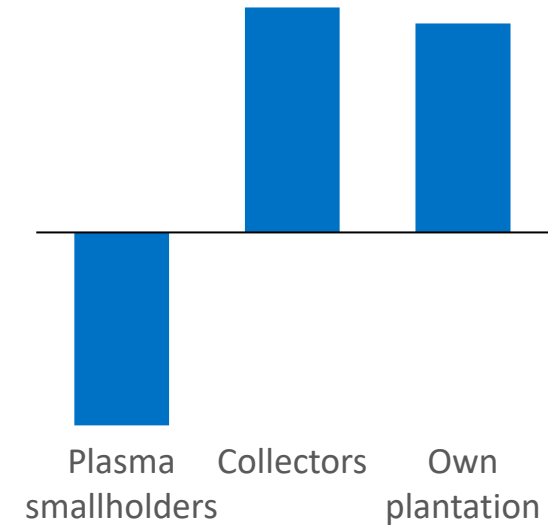
Supply by channel, in % of total



% certified supply by channel, in %



Net profit\*\* by channel, in USD per MT



■ Certified ■ Non-certified

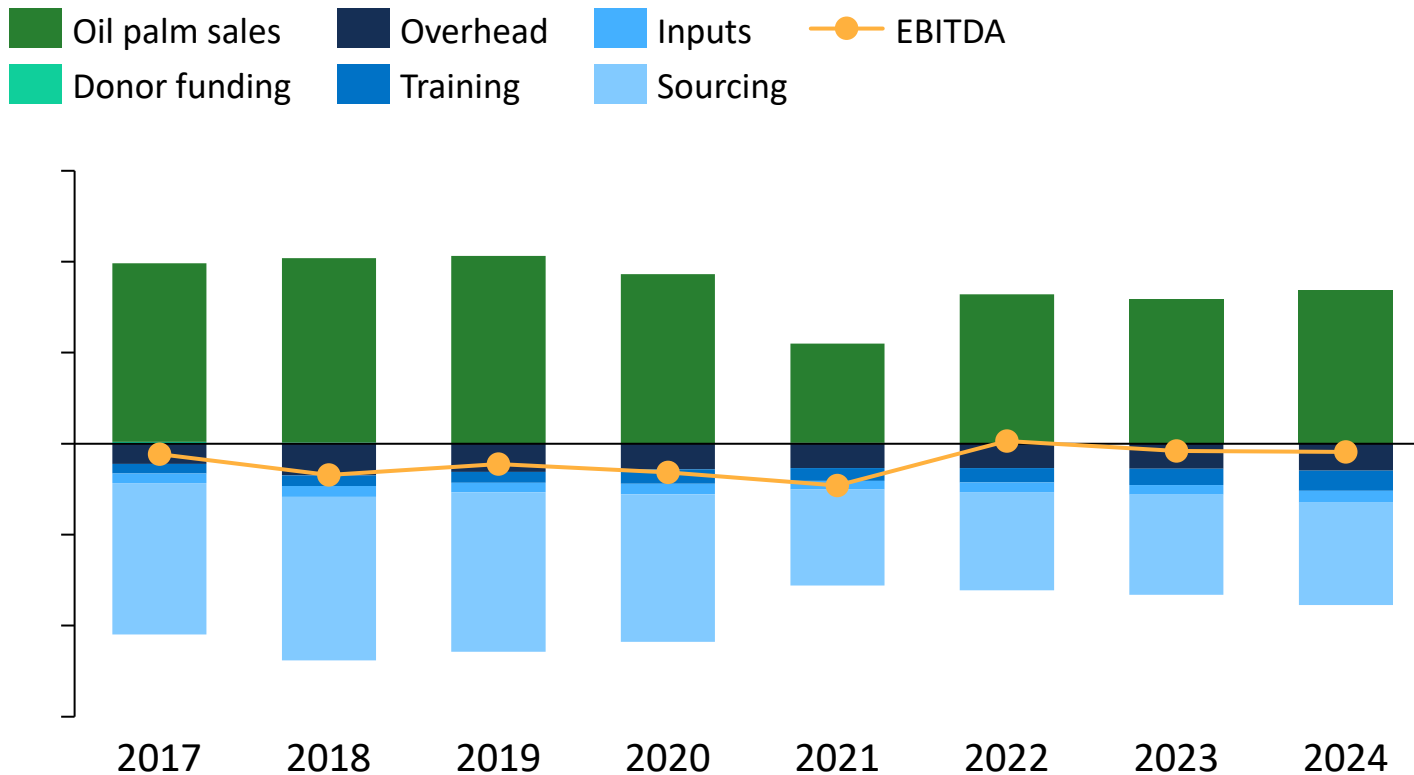
\* For details on the cost allocation of indirect costs to the different PT PAS activities (own plantation, plasma smallholders, collectors, NTFPs, conservation), [see annex](#)

\*\* COGS per MT FFB and Oil palm sales per MT FFB are assumed the same for Plasma smallholders, Collectors and Own plantation due to limited availability on commercial sourcing data. Actual differences in COGS across the sourcing channels re not taking into account

## Business case | Palm oil plasma smallholder farmer services and sourcing

The combined sourcing and service delivery model to plasma smallholders is loss-making. Sales margins seem to be insufficient to off-set the high aggregation, transportation and service delivery costs.

### Revenues and expenses by plasma smallholder palm oil services in M USD per year



- The Plasma smallholder SDM is not profitable for PT PAS over time, as PT PAS has no mechanism to recover any of the expenses related to the implementation of the SDM (Training, Inputs and Overhead).
- The commercial profit on oil palm sourced from the Plasma smallholders can cover on average 61% of the SDM expenses.

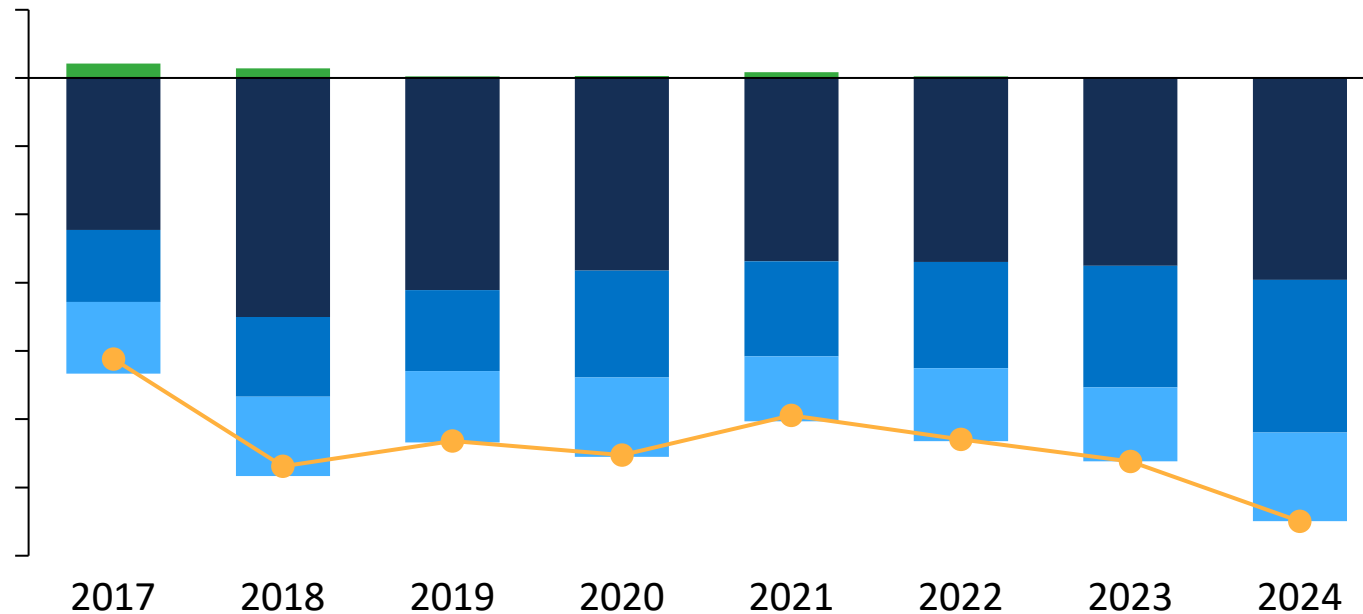
*Note: The margin per FFB sourced has the same value for Plasma smallholders, Collectors and PT PAS own plantation FFB due to a lack of more detailed information on commercial margins. Therefore, the sourcing revenues from Plasma smallholders do not include the additionality of a certification premium.*

## Business case | Palm oil plasma smallholder farmer services only

Service provision is seen as an investment generating indirect benefits such as increased productivity and quality and ultimately higher margins. Subsidies cover only a fraction of the costs.

### Revenues and expenses by plasma smallholder palm oil services in k USD per year

Donor funding Overhead Training Inputs EBITDA



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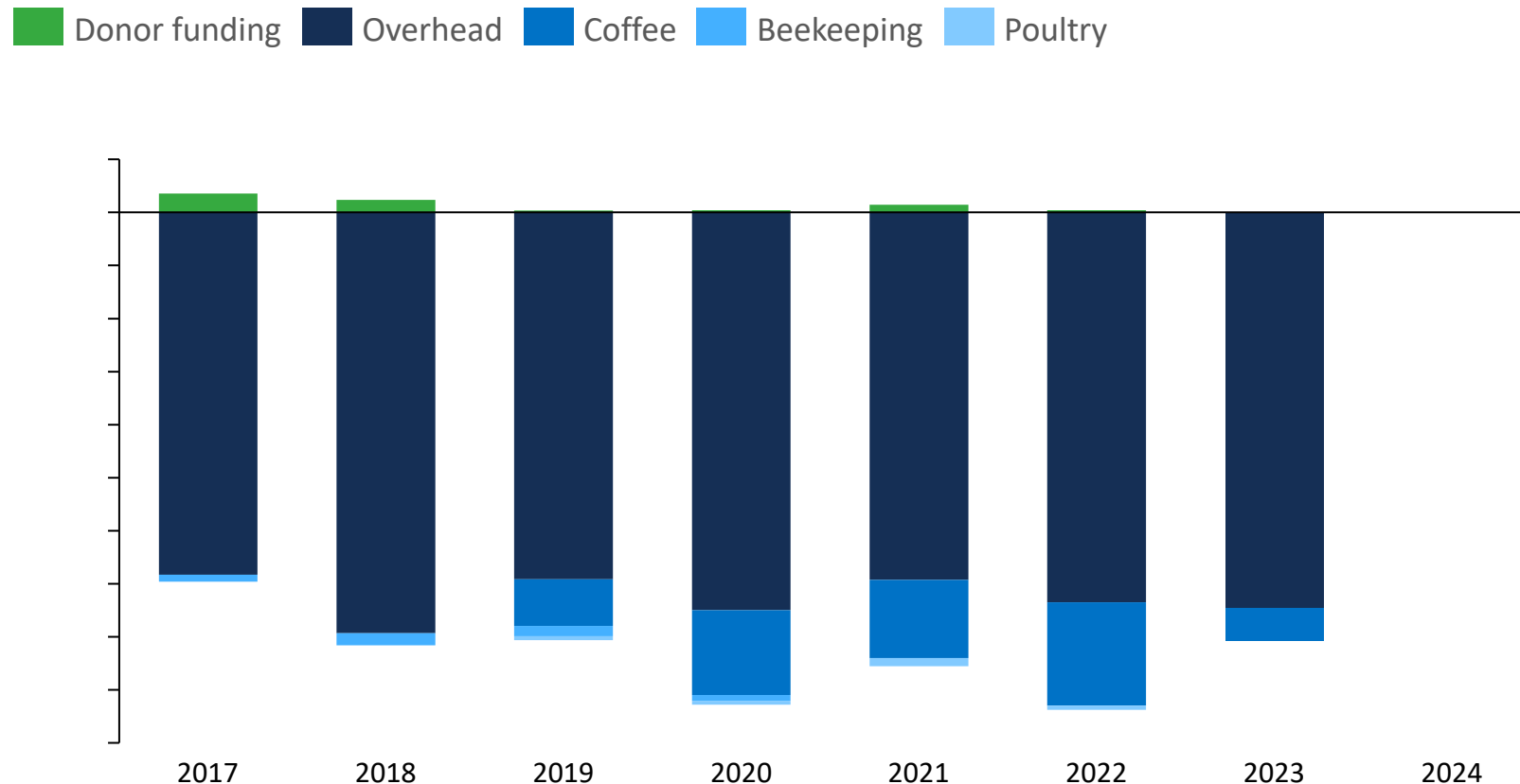
*Note: The margin per FFB sourced has the same value for Plasma smallholders, Collectors and PT PAS own plantation FFB due to a lack of more detailed information on commercial margins. Therefore, the sourcing revenues from Plasma smallholders do not include the additionality of a certification premium.*



## Business case | NTFP service profitability over time

NTFP services cost PT PAS between 350,000 and 470,000 USD per year, generating indirect benefits for communities. PT PAS aims to exit the program by end of 2023 and ensure community self-sufficiency

### Revenues and expenses by NTFP in k USD per year



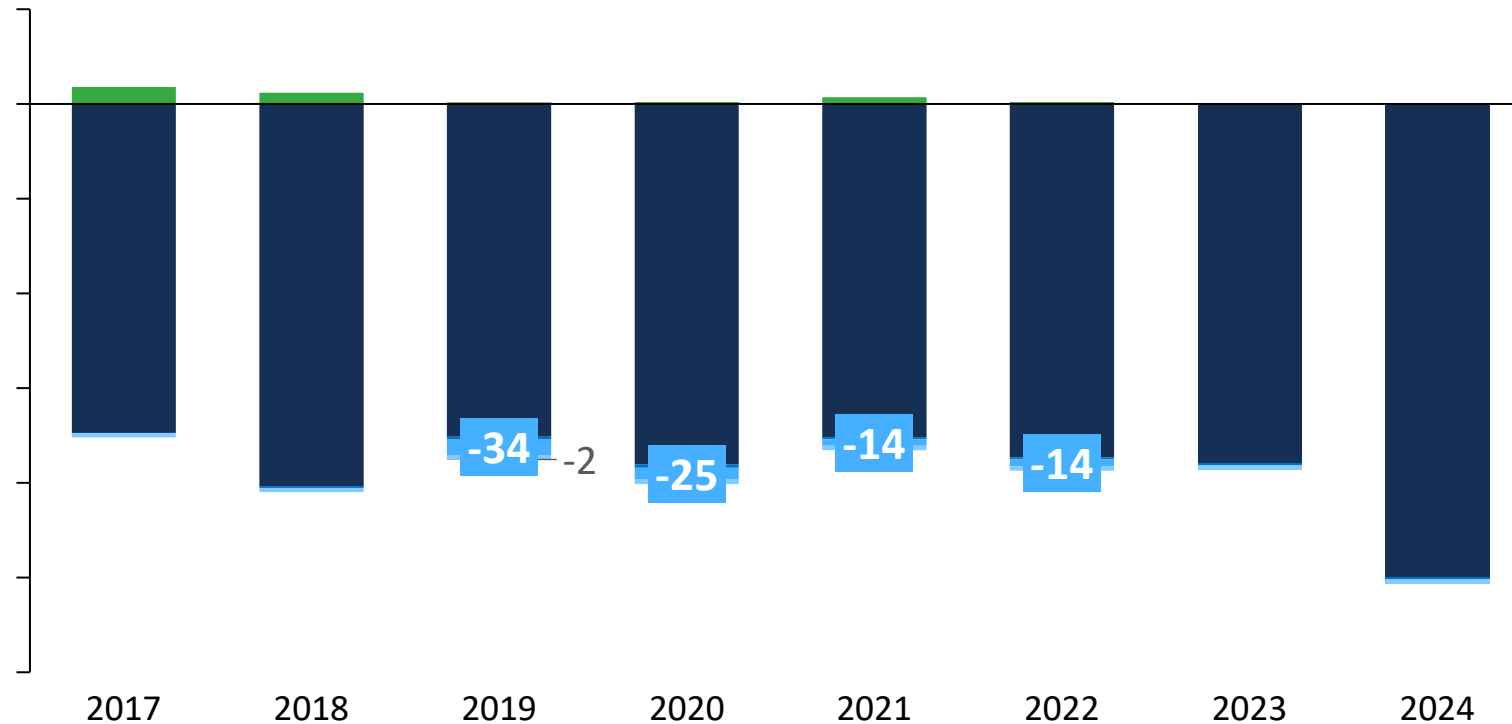
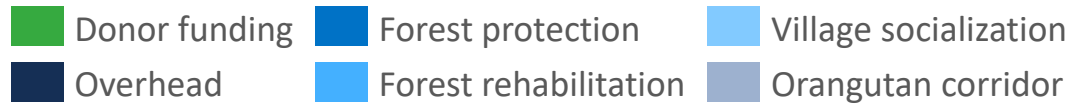
- NTFP service provision does not generate revenues for PT PAS.
- PT PAS starts in 2017 with providing services for beekeeping. From year 2019 onwards, they also implement their coffee and poultry program. The NTFP service provision ends by 2023.
- When comparing all three NTFP services over time, the coffee program runs the longest as smallholders are supported until the plantation starts producing and coffee clearly represents the largest expense due to the high annual coffee GAP training expenses.

Note: Overhead includes expenses such as staff cost for all NTFP services, General & Admin expenses and Finance expenses which were allocated to NTFP services in general. See the [Cost allocation key](#) in annex for details.

# Business case | Conservation profitability over time

Conservation activities are costing PT PAS between 700,000 and 1,000,000 USD per year, mainly driven by overheads\*. At this moment no revenues are generated other than some grant-funding

## Revenues and expenses by NTFP in k USD per year



- Conservation constitutes an expense for PT PAS as there are currently no revenue-generating activities.
- The largest cost categories in conservation are Overhead, Forest rehabilitation, and dissemination activities to surrounding villages.

Note: Overhead includes expenses such as staff cost for all Conservation activities, General & Admin expenses and Finance expenses which were allocated to Conservation in general. See the [Cost allocation key](#) in annex for details.

# Report outline

**1. Executive Summary**

**2. Context**

**3. SDM overview**

**4. Business case**

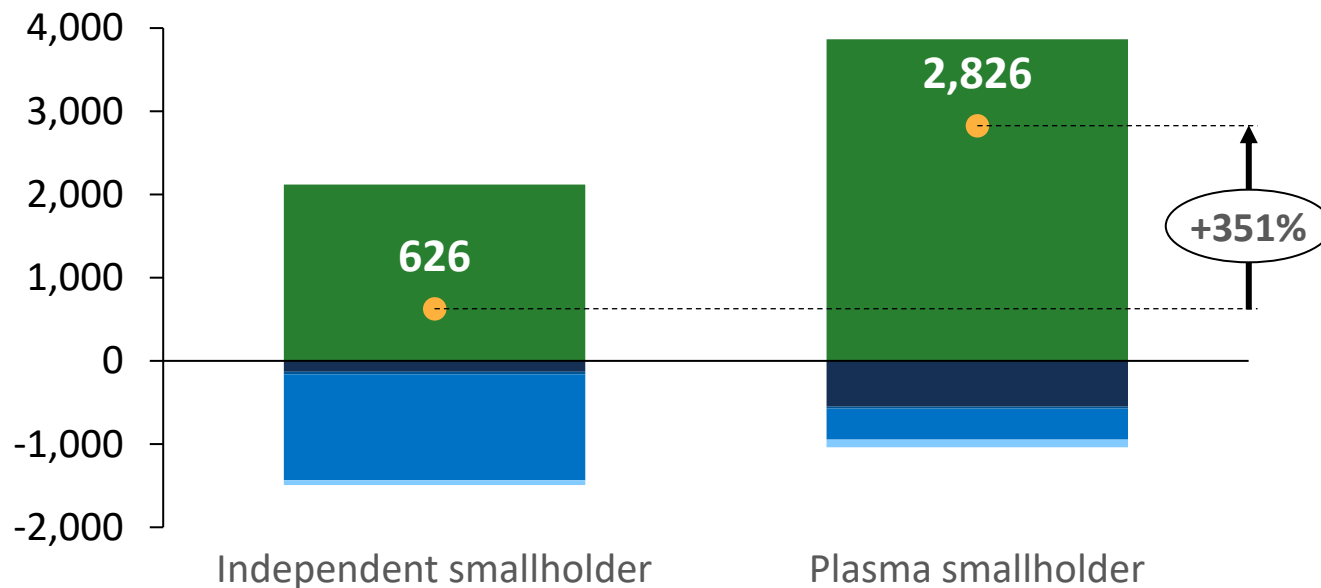
**5. Impact case**

**6. Annex**

## Impact case | Change in FFB income

Working with PT PAS, plasma smallholders can earn 3.5 times more than independent smallholders. Improved yields and higher prices drive up sales revenues while agro-chemical expenses decrease drastically.

### Profitability in USD per year per hectare

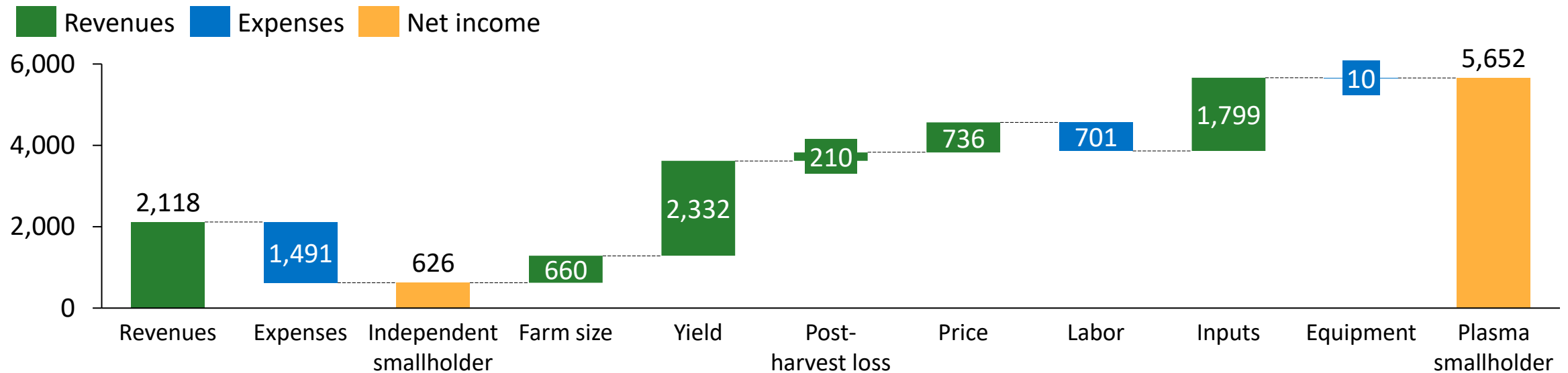


- Receiving services from PT PAS directly provides Plasma smallholders with the opportunity to earn 2,826 USD/ha per year as opposed to earning 626 USD/ha as an Independent smallholder.
- The main differences between the profitability of an Independent and Plasma smallholders are yields, prices, agrochemical use and labor expenses.
- In three years, Plasma smallholders could earn up to 5,562 USD annually on a 2ha oil palm farm, which would elevate their household out of poverty.

## Impact case | Profit drivers

Higher yields, higher prices and a reduced input expenses are the primary drivers of increased smallholder farmer income.

Change in income by profit driver in USD per household per year

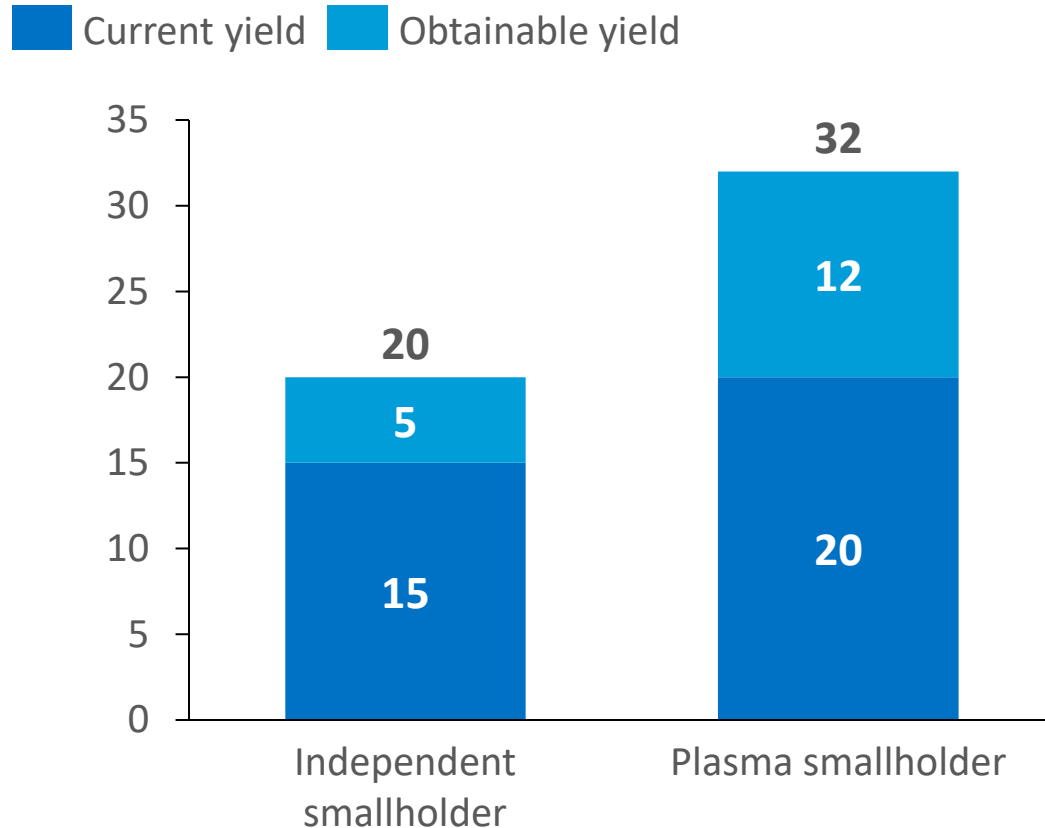


- The largest income drivers are yield, inputs, farm size, labor and price in order of size. [Find the assumptions in the annex.](#)
- PT PAS's support on GAP training and adoption not only increases FFB yield, it also improves their FFB quality. Sourcing quality FFB enables PT PAS to pay a 11% higher farm-gate price and improve the smallholder's livelihood and loyalty.
- Through the GAP training, smallholders understand they need to apply fewer quantities of fertilizer, pesticides and herbicides. Combining this with Plasma smallholders' access to fertilizer at half the local price leads to a significant reduction of input costs.
- On average Plasma smallholders have an oil palm plot double the size as Independent smallholders.

## Impact case | Change in yield

Plasma smallholders can substantially increase their yield with more than 50% through PT PAS training on GAP, path maintenance and agro-chemical application.

### Change in FFB yield, in MT FFB per hectare per year



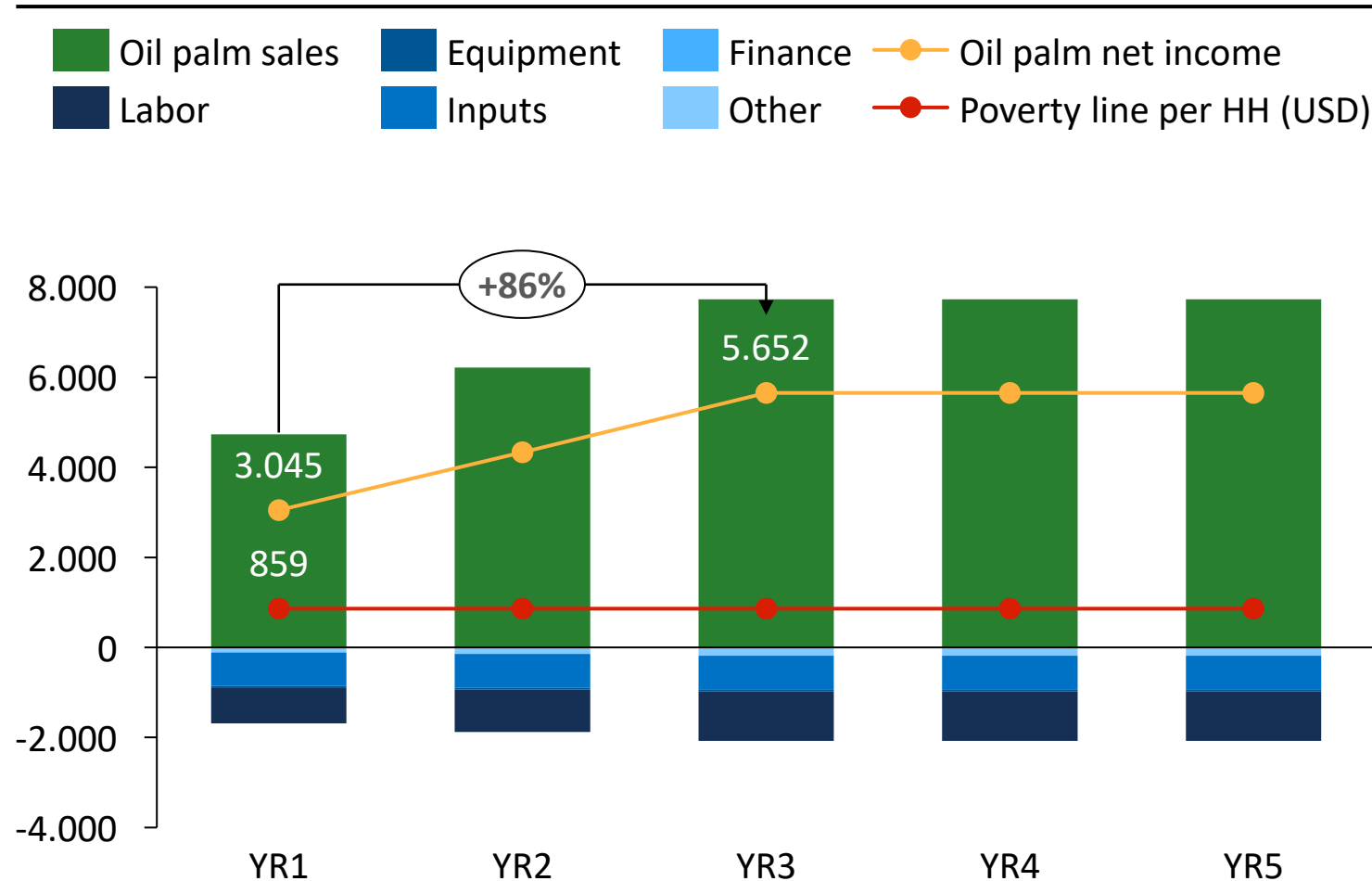
- The Independent smallholders have a very low yield of 15 MT FFB per hectare due to lack of proper training and adoption of GAP and the severe overuse of agro-chemicals. There is potential to increase their yield to 20 MT FFB per hectare in one year by applying good agronomical practices.
- PT PAS oil palm services allow Plasma smallholders – who already have higher yields of 20 MT FFB per year to increase their yields to 32 MT per hectare in two years time.
- Access to consistent GAP training, supervision on GAP adoption regarding path maintenance and agro-chemical application are the key drivers of increasing yield.

Note: The Independent and Plasma smallholder have on average 10year old plantations, therefore their current yield coincides with the regional average yield per ha of 15MT FFB and 20MT FFB respectively.  
Sources: 1) IDH Indonesia, 2) PT PAS interviews, 3) Nebraska study on West Kalimantan oil palm yield

## Impact case | Plasma smallholder profitability

Assuming relatively stable productivity as trees age, plasma smallholders can increase their income by 86% in two years time, earning more than five times above the poverty line

Plasma smallholder profitability in USD per household per year

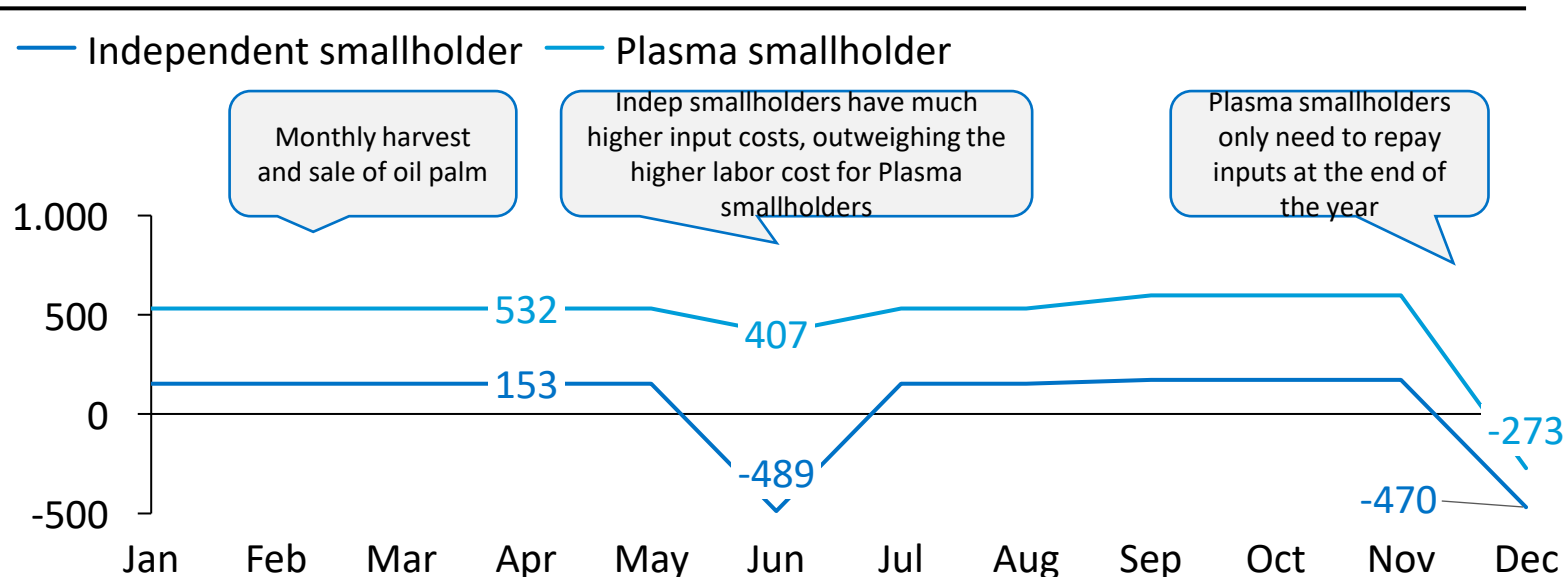


- On average, Plasma smallholders can increase their earnings from 3,045 USD annually up to 5,562 USD in two years time.
- Being part of PT PAS's can elevate the smallholders out of poverty and earn a livelihood more than five times above the poverty line of 859 USD.
- The largest expenses for Plasma smallholders are labor and input, representing respectively 52% and 37% of total expenses.
- Labor costs are high as all labor is hired and labor rates are higher than general to receive better services.
- Additionally, labor costs are expected to increase over time as the total production increases due to improving yields and decreasing post-harvest losses.

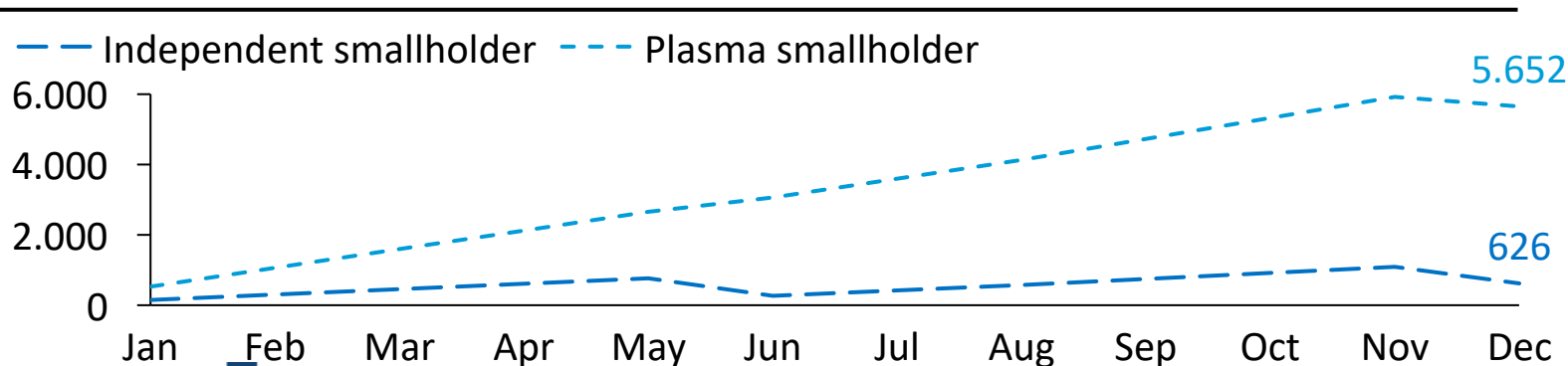
# Impact case | FFB cashflow

Plasma smallholders have a more spread out and stable cashflow pattern than Independent smallholders due to their higher monthly earnings and delayed payment plan for inputs.

**Net smallholder cashflow in USD per household per year**



**Cumulative Oil palm cashflow in USD per year**



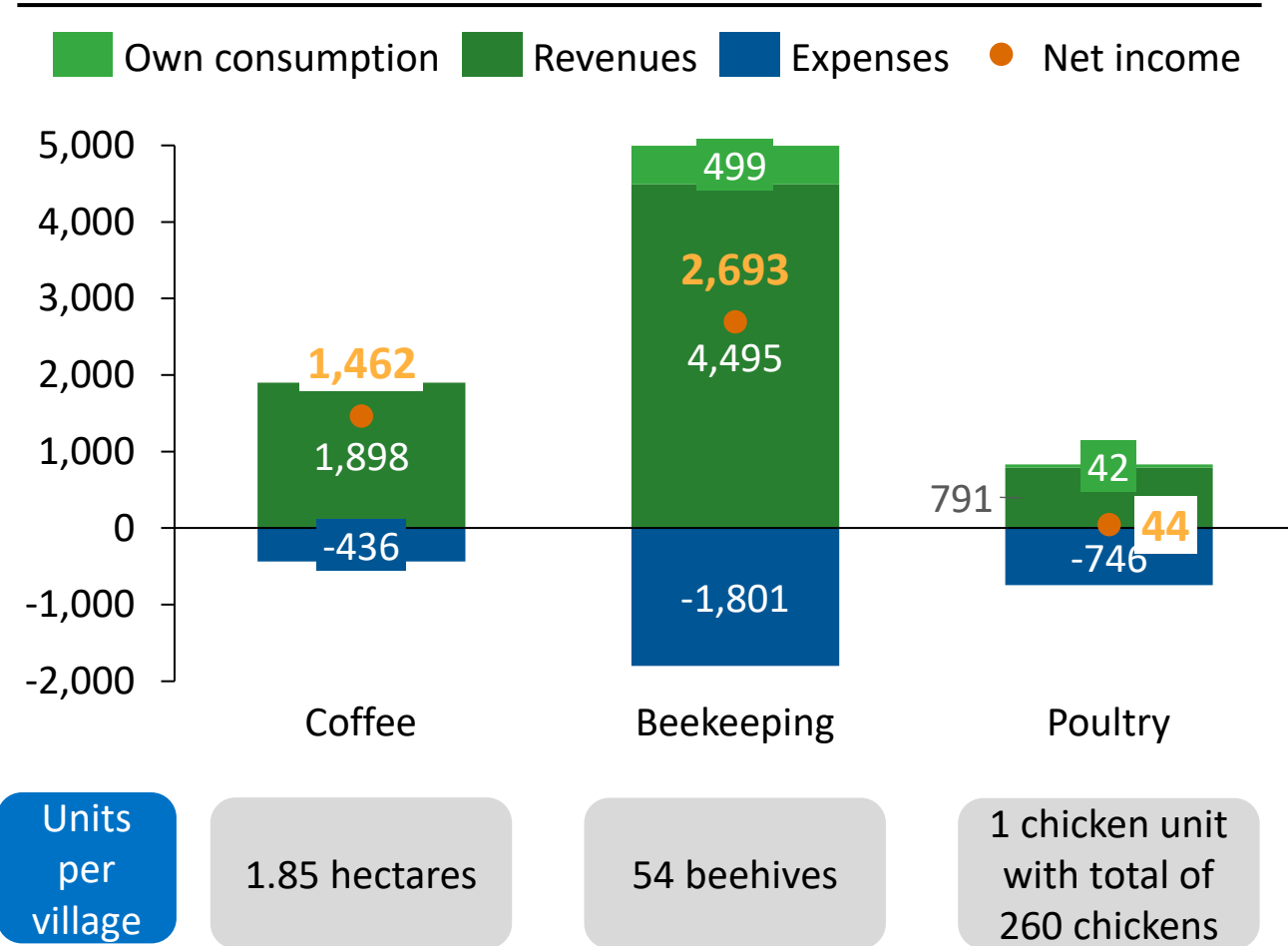
- Plasma smallholders have a clear advantage to Independent smallholders as they earn more on a monthly basis due to their higher yield, price and farm size.
- Secondly, PT PAS pays for inputs in advance and the Plasma smallholders are only required to repay the amount at the end of the year. Independent smallholders on the other hand pay twice a year.
- Thirdly, while Plasma smallholders have a much higher labor cost this is strongly outweighed by the stark reduction in input price and volumes needed.
- On a cumulative basis however, both smallholders appear to have no expected cash flow issues if they are able to save up the monthly revenues for June and December where expenses are significantly higher.



# Impact case | NTFP profitability

While all NTFP are profitable for the village, beekeeping has the largest potential in terms of highest and most timely revenue and its nutritional value

Annual profitability by NTFP in USD per village (PT MAR)

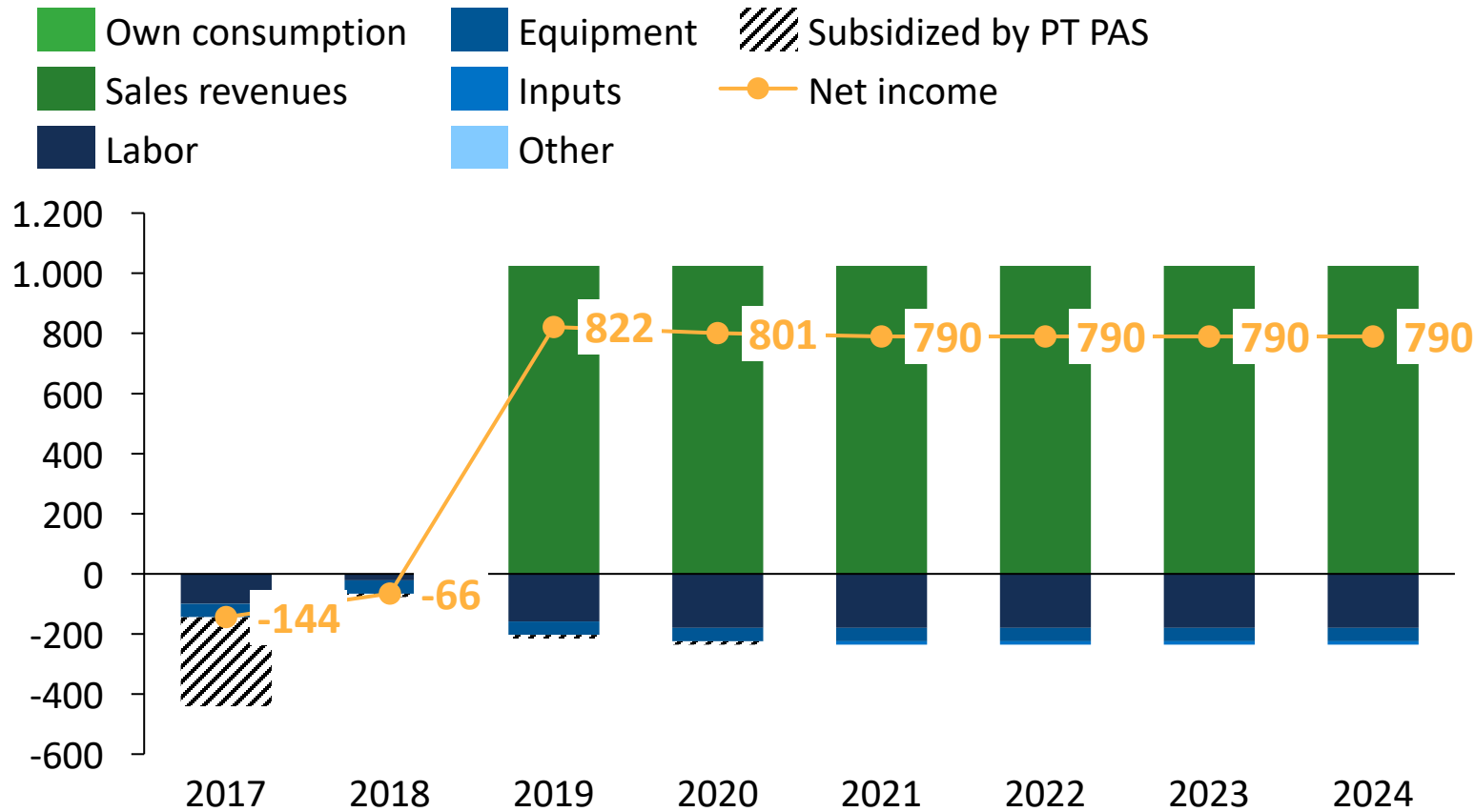


- PT PAS provides a mix of NTFP and services to each village based on the specific needs of each concession.
- The villages in PT PAR are each provided with on average 1.85ha of coffee, 54 beehives and 1 chicken unit throughout the years 2017-2023.
- When comparing the business case for NTFPs it is clear for the villages in PT MAR that beekeeping is not only the most profitable, it also provides them with a substantial amount of honey for own consumption, benefiting their food security.
- Coffee farming also provides a lucrative business for the village, however only from year 3 since planting onwards.
- Poultry is considered to be the least profitable as the annual costs for the village to maintain the chicken unit is very high, totaling to 90% of the total value made by poultry farming.

# Impact case | Coffee profitability

Coffee farming can provide additional revenues to the villagers from year 3 onwards, but in the first 2 years the coffee farm requires labor and equipment for the set-up and maintenance of the farm.

Annual coffee profitability per ha in USD per year

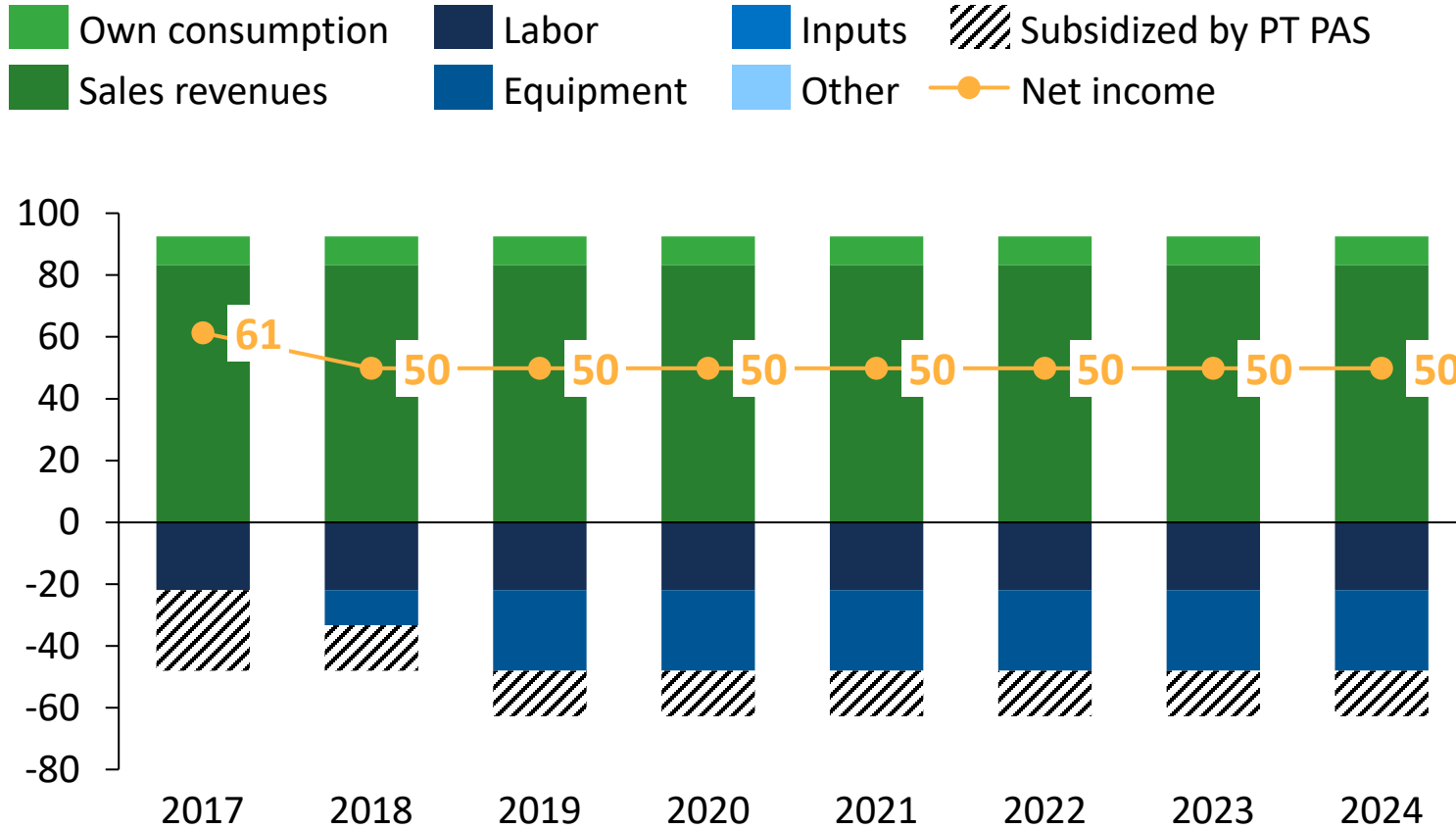


- Coffee farming only becomes profitable from year 3 as the coffee trees need time to start producing and the coffee farm needs to be prepared and maintained by the villagers.
- PT PAS subsidizes the cost for all seedlings, the inputs during the first 4 years, and provides training on GAP for four years.
- Coffee profitability decreases slightly by year 5 as the coffee trees need to be pruned annually, thereby increasing labor costs.

# Impact case | Beekeeping profitability

Beekeeping can provide a stable income source for the village from year 1, as long as the villagers reinvest their earnings bi-annually to purchase new equipment.

**Beekeeping profitability per beehive in USD per year**

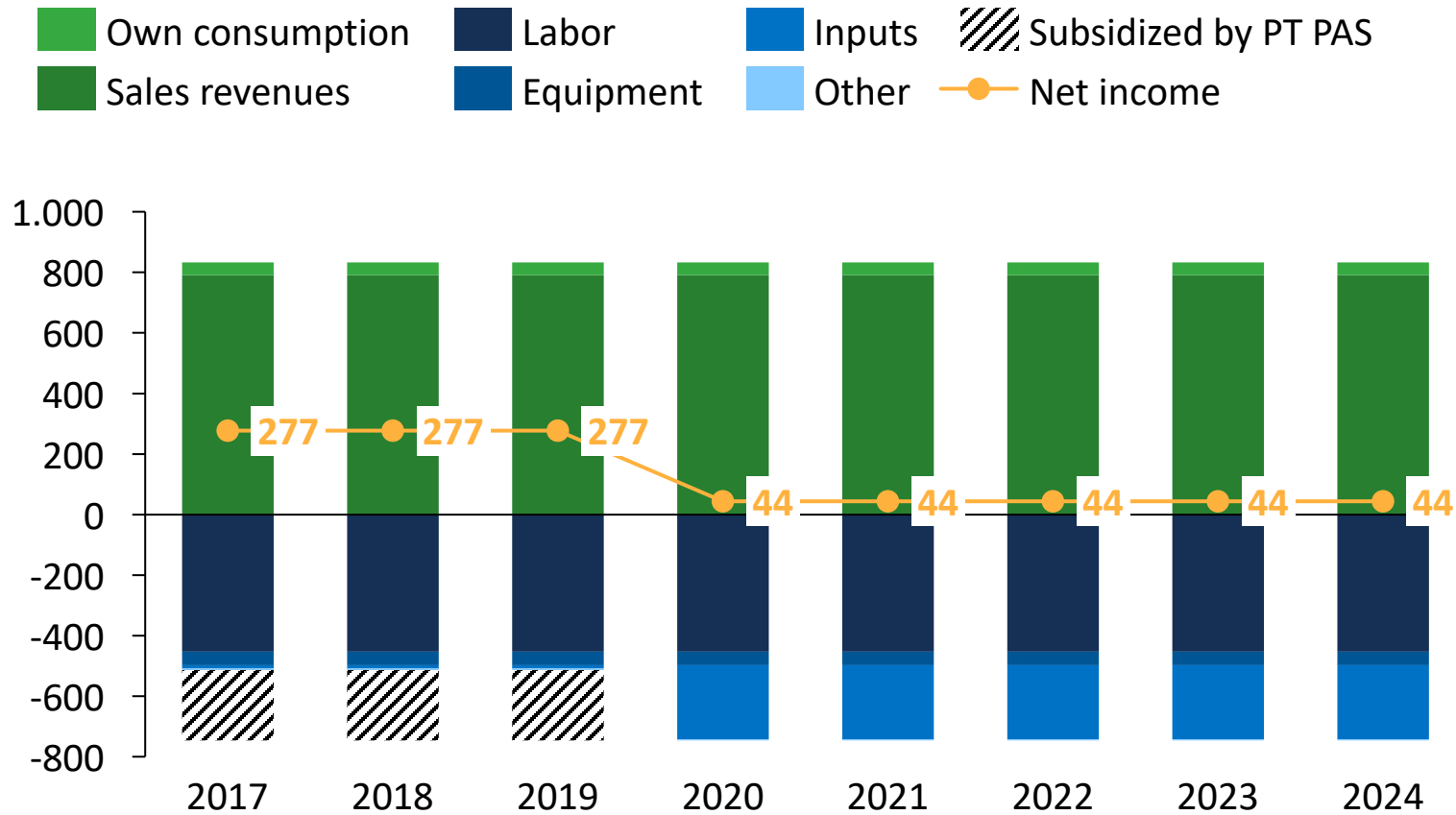


- Beekeeping appears to be a profitable activity from year 1. One beehive can generate an average net income of 50USD per year.
- The beehive can be harvested three times a year providing a steady income stream to the village.
- PT PAS subsidizes the purchase of the first beehive and beekeeping set. The following years, the village needs to use the earnings from the first two years to reinvest in their equipment.
- As the village has multiple beehives at one time, they can profit from economies of scale and spread the cost of the beekeeping set cost across the beehives.

# Impact case | Poultry profitability

Poultry farming can be a stable and profitable business for the village, however it is cost-inefficient with labor and inputs costs taking up for 88% of the revenues.

**Poultry profitability per chicken unit in USD per year**



- Poultry farming can be a profitable business for the village from year 1, providing a steady income every 3 months.
- However, once the subsidy from PT PAS ends, its profitability decreases from 277USD annually to 44USD annually per chicken unit.
- PT PAS subsidizes the purchase of all chicks, their vaccinations and their animal feed during the first 3 years. The following years, the village will need to use the earnings generated during the earlier years to reinvest in their inputs.
- With one chicken unit for 65 chickens, the village can produce up to 260 chickens annually. If the village allocates 5% of the total production for own consumption, they could consume up to 12 chickens in one year.

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# Annex | Glossary

Abbreviation	Meaning
CPO	Crude Palm Oil
CSPO	Crude Sustainable Palm Oil (certified)
FFB	Fresh Fruit Bunches
GAP	Good Agricultural Practices
ISPO	Indonesia Sustainable Palm Oil
ISCC	International Sustainability and Carbon Certification
NTFP	Non-Timber Forest Products
P&L	Profit & Loss Statement
PKO	Palm Kernel Oil
RSPO	Roundtable on Sustainable Palm Oil
SDM	Service Delivery Model
SWOT	Strengths, Weaknesses, Opportunities & Threats
USD	United States Dollar (currency)

# Assumptions | Smallholder farmer segments

	Independent smallholder	Plasma smallholder
Average farm size	2 ha	
Average oil palm size	1 ha	2 ha
Average tree age in year 1	10 years	
Replanting rate	N/A	
Yield	Current: 15 MT FFB/ha Obtainable: 20 MT FFB/ha	Current: 20 MT FFB/ha Obtainable: 32 MT FFB/ha
Post-harvest loss	Current: 10% Obtainable: 5%	Current: 5% Obtainable: 3%
Farm-gate price	1,900 IDR/ kg FFB	2,100 IDR/ kg FFB
Loyalty to PT PAS	0%	100%
Income from other crops	78%	0%
Harvesting labor cost	200,000 IDR/MT FFB	225,000 IDR/MT FFB
Other labor cost	1,437,500 IDR/ha	3,350,000 IDR/ha
Fertilizer amount	1,940 kg/ha	1,384 kg/ha
Pesticides and herbicides amount	1.12 l/ha	1.17 l/ha
Fertilizer price	549,000 IDR/bag	222,000 IDR/bag
Pesticides and herbicides price	75,000 IDR/l	65,000 IDR/l
Transport cost	50 IDR/kg FFB	

# Assumptions | NTFP agronomics

	Coffee	Beekeeping	Poultry
<b>Price</b>	26,000 IDR/kg	130,000 IDR/kg	60,000 IDR/kg
<b>Unit</b>	1 ha	1 beehive	1 chicken unit with 65 chickens for 4 production cycles
<b>Yield</b>	700 kg/ha	12 kg/beehive	260 chickens/unit
<b>Own consumption</b>	0%	10%	5%
<b>Infrastructure</b>	n/a	350,000 IDR/beehive	1,500,000 IDR/chicken unit
<b>Labor cost</b>	4,350,000 IDR/ha	370,000 IDR/beehive	1,930,000 IDR/cycle/unit



# Assumptions | SDM operator

Conservation	2017	2024
Forest patrol	8,118,000 IDR	12,900,438 IDR
Fire Fighting	0	63,159,615 IDR
Village Socialization	150,000,000 IDR	162,555,926 IDR
Forest rehabilitation	0	0
Reforestation - sapling nursery	0	0
Reforestation - maintenance reforested zone	0	0
Orangutan corridor	0	0

# Assumptions | SDM operator

NTFP pilot – total scale	Year 1	Year 7
Coffee area	50 ha	
Beeboxes	150	650
Beekeeping equipment (one set of equipment: gloves, shoes and suit)	5	23
Chicks	1,800	6,692

NTFP pilot – start	Coffee	Beekeeping	Poultry
PT MAR	2019	2017	2019
PT JV	2019	2018	n/a
PT CUS	2020	2018	2020

NTFP pilot	Coffee	Beekeeping	Poultry
Training cost	120,000,000 IDR/village	23,100,000 IDR/village	11,550,000 IDR/village
Unit cost	5,300,000 IDR/ha (seedlings)	425,000 IDR/bee hive	8,382 IDR/chick
Equipment cost	n/a	555,000 IDR/equipment	n/a
Input cost	327,200 IDR/ha (agro-chemicals)	n/a	8,100 IDR/chick

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