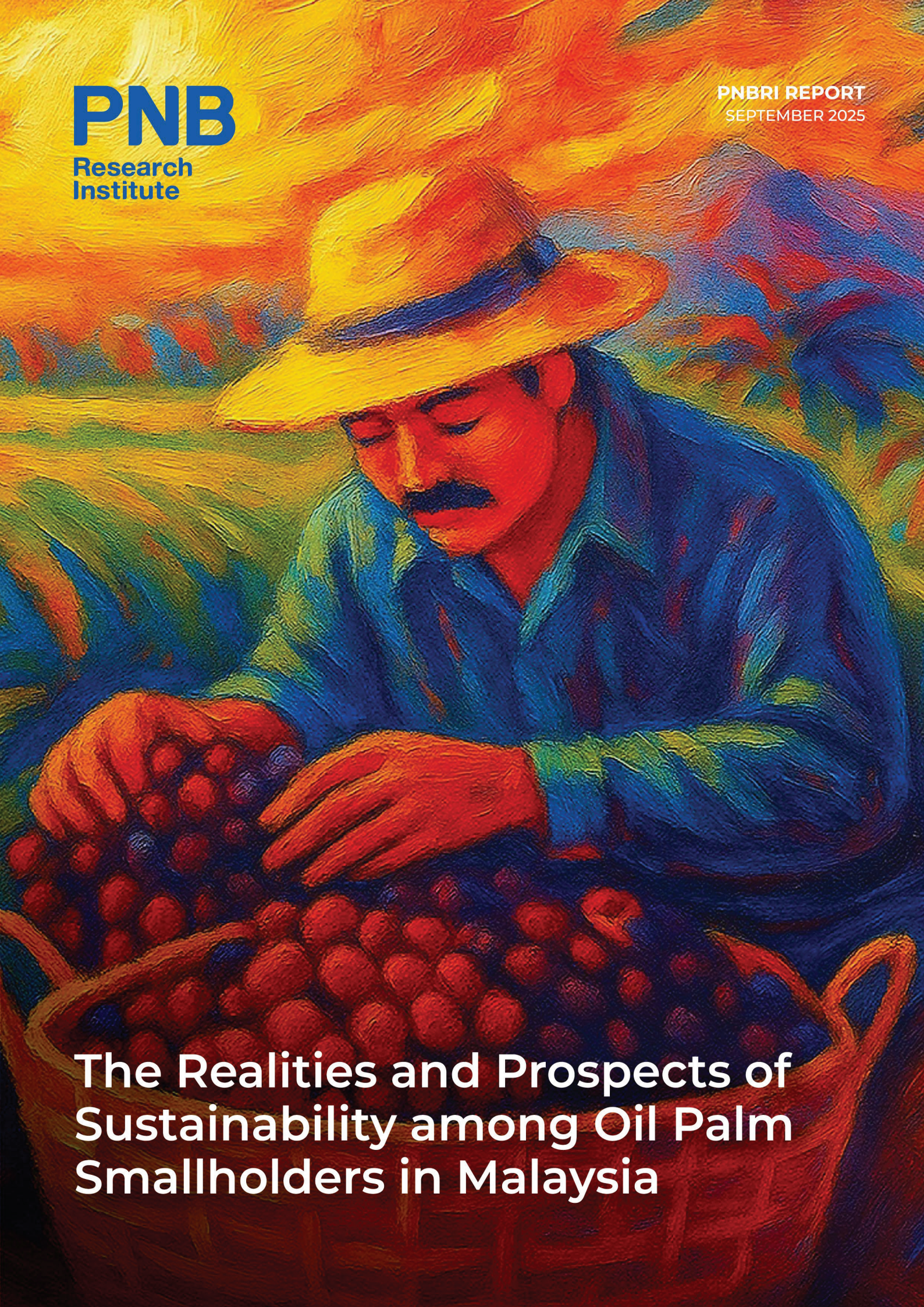
PNB Research Institute

PNBRI REPORT
SEPTEMBER 2025



The Realities and Prospects of Sustainability among Oil Palm Smallholders in Malaysia

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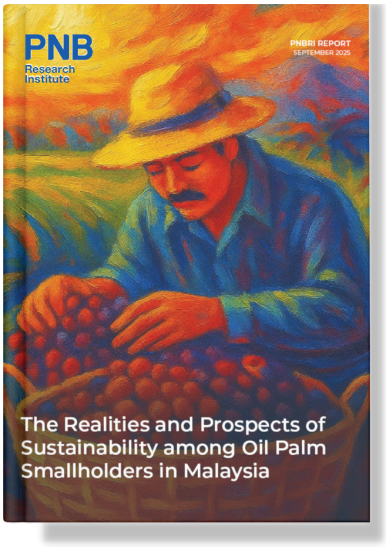

Our cover photo features the work of Abu (n.d.), reimagined through AI.

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This report was authored by Farhana Binti Roslan, Alia Binti Salleh, Dr Ahmad Farhan Bin Roslan, and Adibah Amira Binti Nazarudin. It was approved for publication by the Board of PNBRI and the Management of PNB. For further enquiries, please contact pnbri@pnb.com.my

Foreword

First and foremost, the authors would like to express our utmost gratitude to the smallholders and field officers across Malaysia whom we met in the course of this research. Their candid and hopeful sharing humbled us researchers who came into the project thinking we were equipped to represent their voices. It had since become clear to us that we were just one tiny part of their larger stories – but hopefully a useful one.

Our gratitude extends to current PNB Research Institute (PNBRI) board members, YBhg. Dato' Rizal Rickman Ramli, Ms. Hanizan Hood, and Ms. Nimmi Kamal, for their continued support on the project. Thank you also to Mr. Ahmad Zulqarnain Onn (former PNBRI board member) and Mr. Mohd Redza A. Rahman (former Head, PNBRI), under whose leadership the idea to undertake a comprehensive study on palm oil smallholding was initiated, as well as Dr Sarena Che Omar, under whose leadership the study was concluded. On this note, we are grateful to the management of Permodalan Nasional Berhad (PNB), under the stewardship of Y.M. Raja Tan Sri Dato' Seri Arshad bin Raja Tun Uda and YBhg. Dato' Abdul Rahman bin Ahmad, for having funded and supported this research, including colleagues from the Economics, Investment Research, and ESG Departments who have been our pillars of intellectual and logistical support in various stages of this study.

The authors dedicate our special appreciation to Professor Ahmad Shaufique Siddique from Universiti Putra Malaysia (UPM) and his dedicated team of consultants. Specifically, we thank Dr. Muhammad Firdaus Sulaiman, Dr. Ahmad Hanis Izani Abdul Hadi, Dr. Hayrol Azril Mohamed Shaffril, Dr. Nur Ameera A Jaz, (Associate Prof. Dr.) Nitty Hirawaty Kamarulzaman, Dr. Abdulla Ibragimov, Dr. Halimatun Saadiah Hafid, and Iffahani Azhar Helmi. We confer our utmost gratitude to Tuan Haji Adzmi Hassan and his colleagues at the National Association of Smallholders (NASH), as well as Puan Sheilyza Mohd Ishak of the Malaysian Palm Oil Board (MPOB), who were pivotal in the data collection phase of this study. We are also grateful to Ahmad Fikri Fisal and Anis Farhana Amran for their contributions in the data collection phase of this research.

Our profound appreciation is further dedicated to the subject matter experts whose review of this report elevated its rigour and quality, specifically YBhg. Datuk Dr. Ahmad Parveez Ghulam Kadir PJN. PhD. FASc., Associate Professor Dr. Asad Ata, Professor Dr. Asan Ali B. Golam Hassan and Dr. Cheah Wai Yan. We would also like to sincerely thank the teams led by Dr. Norkaspi Khasim, Haji Khairuman Hashim, and Y.M. Raja Zulkifli Raja Omar at MPOB for their valuable comments based on their on-the-ground experience with oil palm smallholders.

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Last but definitely not least, the authors owe our thanks to Nur Amira Aiza and Mior Adlizul Jazmi, for their excellent artwork on the report, alongside the Corporate Affairs Team at PNB for supporting us in every step of the way.

We sincerely hope this research report will shine a light on a critical topic to the oil palm sector and benefit various stakeholders such as policy makers, regulators, academicians, the investments community, associations, consumers, and other relevant parties.

Executive Summary

The country's progress towards sustainable palm oil has been significant. Malaysia is currently the world's second-largest producer (24% of total world production, as of June 2025) and has shown great strides in undertaking sustainable practices and ensuring a responsible supply of palm oil. At the time of writing, close to 90% of the total Malaysian oil palm planted area is certified as sustainable by the official national standards, the Malaysian Sustainable Palm Oil (MSPO), and more than one quarter is certified as sustainable by the internationally recognised Roundtable for Sustainable Palm Oil (RSPO).

While having largely been successful overall, Malaysian oil palm smallholders represent a sector of planters in the country that continue to face challenges in complying with sustainability certification standards. In part these are due to deforestation regulations, unregulated land clearing, environmental degradation, and human rights matters, but at the core of the problem is their economic livelihood. Unsurprisingly, these regulations have a more significant impact on smallholders compared to large plantation corporations and arguably even medium-sized growers. As such, they are at risk of exclusion from the global sustainable palm oil supply chain, thus increasing their economic vulnerabilities and viabilities.

This work demonstrates PNB's effort to ensure that effective implementation translates into measurable outcomes across its enterprise and investment portfolios. As part of PNB's GEAR-uP commitment to spearhead the automation of Malaysian oil palm plantations and supporting the livelihoods of the communities adjacent to the plantations that it is indirectly invested in, Project PALMA aims to explore the present and future challenges of sustainable palm oil among smallholders in Malaysia, ensuring economic prosperity for local communities while protecting the environment for future generations, in line with PNB's purpose of "uplifting the financial lives of Malaysians across generations."

This inaugural research report by PNBRI focuses on the social context of Malaysian palm oil smallholders. It employs a narrative inquiry approach to highlight the lived experiences of smallholders by amplifying their stories about the issues and challenges they face in adopting sustainable practices, and the solutions that they believe would work, but also by verifying their interest in technological solutions that are being offered.

Incorporating independent smallholders ("ISHs") into global sustainable palm oil supply chains must be a national priority because:

(i) **The significance of Malaysian palm oil smallholders in our socio-political fabric**. Smallholders (independent and organised) in Malaysia account for 27% of the country's oil palm plantation area. They play a crucial role in driving local economic growth and in shaping the country's social and political landscape. Previous national agendas and policies were designed to support the development and livelihood of rural populations. However, increasing global demand for sustainable sourcing of a key ingredient such as palm oil has put oil palm smallholders' income at risk. With as many as 208,000 ISHs managing 808,000 hectares of oil palm, Malaysian palm oil smallholders risk losing their competitiveness in sustainable palm oil production and falling market demand.

(ii) **ISHs may represent the weakest link in Malaysia's sustainable palm oil production**. Because of global regulations and requirements, challenges that smallholders face in meeting the standards and requirements for sustainability certification have been well documented. Most mid-sized growers are compliant with at least the national certification standards, while large corporations have well-aligned their end-to-end operations with global sustainability standards with some opting to exclude sourcing from smallholders altogether to simplify and ensure compliance. However, there is a need to understand the nuances of these issues to improve the prognosis and fiscal resources being spent on these challenges.

In summary, this work observed that ISHs are not yet meaningfully included in the sustainable palm oil supply chain, while those who are do not yet feel the benefit from their inclusion, based on the following key findings:

(i) **ISHs appeared trapped in a cycle of low economic livelihood, which limits their ability to improve their agricultural practices and innovate to increase yield**. 60% of surveyed ISHs depended on a second income source besides selling fresh fruit bunch ("FFB") to achieve an adequate income and run their farm. ISHs struggled to invest in implementing sustainable and good farm practices due to limited financial capacity. With increased input material costs and volatile market prices, ISHs faced significant challenges in achieving a decent living, adopting good agricultural practices, and thus enabling them to achieve optimal yield (See Chapter 4).

Policy recommendations:

- Prepare next generation ISHs through Agri-commodity TVET Entrepreneurship training ("Program TVET Agropreneur Sawit Muda")
- Bulk purchasing of input materials
- Develop human-centric technologies
- Improve financial and business literacy among smallholders
- Facilitate tripartite partnership between ISHs, TUNAS Officers, and large corporations

(ii) **Dependency on private collection centres appeared to limit ISHs' access to higher-paying buyers and thus, their incomes**. ISHs across Malaysia appeared more dependent on such private or third-party collectors (culturally known in Malay as "peraih") due to capital constraints. Such a situation of market power resulted in ISHs having relatively lower bargaining power, making it difficult for them to secure fair pricing for selling FFB. Furthermore, due to the increasing population of ageing farmers, ISHs also relied heavily on collection centres to manage their farms and provide other services (See Chapter 5).

Policy recommendations:

- Expedite and tighten regulations surrounding collection centres
- Diversify and promote alternative sources of agricultural inputs

(iii) **Farm training improves the perception of Good Agricultural Practices ("GAP"), which leads to increased compliance but more needs to be done to ensure full traceability**. Our observations revealed that smallholders' knowledge transfer on GAP was informal, with 61.2% of respondents reporting that they learned about GAP from their peers, suggesting that their behaviours and perceptions of GAP were highly dependent on how well their peers performed or benefited from implementing these practices (See Chapter 6).

Policy recommendations:

- Enhance the current training module to emphasise other GAPs and include complementary knowledge like financial management and technical information, e.g., maintenance of tools
- Explore ways to ease GAP implementation, such as by use of age-appropriate digital solutions for record-keeping

(iv) **Some smallholders relied heavily on institutional support to maintain sustainable practices**. Three key institutional supports are vital for smallholders' sustainable practices, namely financial support schemes, extension services, and state-provided infrastructure. While these support mechanisms enabled sustainable practices by easing costs, providing technical knowledge, and addressing critical needs, we observed a high dependency on these services, bringing rise to the question of the sustainability of these practices in absence of government support. Extension services, for example, continued to suffer from limited and fragmented resources concentrated only in planting, while infrastructure development – often under the jurisdictions of different government agencies – remained uneven and increasingly vulnerable to impacts of climate change (See Chapter 7).

Policy recommendations:

- Demarcate agency role along the supply chain and allocate resources accordingly

(v) **Smallholders' ability to self-organise is key to support sustainable certification and compliance, but the capacity to organise appeared rather weak**. Organisational capacity and collective action are essential for smallholders' sustainability practices, serving as a key requirement for group-based certification approaches that are practised by the standard-setters such as MSPO and RSPO. Being organised also enables greater market access, knowledge sharing, and labour sourcing among ISHs. Significant institutional support was observed to facilitate collective action have primarily resulted in government-related and government-funded ISH groups, rather than truly independent smallholder organisations. A potentially high degree of absenteeism among smallholders – the true prevalence of which is a mystery – perpetuated the challenge for developing truly independent smallholder organisations acting as the "third force" toward sustainability (See Chapter 8).

Policy recommendations:

- Mandate the disclosure of activity status, namely "owner-operated", "owner-supervised" or "non-owner operated" during licensing applications by smallholders

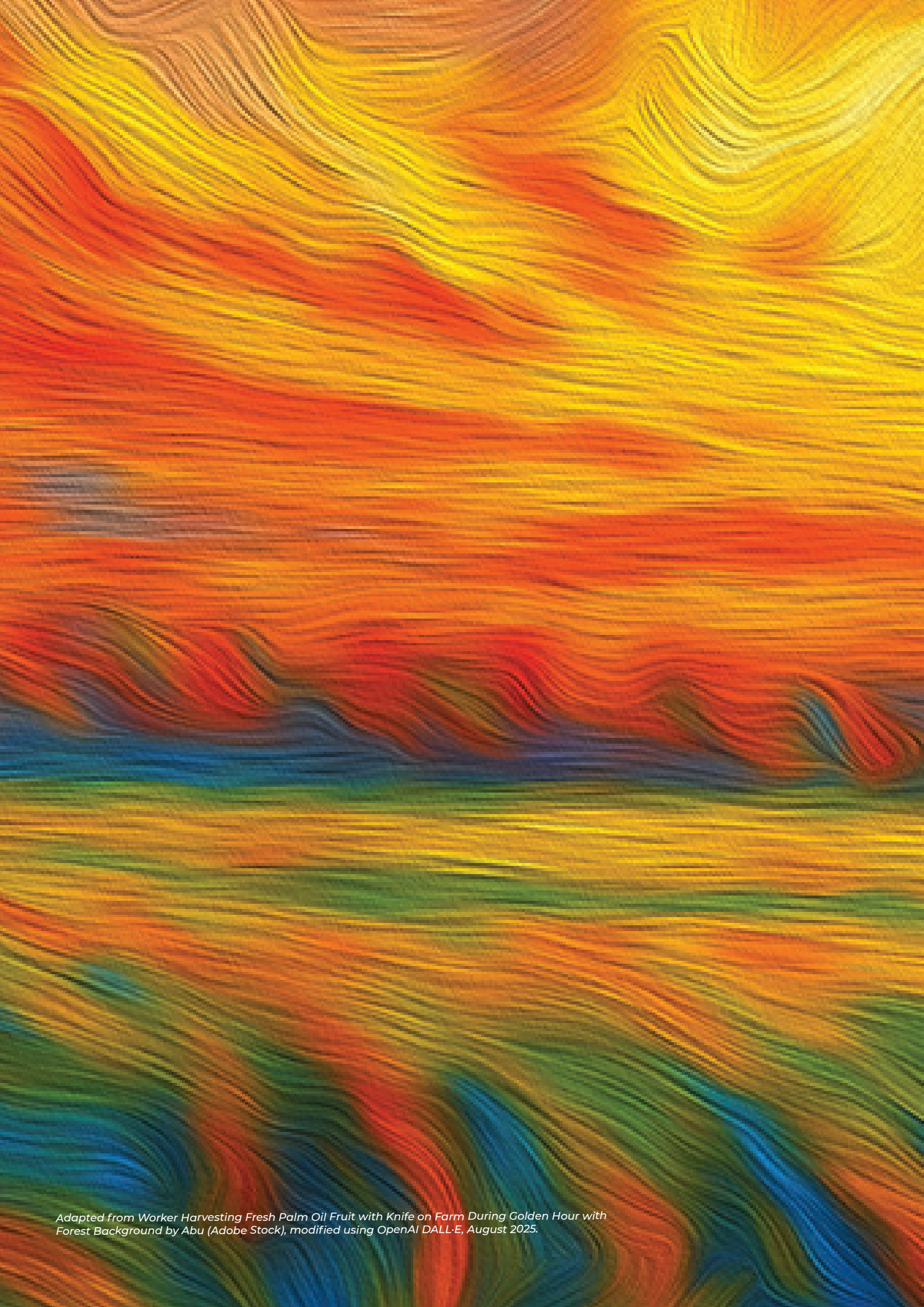
(vi) **More than four (4) in every five (5) smallholders (81%) had been MSPO certified as of 2024, but challenges remain**. Among the respondents in this study, the higher proportions of ISHs who did not find it difficult to get certified were ISHs in the states of Johor and Sabah, ISHs aged 61 to 70 years, and ISHs without formal schooling. In terms of challenges, the most common are that ISHs expected financial premiums from being MSPO certified. Additionally, the challenges are mainly in complying with Principle 3 on legal land status, Principle 4 on social responsibility and employment conditions, and Principle 5 on environment and biodiversity conservation (See Chapter 9).

Policy recommendations:

- Introduce a one-off amnesty (*"Pemutihan"*) period for smallholders at the state's land office
- Strengthen enforcement against the sale and purchase of uncertified and unlicensed FFBs
- Improve the reputation of the MSPO certification among smallholders' self-narratives through communications strategies

One unique feature of this study was the prioritisation of qualitative research methods to understand the challenges, needs, and lived experiences of ISHs, over quantitative measures of impact (of sustainability certifications) or testing of hypotheses. It provides context-specific evidence to support the targeted policy recommendations made. It is important to recognise the limitations of this approach, here findings are not generalisable. Where possible, the study employed a quantitative survey among a sample of Malaysia's entire estimated population of ISHs (n=425) to triangulate the findings from the qualitative insights. This mixed approach lies in combining rich qualitative insights with supporting quantitative data, rooted in local contexts.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Chapter 1:
Introduction

Background

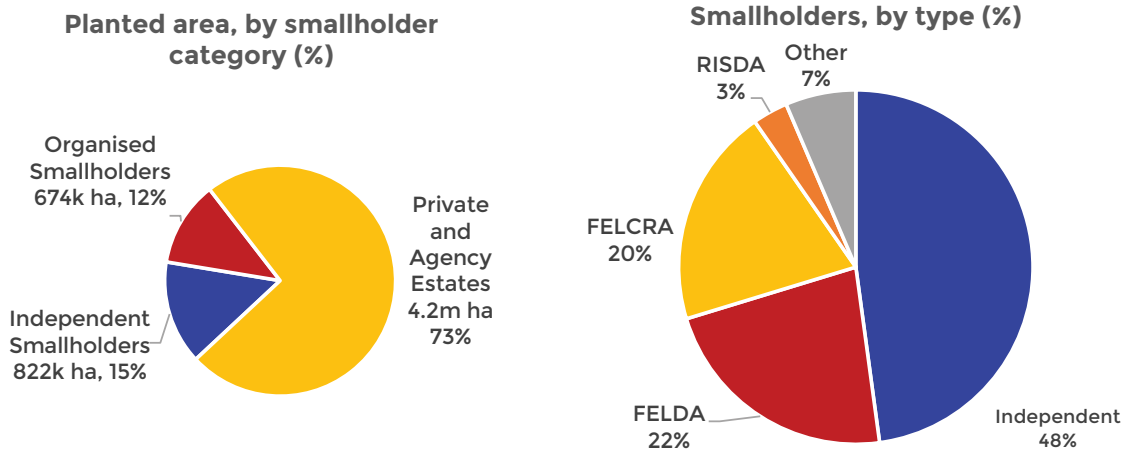
Smallholders represent a significant mode of oil palm cultivation in Malaysia and globally. Smallholders of oil palm plantations account for 40% of the planted area globally. In Malaysia, 27% of the oil palm planted area is owned and operated by organised and independent smallholders (MPOB 2024a). The Malaysian Palm Oil Board (MPOB) – the national regulator and development agency for oil palm and palm oil in Malaysia – defines oil palm smallholders as planters who own planted areas of less than 100 acres or 40.46 hectares. Each smallholder is identified when selling the fresh fruit bunches (FFBs), where an MPOB license is required. There are two types of smallholders in Malaysia, namely:

- **Organised smallholders** ***(pekebun kecil tersusun)*** managed by government agencies such as FELDA, RISDA, FELCRA, SALCRA, and SLDB.
- **Independent smallholders** ***(pekebun kecil persendirian)*** who are self-managed.

Consistent with the importance of palm oil in national agricultural outputs, oil palm smallholders account for 43% of all smallholders in commodity crops. In Malaysia, around 210,000 of them are independent smallholders, managing 822,073 hectares of oil palm, compared to the total planted area of 5.7 million hectares (MPOB 2024a). Additionally, around 233,000 organised smallholders cultivate 674,453 hectares of planted area, as shown in Figure 1 (MPOB 2024a; MPIC 2023). Figure 2 shows that ISHs have the highest average planted area per smallholder at around 3.9 hectares (MPIC 2024). The number of oil palm smallholders continues to grow, with an average of 20,000 new smallholder license applications recorded per year between 2010 and 2020 (MPOB 2020).

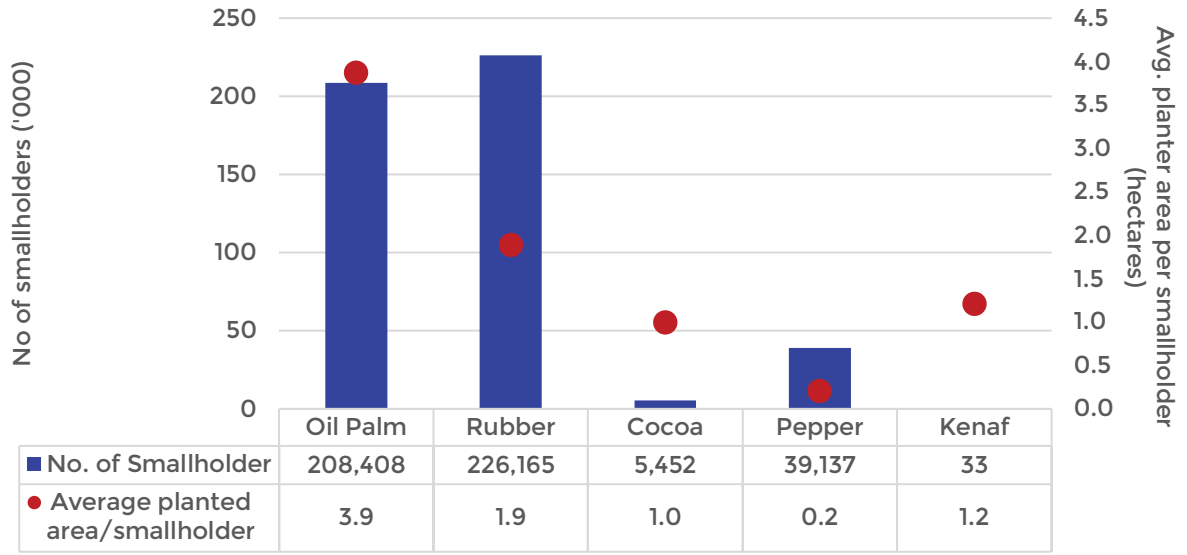
Since this study is concerned with smallholder sustainability practices, it must be noted that around 80% of Malaysian oil palm ISHs are MSPO-certified (MSPO). This high compliance rate can be attributed to strong governmental support, since related government agencies provide full support for certification for smallholders, including costs of audits, equipment, and training. The core findings of this report thus revolved around the difficulties in maintaining high rates of certification, which will be discussed in latter chapters.

Figure 1: Distribution of oil palm planted area and smallholders by type, Malaysia



Source: MPOB data, 2024 & MPIC data, 2023 (MPOB 2024a; MPIC 2023)

Figure 2: Number of smallholders and average acreage by crop, Malaysia



	Oil Palm	Rubber	Cocoa	Pepper	Kenaf
No. of Smallholder	208,408	226,165	5,452	39,137	33
Average planted area/smallholder	3.9	1.9	1.0	0.2	1.2

Source: MPIC data, 2024 (MPIC 2024)

Recently, the average yield of smallholders turned out to be rather comparable to that of estates and plantations, as the trees in Malaysia age, on average. Survey data from MPOB's ***Buku Rekod Kebun (BRK)*** shows that smallholders in Malaysia produce an average between 14.42 and 17.01 tons per hectare per year, comparable to the national average yield of 15.8 tons per hectare per year for estates (MPOB 2024a). This finding contrasts with claims that Southeast Asian smallholders produced only half the FFBs per hectare compared to large plantations on average (Ogahara et al. 2022).

The three most significant states in independent smallholder-planted areas are Sarawak, Sabah, and Johor. Collectively, they account for 73% of all independent smallholder-planted regions in Malaysia, totalling nearly 600,000 hectares (Figure 3). Sabah and Sarawak smallholders tend to have larger average farm sizes, averaging 6.1 ha, compared to those in Peninsular Malaysia. Johor has the highest number of ISHs, with approximately 80,000 smallholders. Among organised smallholders, Pahang has the largest planted area under FELDA schemes, followed by Johor and Sabah FELDA areas (based on 2016 data).

Figure 3: Planted area of ISHs by state, Malaysia (hectares)

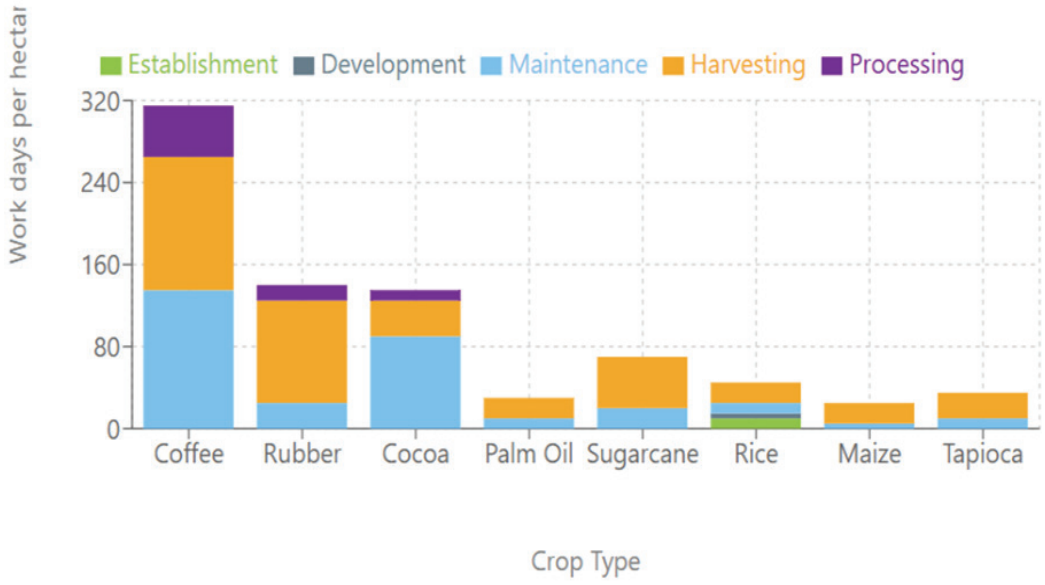
Source: MPIC data, 2019 & 2021

Smallholders represent a highly diverse group, posing various legal challenges, particularly concerning land tenure, which varies significantly in their landholdings. One aspect of this diversity is due to differences in land status, which include freehold, leasehold, and inherited land. Smallholders also employ various livelihood strategies: some rely on palm oil as their primary source of income, while others treat it as a supplementary revenue stream. Productivity also varies widely, as reflected in differences in FFB yields, Oil Extraction Rates (OER), and farm sustainability practices.

Palm oil is particularly attractive to ISHs for several reasons, such as inherited land, experience, low time commitment, and the attractive price of palm oil relative to other crops. This is different from organised smallholders such as those under FELDA, RISDA or FELCRA schemes who were effectively granted land by the government to plant crops that are not of their choice. Many ISHs have access to family land, providing a ready foundation for palm oil cultivation without substantial initial investment into land rights.

Additionally, some smallholders have previous experience in the oil palm sector, often as former employees of the FELDA or other large estates. This experience provided them with the necessary skills and knowledge to manage palm oil production effectively. Another advantage is the relatively low time commitment required for palm oil cultivation (Figure 4), which allows smallholders to pursue other activities or income sources, making it a flexible and appealing agricultural option. Additionally, it is easy to find hired help to manage their farms partially or entirely, as the oil palm sector has developed enough expertise to support a robust ecosystem of subcontractors. Smallholders further benefit from existing government programs, such as replanting benefits, which provide financial support and resources. Furthermore, owing to the prevalence of oil palm planting, they can readily seek advice from friends and family who are knowledgeable in palm oil cultivation and have experience working on their farms or managing oil palm estates.

Figure 4: Southeast Asia average workdays per hectare by major crop, days/ha



Source: (McGill 2022)

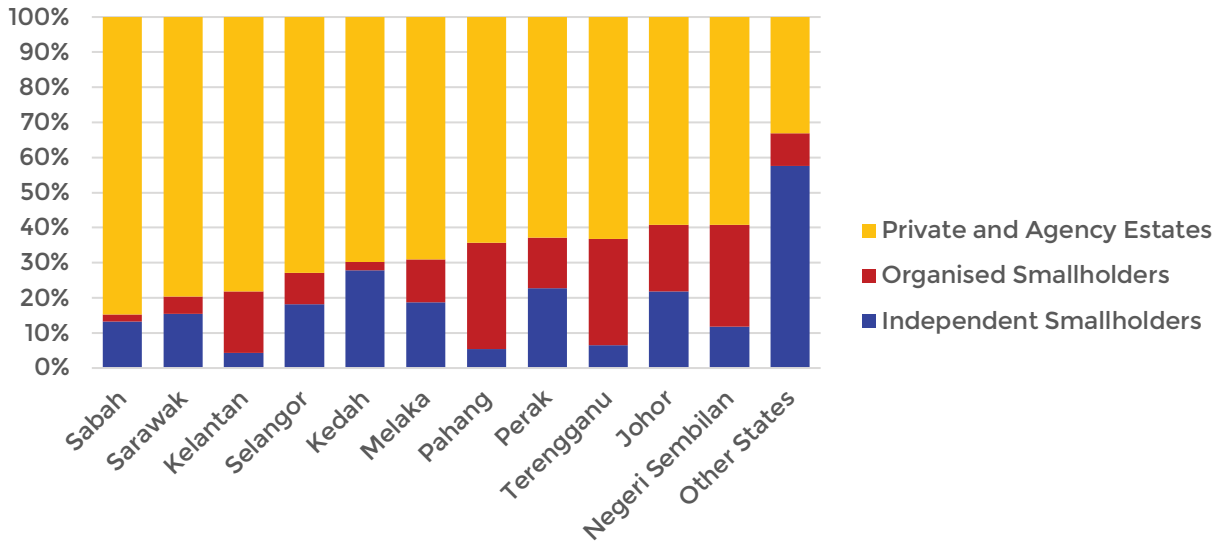
Modes of Production of Palm Oil in Malaysia

> *"Since the first rubber boom in the early twentieth century, land has been at the centre of a contest between big estate interests and peasant agriculture."* (Mehmet 1982)

Estates

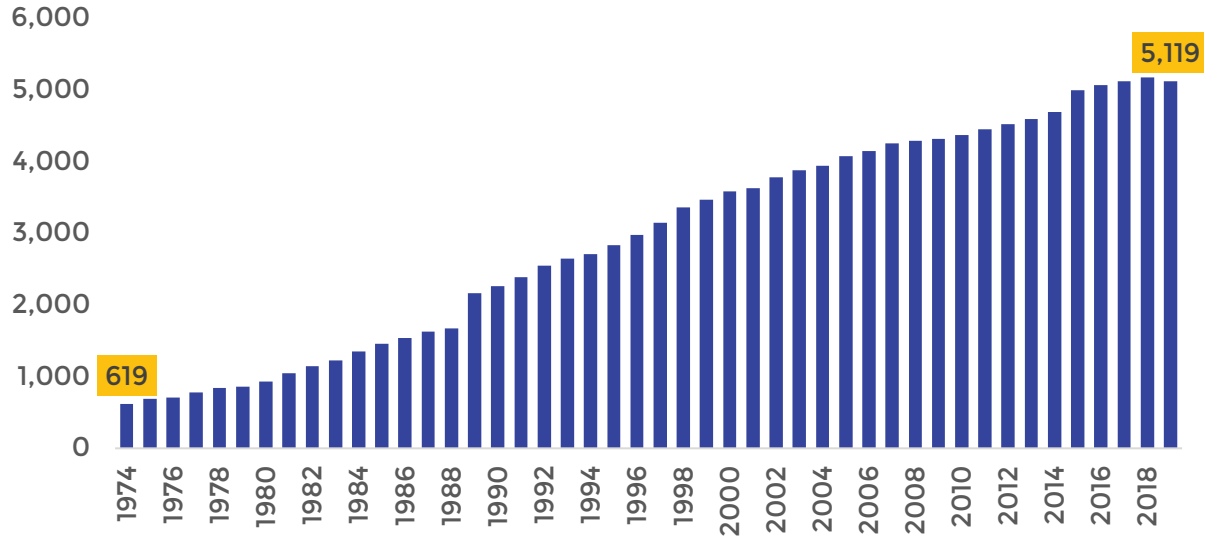
In Malaysia, estates have become the most dominant mode of palm oil production rather than smallholding. Oil palm estates exist across most states, owned by private capital and government-linked companies (Figure 5). It has grown at 4.8% annually for the past 45 years (Figure 6). Out of Malaysia's 5.7 million hectares of planted area, as high as 73% is estates (MPOB 2024a), defined as plantations that span more than 100 acres (40.46 hectares). It is estimated that state schemes comprise around 6% of the total planted area, while the rest are private estates of varying sizes. Out of these estate owners, FGV Holdings has the largest planted area (334,000 hectares) in Malaysia, followed by Sime Darby Plantation (296,000 hectares). Sime Darby Plantation has an additional 282,000 hectares in Indonesia and other international locations. Based on our calculations using annual reports of listed companies in 2021, the top 20 plantation companies listed on Bursa Malaysia collectively accounted for about 27% of the planted areas in Malaysia.

Figure 5: Breakdown of the mode of oil palm production planted area by state (%), 2022



Source: PNBRI's analysis from Malaysia Oil Palm Statistics (MPOB 2024a)

Figure 6: Number of estates 1974-2019, Malaysia



Source: MPOB (MPOB 2021)

Organised Smallholder Schemes

Organised (or managed) smallholder schemes are large-scale developmental programs by the government. These schemes typically aim to achieve two agendas: poverty eradication in rural areas and productive land development. The primary schemes that align with these aims are the Federal Land Development Authority (FELDA) and the Federal Land Consolidation and Rehabilitation Authority (FELCRA).

FELDA

was formed in 1957 for land development and settlement. Each settler was given 10 acres to be planted with rubber or oil palm. Settlers are provided with houses in a centralised village area with amenities. By far, the larger agency, FELDA, has emphasised individual land ownership and targets landless young, married ethnic Malays with agricultural experience.

FELCRA

was established in 1966 to rehabilitate and consolidate rural landholdings, unlocking their economic potential. FELCRA has relied on in-situ land development and a more cooperative approach. The early years of FELCRA were spent solving the issue of youth unemployment in rural areas.

SALCRA

The Sarawak Land Consolidation and Rehabilitation Authority (SALCRA) was established in 1976 to rehabilitate land for agricultural purposes, focusing on Native Customary Rights (NCR) land for commercial purposes. As of 2021, it has 20,655 smallholders (oil palm and rubber), with an oil palm planted area of 52,000 hectares.

SLDB

The Lembaga Kemajuan Tanah Negeri Sabah (LKTNS) (later known as SLDB) was established in 1969 to promote Sabah's rural development. It is tasked with developing state land through land development and land resettlement schemes. As of 2021, it has 6,921 smallholders (oil palm and rubber); the oil palm planted area is 17,000 hectares (across 12 settler areas). SLDB also undertook a joint venture programme, using 'Konsep Baru' in the 1990s under the ***'Gerakan Desa Wawasan'.***

Joint Venture (JV) Schemes

Sarawak introduced a joint venture concept called New Concept ***(Konsep Baru)*** in the late 1990s, which avoided the formation of smallholder lots on Native Customary Rights (NCR) land. New Concept operates under a JV concept, where native landowners are expected to surrender their lands to the State for a period of 60 years to be developed as joint ventures with private companies, in which the State acts as a Trustee on behalf of the customary owners. The land will then be developed as a single estate, disregarding previous smallholder lots.

There is a lack of clarity regarding how native landowners receive benefits under these schemes and how they can reclaim their lands upon the expiry of the lease. The company will contribute capital and receive 60% of the equity. In comparison, 30% of the equity is held by the landowners based on individual land equity, and 10% goes to the state Land Custody and Development Authority (LCDA) as the mediator/management agent. The JV's structure is contested, as dividend/net income can be manipulated by increasing the cost of production.

Independent Smallholding

MPOB grants a smallholding license to a plantation that is less than 100 acres (40.46 hectares). Smallholders have long participated in oil palm planting, and the government's stance towards smallholders has evolved under different administrations. Under the colonial administration, some scholars noted cases of local governors discouraging smallholdings. Using archival material in Johor, Pakiam (2021) found that in the late 1920s, small growers could not expand their oil palm activities following a legacy order by the then Director of Agriculture (DOA) to restrict Malaya-wide small-scale oil palm cultivation. As a result, independent planters in Johor obtained more agricultural land but could not plant oil palm, rubber, or tapioca. In the 1960s, smallholdings served rural development through managed schemes like FELDA, alongside ISHs.

Why Focus on Independent Smallholders?

Oil palm smallholders play a vital role in Malaysia's economy, political landscape, and sustainable growth ambitions. This chapter aims to establish their significance in the palm oil industry by exploring their economic contributions, role in the political economy, and potential for growth through sustainability and ESG (Environmental, Social, and Governance) considerations. The following five (5) themes explain the rationale behind the focus of this research:

1 Smallholders are an important feature of Malaysia's socio-political fabric yet many still live in situations of poverty and deprivation

Smallholders – in general – represent a significant group of economic actors who are integral to Malaysia's socio-political fabric. They represent a class of stakeholders in socio-political life (as voters) and in the commodity agriculture sector (as producers). Yet, many smallholder households are still living below the poverty line. Literature has documented that many smallholding families lived below RM1,600 per month (Senawi et al. 2019a). Among the respondents in this study, as many as 52% independent smallholder households earn less RM2,500 per month (see Chapter 4). While many do not solely depend on oil palm cultivation for a living, not all see palm oil merely as "side income". In Sabah for example, palm oil helps smallholders barely make it through financial difficulties, where income from oil palm provides between one-third to half of a household's income (Wilson et al. 2018).

Their significance as an important class of rural citizenry is well-evidenced by the continuous fiscal support for government agencies in charge of oil palm and rural development.

Organised smallholders, such as those managed by FELDA, FELCRA and RISDA, have always been placed under the purview of politically strategic ministries such as the Prime Minister's Department or the Ministry of Rural Development. Except for a temporary period in 2020, they had never been placed under the purview of the main ministry in charge of oil palm industrial development, that is the Ministry of Plantations and Commodities (MPC).

Independent smallholders (ISHs) are however viewed as sole proprietors and individual business owners. While their outputs are just as regulated (by MPOB's regulator mandate) as those of any other cultivator, they are not directly managed by any ministry or government agency, unlike their ***organised*** counterparts. But given their socio-political importance, their plights continue to be the subject of annual fiscal allocations particularly through targeted support programs under MPOB's developmental mandate, which is an agency of the MPC. With vast rural agricultural land under their management (in aggregate), smallholders also produce other national commodity crops such as rubber and pineapples.

Arguably, ISHs are also drivers of local economic development. Beyond their contribution to the national oil palm production, they are pivotal in driving rural development and transformation. By creating sustainable supply chains, generating purchasing power, and fostering economic multipliers, smallholders can act as catalysts for rural transformation. The creation of FELDA and FELCRA in the 1960s for cash crops was based on a vision to provide 'land for the landless, jobs for the jobless' (NST 2017). These schemes also resulted in new 'rural' communities that flourished with their economic drivers aside from oil palms.

Commodity smallholding is not unique to Malaysia; it is a persistent and characteristic feature of rural Southeast Asia (Rigg et al. 2016). Rigg et al.'s important finding confirmed, to an extent, the imperative for smallholder development programs even if countries have developed industrial-scale commodities for exportation and as societies transition out of agrarian life, such as in the cases of Malaysia and Thailand. Before the advent of palm oil cultivation, smallholders had historically cultivated rubber, cocoa, and tobacco in parts of Thailand and Vietnam. Importantly, there was no loyalty toward any crop, but rather toward agriculture and use of land as a source of rural sustenance. In the future, smallholders in Malaysia may move towards cultivating coconuts, durian, pineapple, or even jackfruit (MPC 2024). The crop may change, but smallholding as a mode of production is likely to remain.

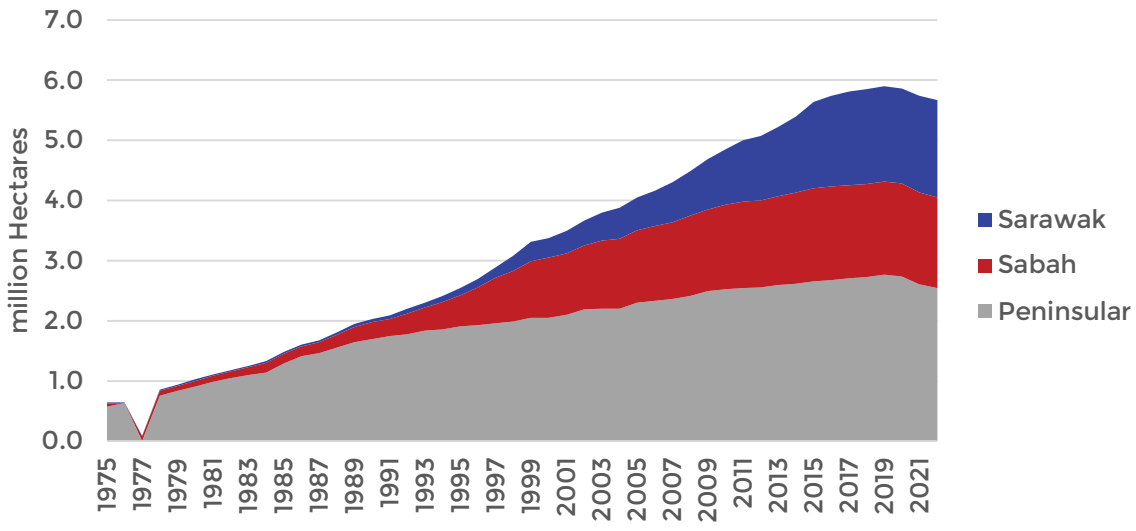
2 Improving smallholders' yields can help improve overall national yields

Oil palm smallholders (independent and organised) currently account for a significant 27% of the oil palm planted area in today's palm oil landscape, which comprises 5.6 million hectares of planted area in Malaysia, despite a slight decrease of 4% (CAGR) since 2019. Individual holdings in smallholdings are highly diverse. The average planted area is estimated to be around 3.5 hectares per smallholder. Peninsular smallholding averages below the national average, while Sabah and Sarawak smallholding averages are higher at 6.5 hectares and 5.5 hectares, respectively. In comparison, FELDA smallholders are allocated 10 acres (around 4 hectares) of land per smallholder.

The government has even identified the ISH segment as an important component of the strategy in improving ageing plots. It sought to solve this issue by offering replanting support schemes to encourage ISHs to replant, previously outright grants and more recently in the form of partial (50%) repayable loans. The federal budget is also being allocated for livestock integration to support livelihoods during the pre-production phase.

Since the 1960s, the oil palm sector underwent a rapid expansion phase but has since reached saturation. Between 1960 and 2020 (60 years), the CAGR of the planted area reached 5%. However, growth has contracted by a CAGR of -1.3% since 2020 (Figure 7).

Figure 7: Oil palm planted area, Malaysia 1975-2022

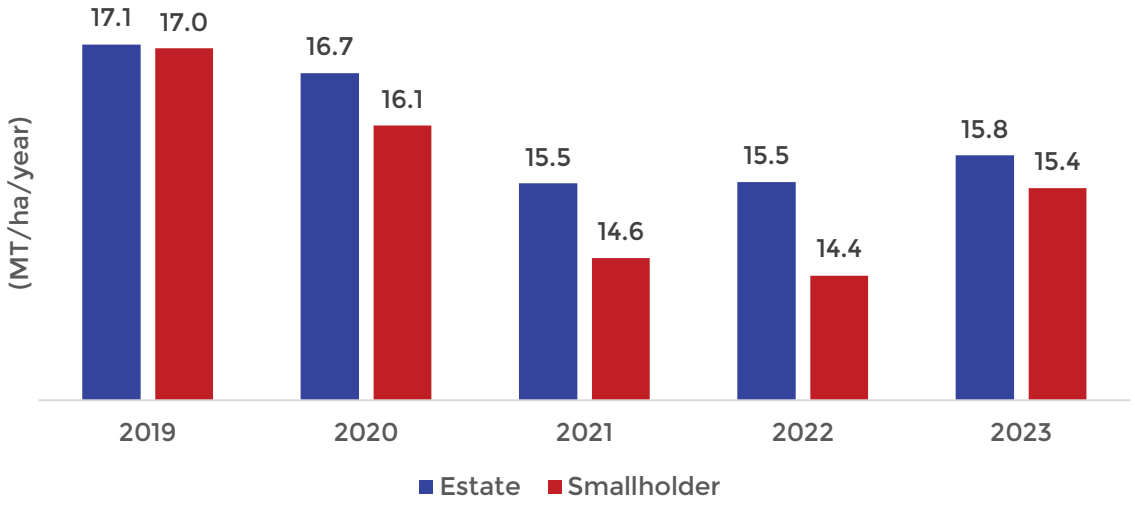


Source: Malaysia Oil Palm Statistics

Diminishing availability of 'easy' land means the sector must now reconsider its strategy to sustain growth. The obvious answer is to focus on increasing yield per hectare. This involves current efforts by large players to research and develop (R&D) improved planting material and regulate or control the prevalence of contamination of planting material available in the market (Ooi et al. 2016). The other strategy from a national standpoint had been to determine the laggard (low-yielding) segment and seek ways to improve it, thus the role of the smallholder segment.

As discussed, oil palm smallholder yields are rather comparable to that of estates (Figure 8) in recent years, as the age profile of trees in larger plantations ages and reaches the next wave of replanting cycle. Admittedly, yields naturally vary with various land sizes and the age of trees. However, MPOB data showed that smallholder yields averaged 14 to 17 metric tonnes per hectare per year in the five years between 2018 and 2022. According to MPOB, the most exemplary of smallholders had recorded fresh fruit bunches (FFB) yields of as high as 26.2 to 28.1 MT/ha/year in 2021 and 2022 respectively, for a 40-hectare farm (Khairul Abidin and Morni 2024). While these farms belong to the smallholder category, they can be considered as professionally run given their size, which is 10 times larger than the average smallholding.

Figure 8: Average FFB yield between smallholder and estates



Source: MPOB

3 Smallholders are at risk of being left behind amid global pressures

Large-scale cultivation and exportation of palm oil have long been the subject of international scrutiny, initially due to perceived health hazards of human consumption of palm-based oil, mass deforestation, and allegations of human rights violations from unfair labour practices. In response, large-scale integrated corporations involved in palm oil have made significant advancements in their sustainability efforts, incorporating global certification standards into their estates, implementing integrated processes such as full methane capture in their crushing facilities and mills, and meeting global food standards in their factories.

Smallholders, on the other hand, remain the least equipped to independently meet these challenges due to the lack of awareness and means. The challenge is that smallholders are still perceived as the "weakest link" in the sustainable palm oil value chain (Solidaridad 2023) so much so that corporations may even opt out of sourcing from smallholders to simplify their supply chain and ensure they achieve their sustainability targets. Such perception, while not entirely unfounded, overlooks the potential of smallholders once they are adequately supported. This underpins the theory of change of standard setters such as the RSPO and International Sustainability and Carbon Certification (ISCC), who envision the improvement of smallholder livelihoods once supported to be included in the supply chain by being sustainability certified. The World Economic Forum (WEF) highlighted the important role of smallholders, for example, in ensuring global food security by making them climate-wise, financially, and technologically secure (Shroff 2022). As such, there is a need to investigate the true causes the lack of compliance.

Sustainability certifications and standards thus represent the most practical theory of change for smallholders. Growing global demand for sustainable palm oil production presents an opportunity for smallholders to be part of the sustainable palm oil supply chain, to increase income and improve livelihoods. Positioning Malaysia's palm oil outputs as "certified sustainable" requires a strategic shift in policy focus, particularly toward empowering smallholders who currently represent a significant yet underutilised growers' segment. The above opportunity highlights the untapped potential of smallholders to contribute to transforming Malaysia's entire palm oil supply chain into one that is certified sustainable. By supporting their inclusion and compliance to sustainability certifications, smallholders may even be considered a "unique selling point" (USP) to improve the narrative and marketability of Malaysia's sustainable palm oil.

4 Inclusion of smallholders plays to Malaysia's strength

There is a case for major oil palm-producing countries like Malaysia to shift their policy focus from a "victim's mindset" to an opportunistic one. Instead of perceiving smallholders as a "drag" to our sustainability agenda and succumbing to the "western" narrative over palm oil, smallholder inclusion can be turned into Malaysia's next narrative for social responsibility. The social component of most certification standards today focuses on fair labour practices; rightly so given its dependence on foreign labour. In addition, it would be strategic for Malaysia to seriously include the plight of smallholders as another social agenda – given its 'strength' in having a sizeable proportion of certified smallholding land. Such "defensive strategy" can help maintain its competitive edge in the global sustainable palm oil market, particularly in the face of competition from Thailand and Indonesia who are rapidly advancing their sustainability agenda among smallholders with significant government support and decisive collective action.

Global buyers are themselves *directly* interested in including smallholders into their respective sustainable palm oil supply chain, as evidenced by increasing grants and endowments from large multinational corporations (MNCs) to support smallholder certification in Malaysia. Across this study, we discovered that large global Fast Moving Consumer Goods (FMCG) and ingredient buyers, such as P&G, Berry Callebaut, and Cargill, have gone as far down the supply chain as Malaysian mills to access and directly fund smallholder certification programs, ensuring traceability and achieving their sustainable palm oil sourcing policies (P&G Chemicals 2025; CDP 2023; Cargill 2025). In some cases, the Corporate Social Responsibility (CSR) functions of international financial institutions have also contributed to these efforts (Tan 2024). These efforts may have also been induced by the relatively limited access to fully certified and traceable sustainable palm oil on the part of these large global buyers. Unilever, for example, reported that they face limitations in sourcing 100% sustainable palm kernel oil and are working towards improving value chain linkages with independent mills and their smallholder supply base in oil palm source regions (Unilever 2024).

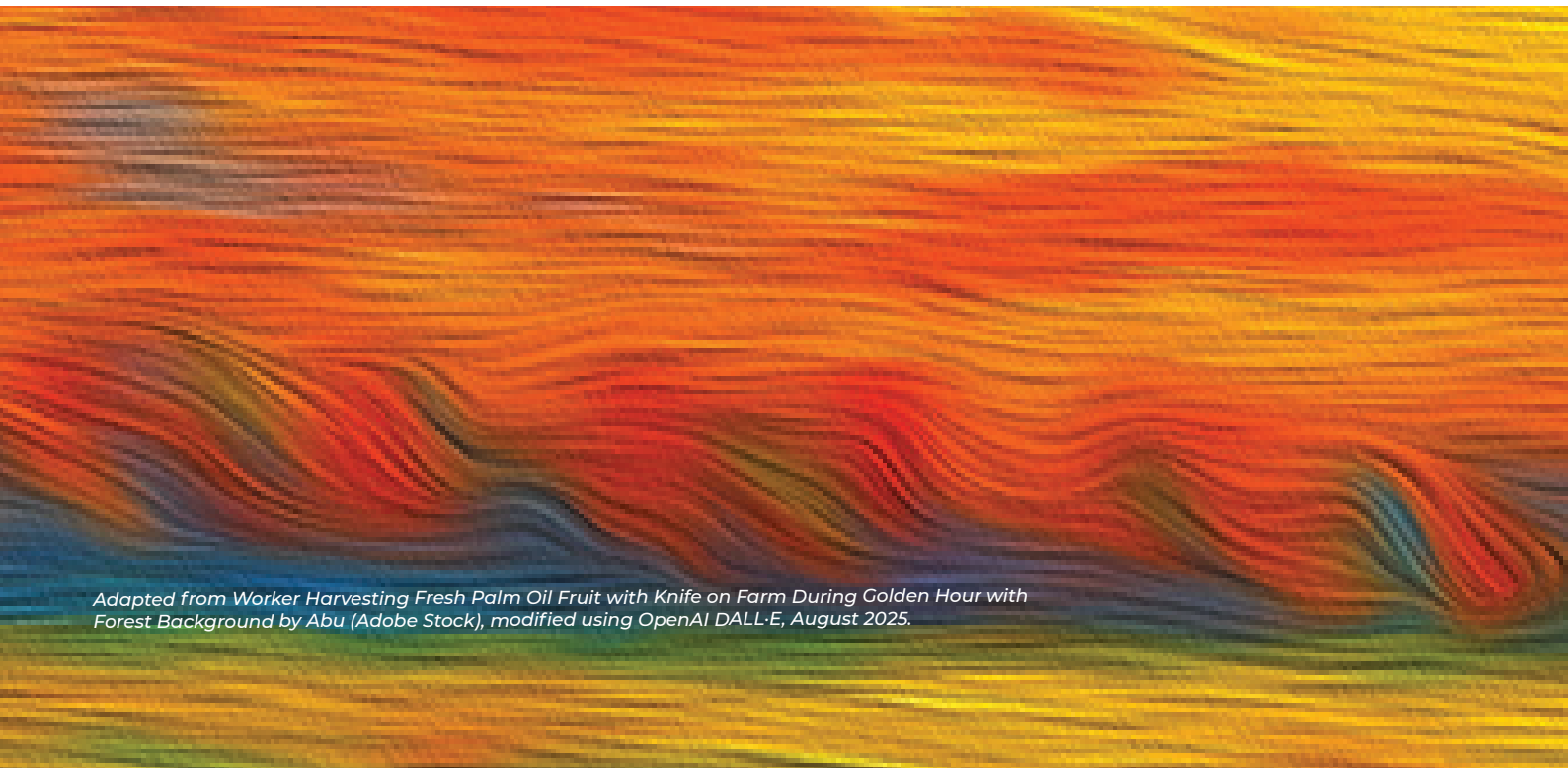
There is also an under-tapped opportunity in non-food applications of palm oil to be met by smallholders, such as palm-based fuels, certified through the (ISCC) system, which is compliant to the European Union's Renewable Energy Directive (RED II). These applications include biodiesel and Sustainable Aviation Fuel (SAF), which offer promising alternatives as it becomes increasingly challenging to meet global food safety and sustainability standards.

5 PNB Group's commitment to the oil palm sector

In August 2024, PNB was among the six Government-linked Investment Companies (GLICs) who pledged its commitments to invest a total of RM120 billion in Domestic Direct Investments (DDIs) under the GEAR-uP program led by the Ministry of Finance under the auspices of the Ekonomi MADANI framework.

Through its group of companies, PNB Group is committed to supporting automation and smart farming in palm oil (MOF 2024b). As part of its broader commitment to modernise Malaysian industries and corporates towards higher value-added and sustainable activities. While such efforts are mainly concentrated within its portfolio of investees involved in large scale oil palm plantations, the need to harmonise this broad commitment with PNB's social commitments becomes more crucial.

The Budget 2025 called for major oil palm companies to "adopt" oil palm smallholding areas *("Kampung Angkat")* adjacent to their estates (MOF 2024a) and to support them in the supply of high-quality seeds, fertilisers, and in helping smallholders comply with sustainability standards. As the majority shareholder of SD Guthrie and an important industry in Malaysia's palm oil legacy, PNB Group is thus interested in obtaining first-hand insights into the lives, challenges and practicability of technological solutions among ISHs whose lives we may and can impact positively.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Problem Articulation

While the previous section provides the importance and justification for studying palm oil smallholders in this research, this section provides the context. This section narrows down the scope of the study to identify research gaps and research questions that this study will address.

Sustainability Claims Against Palm Oil

The oil palm sector has always faced global scrutiny over the issue of sustainability. In the 1970s, Europe and North American markets shied away from tropical oils like palm and coconut due to concerns over their atherogenic effects, which cause coronary health issues. This was, however, proven wrong. Instead, in the 1990s, palm oil demand in Western markets grew rapidly as palm oil was found to be free of harmful trans-fat. The "bad press" around oil palm then shifted to issues of mass deforestation caused by oil palm plantations, with the symbolic *orangutan* – representing Malaysia's native mammal species – becoming the campaigns' poster child. Currently, the largest wave of negative campaigning faced by the sector surrounds the issue of labour rights, with several large companies facing bans due to findings of human rights violations.

The synonymity of palm oil with mass land clearing and deforestation is arguably due to the industrialisation of palm oil, but it has also affected smallholding. Non-governmental organisations, such as the World Wildlife Fund (WWF), were vocal in advocating for a halt in the expansion of oil palm plantations to preserve a significant percentage of biodiversity in the forests of Malaysia and Indonesia, the two largest crude palm oil-producing countries globally. The impact of this narrative against oil palm was immense, leading to widespread criticism and increased scrutiny of the industry. Harmful methods, especially the burning of land for clearing, have been heavily criticised for contributing to pollution, including haze, water contamination, and soil erosion. As a result, both transnational standards, such as the RSPO, and national standards, including MSPO and Indonesian Sustainable Palm Oil (ISPO), were introduced to address the claims made and to differentiate the market for sustainable palm oil through certification. Countries and large plantations have also committed to No Deforestation, No Peat, and No Exploitation (NDPE) policies to improve industry practices.

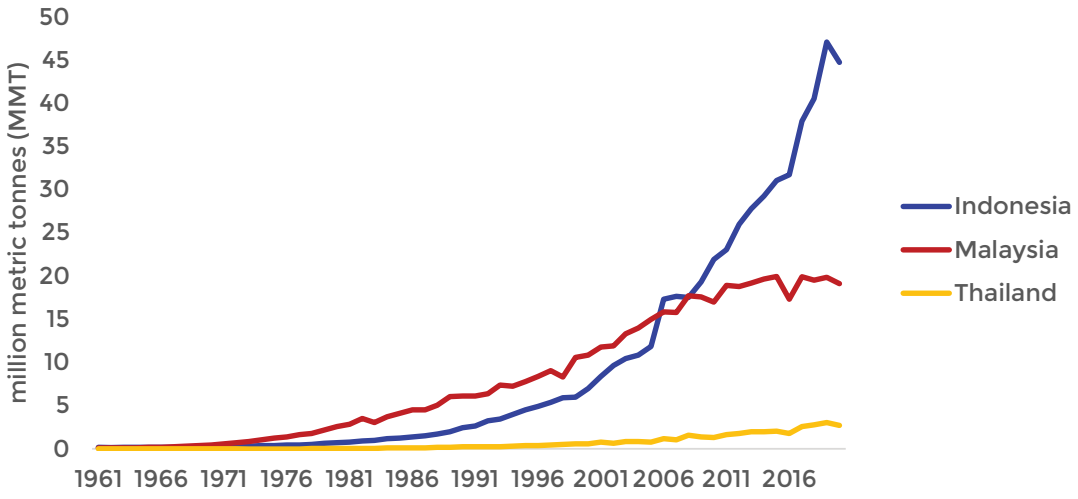
More recently, issues related to labour rights have dominated the media's attacks on the oil palm sector. Despite fully complying with RSPO, estates are now responsible for complying with all other labour rights standards, such as those of the International Labour Organization (ILO). In 2019, an NGO-led petition on the violation of child and forced labour on one of the large Malaysian plantation companies led to a US ban on products manufactured by its Malaysian operatives, including products containing palm oil originating from Malaysia.

These issues have formed a negative bias towards palm oil, leading to Western consumers favouring a "palm oil-free" label over a “sustainable” label. Under this context, the inclusion of smallholders offers an advantage for marketing Malaysian palm oil as sustainable and socially responsible. **How then do we turn smallholders from a policy burden into a market opportunity?**

The Importance of Palm Oil to Malaysia

Malaysia’s focus on sustaining the industry is not surprising, as palm products represent a key export for Malaysia, contributing to 2.9% of the national GDP (MPIC 2024). Malaysia produces 24% of global palm oil production, making it the second-largest producer globally (Figure 9). More than 80% of local production of Crude Palm Oil (CPO) is for export destinations, making up 30% of global palm oil exports. In 2023, Malaysia exported RM102 billion of oil palm-based products (MPIC 2024). In national accounts, palm oil exports (agriculture and manufacturing) are among the top three major exports after electrics, electronics, and petroleum-based products. Malaysian plantation companies also have major upstream operations in Indonesia.

Figure 9: Palm oil production, top three global producers

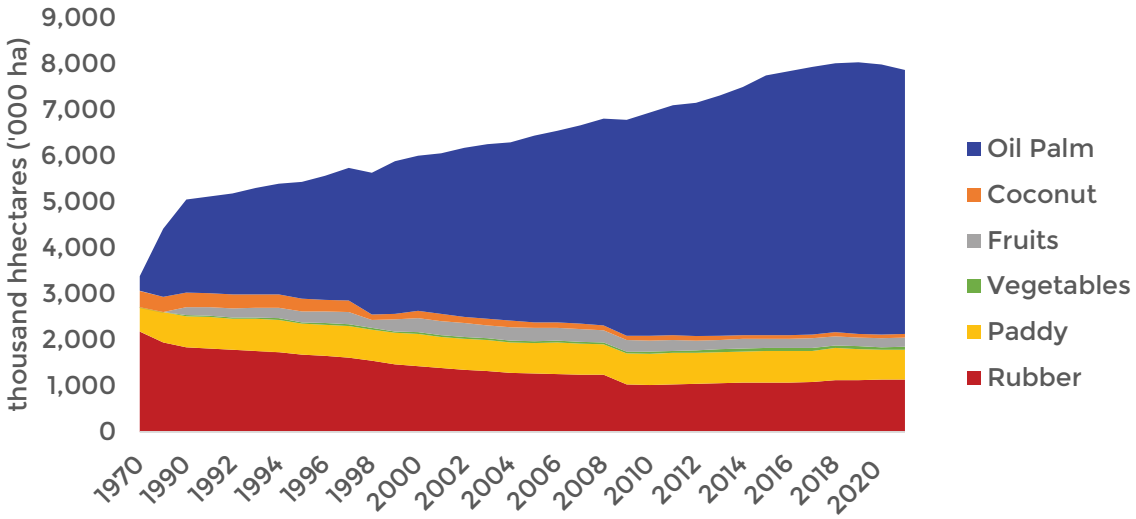


Source: FAOSTAT

The sector was once dominated by foreign planters but is now largely controlled by government-linked domestic corporations. Dutch and British plantation owners began commercial oil palm planting as early as 1910. Later, government agencies such as FELDA, FELCRA, and state-owned schemes drove planting expansion between the 1960s and 1980s (Pakiam et al. 2020). From the 1990s onward, growth was primarily driven by the local private sector (Bissonnette and De Koninck 2017). This period included the acquisition of Guthrie from its British shareholders and its merger with Sime Darby. In 2007, Sime Darby, Guthrie, and Golden Hope Plantations merged to form one of the largest plantation companies globally. Today, SD Guthrie and FGV remain among the leading plantation companies by planted area.

The historical growth of the Malaysian palm oil industry hinged on three critical factor inputs: land, labour, and (the right) climate. During the post-independence growth era of the 1960s, abundant land and a focus on rural development facilitated the rapid development of oil palm cultivation. Oil palm cultivation facilitated rural infrastructure and land redistribution under FELDA and FELCRA, which aimed to eradicate poverty and accelerate rural development through a resettlement program. Supplemented with Malaysia's suitable tropical climate, this institutional intervention opened huge swathes of land for oil palm cultivation, significantly outpacing other crops (Figure 10). From 1961, oil palm became the focus as the government sought to shift away from rubber, which was suffering from global price depression.

Figure 10: Total area under selected crops, Malaysia 1970-2021



Source: BNM Monthly Statistics, December 2023

In terms of land, the era of abundance is drawing to a close. Malaysia has committed to maintaining a 50% forest cover, which currently stands at 54.6% (MalayMail 2023), leaving a limited 1.5 million hectares for all other activities. The efficiency of oil palm – producing 42% of global vegetable oil on just 8% of land – and ongoing advancements in seed technologies offer some optimism for yield upside. Yet, challenges in growing palm oil production continue to emerge as the sector confronts the finite nature of available land resources.

In terms of labour, the sector faces escalating costs and increasing scarcity of foreign-labour intakes, as evident during the COVID-19 lockdown. Oil palm cultivation is labour-intensive, especially during the crucial harvesting season and FFB evacuation. Harvesting needs to be done at least twice a month. It also becomes progressively challenging as palm trees mature and grow taller. This necessitates skilled harvesters to ensure efficient harvesting within the narrow optimal harvesting window of 24 to 48 hours. The work is hazardous due to the tree bark's sharpness, the fruits' height, particularly for mature trees, and the substantial weight of the fruit bunch, which can reach up to 25kg. Presently, the sector employs nearly 400 thousand workers (MPIC 2022), with almost 80% being foreign workers from Indonesia, India, Nepal, and Bangladesh (International Organization for Migration 2023). Notably, for large estates, labour constitutes approximately 35 to 40% of overall operational costs. In response to this challenge, mechanisation and automation investments are on the rise among large planters. However, there is still a considerable challenge in mechanising the harvesting process and a large technological gap between smaller estates and smallholders.

In terms of climate, the equatorial climate that had been crucial for optimal oil palm cultivation is threatened by climate change, posing three key risks to this once ideal climate condition: hotter temperatures, increased flooding, and droughts. The oil palm tree needs consistent annual rainfall of 2,000-3,000 mm, spread evenly throughout the year, with an ideal average temperature of 25°C (Abubakar et al. 2021). The crop also needs at least 5 hours of daily sunlight for optimal yield. While oil palm production experiences seasonal fluctuations, extreme variations such as high temperatures during the dry season can lead to flower loss. Similarly, prolonged wet conditions and flooding, such as during the unprecedented three consecutive La Niña events between 2020 and 2022, pose significant risks to the industry, affecting harvesting windows, weevil (pollinator) populations, and overall yield.

Given the sector's importance, these challenges have also become national challenges. Solving these issues involves a serious re-examination of the entire palm oil value chain, including smallholdings. In aggregate, smallholders own a substantial share of land, which becomes increasingly valuable as new land openings become impossible. Additionally, they have less access to securing labour and less scientific knowledge to adapt to the changing climate.

The Significance of Smallholders in the Malaysian Palm Oil Supply Chain

Having established the importance of palm oil to Malaysia, and the significance of smallholders in the sector, it is critical to set the stage in which oil palm smallholders operate. With the goal of establishing a theory of change aimed at including smallholders in the Malaysian sustainable palm oil supply chain, it is imperative to establish:

(i) **The domain of analysis,** which we establish to be the 'Malaysian Sustainable Oil Palm Supply Chain'; and

(ii) **The unit of analysis,** being the independent smallholders (ISHs); as well as

(iii) the presence of other actors in the realm with whom ISHs interact.

'Malaysian Sustainable Oil Palm Supply Chain' as the Domain of Analysis

Although related and sometimes used interchangeably, the terms palm oil ***"supply chain"*** and ***"value chain"*** are distinct concepts.

"Supply chain" is defined as a network of actors involved in the whole process and different activities (upstream and downstream) that produce products and services for end users (Muysinaliyev and Aktamov 2014). The palm oil supply chain comprises multiple actors involved in palm oil production, from sourcing raw materials to processing and refining palm oil, and distributing and selling the finished products to consumers. Due to the commitment to sustainable production, the interaction between the sustainable practices of these actors during the entire process becomes challenging (Patel and Desai 2019).

In turn, the *"value chain"* is how each activity involved in the production of final products contributes value, which may be economic, environmental, or social, as conceptualised by Micheal Porter's 1985 book "Competitive Advantage" (Foong and Ng 2022). To attain a competitive edge, initiatives such as enhancing sustainability or greening the palm oil supply chain, improving productivity, and promoting social responsibility can establish long-term advantages. This has brought rise to ancillary components to the value chain such as standard-setting bodies, extension service providers, consulting services, and independent auditors or certification bodies. Further downstream, the conversion of low-value raw materials (such as (CPO), palm kernel, empty fruit bunches (EFB), and palm oil mill effluent (POME)) into high-value products should be guided by the global markets and consumers' demands, for example, green energy and sustainable aviation fuel.

The most relevant realm of our analysis would therefore be the 'Malaysian Sustainable Oil Palm Supply Chain', towards understanding the role of ISHs. This chain involves several processing stages and goes beyond the initial production of goods to the final delivery to the consumer. It encompasses all activities related to sourcing, procurement, production, and distribution of products or services.

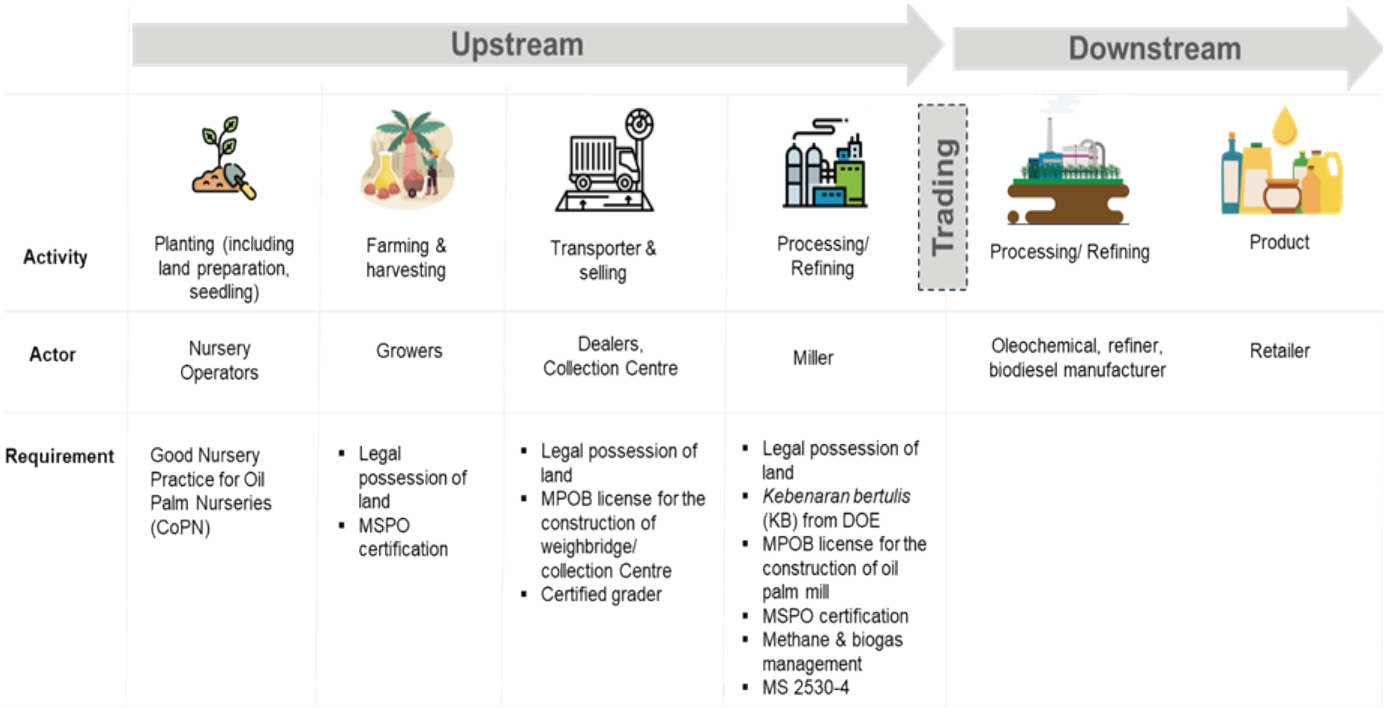
Sustainability commitments to the palm oil supply chain have increased its complexity. Thus, the following section attempts to spell out activities and processes, including the actor's roles and involvement, and to identify gaps in current industry sustainability practices.

ISHs and Other Actors in the Malaysian Sustainable Palm Oil Supply Chain

The palm oil supply chain involves major multinational corporations that procure palm oil from mills and source FFBs from smallholder farmers, large estates, and traders. With sustainable production becoming a priority for large corporations, supply chain management must be transparent and traceable to ensure sustainable practices throughout the supply chain. However, a fragmented and complex supply chain makes palm traceability challenging.

There is a need to understand the various actors – both ***'known and the unknown'*** – and the relationship and roles between these stakeholders in ensuring sustainable practices and achieving a responsible palm oil supply chain. This section describes and maps the actors involved in the Malaysian palm oil supply chain, consisting of upstream and downstream activities (Figure 11).

Figure 11: Map of the palm oil supply chain's actors, activities, and requirements



Source: PNBRI's analysis

The upstream activities of the palm oil supply chain encompass the primary inputs for palm oil production, including seedlings, planting oil palm trees, and applying fertilisers and herbicides. It continued until the harvest and delivery to the mill, where palm oil from FFB is extracted to produce CPO and palm kernel oil (PKO).

Nursery operators, palm oil growers (including oil palm smallholders and estates), and millers are the actors in upstream activities (Mohamed et al. 2015; Ayat K Ab Rahman; Ramli Abdullah; Mohd Arif Simeh and Faizah Mohd Shariff 2009).

(i) ***Nursery operators.*** The chain started with oil palm nursery establishments that grew seedlings from selected parent palms and provided proper care and maintenance to produce high-quality seeds for the growers. Selecting the right seed or planting material from a reliable source can significantly impact future palm oil yields. According to the latest data provided by MPOB in 2024, 659 nursery operators were certified under the Code of Good Nursery Practice for Oil Palm Nurseries (CoPN). The CoPN, formerly known as Oil Palm Nursery Certificates of Competency (OPNCC), provides guidelines to ensure the quality of the seedlings and the efficiency of the oil palm nursery operators (A. K. A. Rahman et al. 2008).

Other activities linked to the nursery include land clearing, land preparation, and planting. These activities occur during the replanting process after oil palm reaches an economic life span of 25 years. The Oil Palm Assistance for Replanting ***(Tanam Semula Pekebun Kecil -*** TSSPK) and the New Planting Scheme for Smallholders ***(Tanam Baru Sawit Pekebun Kecil -*** TBSPK) are available to ISHs to help them with replanting (Mohd Ishak et al. 2020). The scheme funds replanting activities and other agricultural inputs 2 years after planting.

(ii) ***Palm oil growers.*** FFB growers contribute significantly to the palm oil sector in Malaysia as they plant and harvest FFB before transporting it to the mill. FFB growers in Malaysia can be classified into several categories, as explained below.

a) ***Plantations:*** Typically owned by private capital and government-linked companies, they constitute 61% and 22% of Malaysia's palm oil area (Ludin et al. 2014; Mohd Hanafiah et al. 2022). They usually own over thousand hectares of land, and most have mills to process the FFB. Plantations and estates consist of all large and integrated players backed by corporations that are listed on the stock exchange, but also small-medium enterprises (SMEs) owned by private capital and investors. Among the top 10 private estates or large plantations in Malaysia include SD Guthrie (formerly Sime Darby Plantation), Kuala Lumpur Kepong Berhad (KLK), IOI Corporation Berhad, United Plantaion Berhad, and Genting Plantations Berhad (Agriculture 2024), which together command about 27% of planted area in Malaysia (based on authors' estimates). There also large-scale plantations own and managed by federal statutory bodies or state schemes, such as FELDA, FELCRA, RISDA, SALCRA and Sarawak Oil Palm Berhad.

b) ***Smallholders:*** Smallholders own 27% of Malaysia's oil palm planted area (1.5 million hectares), with around 400,000 independent and organised smallholders (Mohd Hanafiah et al. 2022; G. K. A. Parveez et al. 2020). By definition, oil palm smallholders in Malaysia are growers who own less than 40.46 hectares of land. Of the 27% of smallholder-owned planted areas, about 15% (0.8 million hectares) are owned by ISHs.

Box 1: Modes of Oil Palm Smallholding

Independent smallholders cultivate oil palms independently without direct assistance and sell FFB either directly to local mills or through intermediaries (Syarifudin and Zareen 2021). This is a potential challenge for traceability, as oil palm mills receive FFB supplied from various ISHs, and once processed, the palm oil becomes mixed from these diverse sources along the supply chain. In recent years, some of these smallholders have direct support from the private sector, such as Procter & Gamble (P&G), as part of their efforts to support smallholders' journey towards sustainability and improve yield and smallholder livelihoods (Procter & Gamble, n.d.).

Organised smallholders are managed by government agencies such as FELDA, FELCRA, and RISDA. Smallholders in this scheme receive agency support for farm management services and input materials. They may outperform ISHs as they have access to resources, better income, and support to adopt good agricultural practices (GAP) and innovate (Mohd Suib et al. 2023).

Some smallholders are organised as cooperatives. Sustainable Oil Palm Grower Cooperative or Koperasi Pekebun Sawit Mampan (KPSM) is one of the cooperatives established to group ISHs for collective action under an institutional setup (Jelsma, Slingerland, et al. 2017). The cooperative is a platform for smallholders to improve access to resources and markets and assist in palm oil management and income generation (Jaafar et al. 2017).

(iii) ***Extension agents.*** Unlike organised smallholders who receive extension services from their respective agencies, ISHs were left on their own until circa 2002 when MPOB introduced the *Pusat Tunjuk Ajar dan Nasihat Sawit (Pusat TUNAS)*, and alongside it, extension officers known as Pegawai TUNAS Zon (PTZ) (Zonal TUNAS officers). PTZs provide advisory services, educate smallholders on increasing productivity, and introduce related technology and sustainable practices to ISHs. They have also been instrumental in the delivery of flagship MPOB programs for smallholders, namely financial assistance for new planting and replanting assistance *(*Bantuan Tanam Semula Sawit or Tanaman Baru Sawit Pekebun Kecil*)*, the livestock and cash crop integration with oil palm incentive scheme, and as key agents for the management of Sustainable Palm oil Clusters (SPOCs) which is the primary model for MSPO certification among ISHs (MPOB 2020).

Non-governmental entities also play important roles as 'program managers' in assisting smallholders with extension services. This includes private companies (P&G, Wilmar International), NGOs (Rainforest Alliance, WWF, PERTANIAGA, Wild Asia Group Scheme (WAGS)), local cooperatives (such as the KPSM and Koperasi KO-SALESA, and farmers' associations (such as the National Associations of Smallholders (NASH)). Some extension agents assist smallholders in obtaining MSPO and RSPO certifications, which are essential for accessing premium markets and ensuring sustainable practices.

(iv) ***FFB Dealers (or intermediaries):*** FFB dealers, or middlemen, are intermediaries between smallholders and millers. FFB dealers' activities include purchasing, moving, and selling FFB. FFB dealers need to be registered and licensed under MPOB (Parthiban et al. 2023).

(v) ***Collection centres:*** The collection centre (colloquially referred to as 'ramps') is where FFB from smallholders are received, weighed, tagged, and transported to the mills for processing (Ahmad et al. 2023). According to MPOB criteria and guidelines, the collection centre or 'weighbridge' must meet certain conditions, including the possession of a qualified oil palm fruit grader. The collection centre completes the segregation process based on MPOB Grading Guidance before transporting FFB to the mills.

(vi) ***Millers:*** Mills process FFB to produce CPO and CPKO. FFB must be processed in the mill within 24 hours. Most of the FFB processed at the mill and beyond the mill gate are traceable. Details of FFBs sent to the mill should be made available to ensure traceability, including a list of MSPO or RSPO-certified smallholders or suppliers.

Research Objectives

While several scholars and reports have attempted to address the issue of smallholders in producing sustainable palm oil, smallholder perspectives and insights have not been adequately captured. The global demand for sustainable palm oil production requires a traceable supply chain, in which ISHs are often left in the blind spot. With approximately 210,000 ISHs and 822,073 hectares of oil palm planted in Malaysia, excluding these ISHs from the sustainable supply chain would be a significant loss to the nation.

We found there to be a limited number of studies that were able to confirm:

(i) ***whether smallholders*** are truly the "weakest link" in the Malaysian Sustainable Palm Oil Supply Chain, or

(ii) ***why*** many ISHs are still largely excluded from sustainable palm oil production initiatives.

A systematic review conducted by Abideen, Sundram, and Sorooshian (2023) also indicated a lack of research on smallholder sustainability in the palm oil sector. Bringing the complex sustainable palm oil supply chain and smallholders' sustainability practices as the main gaps in this work, this study aims to understand the barriers and develop effective strategies to include smallholders in sustainable palm oil production.

The preceding discussions can be summarised into the following **problem statement:**

> ***Oil palm smallholders present significant economic opportunities beyond rural development, but the opportunities have yet to be fully exploited strategically and at the national level.***

Consequently, this research aims to explore the present and future challenges of sustainable palm oil smallholders in Malaysia. The underlying **theory of change** underpinning such problem statement would thus be as follows:

> ***If independent oil palm smallholders are supported in undertaking sustainability practices, they can be included in the global sustainable palm oil supply chain. When they are part of the sustainable palm oil supply chain, they will benefit from higher yields and income.***

Therefore, the objective of this research is to investigate how smallholders can be supported in implementing sustainability practices to meaningfully include them in the Malaysian and global sustainable palm oil supply chains. This is achieved through conducting both FGD and nationwide surveys with Malaysian palm oil smallholders, thereby amplifying their stories and lived experiences. To meaningfully include smallholders in the sustainable oil palm supply chain, we must first understand the barriers faced and the solutions ***they*** believe will work.

Thus, we sought to find answers to these three questions:

(i) ***First***, what are the key **issues and challenges** for oil palm smallholders in implementing productive and sustainable practices?

(ii) ***Second,*** what are the key **interventions and strategies** for oil palm smallholders to adapt to productive and sustainable practices?

(iii) ***Third,*** what **feasible technologies** are there in the oil palm industry to prepare smallholders towards productive and sustainable practices?

It is envisioned that answers to these research questions can support the achievement of the government's targets in achieving Core Policy 1 on Sustainability, Core Policy 2 on Productivity, and Core Policy 5 on the Welfare of Smallholders, as outlined by the Dasar Agrikomoditi Negara or the National Policy on Agricommodity 2021-2030 (DAKN2030).

This study is scoped to only understand the challenges that ISHs face in implementing sustainable practices and incorporating ISHs into the sustainable supply chain. By no measure should the findings of this research be taken as objective evidence of the benefits of being certified by any sustainability standard or regulation.

Additionally, the term "smallholders" in the succeeding discussions will reference ISHs. The terms smallholders and ISHs will be used interchangeably, and should be taken to mean ISHs, unless otherwise mentioned.

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Chapter 2:
Methodology

Research Methodology Foundation

This chapter explains the theoretical underpinnings of the research methodology used in this report. Due to the intensity of global regulations and requirements imposed on the palm oil industry, it is critical to investigate how these evolving global regulations and requirements in the palm oil industry affect stakeholders along the supply chain, particularly the Malaysian ISHs. Malaysian smallholders are known to face multiple production challenges: meeting compliance requirements, improving farm practices, and enhancing yields and production quality (Solidaridad, Network 2023; Ayompe et al. 2021; Mulyasari et al. 2023).

This report builds on a rich literature that identified and analysed those challenges. To complement previous important findings, this report focuses on understanding smallholders' lived experiences and narratives through a **phenomenological approach**, which centres the "participants' perceptions, feelings, and lived experiences [as] paramount and the object of study" (Guest et al. 2012).

As oil palm smallholding is a well-studied area, the team takes a **grounded approach**. Hence, the research sought to build novel theories from the data being harvested rather than starting with existing theories and testing them. Therefore, no frameworks were pre-assumed to landscape the commodity smallholding in Malaysia (diagnosis) nor to derive our recommendations (prognosis). Additionally, while we acknowledge the main sustainability standards available in the sector (e.g., RSPO, MSPO, MyGAP), none of these certification standards were used as the sole baseline for smallholders' sustainability practices. This approach allowed us to approach the study through unlearning and re-learning the landscape of Malaysian oil palm smallholders.

Guided by these two methodological lenses, this study employs a mixed-method research design with a substantial qualitative component that captures in-depth narratives and is supplemented by quantitative data. Such design allowed us to achieve a sizeable breadth of issues that smallholders face and validate their perspectives with statistical insights. It also provides a comprehensive foundation for evidence-based interventions and strategies that incorporate the voices of smallholders.

Research Design and Methods

The research process consisted of several phases and was iteratively developed to shape and refine the study.

Phase 1: Preliminary Investigation

Guided by a grounded approach, the research employed an initial literature review and stakeholder engagement to understand the prevalent narratives around the palm oil industry.

The initial literature review identified key concepts and previous studies on palm oil. Based on this, we developed a more detailed search string to identify relevant papers related to palm oil from two research databases.

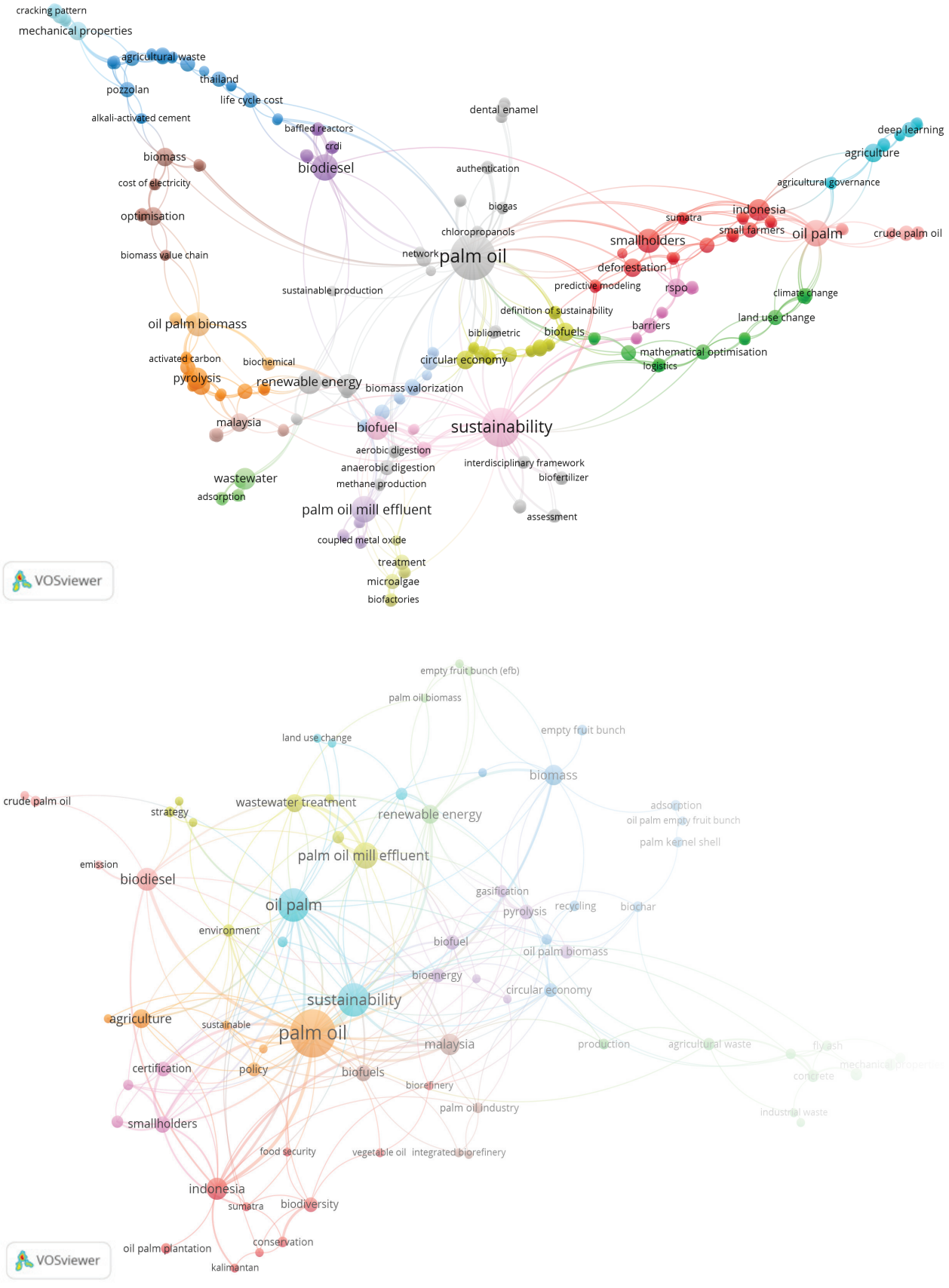
The search string:

(i) ScienceDirect: TITLE-ABS-KEY (("palm oil" OR "oil palm") AND ("Challenges" OR "barriers" OR "issues") AND ("Solution" OR "way forward" OR "strategy"))

(ii) Scopus: TITLE-ABS-KEY (("palm oil" OR "oil palm") AND ("Challenges" OR "barriers" OR "issues") AND ("Solution" OR "way forward" OR "strategy"))

The search string generated 122 papers from ScienceDirect and 485 papers from Scopus, with "sustainability" highlighted as the main concern for the oil palm sector (Figure 12). ScienceDirect and Scopus were selected as they are recognised as the largest databases of peer-reviewed journals, offering the highest reliability compared to other databases (Charef et al. 2018).

Figure 12: Co-keyword network visualisation on oil palm sector research



Source: Analysis using VOSviewer

Co-keyword analysis was conducted using VOSviewer to help clarify and refine the research focus for the study by mapping cluster terms extracted from keywords, titles, or abstracts in a bibliographic collection (Aria and Cuccurullo 2017). This analysis affirmed the initial hypothesis informed by internal PNB data that the palm oil industry faces sustainability issues.

Next, we conducted seven (7) preliminary stakeholder engagement sessions with industry experts, including government agencies, academics, palm oil investment analysts, and industry players. Additionally, we organised a two-day trip in collaboration with the Wild Asia Group Scheme (WAGS) to visit two ISH farms in Perak who had been RSPO-certified.

Phase 2: Problem Refinement

Using the findings from the literature review and preliminary stakeholder engagement, we narrowed our scope of study to independent oil palm smallholders, focusing on their on-farm activities and their relationship with the broader supply chain. To study the independent oil palm smallholders, we formulated three research questions as outlined below:

- **RQ1:** What are the issues and challenges for oil palm smallholders in implementing productive and sustainable practices?
- **RQ2:** What are the key interventions and strategies for oil palm smallholders to adapt to productive and sustainable practices?
- **RQ3:** What feasible technologies are available in the oil palm industry to prepare oil palm smallholders for productive and sustainable practices?

To answer these questions, Project PALMA analysed data and insights primarily from focus group discussions (FGDs), supplemented with systematic literature review (SLR), key informant interviews, and questionnaire surveys.

Table 1 provides an overview of Project PALMA's research design and methods. It shows the linkages between the research objectives and how the data was collected and analysed.

Table 1: Overview of research eesign and methods

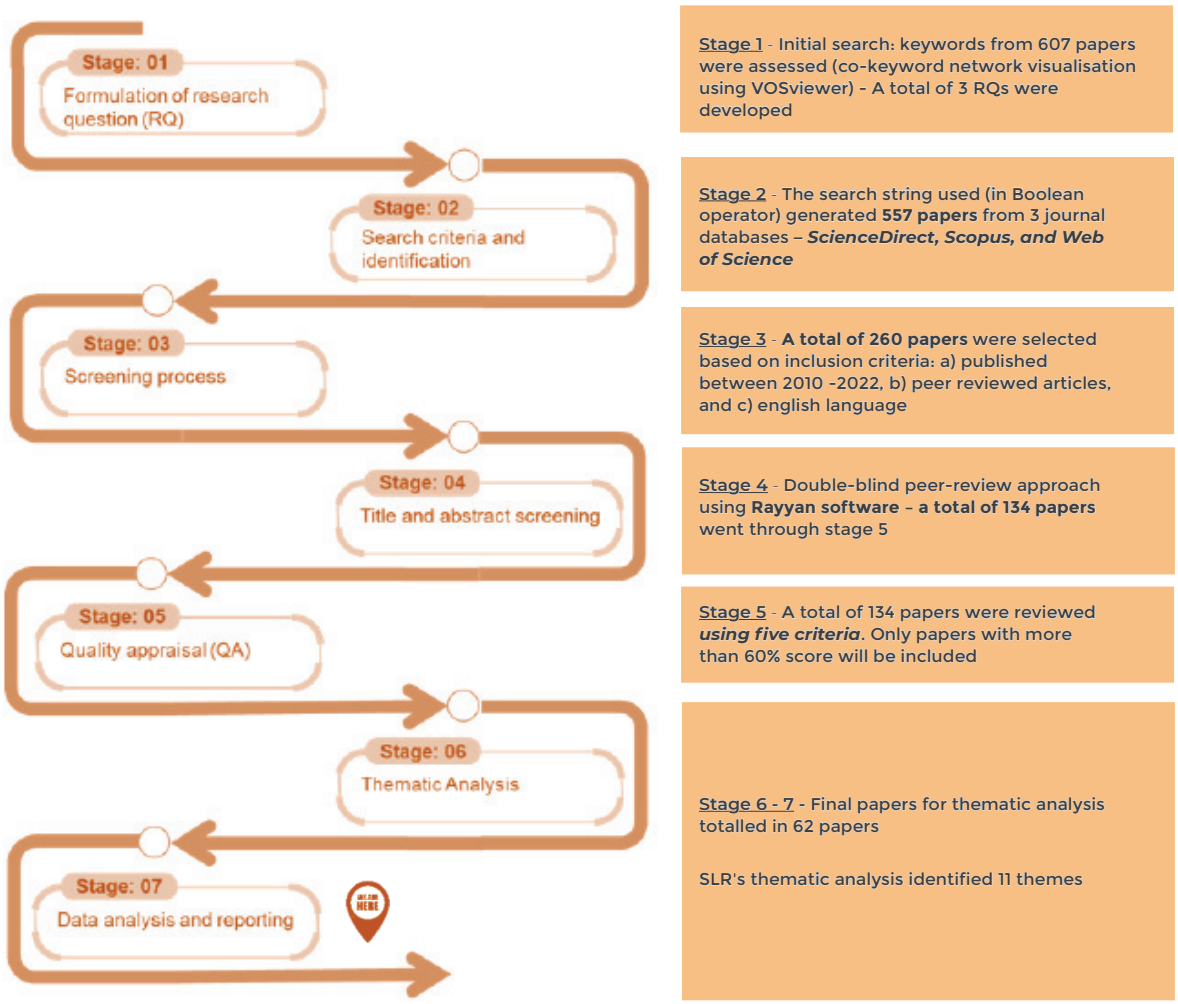
Research Objective	Research Question	Data Collection	Data Analysis
1. Analysis of the issues and challenges for oil palm smallholders in implementing productive and sustainable practices.	*What are the key issues and challenges for oil palm smallholders in implementing productive and sustainable practices?*	Qualitative · Focus group discussion (main) · Key informant interview · Systematic literature review · Literature review Quantitative · Questionnaire survey	· Visualisation mapping analysis using VOSviewer · Qualitative data analysis using ATLAS.ti 23 · Thematic analysis · Quantitative data analysis using STATA · Triangulation · Adaptation of System Dynamics' causal loop diagram
2. Identify and propose key interventions and strategies for oil palm smallholders to adapt to productive and sustainable practices.	*What are the key interventions and strategies for oil palm smallholders to adapt to productive and sustainable practices?*	Qualitative · Focus group discussion (main) · Key informant interview · Literature review	
3. Identify feasible technologies available in the oil palm industry to prepare oil palm smallholders towards productive and sustainable practices.	*What feasible technologies are there in the oil palm industry to prepare smallholders towards productive and sustainable practices?*	Qualitative · Focus group discussion (main) · Key informant interview · Literature review Quantitative · Questionnaire survey	

Systematic Literature Review (SLR)

A systematic literature review (SLR) was employed as a baseline query to systematically search for, appraise, and synthesise research evidence (Grant and Booth 2009) to ensure a rigorous and transparent method for getting a comprehensive review to answer the research questions (Figure 13).

The SLR process encompassed formulating research questions. These questions were addressed by identifying pertinent studies, assessing their quality, and extracting and summarising specific information. This process narrowed down 62 relevant papers for in-depth review and thematic analysis, ultimately synthesising findings and identifying answers to the research questions.

Figure 13: Overview of the SLR process



Focus Group Discussions (FGD)

The research team conducted 30 FGDs with 223 ISHs and 27 MPOB extension officers (PTZs) from 11 states in Malaysia. The FGD participants were recruited through MPOB and the National Association of Smallholders (NASH), representing the palm oil smallholders' community. The appointed enumerators facilitated the FGDs and transcribed the recordings. The transcribed interview data were thematically analysed using a six-phased thematic analysis process.

Key Informant Interviews

The team conducted six (6) key informant interviews with industry leaders, professionals, and regulators to bring the institutional perspective on industry challenges. The information obtained from these expert interviews was used to augment the SLR output and refine interview protocols for our FGDs and questionnaire survey instruments.

Structured Questionnaire Survey

As a method for triangulation, the team surveyed independent oil palm smallholders nationwide in Malaysia through a face-to-face survey method using a structured questionnaire. The survey questionnaire was developed using input from SLR, FGDs, and key informant interviews. To validate the questionnaire, we conducted a pilot survey with practitioners, academicians, and subject matter experts to gather feedback and improve the survey questionnaire before the data collection exercise.

The survey's main components include basic respondent profiling such as their farm location and palm oil experience, as well as smallholders' demographic profile, land status and ownership, farm management, supply chain involvement, good agricultural and sustainable practices, certification and technology adoption, and their issues and challenges.

We used a non-probabilistic sampling method, specifically purposive sampling (Berndt 2020; Moser and Korstjens 2018), based on Krejcie and Morgan (1970) sample size guidelines which indicated that 384 respondents are required to represent the 329,306 population size with a margin of error of 5%.

Proportionate stratified sampling (Md. M. Rahman et al. 2022; Berndt 2020) was then used to determine the proportionate number of respondents from each of Peninsular Malaysia, Sabah, and Sarawak, paying attention to at least the reality that smallholders in Sabah (at 6.5 hectares[1]) and Sarawak (at 5.8 hectares[2]) tended to have average landholding sizes that are larger than those in Peninsular Malaysia at about 3.9 hectares (Senawi et al. 2019a) (Table 2).

The survey was conducted during MPOB smallholder events and meetings organised by NASH. Trained enumerators facilitated the face-to-face surveys to ensure accurate and comprehensive data collection. The survey, which started in May 2024 and ran until July 2024, collected a total of 464 survey responses. Finally, 425 valid samples were used in this study for further analysis.

Table 2: ISHs' oil palm planted area distribution and sample size

State	Estimated Number of Smallholders in Malaysia (A) (Source: MPOB)	Percentage of Smallholders to Total (B)	Number of Expected Sample Size (AxB)	Number of Actual Sample Collected
Pahang	68,485	21%	81	82
Johor	70,804	22%	84	99
Perak	33,606	10%	38	40
Negeri Sembilan	18,675	6%	23	17
Sarawak	56,992	17%	65	64
Terengganu	16,082	5%	19	18
Kedah	6,709	2%	8	12
Kelantan	9,019	3%	12	9
Sabah	35,816	11%	42	41
Selangor	7,353	2%	9	20
Melaka	4,142	1%	5	23
Other state	1,623	-	2	-
	n= 329,306	**100%**	**s= 384**	**s= 425**

[1] Author's calculation, based on total planted area of 203,680 Ha and 31,538 smallholders in Sabah

[2] Author's calculation based on total planted area of 234,812 Ha and 40,513 smallholders in Sarawak

It is important to note that the non-probability nature of this sampling method means that findings cannot be statistically generalised to the broader population of ISHs in Malaysia. The results should therefore be interpreted with caution regarding their representativeness of the entire population. However, the identification of shared concerns across different respondent groups suggests some degree of transferability of findings. The survey findings should also be read in terms of its validating role to the FGD data, which form the main insights of the study. In other words, readers should read the survey findings together with the FGD data as an in-depth exploration of the on-the-ground case, which illuminates the wider phenomenon.

Phase 3: Data Analysis

Thematic Analysis

Next, we conducted a thematic analysis (TA) on two (2) textual data sources: (1) identified literature from SLR and (2) FGD transcript (Naeem et al. 2023; Nowell et al. 2017; Berbekova et al. 2021) to identify and analyse distinct patterns of themes presented. Combining deductive (derived from pre-existing theory or literature) and inductive analysis (derived from data) (Azungah 2018) provided an in-depth understanding of the themes, enhancing the explanation of the underlying narratives and phenomena associated with each theme.

This analysis involved iterative coding to uncover emergent themes – beginning with developing initial codes, sub-themes, and themes – using ATLAS.ti 23, a qualitative data analysis software. A 'theme' refers to a specific pattern of meaning found in the data (Burns 2018) that answers the research question. We followed the six-phased thematic analysis (Byrne 2022; Nowell et al. 2017):

(i) **Phase 1 - Familiarisation with data:** Reading the entire dataset and identifying appropriate information relevant to the research questions.

(ii) **Phase 2 - Generating initial codes:** Coding iteratively relevant data that address the research questions.

(iii) **Phase 3 - Generating themes:** Reviewing and analysing coded data; clustering codes into sub-themes or themes that share a similar underlying concept or feature.

(iv) **Phase 4 - Reviewing themes:** Vetting and discussing themes and subthemes collectively as a team. This includes combining some sub-themes and themes or separating them if they carry different, distinct meanings.

(v) **Phase 5 - Defining and naming themes:** Conducting a peer debriefing process by sharing and discussing the themes with subject matter experts.

(vi) **Phase 6 - Producing the report:** Final analysis and report writing.

Adapted Causal Loop Diagram (CLD)

To understand and analyse the underlying causes and effects of the identified sub-themes, we employed causal loop diagram (CLD), adapted from principles of system dynamics to visualise and analyse how each sub-theme interacts and influences another (Shoar and Payan 2022) as a matter of visualisation. The process guiding the development of the CLD is as explained in Tomoaia-Cotisel et al. (2022) and Rajah and Kopainsky (2024), as the CLD is developed through an interpretive quotations analysis. The CLD is presented and discussed in the results section.

Statistical Analysis

Stata ME 18.0 was the primary statistical package used to analyse the data collected from the structured questionnaire obtained from our nationwide survey, and all data were checked and sanitised before analysis. The data analysed were limited to cross-tabulation of variables for basic inferential analysis. No causal inferences and econometric methods were employed to establish causal relationships between any two variables in this study.

Phase 4: Identification of Recommendations

Key findings from the previous phases provided an in-depth understanding of the scenario surrounding smallholders in implementing productive and sustainable practices. These findings directly informed our development of targeted recommendations tailored to address the specific challenges identified. These were built upon data analysed from multiple sources, as explained in the previous processes, with evidence justifying the intervention or strategies. We use four types of triangulation (Fusch et al. 2018; Campbell et al. 2020; Joslin and Müller 2016) to improve the work's reliability and reduce bias, strengthening our suggestions for intervention and strategies:

(i) **Data triangulation,** using data from multiple groups of stakeholders and individuals who associate with palm oil smallholders. Furthermore, the data collected in this work consists of smallholders at different locations and profiles, providing multiple scenarios. With secondary data from SLR, literature review, and policy document analysis conducted to support some of the arguments we made in this work, the richness of data from different sources strengthened the ***credibility*** of our recommendations.

(ii) **Investigator triangulation,** through multiple Investigators or researchers involved in this work, reduces the possibility of bias in analysing the data while providing diverse perspectives and interpretations. A series of discussions and brainstorming among the research team during the research process enabled the team to give insights and reach similar conclusions and recommendations. We also sought expert review and stakeholder validation through a validation workshop in February 2025.

(iii) **Theoretical triangulation** involves proposing interventions and strategies using multiple theories or perspectives (Van Drie and Dekker 2013; Fusch et al. 2018). We identified and studied the following theories and perspectives as a basis for recommendations: Theories of change, Social learning, Innovation diffusion, and Agents of change.

(iv) **Methodological triangulation**, this work includes mixed methods and multiple data collection methods (FGD, KII, SLR, survey, policy documents, and admin data). This triangulation aimed to overcome each method's weaknesses by combining two or more research methods in studying the same empirical unit (Arias Valencia 2022). The recommendations for solutions in this work included different types of analysis on various data sets and the convergence of evidence to support and validate the interpretation of the Malaysian oil palm smallholder scenario.

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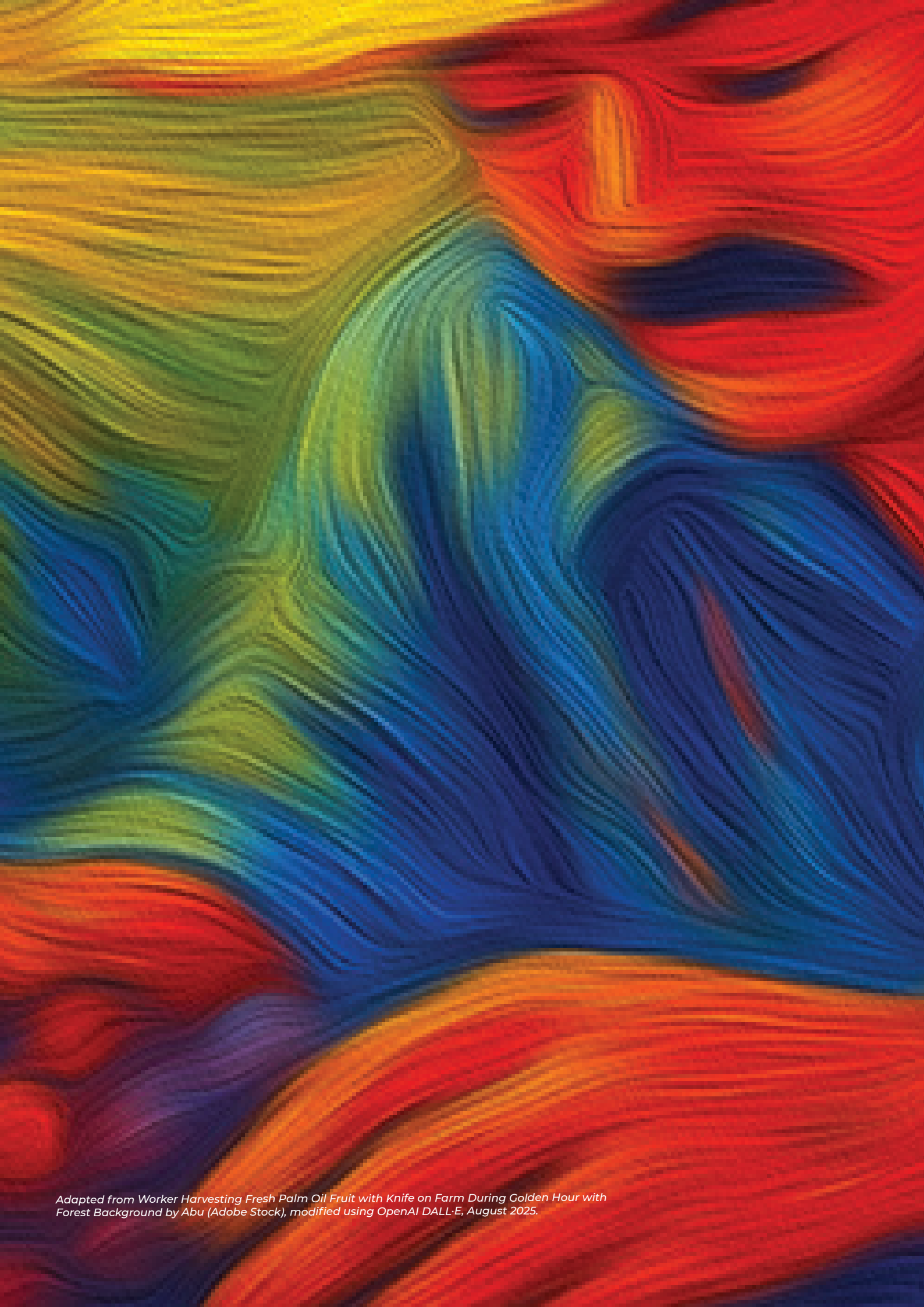


Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Chapter 3:

Key Findings

The Six (6) Main Themes of This Study

As discussed earlier, the chosen methodological approaches have required the authors to disassociate themselves from any preconceived conceptual frameworks. Instead, the TA process, including multiple bouts of debates and validations, drew out a total of **53 sub-themes and six (6) core themes** centred on palm oil smallholders' inclusion in a sustainable supply chain. These six overarching themes are: (1) production; (2) market access; (3) farming knowledge; (4) institutional support; (5) capacity for collective action; and (6) compliance to certification standards.

Table 3 provides an overview of these themes and their sub-themes, which served as the basis of organising the chapters of this report.

Table 3: An overview of the themes and sub-themes identified

Themes	Sub-themes	Description
Production	1. Yield 2. Labour 3. Farm practices 4. Input materials 5. Access to input material 6. Certified input 7. Management skills 8. Marginal land 9. Land size 10. Technology cost 11. Technology efficiency 12. Technology usage	The discussion focuses on the factors that influence smallholders' palm oil production. Palm oil production is commonly measured by yield performance (Rhebergen et al. 2018; Hoffmann et al. 2017), and this theme explores the underlying factor affecting yield among smallholders in Malaysia. ***Key highlight:*** Smallholders' income and capital determine their ability to improve yield through high-quality input materials, productive labour, and appropriate technology.

Themes	Sub-themes	Description
Markets and livelihood	13. Market requirement 14. Market volatility 15. Market access 16. Bargaining power 17. External shocks 18. Financial assistance 19. Financial limitations 20. Capital constraints 21. Debt burdens 22. Profit margins 23. Poor grading	This theme explores the interlinkage between the market and smallholders' livelihoods. Due to dynamic market conditions, smallholders must comply with specific market requirements (Bank 2010; Ogahara et al. 2022). Understanding how this condition affects smallholders' livelihoods is critical, as we observe various scenarios and reactions from the smallholders. This theme also examines the challenges faced by smallholders in their interactions with other market actors within their supply chains. ***Key highlight:*** Access to trusted buyers determines FFB offtake price from smallholders. Smallholders rely heavily on a few actors to purchase their FFB and other services, such as harvesting and transportation.
Knowledge and education	24. Awareness 25. Farm knowledge 26. Knowledge transfer 27. Training 28. Communication 29. Access to training 30. Financial literacy	Smallholders' knowledge and education levels significantly impact their perception and attitude toward improving palm oil production, livelihoods, capacity, and participation in sustainable practice and certification (Saadun et al. 2018). In this theme discussion, we investigate and evaluate the current training or program and its impact. ***Key highlight:*** Access to training or programs impacts smallholder awareness and compliance with GAP and specific requirements (e.g., MSPO, RSPO, EUDR). Translating knowledge into practice remains a huge barrier.

Themes	Sub-themes	Description
Institutional support	31. Partnerships and engagement 32. Land regulation and administration 33. Land title and ownership 34. Insecure land tenure 35. Land encroachment 36. Absence of Land Maps 37. Technology suitability 38. Contract farming arrangements	How institutions become part of today's system encompasses various aspects that occur at the strategic level, especially related to policy and regulation, cross-sectoral function, governance, and stakeholder collaboration (Raharja et al. 2020). This theme looks into how institutions affect smallholders in Malaysia, including available support schemes, inter-agency coordination, and regulatory aspects. ***Key highlight:*** Effective coordination and collaboration among stakeholders could be part of a strategy to strengthen the institution and improve the future performance of palm oil smallholders. However, governing multiple stakeholders with varying powers and interests can be difficult.
Organisational capacity and collective action	39. Organisational capacity 40. Responsible Leadership	Smallholders' ability to strengthen their supply chain position necessitates institutionalisation by forming cooperative organisations or collective action with a shared interest (Raharja et al. 2020; Jelsma et al. 2024). While forming smallholder cooperatives or collective action can be difficult due to various factors, this section discusses some scenarios and the ability of key stakeholders, including the smallholders, to organise and implement collective action. ***Key highlight:*** Smallholders' ability to organise themselves or engage in other forms of collective action gives them a stronger voice in advocating for their needs and interests and better access to inputs and the market.

Themes	Sub-themes	Description
Certification	41. Certification adoption 42. Certification requirement 43. Certification assistance 44. Certification standards 45. Certification premiums 46. Certification cost 47. Motivation for certification 48. Compliance requirement 49. Certification process 50. Obtainment of certification 51. Stakeholder interest 52. Bureaucracy around certification 53. Documentation	While there is global demand for sustainable palm oil production, only 30% of smallholders in Malaysia are certified by either MSPO or RSPO (Rizal and Nordin 2022a). The demand for sustainable palm oil production and other requirements put smallholders in a challenging situation. This section captures the perspectives of smallholders and relevant stakeholders on achieving certification and compliance requirements. ***Key highlight:*** Compliance with requirements requires intervention across multi-variables. Understanding motivation and the underlying factors influencing smallholders and other stakeholders to participate in the certification process will provide a strong basis for certification.

The consolidation of smaller themes into these six overarching themes was guided, as much as possible, by the principles of mutual exclusivity and collective exhaustivity (MECE) with respect to the data to reduce overlaps between themes. While this was the aspiration, it must be emphasised that a high degree of interlinkages and relationships between these themes remained. In addition, the authors do not claim to have exhaustively captured the entirety of issues surrounding oil palm smallholders beyond what our data had captured.

As such, the authors saw it fit to use an adapted version of the **Causal Loop Diagram,** borrowed from the principles of Systems Dynamics (Sterman 2000), to further unravel and illustrate six key insights (Figure 14) that will be discussed in the following chapters.

In summary, the six key insights explained that:

(i) Independent oil palm smallholders are trapped in a low-income cycle;

(ii) Malaysian oil palm smallholders are price-takers;

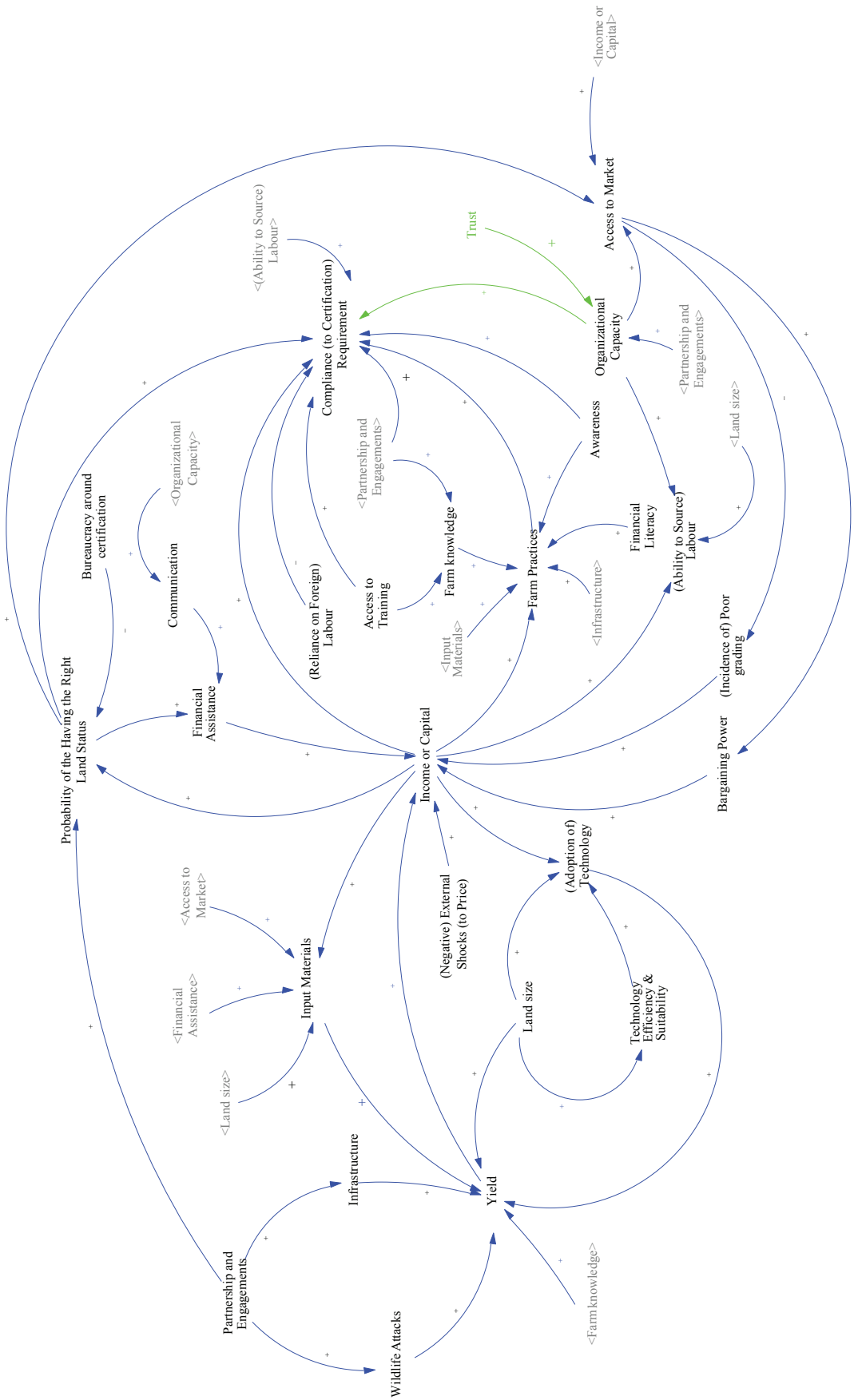
(iii) Knowledge does not necessarily translate into practice;

(iv) ISHs are not “independent” in the true sense;

(v) Organising is common but tends to be sponsored by large institutions; and

(vi) ISHs expect but do not experience benefits from certification.

Figure 14: Six key insights identified from the causal loop diagram (CLD)



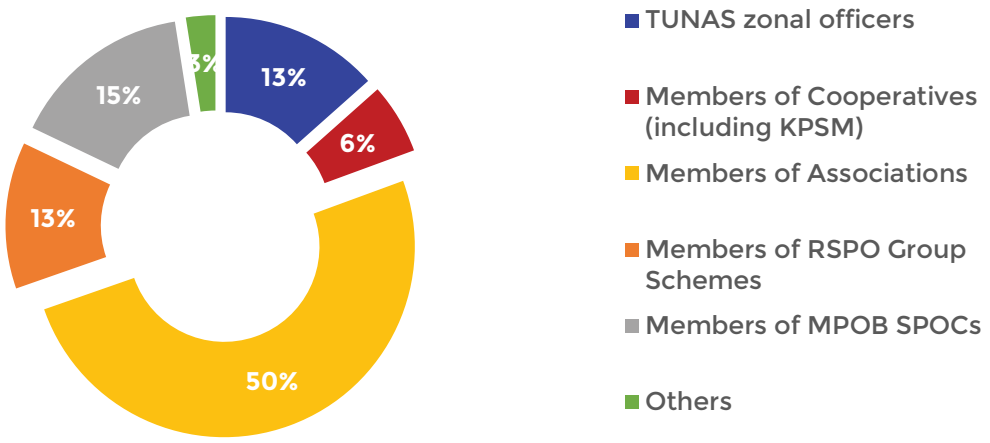
Source: PNBRI's analysis

Profile of Independent Smallholders in the Study

The following are a distribution of our respondents.

For the focus group, the type of respondents, based on affiliation, were mainly skewed to members or affiliates of the smallholder associations (particularly the NASH) at about half of the discussant population (Figure 15). The remaining half consists of an almost equally-distributed share between ISHs who are under managed group schemes for RSPO certification, members under the Sustainable Palm Oil Cluster (SPOC) managed by MPOB TUNAS officers, and TUNAS officers themselves.

Figure 15: Distribution of discussants in Focus Group Discussions (FGDs)



Additionally, the face-to-face survey using a structured questionnaire yielded 425 respondents, with Johor, Pahang, and Sarawak being the top three states represented in our survey (Figure 16). Johor, the state with the highest number of ISHs surveyed, also has the highest number of smallholders who own less than 5 acres of land, followed by Sarawak (6.4%) and Pahang (5.9%) (Figure 17, 18). Based on the overall breakdown of the distribution of respondents by land size, 41% of our surveyed respondents owned small land sizes of less than 5 acres. This indicates that the significant presence of small land-size owners makes it challenging to achieve economies of scale.

Figure 16: Number of respondents by state

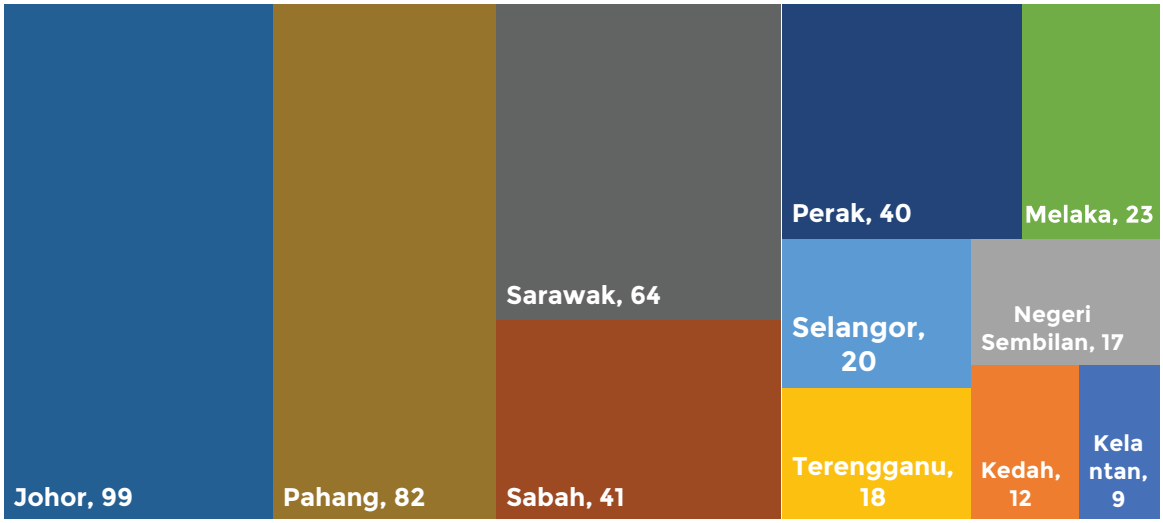


Figure 17: The distribution of respondents, by land size (hectare)

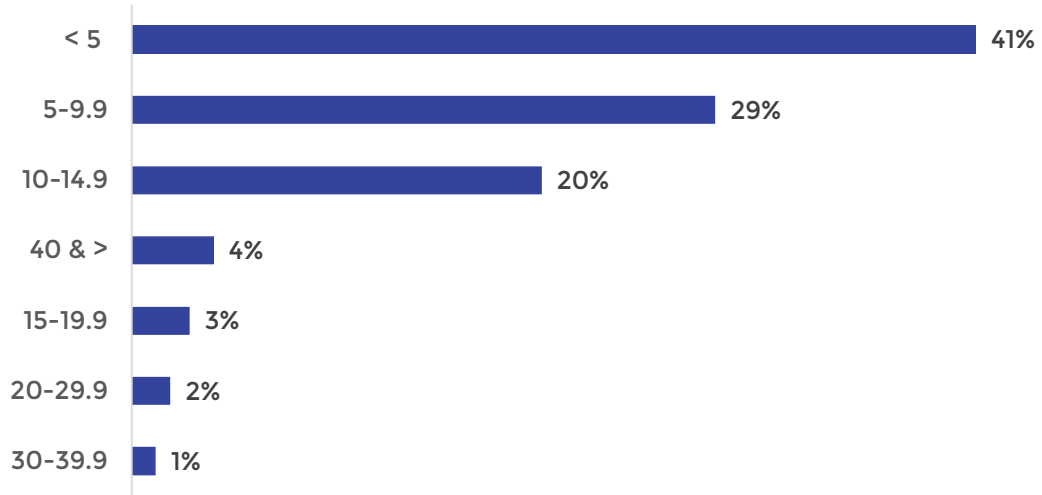
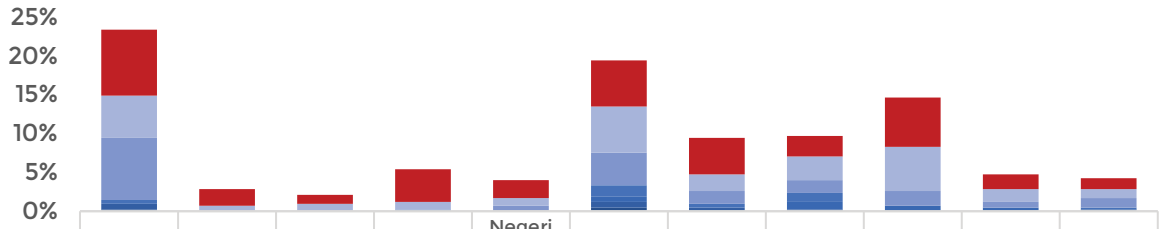


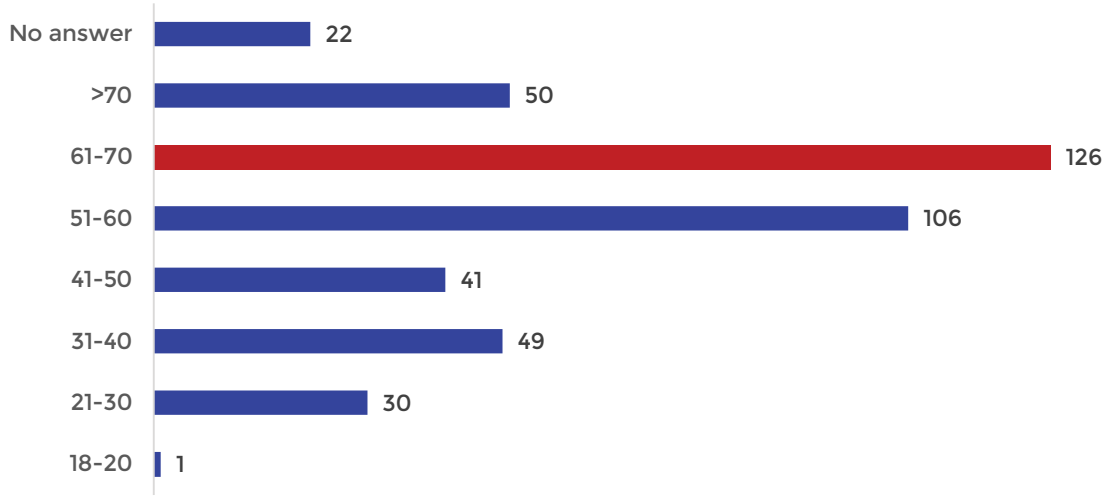
Figure 18: Distribution of respondents across states, by land size (%)



	Johor	Kedah	Kelantan	Melaka	Negeri Sembilan	Pahang	Perak	Sabah	Sarawak	Selangor	Terengganu
< 5	8.5%	2.1%	1.2%	4.3%	2.4%	5.9%	4.7%	2.6%	6.4%	1.9%	1.4%
5-9.9	5.4%	0.7%	0.9%	0.9%	0.9%	5.9%	2.1%	3.1%	5.7%	1.7%	1.2%
10-14.9	8.0%	0.0%	0.0%	0.0%	0.7%	4.3%	1.7%	1.7%	1.9%	0.7%	1.2%
40 & >	0.5%	0.0%	0.0%	0.2%	0.0%	1.4%	0.5%	1.2%	0.0%	0.0%	0.2%
15-19.9	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.9%	0.7%	0.5%	0.0%
20-29.9	0.7%	0.0%	0.0%	0.0%	0.0%	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
30-39.9	0.2%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.2%	0.0%	0.0%	0.2%

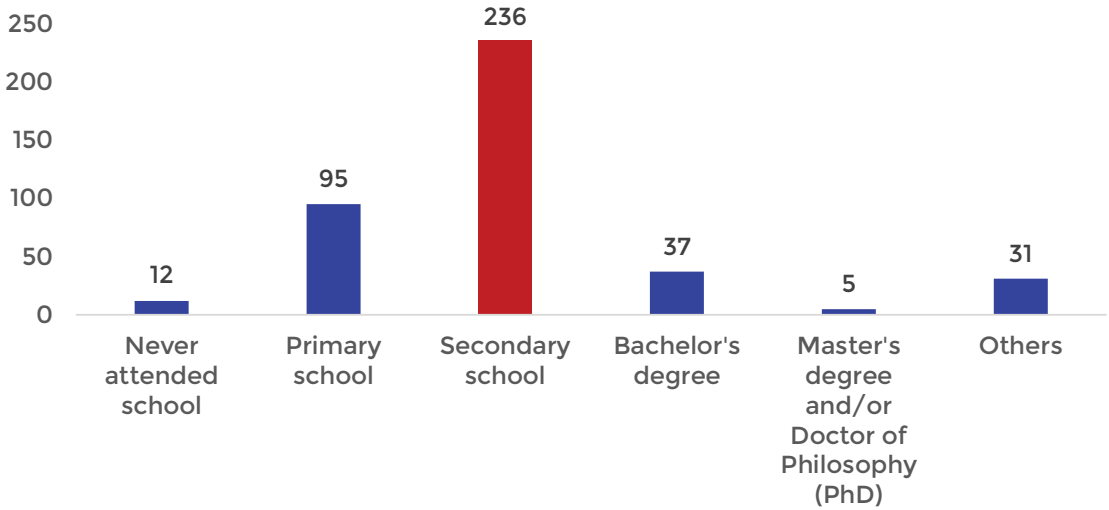
In terms of age, the survey results show that the age profile of smallholders is ageing, with 41% of respondents aged 60 years or older (Figure 19). Similarly, commodities such as paddy had been experiencing a similar ageing profile among smallholders (Khazanah Research Institute 2019). In contrast, the agrifood sector had been seeing a relatively younger age profile among smallholders, potentially signalling a growing interest in agri-food relative to agri-commodities. If this trend continues, it could impact the productivity and the sustainability aspirations of Malaysia's broader palm oil sector in the future. Previous studies have shown that the age of smallholders is one of the factors that influence their productivity and economic efficiency.

Figure 19: Number of respondents, by age group



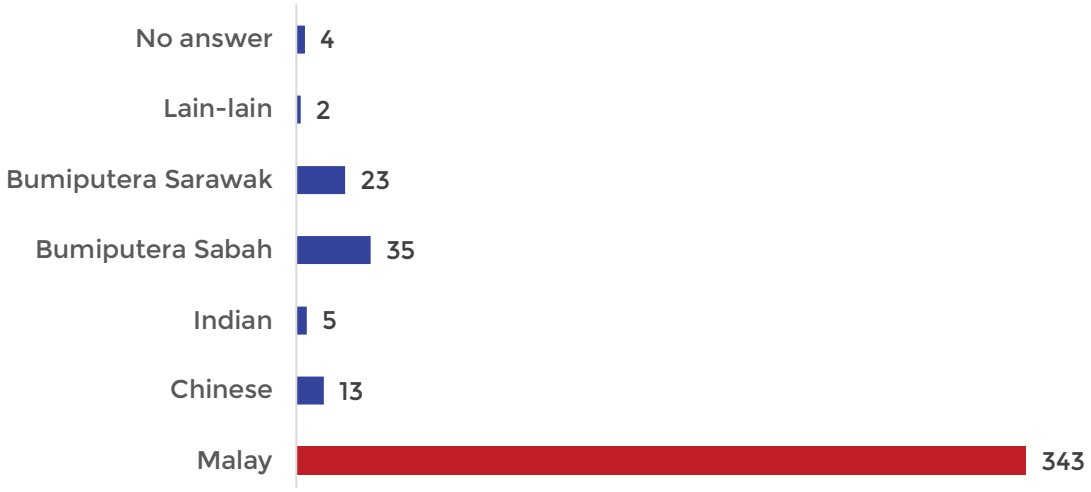
In terms of education, the highest level of schooling is predominantly at the secondary level (Figure 20). These data revealed that the level of education among smallholders is relatively low, which could influence the decision to adopt new technologies or sustainable practices, as they may lack the necessary knowledge and skills.

Figure 20: Number of respondents, by education level

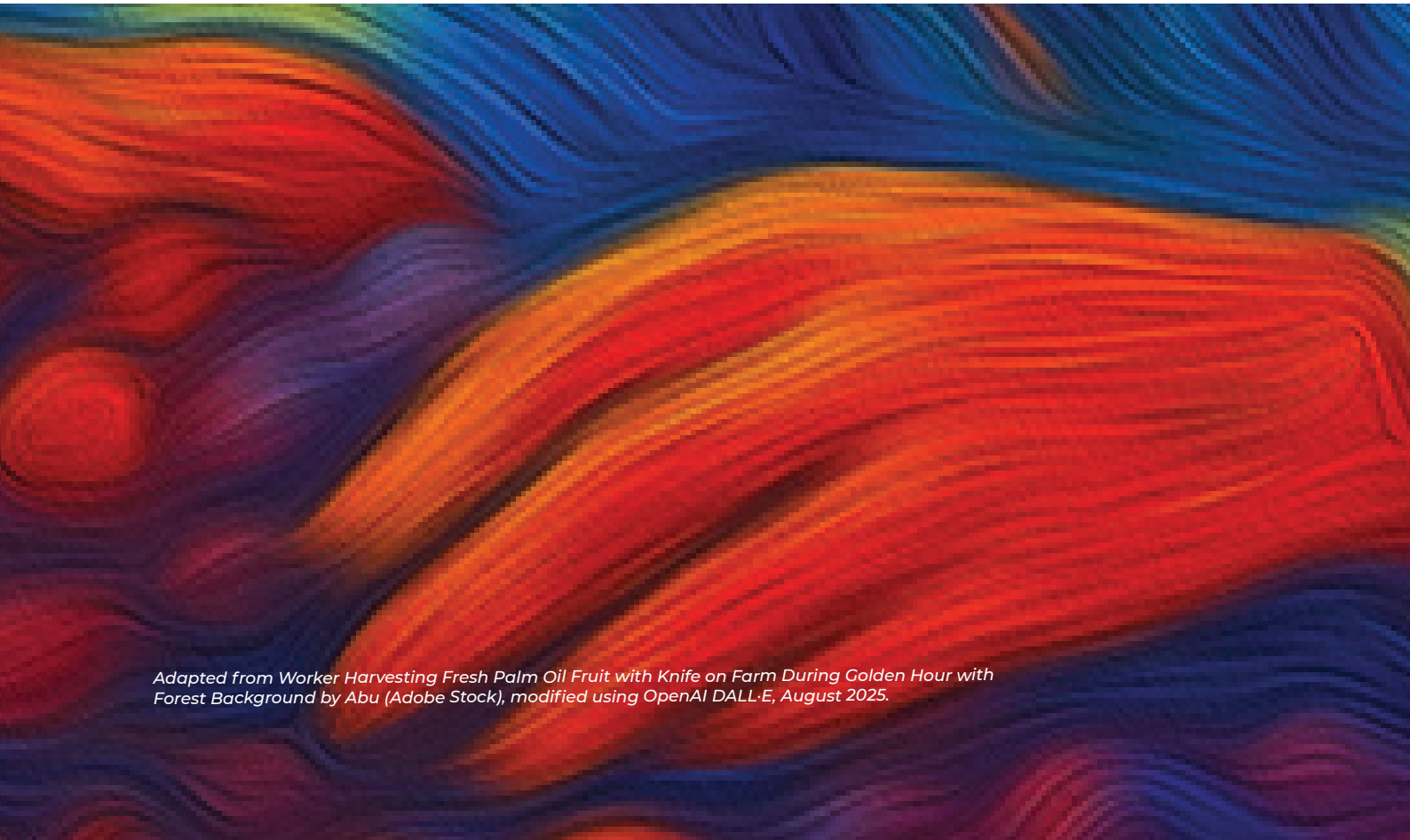


In terms of ethnicity, the Malays were found to be the majority race group surveyed in this report (Figure 21). While some previous research studies have examined how social differentiation influences farming practices, for purposes of this study it was impracticable to examine how different racial groups behave and adopt good farm practices due to the limited representation of other races in this study.

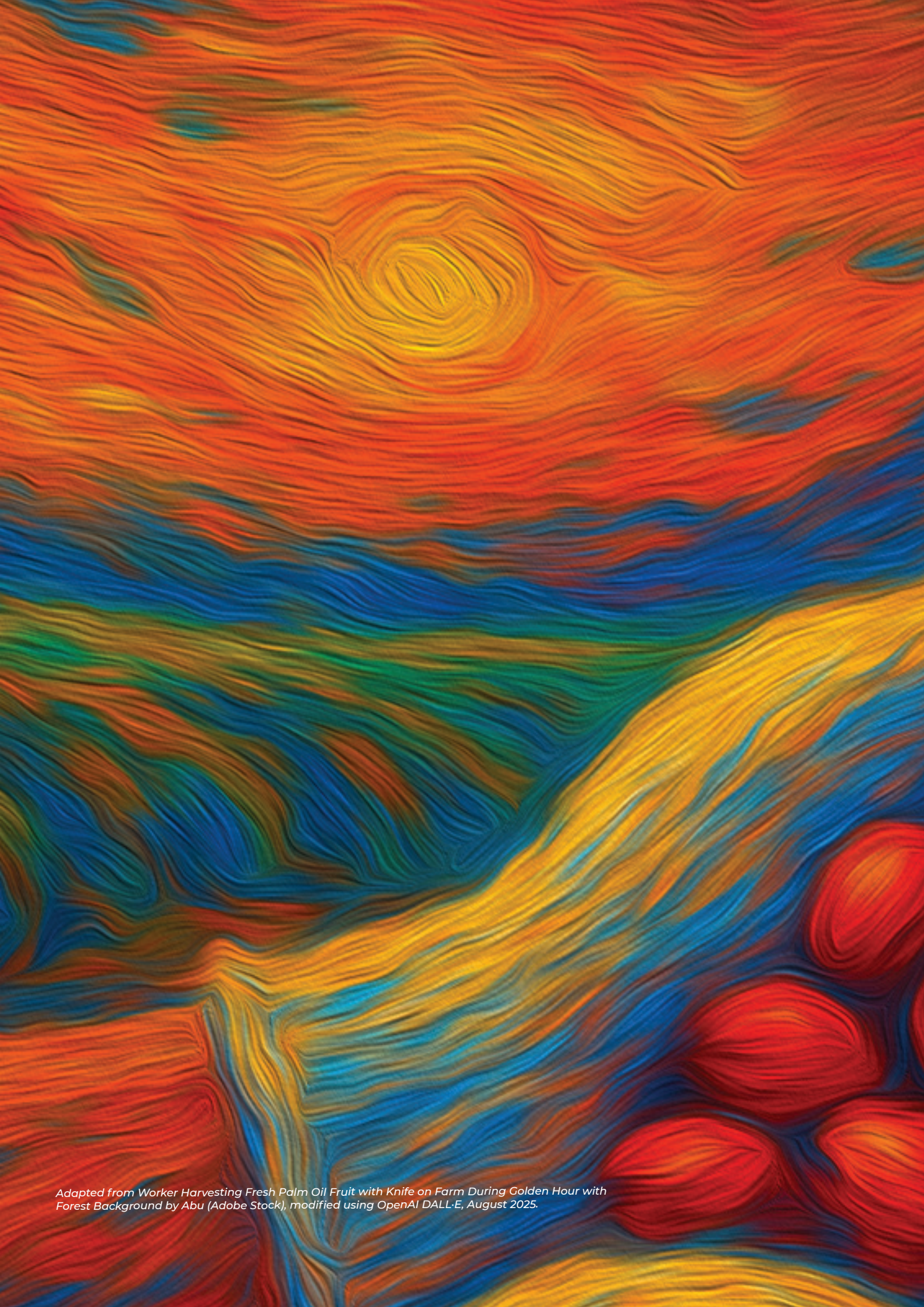
Figure 21: Number of respondents, by ethnicity



The next six chapters will discuss the main themes of this study with evidence primarily from the focused group discussions, but supported by findings from the above population of survey respondents.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.



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Chapter 4:

Production, Income, and Financial Capacity of Smallholders

This chapter aims to explain the first key theme of this report, that ISHs are trapped in a kind of "low-income cycle". In this chapter, we explain how yield (or production) is both a factor and a result of income for smallholders. The lower the income of smallholders, the less they have (to plough back into fertilising and running the farm), and in turn the less yield and income they can earn from their land.

Efforts to enhance and sustain smallholders' income in the long term depend heavily on palm oil production, which is typically measured by FFB yield performance (Rhebergen et al. 2018; Hoffmann et al. 2017). This section discusses some of these factors and their interrelations, which affect smallholders' production levels. Our surveyed smallholders yielded an average of 14.95 MT/ha/year, slightly lower than the national average of 15.8 MT/ha/year (data from MPOB 2023).

We begin by analysing the relationship between land size, age profile of trees, and yields, by State. Figure 22 shows that smallholders in Perak were the most productive, yielding 20 MT/ha/year, followed by Melaka at 18 MT/ha/year and Selangor, Kedah, and Kelantan at 17 MT/ha/year. Our data showed that most of these states have a significant percentage of prime-aged trees (Figure 23), with more than 45% of planted areas having trees older than 9 years, contributing to their high yield.

Interestingly, despite being home to 65% of the total smallholding planted area and having the majority of trees in their prime age, the average yield in Johor was only 13 MT/ha/year, which was lower than in other states with similar tree age profiles.

Figure 22: Yield of ISH between states (MT/ha/year)

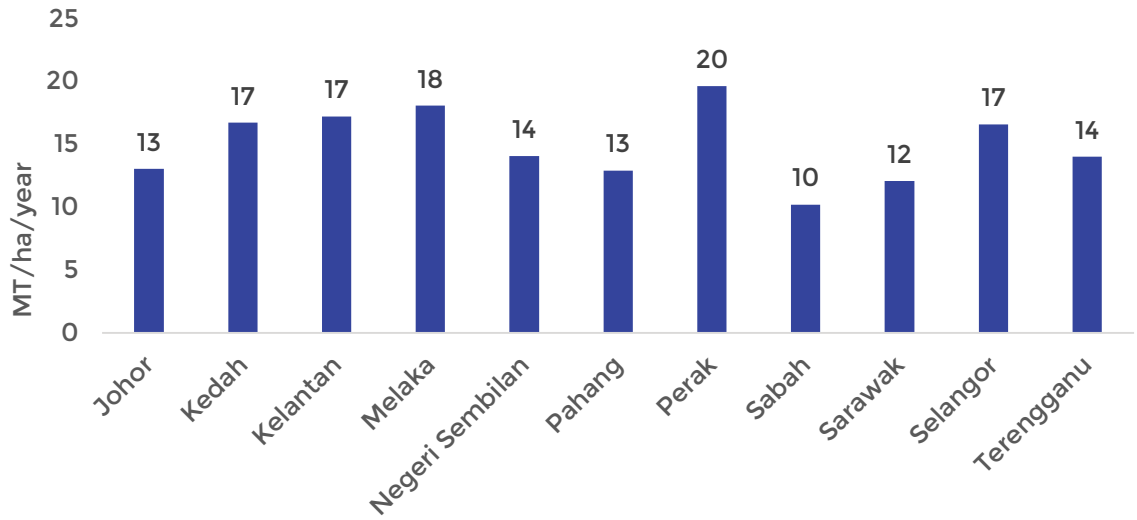
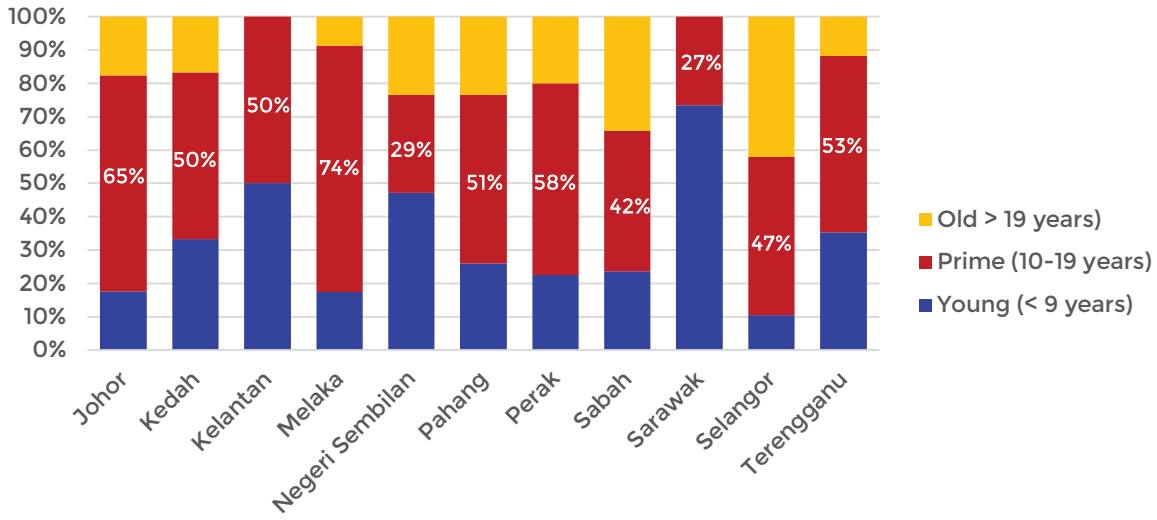


Figure 23: Distribution of tree age profile, by state (%)



This paradox suggests the dominance of other factors, such as soil quality, weather patterns, climate conditions, and farm management practices, which may have influenced the average yields in this state. Because the factors influencing yield may differ between states, it is critical to identify the specific factors influencing yields among smallholders at the local level.

Achieving optimum yields has been proven achievable by some smallholders yield have in Malaysia, as found during our FGD.

> ***"(...), if we talk about the average yield of smallholders so far, based on my area (Layang-layang) and record that I have monitored for "ahli kelab 30 tan", most of the (ethnically) Chinese (smallholders) were able to achieve more than 25 tons/ha/year."***
>
> **(Peninsular)**

To improve smallholder incomes, there is a need to understand factors that influence yields and structural barriers that may be working against them, from a systems point of view. In our study, smallholder yields have reached 19 MT/ha/year, or even close to 30 MT/ha/year under favourable conditions. When land expansion is not viable due to the national commitment to maintaining at least 50% forest cover nationally (Ministry of Energy and Natural Resources 2021), improving productivity becomes even more important.

Our most important finding was how smallholders' income *itself* was a key determinant towards increasing their yields. In other words, the lack of income from any given period, was precisely due to the lack of income in the previous periods. Essentially, ISHs were observed to be "trapped" in a vicious cycle of low economic livelihood – where limited financial capacity limited their ability to plough back income into improving farm practices or into innovating, limited their yields, which in turn, further limited their incomes.

As a result, income from palm oil alone was insufficient to support smallholders' livelihoods and farm operations. As many as 52% of our surveyed smallholders had household income below RM2,500 (Figure 24). In addition, more than half earned less than RM1,700 monthly from FFB sales (Figure 25).

Figure 24: Smallholder's household income and other income sources

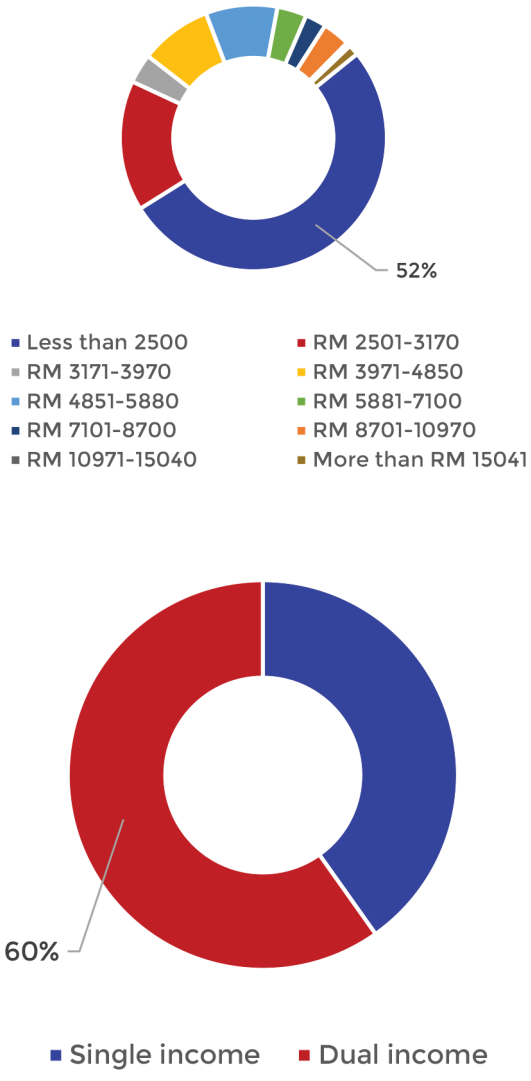
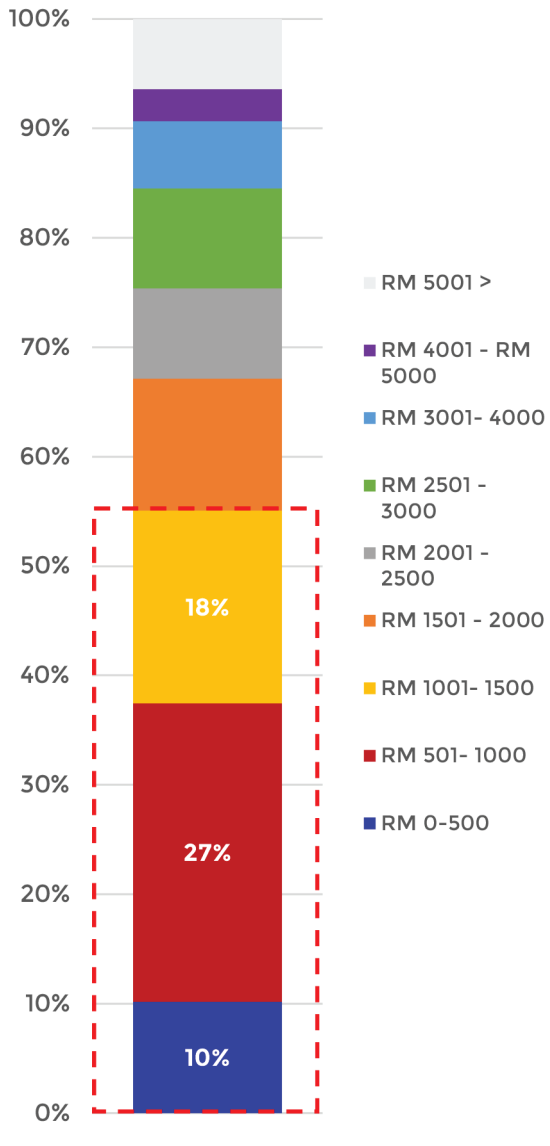


Figure 25: Income from selling FFB (RM)



4.1. ISH Status: Income, Participation and Age

According to our data, the median smallholder made RM1,500 per month from gross FFB sales in 2023. This translates to an average FFB sales of about RM620 per month ***per hectare***, considering the average mature landholding of 2.42 Ha. The value of FFB sales however varied widely depending on each smallholder's yields and the price of FFB offered by collection centres. After factoring in deductions such as input material cost (e.g. fertiliser and pesticide) and labour costs, the actual take-home income of smallholders might be significantly lower.

This, in turn, forced smallholders to seek alternative income sources, as they could not rely solely on income from FFB sales. Figure 24 also showed that as many as 60% of respondents had dual or more incomes, in addition to incomes from oil palm farming. Having alternative income sources may positively improve the financial status of smallholders, but can also negatively affect overall participation and production:

> ***"(...), the number of full-time farmers is below 50%, indicating that palm oil production cannot be optimised."***
> **(Peninsular)**

It could be observed that the status of the smallholders, i.e. whether they are full-time or part-time farmers, could influence yields. However, in terms of their financial capacity to operate their farm, it may not make any significant difference whether one was a full-time or a part-time farmer. Both could face different challenges, as narrated below:

> ***"They (smallholders) solely rely on income from oil palm yields to purchase fertilisers and pesticides.... due to the high labour cost, SHs cannot depend on hired workers to assist them; instead, they manage all oil palm farm operations themselves."***
> **(East Malaysia)**

> ***"Most palm oil smallholders typically are not full-time farmers. Also, most rely on hired labour because their age or physical condition doesn't allow them to work as much. So, even if they get a high yield from their palm oil, much of it goes towards labour costs. They pay for labour, fertiliser, pesticides, and harvesting. Therefore, their actual income is minimal"***
> **(Peninsular)**

With 41% of smallholders surveyed as ageing farmers, the dependency on contracted labour was also observed to have increased as they became less physically capable of managing their farms, further adding costs to their operations. This could lead to poor farming practices, less harvesting, and declining productivity, if not addressed. More than half (52%) of the smallholders depended on third-party services for their farm management activities, such as harvesting and pesticide application, potentially due to the above-mentioned factors.

Smallholders' incomes influenced their financial capacity to run their farms, which included costs of labour, fertiliser, and pesticides. Smallholders who reported being financially incapable of implementing regular fertiliser applications also reported having inadequate income. This may explain why some smallholders struggled to properly manage their farms, which could result in poor farming practices and low yields.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

4.2. Input Materials

The study found that the most dominant factor contributing to smallholders' struggles in operating their farms were rising and fluctuating input material costs, like fertiliser and pesticides. Input materials prices, like fertiliser and pesticides, were ranked as the two most serious challenges faced by smallholders surveyed (Table 4). Our survey revealed that input materials accounted for more than half of the total cost (excluding labour cost), with fertiliser accounting for most of the costs. Smallholders spent an average of RM 4,525.52/ha/year on fertiliser alone, or approximately RM 1,508.50 per hectare, for a typical application frequency of three-times fertiliser a year, for trees older than four years (which makes up 94% of tree profiles in our survey).

Table 4: Top 5 issues and challenges faced by smallholders surveyed

Issues & Challenges	Mean	NV[1]	Rank
Fertiliser price increase	4.37	1.00	1
Pesticide price increase	4.35	0.99	2
Reduction in financial assistance and subsidy from the government	4.28	0.94	3
Lack of additional capital to purchase the high-tech farming tool	4.04	0.80	4
Lack of capital for replanting	4.04	0.80	5

1. NV = Normalisation value

Aside from costs, smallholders were also concerned about the quality of fertiliser. When the costs of the standard fertiliser in the market became too high, smallholders opted for other options, such as cheaper, potentially counterfeit, fertiliser. Cheaper fertilisers usually came in repacked bags mixed with other unknown substances and may not contain the same nutrient content as standard fertilisers. Using such low-quality input materials might also contribute to lower yields in the future by way of sustained farm degradation and long-term soil health issues:

"Even though the fertiliser is applied 4 times a year, the results are not good because of the poor quality of the fertiliser. I don't know how they do it, but they reprocess the fertiliser, repack it, and mix it with other materials."
(East Malaysia)

High costs of input materials also made it difficult for smallholders to implement GAP, such as regular fertilisation and pesticides, which affected yield. GAP was an important factor in increasing yield, evidenced by smallholders who were reported to have achieved as high as 28 MT/ha/year in FFB yields. Extension officers interviewed during this study attributed their yield performance to good agricultural practice, knowledge, and experience:

"In Melaka, I can inform you that there are farmers who can achieve 28 tons per acre."
(Extension Officer)

"Actually, MSPO has taught smallholders a lot about good fertilisation as well as how to make our palm oil more sustainable..."
(Peninsular)

"(...), good agricultural practices (GAP) have helped smallholders a lot in grass management and soil moisture, efficient fertilisation..."
(Peninsular)

These success stories highlighted the potential benefits of implementing GAP for smallholders, including increased yield and income. It also underscored the importance of addressing barriers, such as high prices of input materials, to enable more farmers to adopt these practices effectively.

4.3. Technology Adoption and Productivity

This study also demonstrated a low level of on-the-farm productivity among smallholders. According to our survey, technology adoption among smallholders was low (52% of respondents were aware, and only 16.7% of smallholders used technology and mechanisation). This low adoption rate prevented smallholders from improving efficiency and yields in the face of a foreign labour shortage, limiting their market growth and competitiveness.

> ***"However, it depends on the financial capacity, and there are various technologies for pruning, but the cost is high (...), a motor vehicle to transport the fruit costs RM18,000. In my opinion, I can't afford it."***
> **(Peninsular)**

> ***"If we ask them to use CANTAS, they refuse. They prefer to use sickles. Another point is that they will be charged again if the machine breaks down. As a result, the workers face constraints there and prefer to use manual methods"***
> **(Extension Officer)**

> ***"Depending on the size of the farm, like mine, which is small, it's not worth using technology."***
> **(Peninsular)**

Some smallholders felt that technology only added to their costs, including technology-related expenses such as machinery maintenance, repair costs, and the need for additional labour services. Challenges arose in introducing technology, mainly due to financial constraints and small land size. However, we also observed an ingrained mindset of preferring to hire workers rather than invest in machinery among some smallholders. All in all, smallholders were observed to often resort to conventional manual labour.

"(CANTAS is) Not so much on increasing yield, but it reduces the energy required (e.g. for harvesting). Using technology really helps older people like us (...),. Using technology benefits older people like us (...),. If there is technology that can make harvesting fruit easier, maybe reduce the time spent harvesting."
(East Malaysia)

"The CANTAS machine's support isn't strong and shakes when the tree is tall. The CANTAS is as heavy as a water pump, so you must have the strength to hold it steady and prevent it from shaking."
(East Malaysia)

While some smallholders expressed interest in technology, its applicability is limited, especially for elderly farmers with physical limitations. Although MPOB had developed harvesting technology, such as CANTAS, it did not meet the needs and capabilities of some of the smallholders interviewed. From our conversations, farmers might have needed physical-augmenting technology such as exoskeletons to help with physically demanding tasks like harvesting.

Our survey results also allowed us to analyse the degree of technology adoption among smallholders. Using the Likert scale, we derived a "technology adoption" index and applied it to Rogers' innovation diffusion curve (Robinson 2009; Rogers 2003; 1995) to assess technology adoption among smallholders. As high as 87% of surveyed respondents used manual tools and conventional methods, indicating a very low rate of technology adoption among them. Most smallholders (99%) fell under the "late majority" category on Rogers' curve, which describes a social system that waits until most of their peers (or the average group) adopt the innovation (Sahin,2006).

Smallholders were in, short, sceptical, of innovation, and our FGD reflected their reluctance to adopt new technologies, thus slowing down efforts to improve productivity and yields:

"I think the use of technology has not resulted in significantly increased yields. So far, the technology, whether drones or the CANTAS machine, hasn't been used here."
(Peninsular)

While hard to adopt, technology – particularly automation in fertilisation and harvesting – is also increasingly becoming the very option to improve yields, given limited land availability and ageing smallholders. While technological adoption may be costly, its returns can be meaningful.

A simple sensitivity analysis could illustrate the case for yield enhancement using technology. Under current assumptions of zero technology adoption[3], even a modest 10% increase in yields could improve monthly net incomes of the hypothetical smallholder[4] by between 16% and 18% (about RM113 to RM138), depending on FFB prices. Should there be savings from labour costs due to the adoption of mechanization equipment in harvesting activity, there is potential for even greater savings and greater income improvements, especially if the costs of technology adoption are borne by the government.

4.4. Land Size and Economies of Scale

Smallholders with small land holdings (typically less than 5 hectares) were also observed to have struggled to achieve economies of scale from their farming activities. Though we were limited in our ability to ascertain if small land size (or lack of economies) was the most dominant root cause for low incomes from farming, the impact of land size on production was well demonstrated. Smallholders with only a few hectares of land found it challenging to cover the cost of implementing GAP and regular farm maintenance, as highlighted by the smallholders during the FGD:

> ***"Three (3) acres is not economical for oil palm planting. Because (...), 60% of the income goes to fertiliser."***
> **(Extension Officer)**

Land size, yields, and market prices all influenced income. When market prices were volatile and unpredictable, the only way for smallholders to ensure a consistent income was to increase their productivity and farm efficiency (i.e. to lower costs). However, due to their dependence on collection centres and third-party FFB aggregators (see Chapter 5), smallholders were vulnerable to price fluctuations and changes in market demand for FFB:

[3] Assuming FFB price per tonne of between RM500 and RM600 per MT and two fertilisation cycles per year

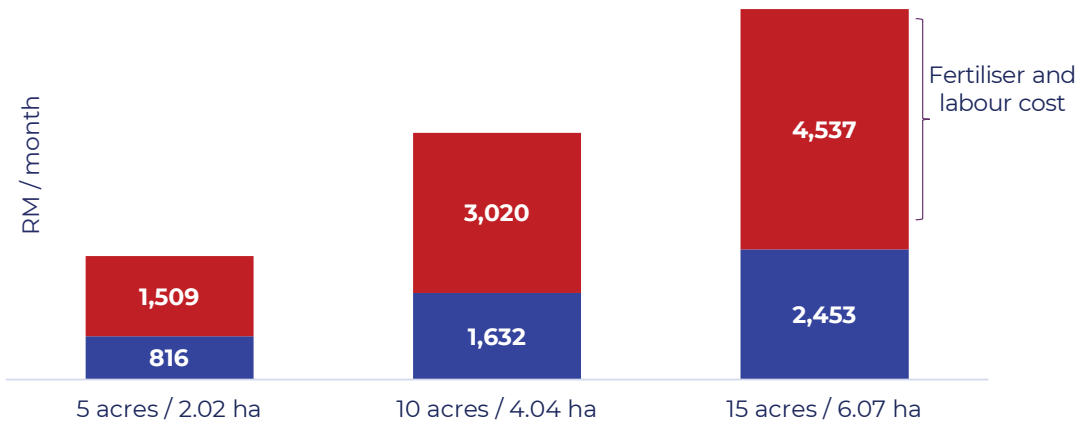
[4] The hypothetical smallholder in our analysis owns 2.02 Ha or 5 acres of land

"We can see that most smallholders hope their income will increase over time, but it depends on the condition of their palm oil production."
(Extension Officer)

"(...), last year (2022) was good, but this year is tough. Now the price is RM600 per ton. The price has dropped. We smallholders sometimes get 4-5 tons a month. I have about 6 acres."
(Peninsular)

We estimated the minimum land size for achieving economies of scale (Figure 26) to be 10.39 acres (4.21 Ha), defined as the minimum land size to achieve monthly profits equivalent to the prevailing national statutory minimum wage of RM1,700. By incorporating survey and interview data, such as average yield (14.95 tonnes per hectare), land size, costs of input material, labour costs, and average FFB price for 2023 (RM 600/tonne), we estimated smallholders' net profit to represent roughly 46% of the total returns generated by selling FFB, or RM 404/ ha on average, across all land sizes. Based on this estimate, we obtained a minimum land size of 10.39 acres (4.21 hectares) to become economically feasible for smallholders.

Figure 26: Net profit from sale of FFB after fertiliser and labour costs, by land size



Note: *Profit estimation is based on (a) FFB price at RM 600/tonne (average in 2023); (b) Fertiliser and labour costs based on MPOB fertiliser prices (2x per year) and labour costs from the survey; and (c) average yield = 14.95 tons/ha from the survey.*

Since smallholder incomes are highly sensitive to both FFB price and yields, we conducted a scenario analysis using the same data as above to assess the impact of potential changes in these variables on smallholder net profits (see Figure 27). Using the minimum economically feasible land size (4.21 hectares), it was discovered that smallholders will require price support when FFB prices fall below RM600 per tonne. Every RM50/tonne decline in FFB price will result in a loss of approximately RM260 per month in income for smallholders. Conversely, in a low FFB price environment, smallholders must increase yields by between 16.52 and 18.46 tonne/ha to earn RM 1,700 per month.

Figure 27: Scenario analysis for the impact of potential changes in smallholder income and FFB prices

As will be discussed further throughout this report, smallholders have been provided with an array of support from the government. The objectives of these support programs are twofold: (1) to combat poverty and improve incomes and (2) to increase national outputs of palm oil.

Recommendations

Towards empowering smallholders to continue the business, optimise their income, productivity, and livelihood, the following are recommended:

(i) Prepare Next Generation ISHs Through Agri-commodity TVET Entrepreneurship Training ("Program TVET Agropreneur Sawit Muda")

The next generation of smallholders (landowners) must be primed to continue participating in the oil palm industry to ensure its long-term sustainability, considering the ageing demography among ISHs, labour shortages, unsustainable practices, and low in-farm productivity. As a significant contributor to the Malaysian economy, declining smallholder production may result in reduced export volumes and a loss of competitiveness for Malaysia.

It is critical to equip the next generation of smallholders with the necessary business acumen, skills, and knowledge to continue the business while improving practical expertise, such as in precision farming and sustainable farm management. One way to achieve this is by preparing an entrepreneurship pathway in agri-commodity Technical and Vocational Education and Training (TVET), enabling TVET graduates to become "facilitators of change" and encouraging them to continue cultivating oil palm with modern agricultural practices.

Based on the existing Dasar TVET Negara 2030 (Sekretariat Majlis TVET Negara 2024), a proper design of TVET curriculum in agri-commodity may include entrepreneurship elements aimed at private smallholding land, which may encourage inheritors and next-generation smallholders to continue the business. To ensure the successful implementation of TVET initiatives, a clear outcome and actionable strategy should be developed to produce highly skilled and knowledgeable workers with a balanced theoretical and practical component.

(ii) Bulk Purchasing of Input Materials

To overcome the challenge of high input material prices, this work recommends bulk purchasing of key inputs, such as fertilisers, through KPSM. Bulk purchasing is a common strategy to secure lower prices and achieve higher volumes. To make this effort attractive to ISHs, two important features may be added, namely (1) *transparency*, by showing the bulk purchase price compared to the small order price, and (2) *quality checks*, by incorporating sample testing of purchased fertilisers. These two features may help to build trust among participating ISHs. The bulk purchasing strategy aligns with Recommendation (vi) in Chapter 5 to empower KPSM with working capital to compete with collection centres.

Undertaking bulk purchasing also helps improve trust for ISHs towards local organisations, a challenge highlighted in Chapter 8. It provides immediate, measurable financial benefits for ISHs in organising, which allows them to build confidence for tackling complex issues like collective bargaining with mills.

(iii) Develop Human-Centric Technologies

Human-centric technology is defined as an approach that places humans (in this context, smallholders) at the centre of the design or implementation process for technology, ensuring that their problems, needs, preferences, and capabilities are considered throughout the process (Garard et al. 2024; Somers and Stapleton 2014). This approach aims to develop user-friendly, accessible, and responsive technology solutions that address the unique challenges faced by smallholders in agriculture.

While great strides have been made in introducing mechanisation practices on farms, our study has shown why smallholders may still be reluctant, such as an ingrained preference for hiring foreign workers, the costs of procuring technology, and suitability concerns.

In our context, human-centric technology can be either (1) simpler technologies or (2) non-mechanical technologies. These include biotechnological-related to input materials (e.g., seed quality testing) and digital- or IoT-based technologies to help smallholders automate good farming practices. To increase productivity, we propose the following initiatives:

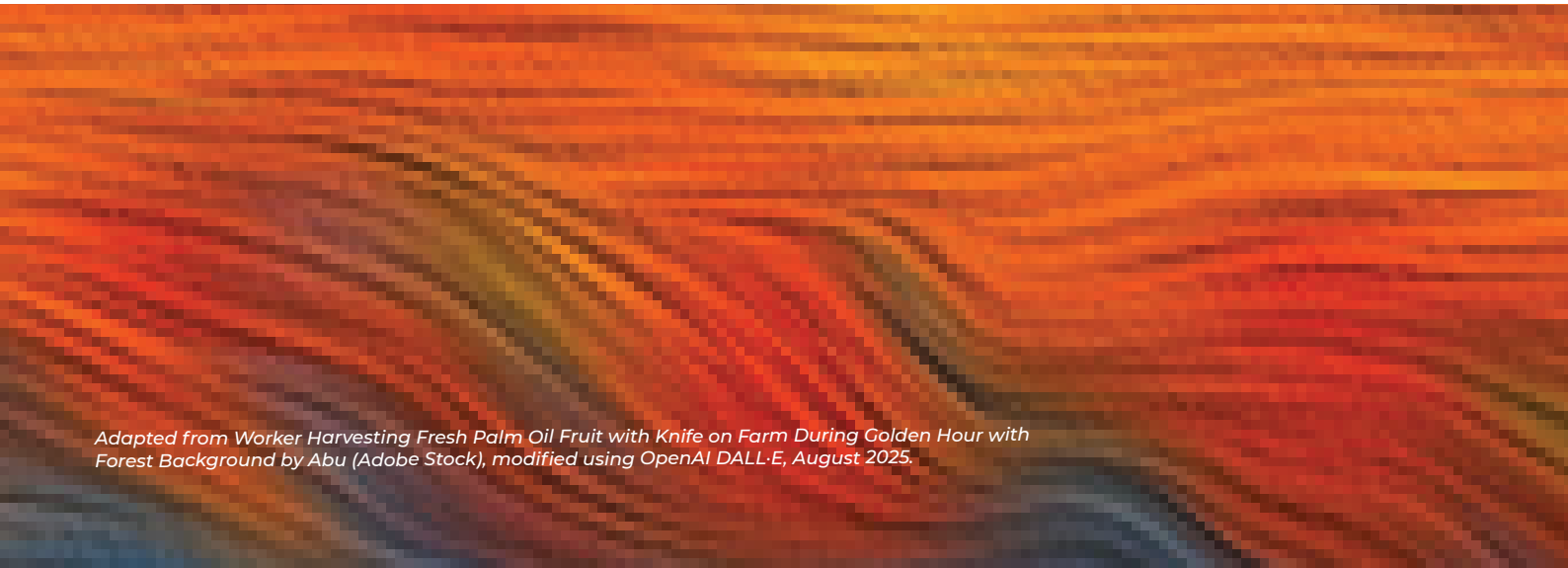
- **Introduce incubator or accelerator programs** (e.g., sandbox or living lab for technology development) within the existing Centre of Excellence (CoE) at MPOB to assist innovators in developing more human-centric technology to increase the chance of adoption.
- **Technological interventions on input materials,** including mandating seed testing and regulating fertiliser production, should be introduced to protect smallholders from counterfeit input materials that impede productivity.
- **Integrate big data and real-time technology** (e.g., simple apps for productivity measurement or sustainability practice, record farm performance or production) into the Sawit and e-Sawit Intelligent Management System (SIMS and eSIMS)
- **Provide technology grants** for early adopters through MPOB, in partnership with relevant agencies with underutilised technology-related financing capacity, such as SME Corp.
- **Endow cooperatives (e.g., KPSM) to offer shared services to smallholders** by using technology. This can also be adopted by stakeholder groups with financial resources (e.g., NGOs, large corporations).

(iv) Improve Financial and Business Literacy Among Smallholders

Smallholders can lose approximately RM250 per month if the price of FFB falls by RM50 per tonne. For families on a tight budget, this loss can make it significantly harder for them to meet their basic needs, including food, education, and emergency savings. **Financial and business literacy** can make a significant difference here. By equipping smallholders with improved skills in managing cash flow, recording expenses, and planning for risks, they are better able to cope with the volatility in FFB prices and ensure income stability.

Supporting literacy and resources for smallholders to improve their financial management skills ultimately leads to greater resilience in times of uncertainty. Key modules such as financial literacy and management can be introduced in GAP training. In alignment with the goal of penetrating the global market, cultivating a business mindset among smallholders in their farm management is imperative for building a strong sense of ownership, thereby enhancing involvement and presence on the farm.

A retuning of the strategic communications can also represent a powerful means for smallholder empowerment by shifting the narrative from their role as 'rural peasant folk' to that of an 'investor' or 'business owner. Among the implications of such empowering narratives, as expressed by the chairman of the NASH, include equipping smallholders with the necessary business acumen to estimate the "bankability" or economic viability of their pursuit of planting oil palm, such as smallholders who own small pieces of land.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

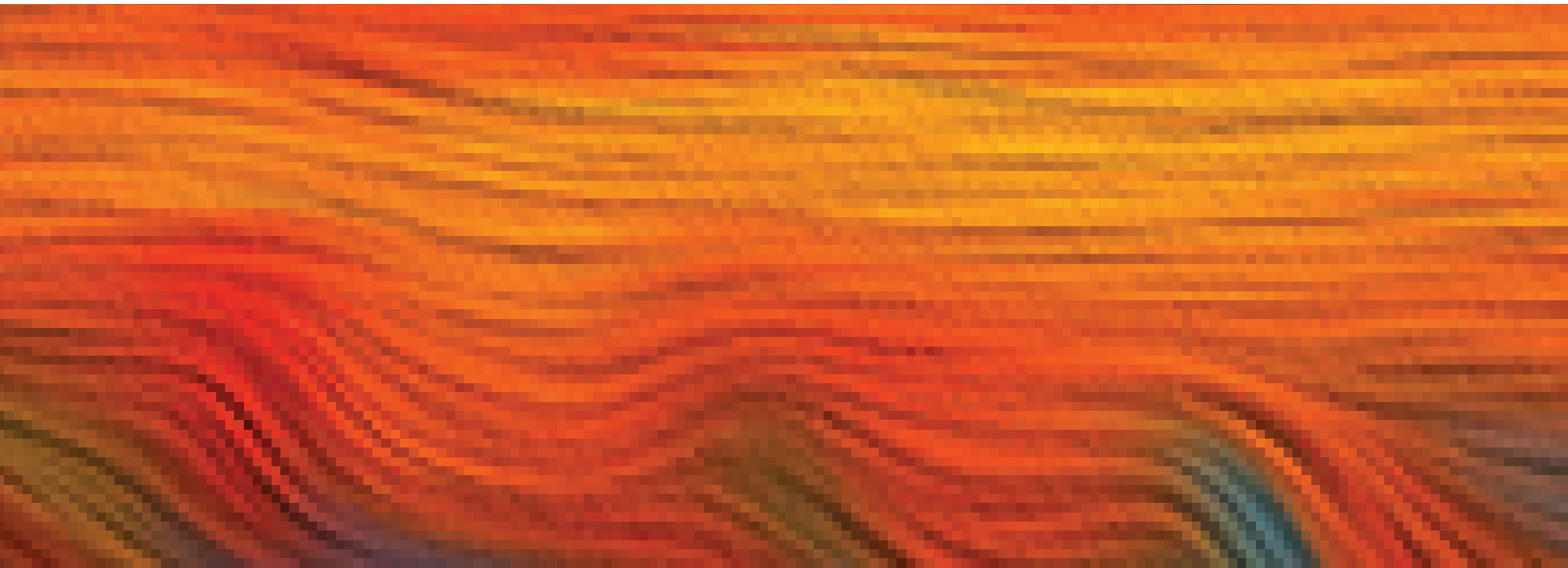
(v) Facilitate Tripartite Partnership between ISHs, TUNAS Officers, and Large Corporations

A tripartite partnership, as part of an effort to establish a broader, multi-stakeholder platform, offers opportunities to improve coordination and open communication across the sector. It enables effective collaboration and participation between large planters, smallholders, and extension officers, building social capital and mutual trust among stakeholders.

Each of the stakeholders should achieve a co-benefit by achieving something tangible: a) Smallholders gain stable income and technical support; b) large planters secure a consistent and traceable supply; and c) extension officers (TUNAS) scale up their impact by reaching more farmers and providing smallholders with the necessary guidance and information.

- **Smallholders** receive stable income and guidance for improving yields, implementing sustainable practices, and accessing formal markets.
- **Large planters,** which are often surrounded by smallholder communities that benefit from shared infrastructure, can ensure a consistent and traceable FFB supply by including smallholders in sustainability efforts such as training, wildlife management, and direct sourcing, all while raising their social responsibility profile.
- **Extension officers (TUNAS)** broaden their reach and impact by guiding more farmers with practical advice, sustainability expertise, and market insights, enabling smallholders to thrive and scale best practices.

In addition, such a **tripartite platform can be enhanced by tools such as a shared data platform, which facilitates better tracking, geotagging, traceability,** and impact monitoring.



Summary of Chapter 4: Production, Income, and Financial Capacity of Smallholders

This section explains how smallholders became trapped in a cycle of low economic livelihoods, which limited their ability to increase yields, with income being the key determinant for breaking out of this cycle. Our observations and data indicate that smallholders with less than 5 hectares of land were the most vulnerable group, as they struggled to cover their farms' operating costs while also considering reasonable living expenses. Here, we highlight key points from this chapter:

- Significant challenges in meeting farm operating costs, such as high fertiliser, pesticide, and labour prices, combined with uncontrollable factors such as volatile market price fluctuations and decreases in FFB selling price, limit smallholders' income and ability to invest in necessary resources for improving their operations and adapting to changing market conditions.
- Low adoption of technology and ageing farmers led to decreased productivity and yield. Smallholders were sceptical of technology and innovation because they saw no benefits from adopting it. Furthermore, they believed the technology was unsuitable for their specific needs and conditions.
- **Policy recommendations** towards improving smallholder income and livelihoods include:

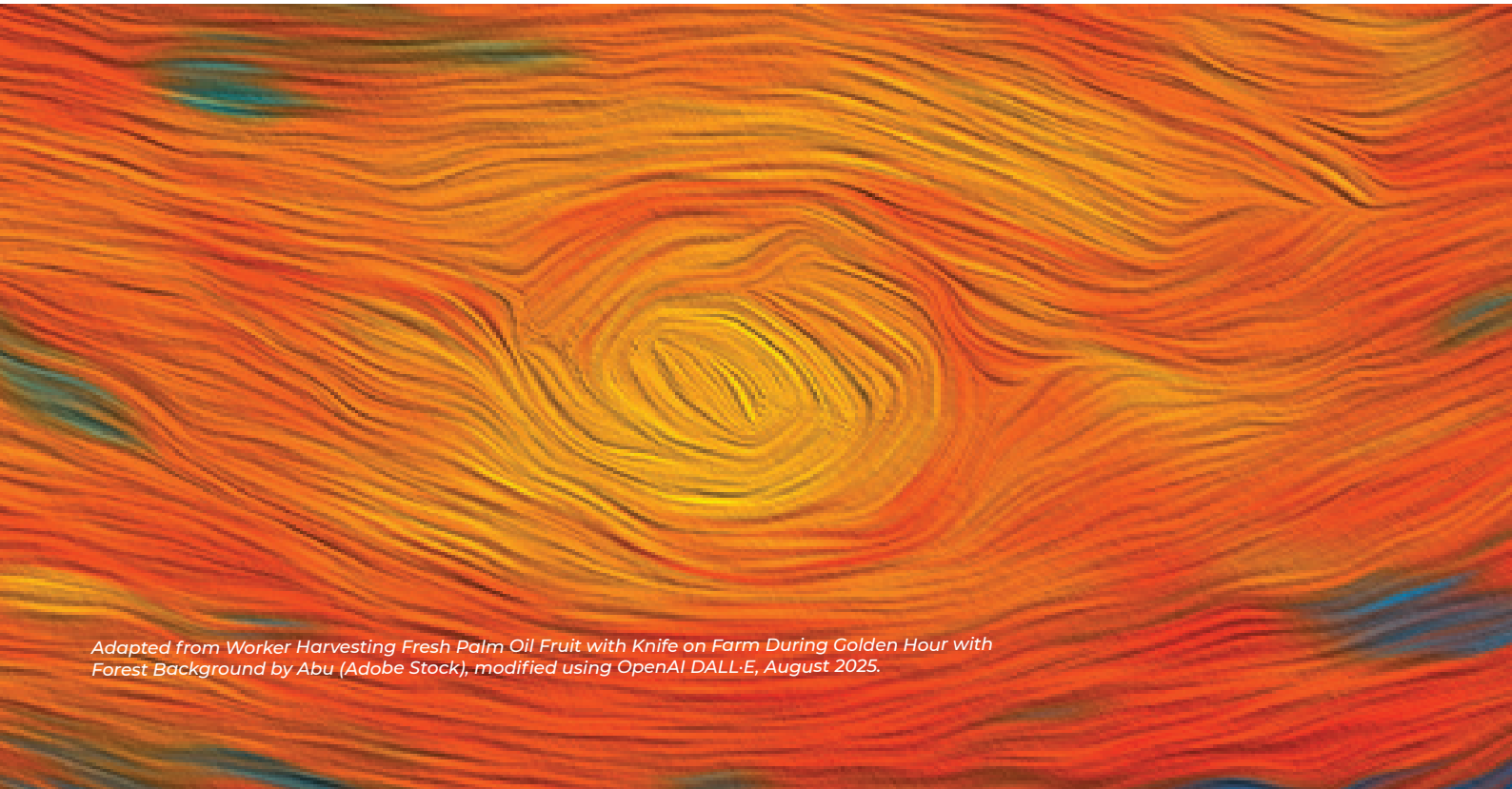
  (i) Preparing the **next generation of independent smallholders (ISHs) through agri-commodity TVET** (Technical and Vocational Education and Training) entrepreneurship programs, equipping them with business acumen, digital skills, and sustainability know-how to thrive in a modern agricultural economy.,

  (ii) Facilitating **bulk purchases of key inputs** such as fertilisers, tools, and seedlings through organised platforms such as KPSM (Smallholder Cooperative), resulting in cost savings, improved quality control, and increased bargaining power.

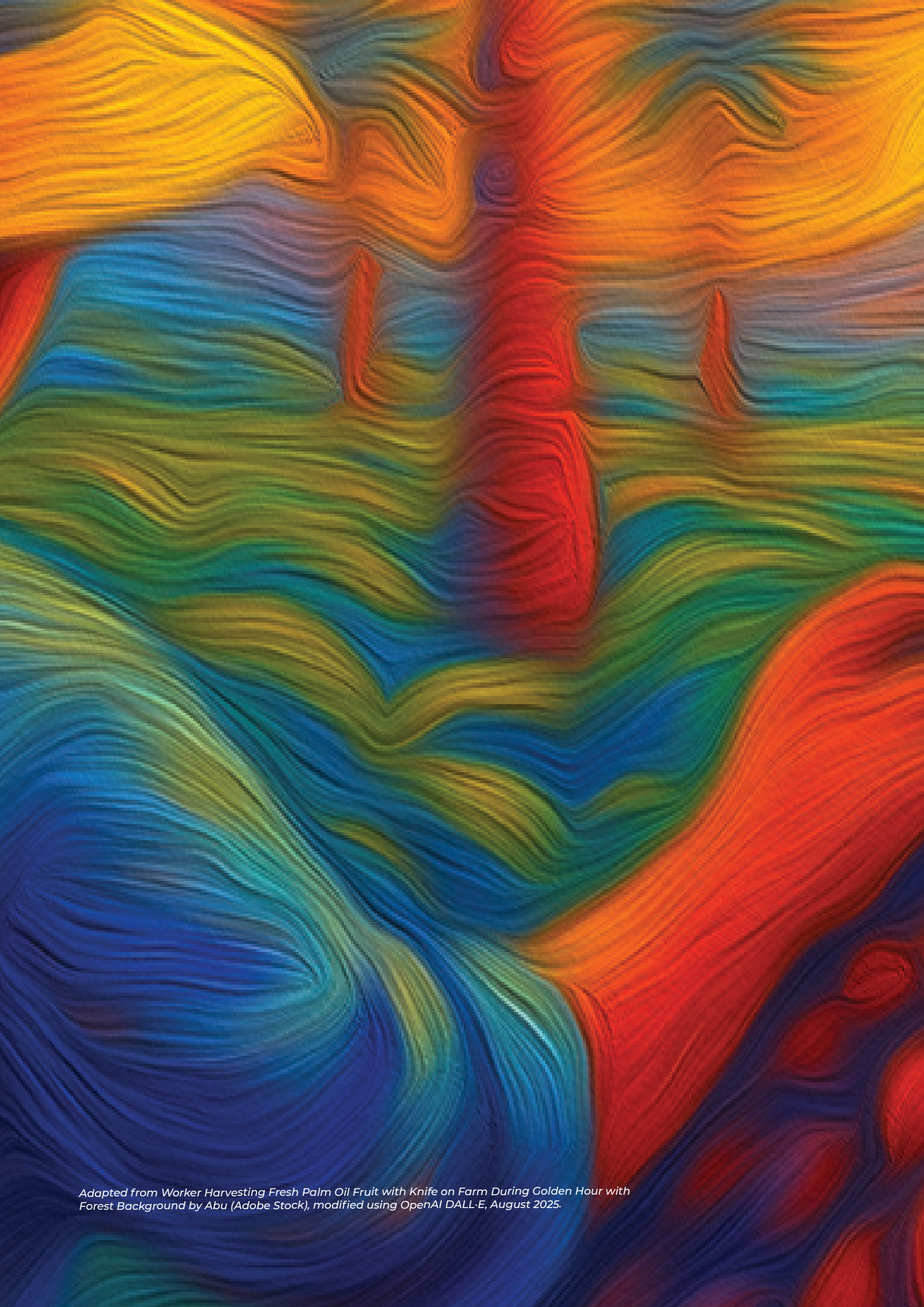
(iii) **Developing human-centric technologies** tailored to smallholder needs, such as mobile-based advisory apps, precision farming tools, and low-cost mechanisation, to boost productivity and decision-making.

(iv) **Improving smallholders' financial and business literacy** through targeted training and readily accessible resources, allowing them to manage farm finances, obtain credit, and make informed investment decisions.

(v) **Establishing a tripartite partnership** between government agencies, industry players, and smallholder organisations to align incentives, share knowledge, and coordinate support systems for inclusive and sustainable growth.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Chapter 5:

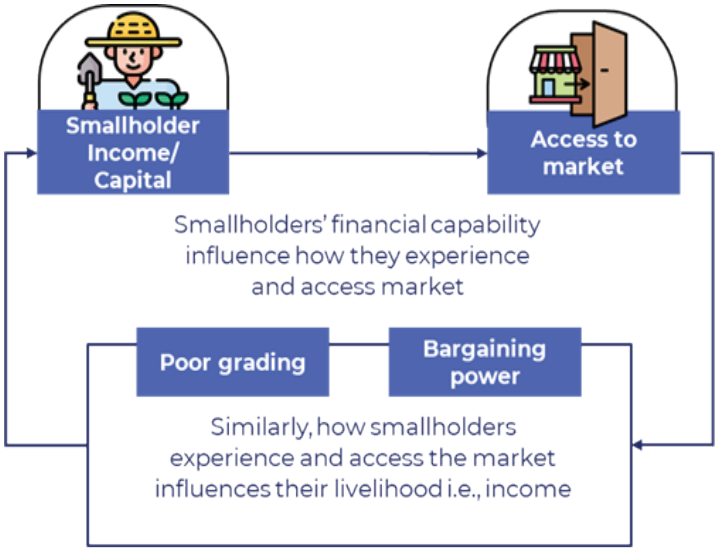
Non-Price Market Preference and Smallholder Income

This chapter aims to present our second key finding, where Malaysian smallholders are mainly price takers. In this chapter, we complement the analysis in the previous chapter, by examining how smallholders' relationship and dependency on the role of aggregators may contribute to such "low-income cycle".

This study found that smallholders are price takers in both the input and output markets in which they operate. In the input markets, smallholders pay more for input materials due to their small order sizes. Some smallholders even purchase input materials such as fertiliser bags and pesticides online and from unverified suppliers. Unlike estates, they are not eligible for bulk pricing on input materials due to large volume purchases. In the output markets, the volumes they individually produce are too small to command higher prices for their FFB outputs, especially if they depend on these dealers to access mills (i.e. due to their remote collections and small volume, only small proportion of smallholders can directly deal with large mills). This demand-supply relationship in the market is well understood. However, less is understood about the non-market factors that contribute to smallholders' bargaining power.

From this study, we found that non-price factors also influenced smallholders' decisions in choosing where or to whom they would like to sell their FFBs. Figure 28 illustrates the influence of smallholders' state of livelihood on their bargaining power, which in turn impacts the price at which their produce are sold, thus ultimately impacting their incomes.

Figure 28: Observed mutual dependency relationship between smallholders' income and market access



Source: PNBRI's analysis

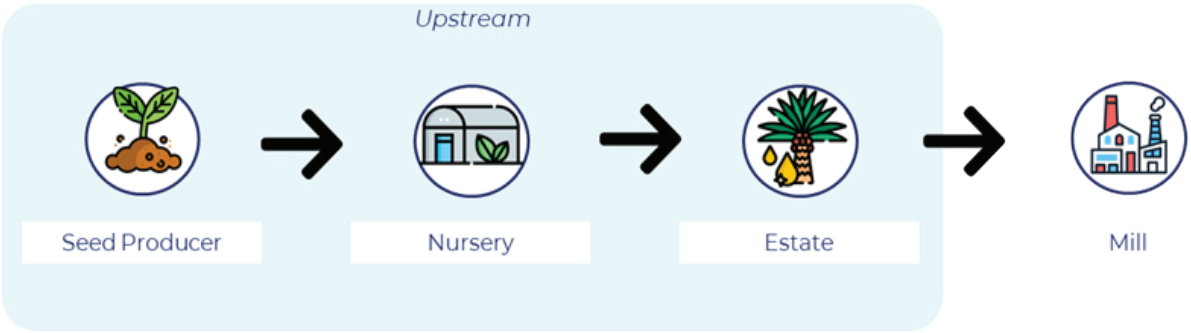
Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

5.1. The Indispensable Role of the Middleman

In Malaysia, the oil palm industry is primarily organised around large corporations. These are integrated corporations with operations in both the upstream and midstream parts of the supply chain (Figure 29). Many of these large corporations are also involved in downstream businesses that manufacture final palm oil products or ingredients for the oleochemical industry. As a result, most mills are typically operated by large estates and operate in large capacities. The integrated structure allows these corporations to optimally locate their mills in catchment areas that are far enough to collect as many fruits as possible from plantations and farms to meet the large mill's volume capacity but also close enough for the fruits to arrive within the optimal 24-hour window.

As of July 2023, MPOB reported a total of 447 operating palm oil mills with capacities from 20 to 120 tonnes per hour, which are considered large mills[5]. Large-capacity mills require wider FFB catchment areas, resulting in a larger distance between mills. Large-capacity mills also source from mid-sized estates, providing a steady FFB volume throughout the year. A good agricultural road network has further allowed mills to receive FFB from estates as far as 80km away (Stek and Ata 2024), thus reducing the role of the middlemen. For instance, one SD Guthrie mill in Malaysia serves an average of 94 sq km[6,7], of planted area, if the company's total planted area in Malaysia were to be divided by the corresponding number of mills.

Figure 29: Typical supply chain for an oil palm plantation



Source: Adapted from SD Guthrie Berhad Website

[5] ALarge-scale mills refer to mills processing more than 10 tonnes per hour

[6] SD Guthrie total planted area in Malaysia is 309,145 ha which is equivalent to 3,091.5 km², accessed via the corporate website

[7] Reported number of Malaysia mills is 33 (SD Guthrie 2022)

There is a small window of opportunity for smallholders to directly send their FFB produce to mills. This window typically only becomes available during low FFB seasons, when mills become less choosy over fruit quality in order to meet their processing capacity (Stek and Ata 2024). For example, during the year 2023, only a mere 63 smallholders were reported to have direct access to SD Guthrie International (SDGI) mills (SD Guthrie 2023). This is in the context of SDGI having one of the largest numbers of mills in Malaysia, and the same 280,000 independent smallholders that are operating in Malaysia in 2023.

Outside of this season, smallholders typically rely on a 'middleman' role, played by FFB aggregators known as collection centres (or ramps, or dealers), who have preferred access to the mill. For mills, it is more convenient to deal with a smaller number of middlemen compared to many smallholders for the same volume of FFB. It is also easier for the mill to manage its accounts (A. K. A. Rahman et al. 2009). For smallholders, mills with large catchment areas also mean a longer distance from the farm, resulting in higher transportation costs.

This situation brought rise to the important role of the aggregators in the palm oil supply chain. Aggregators are individuals or firms responsible for transferring or moving agricultural produce from the point of production to the point of consumption. They also act as the bulk purchaser of farmers who produce and resell the items to other sellers and/or final consumers (Ishak et al. 2018). In summary, aggregators add value to the supply chain in two ways:

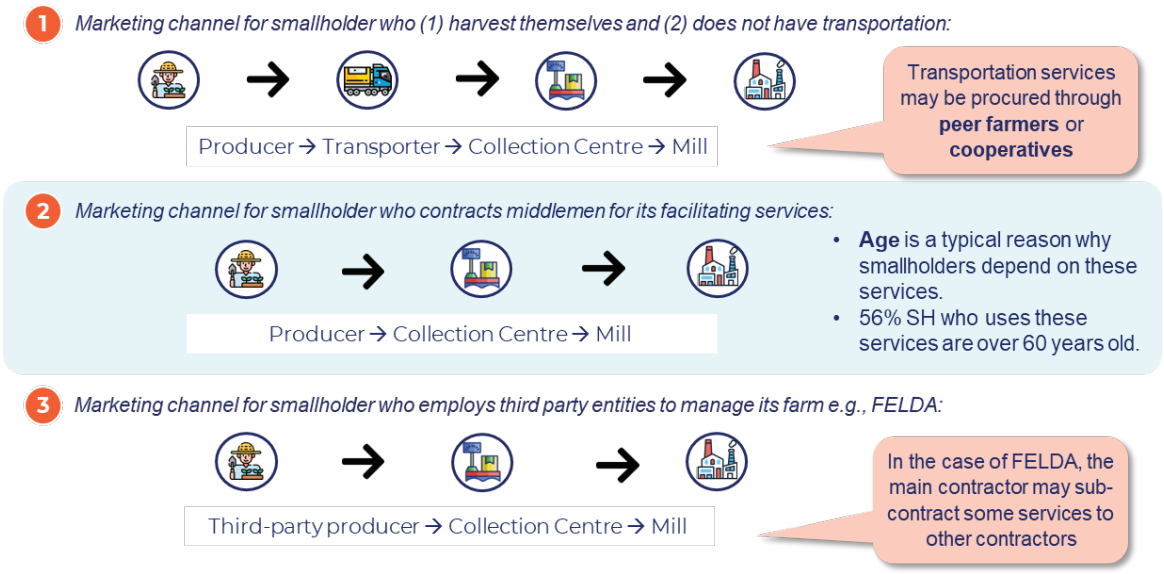
- **They buy and aggregate FFBs** from many smallholders to be sold to mills; and
- **They act as facilitators,** such as providing additional services like foreign labour for day- or tonnage-based contracting to do harvesting, and transportation. These costs will be deducted from the FFB sales.

It is worth noting that this relationship, however, is not unique to oil palm. In the fruit supply chain, several other intermediaries are involved, namely, collectors ("***peraih***"), wholesalers, and private traders. Supermarkets and hypermarkets tend to source their fresh fruits from one party, i.e., wholesalers, instead of directly from farmers, for better cost optimisation (Zakaria and Abdul Rahim 2018).

The marketing channel also differs depending on the kind of service a middleman offers (Figure 30). For example, smallholders who require harvesting services typically depend on collection centres for transporting their produce off their farms – mostly located in rural areas. Other smallholders who harvest fruits themselves and have their own ways to transport out their fruits typically only sell to collection centres.

In a comparative cooperative or FELDA model, smallholders fully outsource farm management to third-party entities, and these entities may hire collection centres for any of the three services of harvesting, transporting, and off-taking of FFB.

Figure 30: Typical marketing channel for smallholders in Malaysia



Source: PNBRI's analysis

Due to an increasing number of aggregators in recent years[9], competition began to heighten between the dealers. Dealers compete either by providing more and better services, or by offering other social benefits, such as cash advances or soft loans (Ishak et al. 2017). Their increasing numbers, in relation to the number of mills, have also increased competition for fruits.

Ironically, the increasing competition between dealers did not necessarily improve the bargaining power of smallholders. While the study was unable to ascertain how rampant, such competition has in some cases become a breeding ground for malpractice, with dealers harvesting and selling unripe and unlicensed (and uncertified) fruits while co-mingling them with licensed and certified ones. This will be addressed in the subsequent discussion.

[9] The number of licensed Oil Palm Fruit Dealers in 2021 and 2023 was 3,460 and 3,569, respectively (MPOB 2021; 2023).

5.2. Dependency on Private Collection Centres and its Impact on Smallholder Livelihoods

The literature generally agrees that smallholders have a relatively low bargaining power compared to middlemen. In the first place, the market power has essentially shifted from the producer (in our case, the smallholders) to the buyer (in our case, the collection centres), when the rights to grade or to determine the quality of outputs lie in the hands of processors or retailers (Lee et al., 2012 as cited in Rizal and Nordin 2022).

Having low bargaining power significantly impacts smallholders' income. While dealers make their income from price differences between the FFB they sell to mills and the FFB they purchase from smallholders, having the higher bargaining power can in theory, incentivise them to capture an excessive share of this portion from smallholders. Dealers value add as follows:

- **Grading fruits** in bulk;
- **Advancing cash,** where they pay smallholders before getting paid by mills (because mills only determine prices by month-end, or at the point of payment), and;
- **Coupling fruit offtake with additional services** such as transportation, and labour

Smallholders therefore tend to receive lower (or unfair) prices because of undifferentiated grading for their fruit bunches (Martin et al. 2015), as a result of the pooling of high-quality (ripe) with lesser-quality fruits, as discussed in the literature.

We found that dependency on additional services may have something to do with lower bargaining power. One focused group revealed that some smallholders who relied on one collection centre for harvesting, off-taking and transporting fruits out of their farms will also need to commit to supplying their FFB to this dealer; in other words, they could no longer 'shop around' for the best deal.

> ***"Smallholders who depend on collection centres for transportation and facilities cannot decide where to sell. Even if the price is low, we have to sell there for the whole year. No choice."***
> **(Peninsular)**

Our FGD also revealed an instance of moral hazard, where collection centres collected any FFB, including unripe ones, to meet their quota. Due to information asymmetry and the limitations of grading by sampling, mills would offer lower prices, reject more FFB fruits or grade fruits lower, in terms of OER – which is the multiplier at which dealers are paid.

> ***"Private collection centres take all kinds of FFB, including the unripe ones, paying us lower."***
> **(Peninsular)**

There are three types of collection centres: privately owned, cooperative-run, and agency-related centres. The FGDs confirmed that some smallholders also sold their FFB to ramps operated by government-linked agencies (such as FELDA and RISDA) and to cooperative-run (such as KPSM) collection centres.

Our survey revealed that smallholders forego an estimated monthly price differential of an average of RM430 that they could have gained by selling to these agency-run ramps, by continuing to engage in private collection centres (Figure 31 and Figure 32).

This preference may be due to several factors, which will be discussed in the following section.

Figure 31: Rate of respondents reported having access to a collection centre, by type (%)

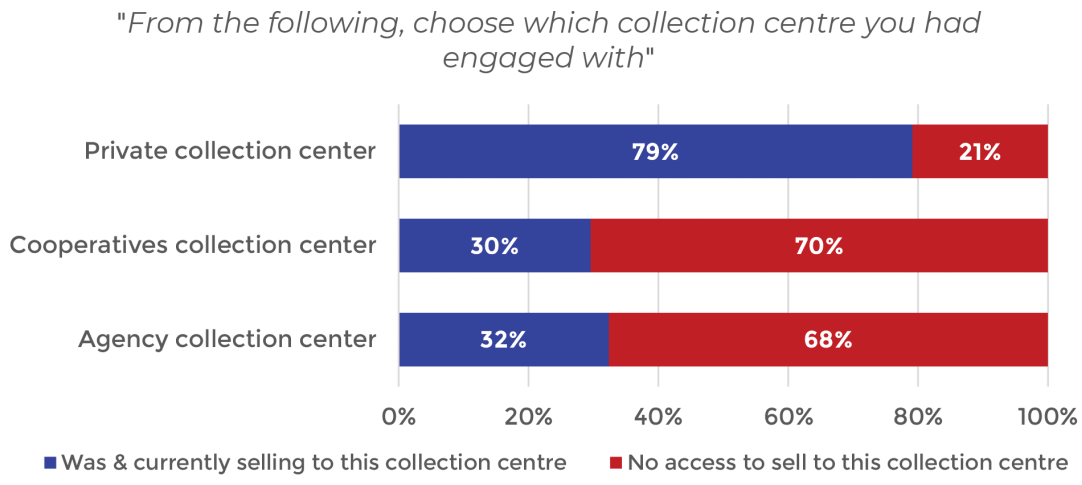
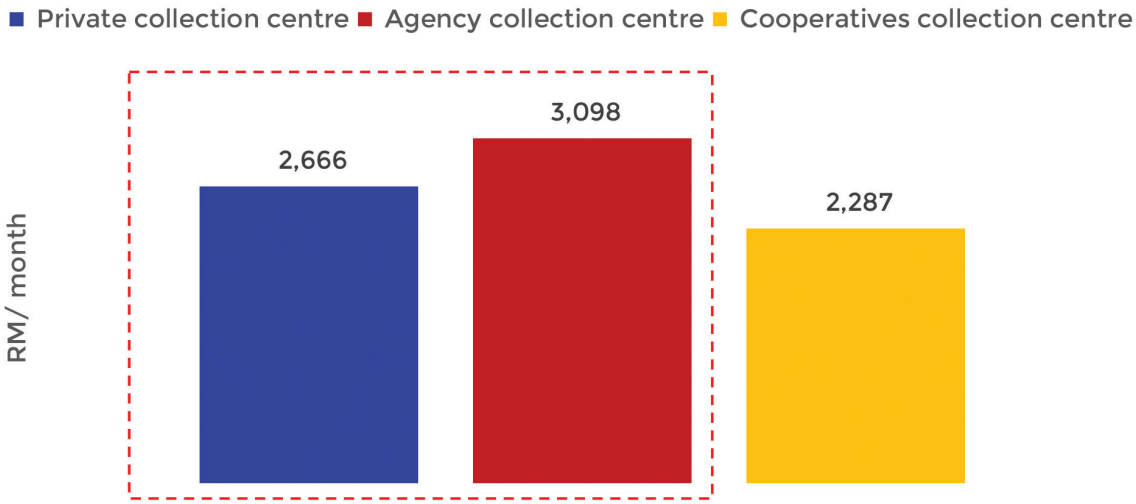


Figure 32: Average income per month from selling FFB, by type of collection centre (RM/month)



5.2.1. Capital and Physical Constraints

Many smallholders have capital and physical constraints as discussed in the earlier chapter. In several FGDs, it was revealed that smallholders might even strike a credit deal with the collection centre to purchase input materials. Smallholders' net income from selling their FFB to this dealer will inevitably be lower, allowing them to pay off this debt. This occurrence is not unique and is consistent with evidence in the literature that found smallholders' decisions to sell depended on whether the miller was prepared to give cash advances or loans when their cash flow situations were tight (Martin et al. 2015).

> ***"Sometimes smallholders make a loan deal with collection centres to manage their farm. The actual income from FFB sale will be net debt, not optimal for smallholders."***
> **(Extension Officer)**

Despite being aware of the risks of bad debt, these private collection centres still offered such social services. This is partly to gain a competitive advantage, but mostly to support the smallholders (Ishak et al. 2017).

In some cases, smallholders were also paid lower in return for getting the cash speedily, i.e on a cash-on-delivery (COD) basis. Apart from cash advances and loans, our FGD participants shared that only private collection centres paid COD:

> ***"If we take the cash on the spot, we will usually get RM50 to RM60 (per MT) lower than if we take the payment monthly. This is because the collection centre needs to estimate how much the mill will pay them later (rather than paying smallholders what the mill paid them)"***
> **(Peninsular)**

Where ramps operated by government-linked agencies and cooperatives (such as KPSM) tended to pay monthly or bi-monthly, the COD offered by third-party private dealers had become a key feature for smallholders to sustain their day-to-day expenses – especially with more than half (52%) of the smallholders surveyed in this study earning household incomes of less than RM2,500 per month.

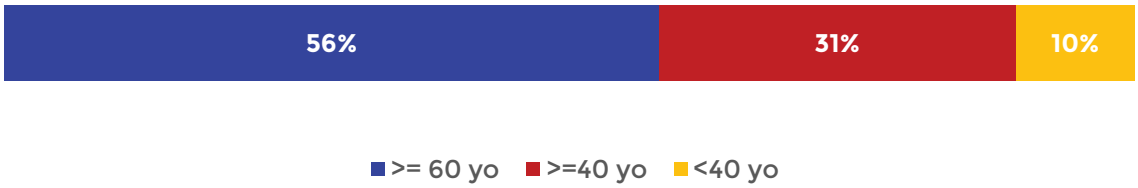
> ***"Smallholders need cash for their daily expenses, and only private collection centres can pay immediately, not a mill."***
> **(East Malaysia)**

> ***"If you sell to mill, you will get paid later. We smallholders, if possible, want to be paid fast"***
> **(Peninsular)**

Physical constraint is another important factor. Harvesting is taxing on the body and requires niche skills in using the pole sickle. Our survey reflected this limitation and found that more than half of the smallholders who depended on labour services from private collection centres were over 60 years old (Figure 33). Similarly, one FGD participant highlighted that those who contract a collection centre for their labour services were typically 50 years old and above.

Figure 33: Percentage of smallholders who use labour from collection centres, by age

"*Collection centre is your main source of labour*" **versus** "*Age*"



In the area that I administer, most of them (smallholders aged between 30 and 40) can do the plantation activities by themselves. Those who are 50 (years old), will usually hire a contractor or ramps to manage their palm oil plantation"
(Extension Officer)

Additionally, there is a need to frequently monitor and verify the performance of manual labourers, and to remunerate them on-site. These limitations can be addressed by engaging with 'trusted' dealers who also offer harvesting services, especially for absentee landowners and older smallholders who are away. Some ageing smallholders also preferred having to only engage with a single party for all farm activities, including input materials, as revealed in one FGD.

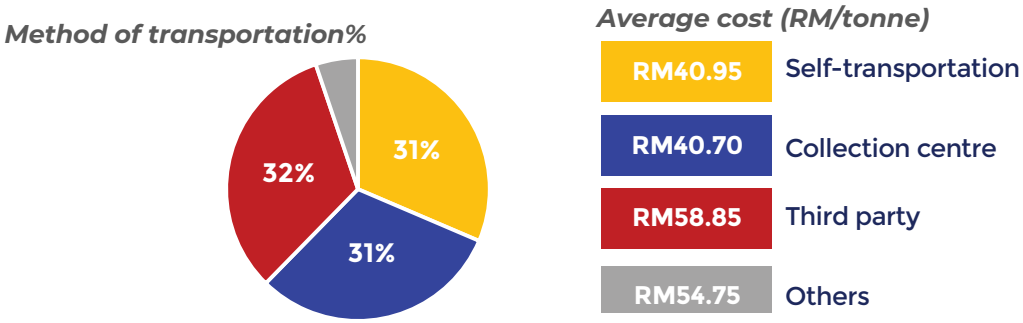
"For aged smallholders, they sometimes utilise the middleman or collection centre to get their fertiliser from"
(Extension Officer)

Smallholders who only depend on the pick-up services from private dealers have options to source third-party vehicles or invest in their own. We found an immaterial difference between using one's own vehicles and the collection centre's vehicles (Figure 34). This provides wider options for smallholders to sell their FFB to, including directly to the mills.

> ***"Mills offer better FFB price, but you need to use your own transportation to bring your fruits there."***
> **(Extension Officer)**

Figure 34: Source of transportation and the average transportation cost/ tonne

"*What is your transportation method to carry the FFB from farm to collection centre or mill*?" **and** "*Transportation cost*"



This dependency of smallholders on the middleman has become almost structural, much like smallholders of other commodities globally. All actors that comprise this dependency structure benefit from it; thus, there were no real incentives for anyone shifting market power to the smallholders. The mills benefited from getting a consistent supply of FFB, by contracting with collection centres rather than with smallholders. Aggregators have the chance to make 'easy profits' to the tunes of RM12.40/MT or RM12k/month (A. K. A. Rahman et al. 2009) in three ways:

- Assigning smallholders with different (typically lower) OER than the levels accorded to them by mills;
- Not trickling down the Kernel Extraction Rate (KER) to smallholders, which are offered by the mills to them, and;
- Charging additional fees for transportation, forklift, weighbridge, and other services.

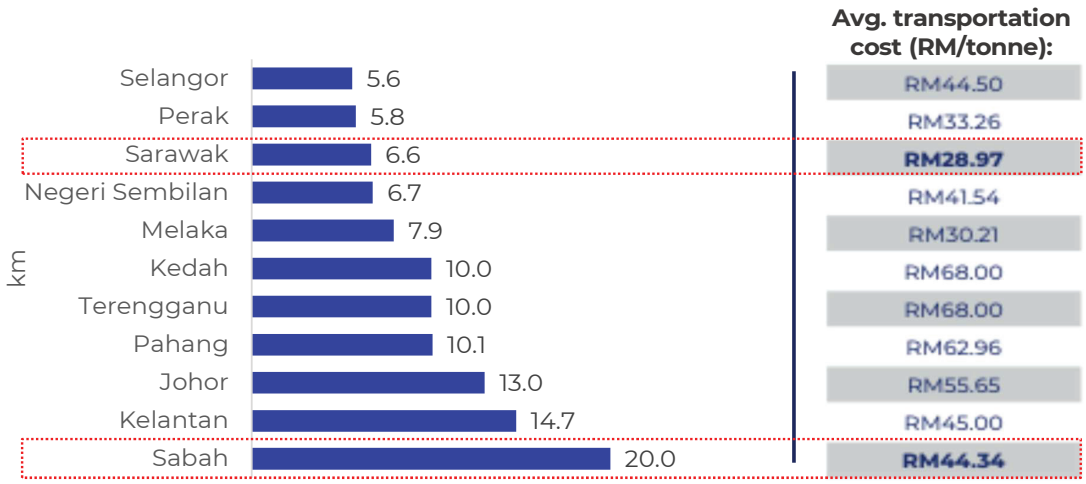
Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

5.2.2. Proximity

Dependency on private collection centres are also due to proximity. The further away they were from the nearest mill, the higher the transportation costs they would have to bear (Figure 35). As mentioned above, one mill can accept supplies from as far as an 80km radius for the FFB to arrive within 24 hours. As a result, the distance from one mill to another can be up to 160 km. In contrast, our survey showed that the maximum average distance from a smallholder's farm to the nearest collection centres was 20 km. Collection centres thus became the natural choice.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Figure 35: Average farm distance (km) to collection centres by state vis-à-vis average transportation cost



Our survey data also showed a weak positive correlation of 0.27 between the distance to the collection centre and the average transportation cost[10]. This means that the distance of smallholder farms to the nearest collection centre has a small impact on their transportation cost. To minimise the state-level cost difference factor, by comparing the cost per kilometre distance in Sabah and Sarawak, the calculation shows a higher correlation coefficient, i.e., 1 kilometre further from the collection centres adds approximately 0.5 times the transportation cost[11].

It is unlikely that the Malaysian ISHs are ready to be independent from the middlemen at this juncture. Nevertheless, efforts are being made to regulate the dealers through e-SIMS and MSPO certification to better protect the smallholders. Smallholders themselves could play the role of the middlemen. This was the idea behind the MPOB-led introduction of KPSM; to endow smallholder cooperatives to open ramps that introduces competition and reduce smallholders' dependency on third-party private collection centres. However, cooperatives cannot compete only by way of competitive pricing, but also by way of offering labour services, transportation, bulk purchasing of fertilisers, and favourable payment terms (cash-on-delivery).

[10] Correlation analysis is typically used to compute any association between two variables. Positive correlation means as one variable moves in one direction, the other variable moves in the same direction. The stronger the positive relationship, the higher the coefficient number to 1

[11] $(Cost_{Sbh}/Cost_{Swk})/ (Distance_{Sbh}/Distance_{Swk})$

Recommendations

To improve smallholders' bargaining power in FFB markets, the following are recommended:

(vi) Capitalise KPSM with more working capital to compete with private collection centres

As indicated by our findings, smallholders became less sensitive to prices when they depend on labour (67% of smallholders) and transportation services (82% of smallholders) on specific private collection centres. Thus, KPSMs need to not only compete through price but also through providing additional services; potentially as a way to gain an additional source of income. However, the level of service must be consistent with what the smallholders currently enjoy by employing private collection centres.

We recommend that government financial assistance be injected as working capital into KPSMs to provide labour and transportation to their smallholder-customers. Beyond these services, these cooperatives may even address smallholders' critical need for immediate cash by offering favourable payment terms (COD) and credit facilities backed by legal agreements, thereby building trust while providing the liquidity.

(vii) Expedite and tighten regulations surrounding collection centres

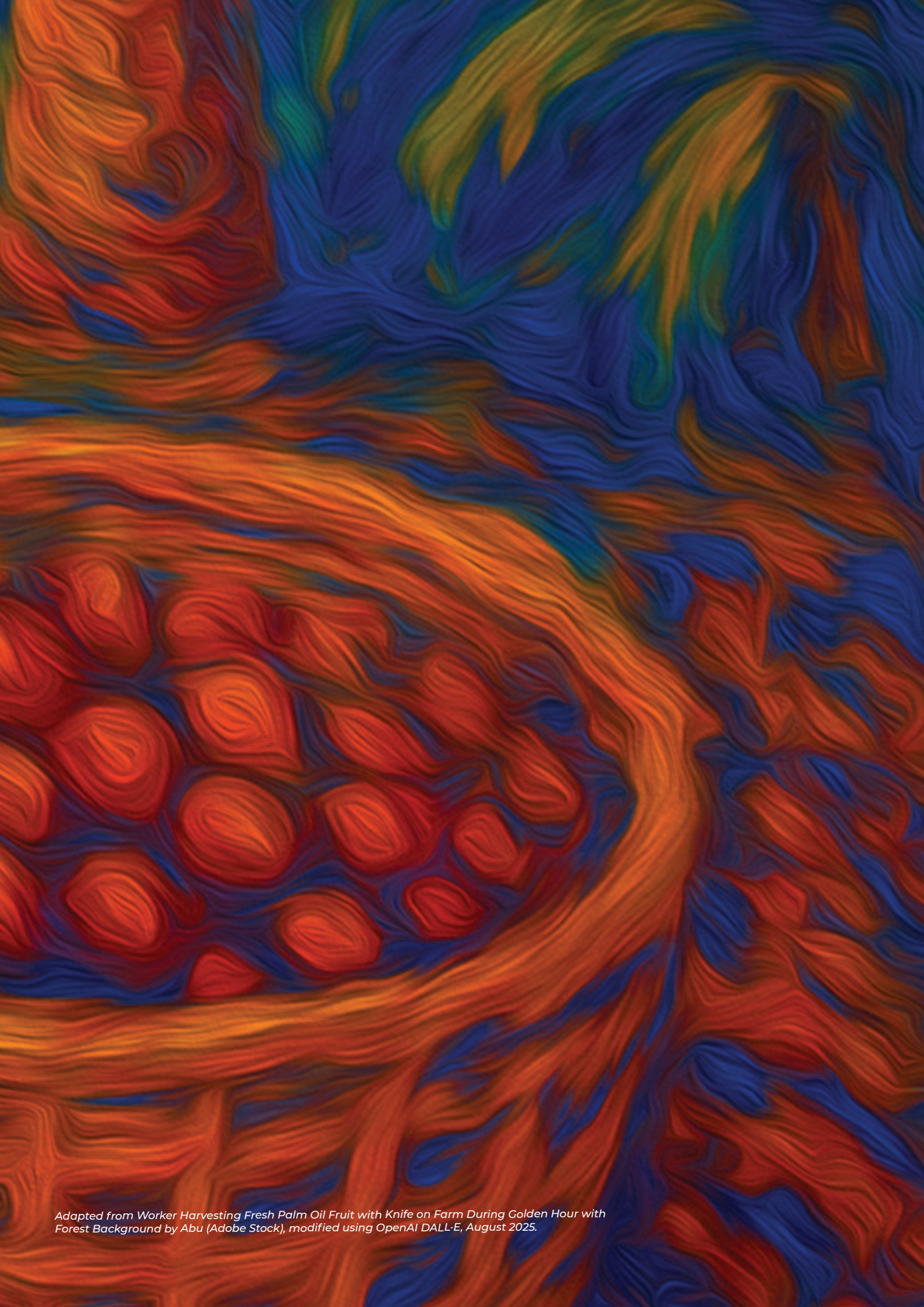
Currently, both the smallholders and mills are subjected to MSPO, but not the middlemen. As providers of labour services, the workers provided the collection centres were also neither trained nor monitored, leading to the practice of collecting unripe fruits.

Expediting the implementation of MSPO 2.0 certification as a licensing requirement for collection centres can improve smallholders' bargaining power. This includes transparent pricing, grading at the collection centre site (i.e., OER is known prior to sending to the mill), among others. Apart from the certification requirement, higher financial surveillance and enforcement against collection centres that offer illegal borrowing is crucial to dilute smallholders' dependency on them.

Summary of Chapter 5: Non-Price Market Preference and Smallholder Income

This chapter examines the dynamics between actors in the smallholder supply chain, with a particular focus on the relationship between smallholders and the middleman. Middlemen are integral not only as aggregators but also as facilitators or service providers. Providing extra and consistent services, especially labour and financial support, has created a natural reliance for non-owner-operated and ageing smallholders. Here, we highlight important key points from this chapter:

- **The price factor is less important in smallholders' choice of off-taker.** ISHs forsaken higher selling prices from agency collection centres to enjoy the private collection centre's services.
- **The over-reliance on middlemen, i.e., utilising their labour, transport, and access to a mill, may have limited smallholders' options to sell and the price they receive.** Lack of oversight by the farm owners could result in poor practices by the contracted labour, such as collection of unripe fruits.
- **Smallholders who were cash-strapped depended on private collection centres the most.** Mills, agencies, and cooperative collection centres only pay on a monthly or bi-monthly basis. Another cash alternative payment, such as a voucher or credit note, can be considered by collection centres to bridge the period between the payment received from the mill (at the end of the month) and the payment to smallholders (on a daily basis).
- **It is unlikely that smallholders can be independent from the middlemen** in the foreseeable future. However, there is a role for KPSMs, agency-run ramps, or nearby mills to invigorate competition in certain areas by offering not just better prices, but also additional services to the level of these private collection centres.
- **Our policy recommendations address the need to improve smallholders' bargaining power in the FFB market.** This includes tightening regulations surrounding collection centres to reduce GAP non-compliance practices by their workers. Another possible method is to diversify and promote alternative options for smallholders to sell their fruits, including access to labour, transportation, and favourable payment (or credit) terms.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Chapter 6:

The Importance of Education in Implementing Good Agricultural Practices

This chapter aims to investigate whether a high level of awareness and knowledge of sustainable farming practices leads to greater compliance, and why, if it does not. It begins to explore one root cause of smallholders' inability to practice good agricultural practices (GAP) and being sustainably certified – knowledge. This chapter also discusses the importance of equipping smallholders with financial literacy and technical knowledge.

Knowledge is power. Gaps in information and know-how in oil palm planting were the main reasons for smallholders' low productivity and product quality (Anggraini and Grundmann 2013). Other literature reports that smallholders lack the skills, knowledge, and funds to meet the demand for certification, such as sustainable management practices and record-keeping. Similarly, in another report, smallholders were said to opt for palm oil land expansion to increase yield instead of replanting the trees, since they did not know that aged trees have lower yields (Hutabarat et al. 2018).

In general, we found a positive relationship between attending training and the adoption of GAP, which aligned with existing literature. However, the interviews have identified three challenges or opportunities to address towards increasing the compliance rate to 100%. Our thematic analysis has brought up several key words, such as 'farm knowledge', 'access to training', and 'financial literacy', as drivers in implementing good farm practices (Figure 36).

Figure 36: Relationship of knowledge towards compliance with sustainable practices

Source: PNBRI's analysis

6.1. Access to Training and the State of Smallholders' Knowledge of Good Agricultural Practices (GAP)

Our conversations with extension officers revealed that many smallholders still did not understand GAP, while some confused GAP with certification and licensing. This indicates a critical need to educate and clearly communicate the differences between these concepts.

> ***"I can confirm that our smallholders don't have (the understanding) (...), in fact, until now, not only did they get confused between GAP and MSPO, they also even mixed up between certification and licensing"***
> **(Extension Officer)**

This is the typical impression of smallholders, as corroborated by other studies like Abazue et al. 2015 and Besar et al. 2020. In the study, a questionnaire survey of 270 Sarawak smallholders revealed that 71% were unaware that oil palm production could lead to negative impacts, such as pollution and biodiversity loss. In another face-to-face interview, it was reported that there exists "a handful of oil palm planters who sow (the fertiliser) exactly on the oil palm shrub. This is an incorrect tempering technique[12]."

However, our survey results showed otherwise. Figure 37 shows that at least 79% of surveyed smallholders indicated they know what "good agricultural practice" means.

[12] For mature or large palm trees, fertilisers should be applied to the soil around the perimeter of the palm leaves. This is because the roots of palm trees extend to the tips of the leaves or fronds, allowing the fertiliser to be quickly absorbed when placed at the soil's surface

Figure 37: Percentage of smallholders who are aware of the concept of Good Agricultural Practices

The discrepancy could be due to the differing perceptions of GAP among officers and smallholders. During enumeration, smallholders could list several good practices such as “enough rounds of fertilisation" and “no burning”. Additionally, acquiring farming knowledge as a palm oil smallholder in Malaysia is relatively easy through various platforms and providers, including the smallholders’ peer network itself (refer to Box 2).

Our survey reported that more smallholders (61.2%) received knowledge informally (Figure 38); however, when smallholders attended formal training, it was typically through MPOB (Figure 39). The MPOB extension service unit, TUNAS, or ‘Tunjuk Ajar & Nasihat Sawit’ (Coaching and Advisory for Palm Oil Plantations), was established in September 2002 and commenced its field exercises in January 2003. As of 2024, there are 49 TUNAS offices nationwide, with a reported ratio of officer to smallholder of 1:1200-1500 (Hashim 2023; MPOB 2024b). Considering its size and length of service in the field, most smallholders are more familiar with TUNAS officers than with officers from other palm oil agencies, such as RSPO, WWF, or Wild Asia.

Figure 38: Smallholders' source of information on GAP

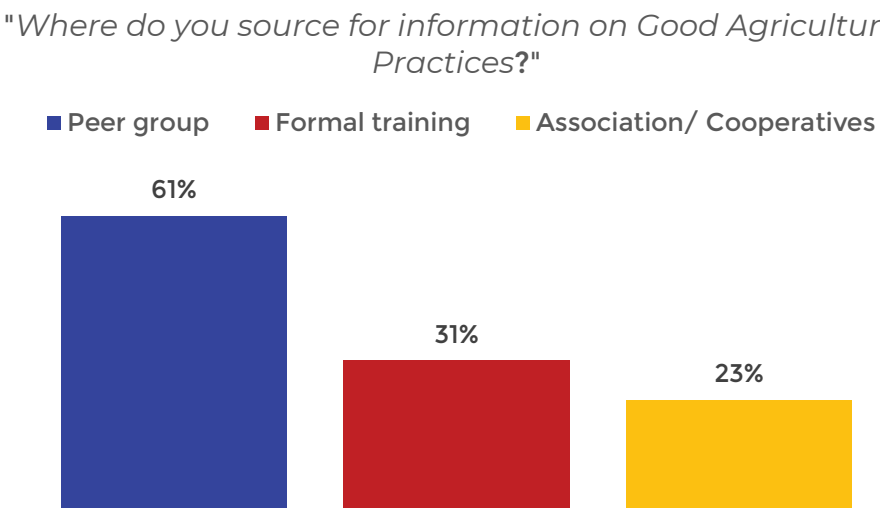
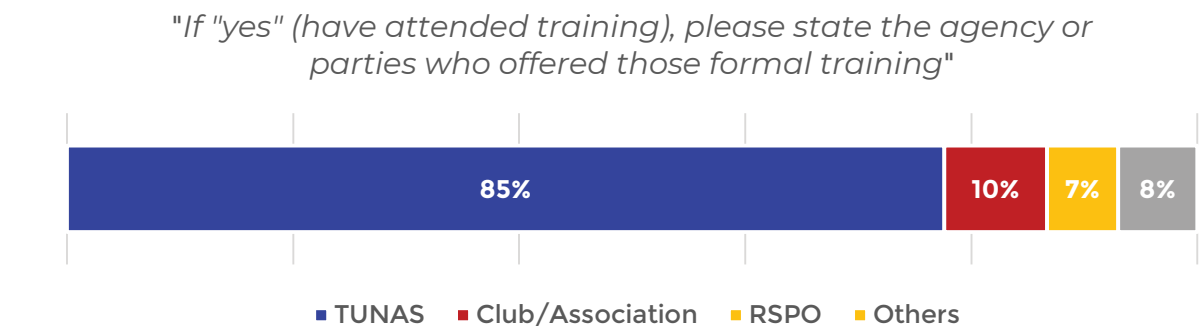


Figure 39: Smallholders' source of formal training on GAP



During data collection, the PNBRI team participated in two extension programs run by different agencies. Our observations highlighted a high number of attendances for MPOB TUNAS programs, but higher participation in the other program. This observation is consistent with the FGD interview with the extension officers:

> ***"When we conduct the training on fertilisation method, they (the participating smallholders) ended up asking us what MPOB can do for them to reduce the price of fertiliser (...),"***
> **(Extension Officer)**

Hasan and Faruq (2011) in Basaruddin et al. (2021), explained that the higher productivity of private programs can be due to the content being more up-to-date and better oriented toward farmers' needs. Another key observation related to this point is that, in both programs, demonstration sessions, such as those on how to wear PPE correctly, consistently caught the participants' attention compared to the presentation sessions. The officer, in one of the FGDs, also provided similar feedback.

> ***"(On advisory services) If I were to say the most impactful training to smallholders would be the method demonstration"*** **(Extension Officer)**

Additionally, we noticed lively and frequent Q&A sessions throughout the training, which served as a good attention grabber to help retain participants' attention.

Our survey also informed that smallholders' education level was not a factor in their decision to attend training (Table 5). The following table shows that the percentage of ISH attending GAP training is about the same, except for smallholders who have a bachelor's degree.

This means that smallholders from all educational levels had equal access to the training. Hence, a tailored approach, such as ensuring that training materials and presentations are delivered in a comprehensible manner to meet the varying levels of understanding among all smallholders, may improve the productivity of extension programs.

Table 5: Percentage of smallholders who attended GAP training by education level

Highest level of education	Number of ISH in the category	Percentage of ISH who attended GAP training
No schooling	12	42%
Primary education	95	62%
Secondary education	238	51%
Bachelor's degree	37	32%
Doctorate	5	80%

Box 2: Getting information as a palm oil smallholder

Typically, smallholders can engage three information providers for palm oil: Extension officers, Peer smallholders, and Palm oil-related agencies.

Smallholders' first point of contact is usually their peer farmer, especially to get information on plantation tips and prices that collection centres are offering. Some smallholders grouped themselves to form a support group or association, such as NASH, and started to offer more formal teach-ins or co-host training sessions with MPOB TUNAS. The exchange is usually informal, often via chats and texts on messenger apps like WhatsApp or social media platforms like Facebook.

Once licensed, smallholders are usually assigned to a Sustainable Palm Oil Cluster (SPOC). Through various programs, TUNAS officers will invite the smallholders under their SPOC supervision to attend. During these programs, TUNAS officers will explain GAP, MSPO certification, available assistance scheme, licensing, and the roles of MPOB cooperatives i.e. KPSM (Basaruddin et al. 2021). Other extension officers from organisations such as ASB, RSPO, and WAG also exist. They may offer different courses, but the focus will still be on sustainable agricultural practices.

Lastly, smallholders may also obtain information, such as daily FFB prices and standards for GAP, from the MPOB and MSPO websites or applications. Biannually, MPOB organises a conference or forum on smallholders, where government officials, industry players, smallholders, associations, and researchers can exchange new knowledge and information.

Note: *This list is non-exhaustive. Other information providers, such as Bursa Malaysia, which lists commodity and options prices, are also listed on the Bursa stock exchange.*

6.2. Knowledge-to-Practice: Three Key Challenges

MPOB has played an important role in providing support and resources to smallholders (including agricultural inputs, extension services, and training). However, these forms of support may not necessarily translate into actual implementation on the ground. This is particularly true for smallholders who did not actively participate in MPOB programs or preferred taking advice from friends and families over those of extension officers, as reported:

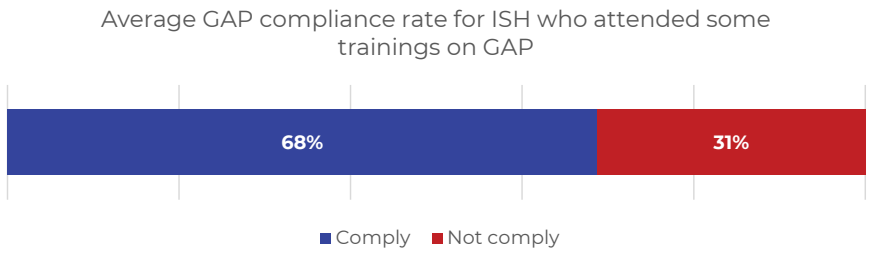
> ***"They prefer to listen to their friends (e.g. their neighbours). If they were to listen to our advice, they would mention how they are more experienced than you (the officers), who are still new. They will say, 'I've been with palm oil since I was small, and now I've gone through three phases of planting palm oil.' That's why they prefer to follow their methods rather than the advice we give."***
> **(Extension Officer)**

Even with substantial government support, smallholders' personal motivations (or lack thereof) could prevent them from adopting these practices. While 65% of our surveyed smallholders knew of GAP and had attended training, such awareness did not necessarily translate into actual implementation. Without a deeper understanding of human behaviour or action (Rizal and Nordin 2022), our study was limited in its ability to uncover why smallholders who were not implementing GAP did not do so.

However, as reported from the narratives above, smallholders' decisions to implement GAP could be influenced by social structures, which is consistent with the findings in the work of (Ahmad Rizal et al. 2021). In social structures, the strength of interaction among community members could explain smallholders' decision to adopt GAP. Smallholders are more likely to be influenced by their peers and neighbours. As a result, investigating how social structures can improve GAP among smallholders is critical as part of the effort to increase smallholder yield.

Our FGD interviews with TUNAS officers indicated a positive relationship between access to training and GAP implementation. This aligns with our survey findings, which showed an average rate of 68% GAP compliance among smallholders who had attended some GAP training (Figure 40). In the survey, smallholders were asked to tick the box if they complied with any selected fourteen (14) GAPs[13]. Equal weight was assumed to calculate the average rate of GAP compliance.

Figure 40: Percentage of smallholders who are aware of the concept of good agricultural practices



We can observe comparable results by correlating the rate of GAP compliance with smallholders' awareness of GAP. 65.7% of smallholders who were aware of the GAP concept implemented good agricultural practices. Awareness can be instilled by attending training or stem from previous experience. For example, two extension officers in the FGD mentioned that veteran smallholders tend to implement GAP, which was attributable to their previous work experience.

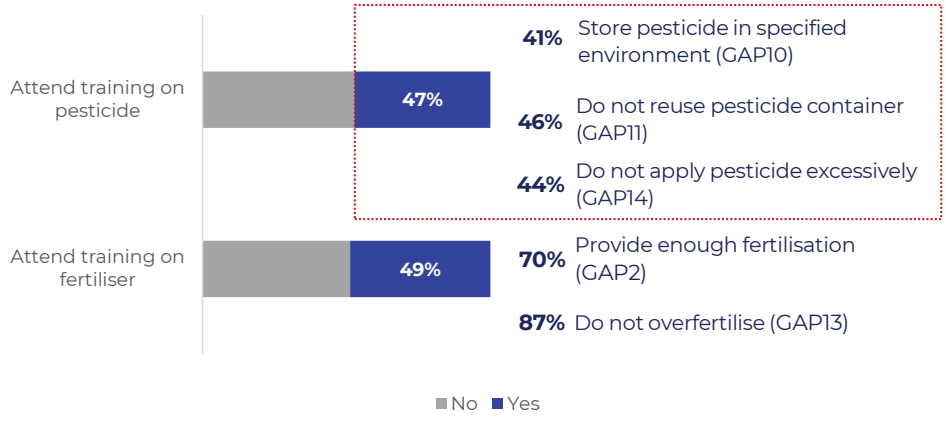
[13] This list is based on MSPO requirement, covering record management, fertiliser application, pruning, PPE use, and reuse of pesticide container. The full list is in the appendix available at www.pnbri.com.my.

> ***"Smallholders who achieved 28 tons/acre are veteran farmers since they once worked in a plantation estate***
> **(Extension Officer)**

> ***"Most (smallholders) who implement GAP have been working on their farm for a while and know the ways (best practice)"***
> **(Extension Officer)**

The findings are also consistent if we analyse the impact of training on fertilisation-related GAP compliance. However, an intriguing observation arises when comparing the GAP compliance rates for fertiliser and pesticide application: the compliance rate for pesticides is lower, despite a similar number of smallholders attending both trainings (Figure 41). This might be because the incentive to implement one GAP over the other differs, namely, smallholders were highly aware of how fertiliser impacts FFB production, but not necessarily pesticide.

Figure 41: Rate of GAP compliance according to the training smallholder attended



Smallholders were also asked about their perception of GAP. Almost all (92%) agreed that generally practising GAP could increase FFB production. Nevertheless, the rate of GAP compliance had yet to match its high rate of positive perception. This phenomenon could be attributed to three factors: **ease of practice, compliance incentive, and preference.**

6.2.1. Ease of Practice

On the surface, some smallholders appear inflexible in adopting sustainable practices. For example, in one of the FGD quotes below, the word "easy" was used to explain why they still practice burning. However, research shows that the recommended practice was almost impractical due to high costs. With a land area of only 1 acre and no pre-planning to replant, the cost could not be shared or optimised with neighbouring farms.

> ***"By right, replanting requires old trees to be cut and shredded, but it is easier to just burn. Though burning is not a good practice."***
> **(Peninsular)**

More often than not, absentee owners, such as second or third generations who inherited the land but work outside the plantation area, have to hire a contractor or foreign workers to manage their plantation. It is "easier" to appoint someone and receive passive income monthly than to monitor or even work on the land itself.

> ***"(...), the children (who inherited the land) live in KL and do not care about farm management. Their only concern is on yield"***
> **(Extension Officer)**

A high reliance on foreign workers without frequent monitoring, combined with low incentives in the form of extra pay to practise GAP, made implementation challenging. One officer highlighted in an FGD that workers were typically paid by weight or area; therefore, it was only expected that they would do the bare minimum, especially when there were no owners in sight.

> ***"Sometimes we invited the farm workers to our training (on GAP) (...), but because their pay is based on the job (i.e., per weight, per area), good practice is secondary"***
> **(Extension Officer)**

> ***"The workers harvest unripe fruit too, because the pay (is) per weight"***
> **(Peninsular)**

6.2.2. Compliance Incentive

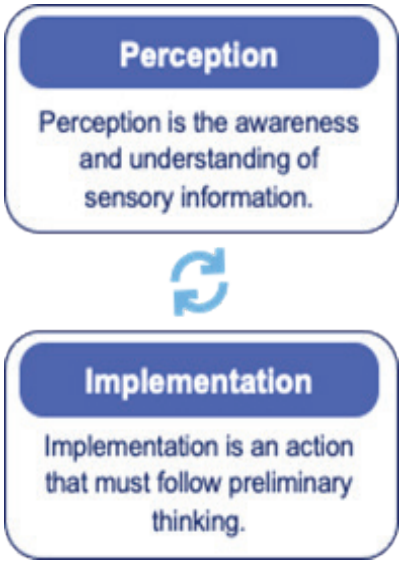
Even for smallholders who self-operate, **the lack of foreseen benefits might stall them from implementing GAP.** Rising production input costs and the absence of alternative income sources aside from FFB sales have made following the GAP guideline challenging. For example, one smallholder reported that they had to resort to intercropping to maintain a continuous income while replanting their land in stages.

> ***"We cannot afford to replant all areas, so we do it by intercropping, which is bad"***
> **(Peninsular)**

> ***"Usually, I give fertiliser three times a year, but only twice now since the price has become expensive"***
> **(Peninsular)**

These behaviours align with the study by Ni, Ali, and Zainudin (2016), which explained that ***"effective implementation only happens when positive perception and its subsequent actions occur throughout the lifecycle of implementation" (Figure 42).*** This means that smallholders will only effectively implement GAP when they genuinely believe it is beneficial. They will continue to do so as long as they observe positive benefits, which will continuously improve their perception of GAP. Currently, for owners who self-manage and operate on minimal profit, and for workers who do not receive additional compensation to adopt GAP, there is no actual incentive to do so.

Figure 42: The implementation framework introduced in Ni, Ali, and Zainudin (2016)



Source: Ni, Ali, and Zainudin (2016)

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

6.2.3. Preference

Another factor contributing to non-compliance, as discovered during the FGD, was the smallholders' own preference to manage their farms as they see fit. This might stem from a distrust of the extension officers due to their inexperience during interactions, although we have not personally observed such interactions during our visit. One TUNAS officer mentioned in the FGD:

> ***"(Smallholders) prefer to practice their own (farm management) method compared to what has been advised (i.e., GAP)"***
> **(Extension Officer)**

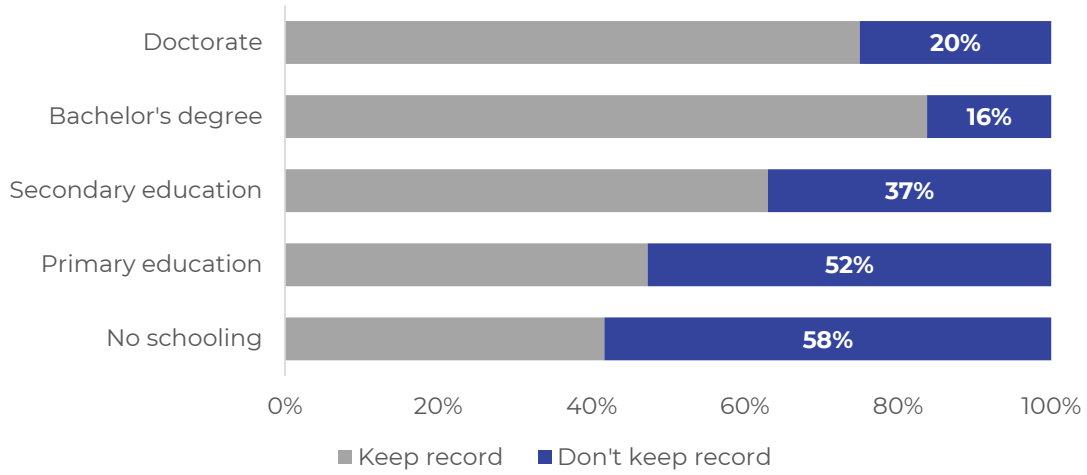
One study was done to assess smallholders' acceptance towards an extension service. While generally the image of extension officers is positive, smallholders gave a lower score when asked if the Q&A discussion helped to provide a deeper understanding (Basaruddin et al. 2021). In a separate study, trust had a positive influence on the possibility of smallholders adopting RSPO certification (Nupueng et al. 2023).

From the FGDs, it can be concluded that these three challenges – ease of practice, lack of compliance incentive, and smallholder preference – remained a hurdle in GAP adoption, with or without the smallholders attending any training on GAP.

Another possible reason for low compliance could be a low literacy rate, making consistent record-keeping challenging (Furumo et al. 2020). A lack of records may lead to inefficient agronomic practices, such as the under- or over-application of fertiliser. Although this particular issue was not raised during the FGD, our survey results aligned with Furumo's report findings, which indicated that more smallholders with lower education levels did not keep proper records of their farm activities (Figure 43).

This is a crucial finding to consider when designing a program for smallholders. A more simplified recording format may be designed and proposed for these smallholders, along with involving family members to assist with record-keeping.

Figure 43: Percentage of smallholders who did not keep records of farm activities, based on level of education



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6.3. Importance of Education on Related Topics to Farm Practices

During FGD engagements, issues related to a lack of technical skills and financial management were brought up. Maintaining records is crucial for effective farm management efficiency. Good bookkeeping also ensures that future costs of plantation operations can be sufficiently covered by the income generated from FFB sales. However, several FGD interviews recorded instances of weak financial management.

> ***"Sometimes, when the 6 months yield is great, they spent the fortune made, and for the next 6 months, they were left with no capital to invest back into the land. That is why their yield keeps diminishing and maintenance is lacking."***
> **(Peninsular)**

> ***"Record keeping of smallholders is very poor, they don't know how to calculate one-year income and cost"***
> **(Peninsular)**

> ***"Income from FFB sale is used for food and schooling expenses"***
> **(East Malaysia)**

Another common complaint voiced during the FGDs was weight miscalibration at the collection centre, potentially resulting in an incorrect reading and, thus, inaccurate payment to smallholders. During our visit to one of the collection centres, the scale used is manual (Figure 44) and, admittedly, it is susceptible to miscalibration. However, a recent presentation from the National Metrology Institute of Malaysia (NMIM)[14] informed that a different allowable margin of error exists for weighbridges with different scale capacities[15].

Knowing the capacity of the weighbridge and its allowable margin of error can help smallholders minimise income loss. For example, smallholders with smaller production tonnage can send their FFB to the collection centres that used smaller weighing scales, instead of the collection centres who seemingly offered higher prices but also used larger scales. Such a simple move could possibly reduce weighing errors by about 10 kilograms.

> ***"Smallholders only rely on OER set by the collection centre. Usually, they will sell to the centre which offers the highest price"***
> **(Extension Officer)**

Figure 44: Daily price shown at the collection centre and its manual scale

Source: PNBRI's images

[14] NMIM is responsible for the maintenance and dissemination of national standard of any measurement, including the standard for allowable margin of error for the different FFB weigh bridge capacities

[15] Conference Proceeding, Persidangan Pekebun Kecil Malaysia 2024

Lastly, smallholders reported a grim response to using technology due to the minimal to nonexistent maintenance support from the provider. For example, one smallholder mentioned that the CANTAS sickle pole comes in parts, and they lack the expertise to assemble them. Another expressed concern that they lacked the necessary technical skills to repair the machine if it were to become damaged.

> ***"If something goes wrong with this machine, we don't have the technical knowledge (to repair)"***
> **(East Malaysia)**

> ***"CANTAS came by parts, (but) who should assemble (it)?"***
> **(East Malaysia)**

Our survey revealed that only 105 out of 425 smallholders attended technology training, despite 92% agreeing that technology could enhance their production. The concern regarding maintenance may have discouraged attendance, as they perceived a greater risk in maintenance compared to the potential benefits of purchasing and using the machine.

It has been demonstrated that simply providing the best practices in planting knowledge is inadequate. Given their disadvantaged position due to low income and bargaining power, smallholders must be equipped with additional technical knowledge, including finance, maintenance, and new standards.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Recommendations

To improve smallholders' knowledge and GAP adoption, the following are recommended:

(viii) Enhance the current training module to emphasise other GAPs

Levels of priority in implementing different GAPs can be observed in the findings, indicating a need to emphasise the importance of implementing these GAPS equally. The messaging surrounding practising GAP, i.e., complying with certification for higher productivity, can gradually transition to promoting GAP for better access to the global market. This would reinforce the idea that all GAPs are equally important, not just fertiliser application. At the same time, this effort can be supported by more frequent ad-hoc on-site inspections by both extension officers and their peers.

Other knowledge-sharing sessions, like tool maintenance and metrology, can be conducted with a smaller, targeted pool of smallholders. Those smallholders who consistently participate in the technical training can be identified as local champions and agents of knowledge diffusion.

(ix) Explore more ways to ease the GAP implementation

To support smallholders' efforts in practising GAP, particularly those with lower educational levels, record-keeping exercises must be simplified further. While the current practice involves collection centres managing smallholders' record-keeping, smallholders can be empowered to take charge of their own records by introducing straightforward actions and instructions for doing so. By leveraging AI functions such as image-to-text and transcription, smallholders can read and record or take a photo of their sales receipts, allowing the tools to convert these into text input.

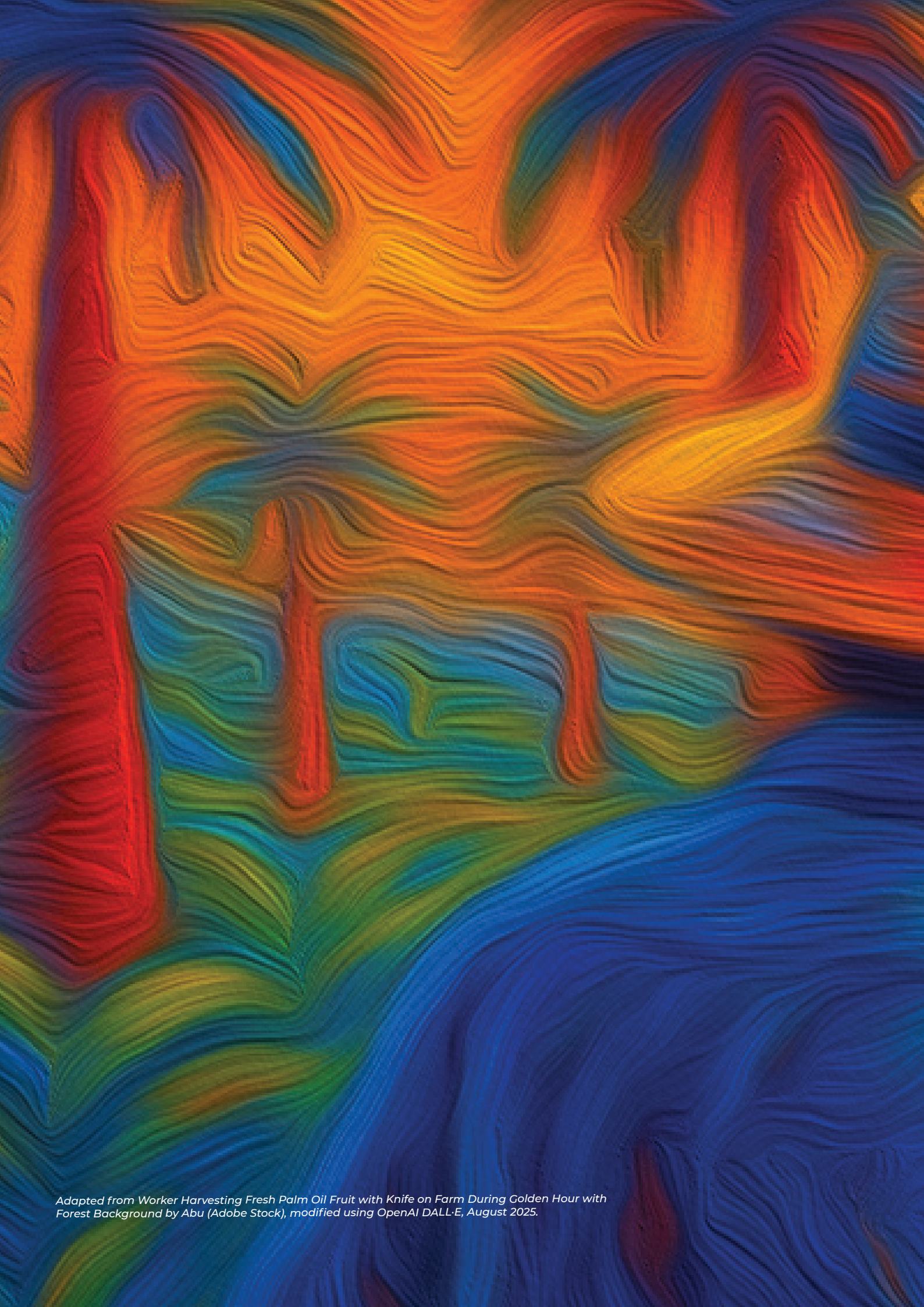
In the future, data integration and automation can be fully utilised to replace manual record-keeping. For example, a fertiliser seller can automatically register the purchase to the smallholders' account, which can serve as proof of record-keeping for certification audit purposes.

Summary of Chapter 6: The Importance of Education in Implementing Good Agricultural Practices

This chapter examines the impact of knowledge on the implementation of good agricultural practices among smallholders and attempts to identify exogenous factors contributing to non-compliance. The implementation framework explains that **"effective implementation only happens when positive perception and its subsequent actions occur throughout the lifecycle of implementation".** Here, we highlight important key points from this chapter:

- In Malaysia, the palm industry is mature with high institutional support, making getting information as a smallholder effortless. Apart from trainings organised by multiple agencies, peers and online sites are other important sources of information. This conducive environment may have contributed towards a high awareness level of the concept of good agricultural practice among smallholders.
- Attending training has a positive impact on GAP implementation; however, other factors, such as ease of practice, perceived benefits from the practice, and personal preference, also contribute to its sustainability.
- It is recommended that more efforts be taken to explore easing the practice, such as utilising image-to-text and speech-to-text functions to record their expenses. At a more advanced level, automation and data integration may further ease record-keeping.
- Apart from providing GAP training, there are benefits identified from equipping smallholders with complementary knowledge, such as financial management and technical information, i.e., maintenance of farming tools.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Chapter 7:

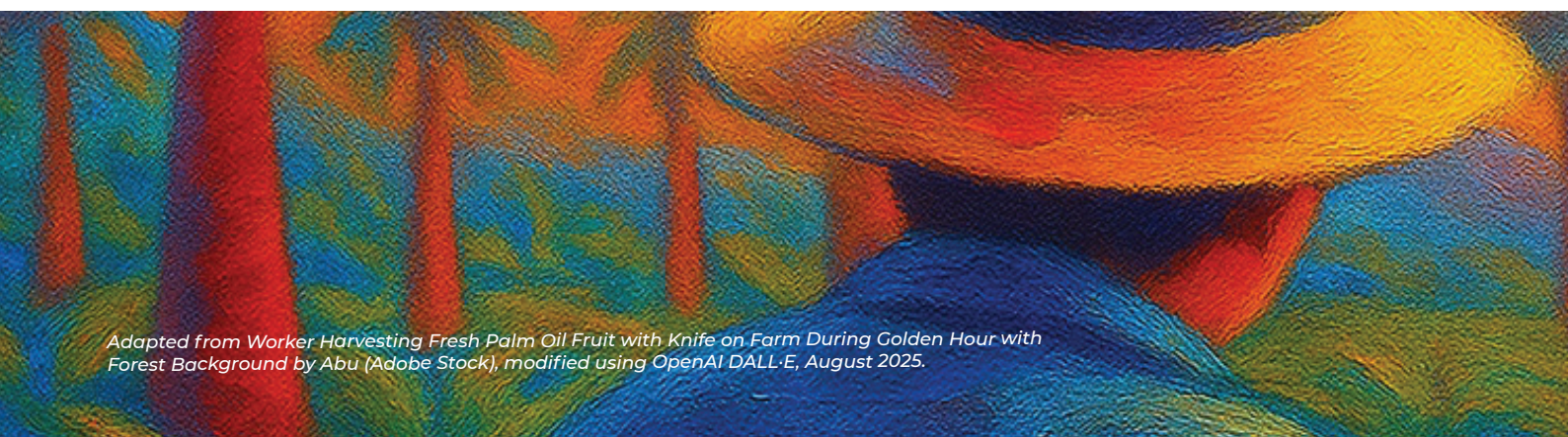
Institutional Support Towards Sustainability

This chapter aims to understand how identified institutions support and shape smallholders' attitudes and performance regarding sustainability. It was guided by the definition of institutions as "the formal and informal rules and norms that govern human behaviour" (North 2003). Institutional support refers to assistance afforded through such structures.

Definitional clarity is essential here as the 'institutions' in the oil palm sector are typically understood as the statutory bodies, specifically the MPOB as the regulator and FELDA and FELCRA as managers of organised smallholding projects. Additionally, since the 1960s, smallholding as a mode of production has been formally institutionalised in Malaysia through FELDA and FELCRA, which created a category of 'organised smallholders', namely oil palm smallholders who establish and work in newly developed agricultural settlements. Since 1985, FELDA smallholders have gradually transitioned to a share-based system, where they hold shares in the land while it is managed by contractors appointed by FELDA or FELCRA (Sutton 1989).

Beyond these statutory institutions, the chapter discusses **three institutions that emerge prominently from our FGDs and have strong links to smallholders' sustainable practices:**

1. **Support Schemes:** the various financial-based support schemes for ISHs
2. **Extension Services:** the technical and knowledge support provided by state agencies to support smallholders
3. **State-provided Infrastructure:** agriculture infrastructure, human-wildlife management, and land-related institutions



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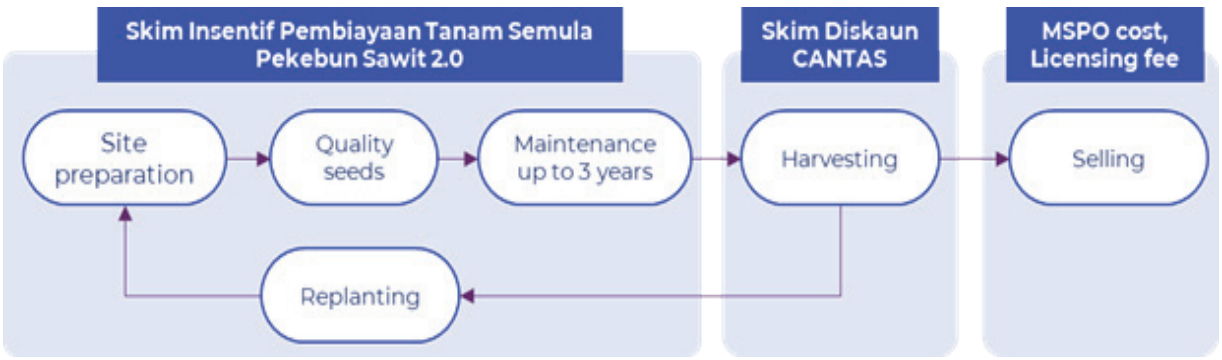
7.1. Support Schemes

ISHs have access to various support schemes covering all smallholding aspects (Figure 45, Table 6). Smallholders can apply for loans of up to RM5,000 per hectare for planting to purchase farming inputs such as fertilisers, chemicals, pesticides, and machinery. Smallholders with mature farms can access a replanting scheme offering a 50% grant and a 50% loan scheme to cover land preparation, purchase high-quality seeds, and farm maintenance for up to 36 months until planting reaches prime age. Two additional grant schemes incentivise smallholders to diversify their income through intercropping with livestock or other crops. To ease technology adoption in harvesting, smallholders can access a RM1,000 discount to purchase the CANTAS harvesting machine, which costs from RM2,900 to RM4,500, depending on the model. Furthermore, to ensure compliance with MSPO standards, smallholders' MSPO certification and audit costs are borne by MPOB.

Figure 45: Support schemes available to ISHs



Source: PNBRI's analysis

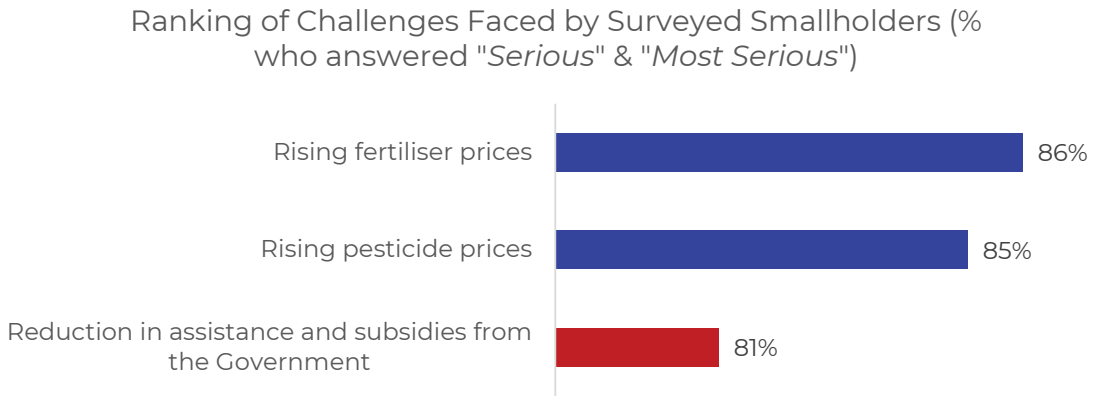
Table 6: Support schemes for smallholders provided by MPOB (PNBRI Analysis from various sources)

Scheme	Objective	Financial Support	Eligibility Criteria and Scope
Skim Intensif Integrasi Tanaman Dengan Sawit (ITa)	Increase smallholders' productivity and income by optimising land use and crop diversification	RM7,000 to RM15,000 (varies by crop type)	• Maximum planted area: 6.5 ha • Valid MPOB license holder • MSPO certified • Palm tree age <2 years old (replanting) or new planting
Skim Insentif Integrasi Ternakan Dengan Sawit (ITe)	Increase smallholders' productivity and income through integrated livestock farming systems	**Total:** RM15,000 • RM3,500 for infrastructure e.g. animal shed • RM11,500 for input cost	• Maximum planted area: 6.5 ha • Valid MPOB license holder • MSPO certified • Limited to one livestock project per applicant
Skim Insentif Pembiayaan Tanam Semula Pekebun Kecil Sawit 2.0 (TSPKS 2.0)	Facilitate replanting with high-yielding planting materials to improve productivity	**Peninsular Malaysia:** RM14,000/ha **Sabah & Sarawak:** RM18,000/ha **Structure**: 50% grant, 50% financing **Terms**: 2% p.a., up to 12-year tenure **Provider**: Agrobank	• Smallholders with maximum planted area of 10 ha (maximum planted area supported: 6.5 ha) • Valid MPOB license holder • **Coverage:** land preparation, high-quality seedlings, farm maintenance (up to 36 months) • **Target:** palm tree >25 years or unproductive stands
Skim Pembiayaan Mudah Input Pertanian Sawit (IPPKS)	Provide working capital support for essential farm inputs (fertilisers, agrochemicals, machinery, infrastructure)	Up to RM5,000/ha Up to 60-month tenure	• Maximum planted area: 6.5 ha • Valid MPOB license holder • ***Target:*** Palm tree age <22 years
Skim Diskaun Cantas (SKIDIC)	Promote mechanisation adoption in harvesting operations to address labour shortages	Subsidy for purchasing CANTAS: RM1,000/ unit	• **Smallholders**: minimum harvesting area of 1 ha • **Independent harvester/ contractor:** minimum 20 ha OR harvests in areas owned by at least 10 smallholders • **Estates**: minimum 50 ha

Note: *All schemes require compliance with MPOB regulations and are subject to annual budget allocations. Eligibility criteria and scope for each scheme may change based on annual revisions.*

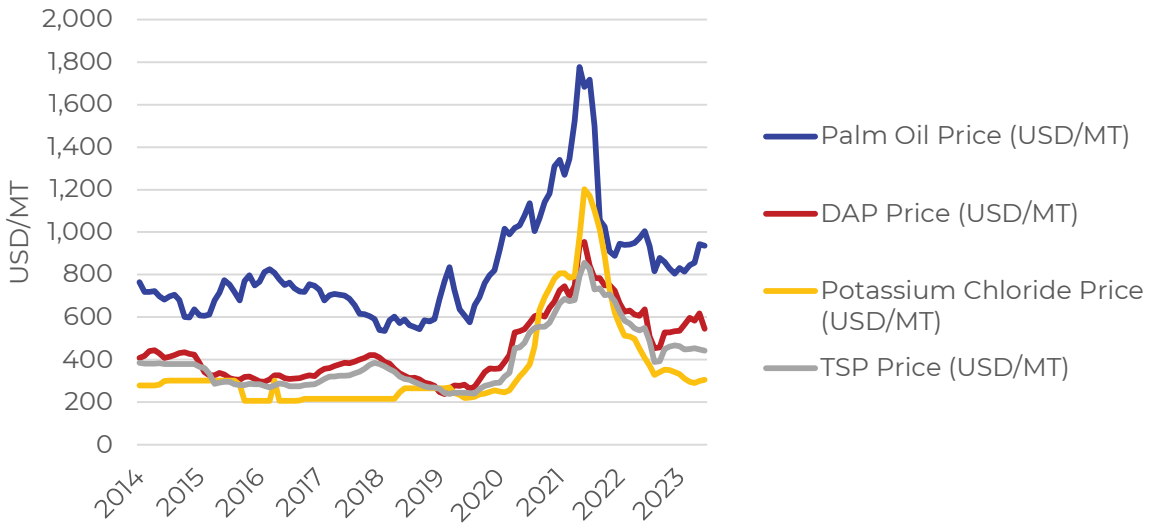
Government support schemes have been integral to smallholding. These supports typically target smallholders with small land sizes below 6.5 hectares, as land size is used as a proxy to differentiate capital ability within the smallholder population. This reliance is evident, with 81% of surveyed smallholders seeing any reduction of government support as a "serious" or "most serious" issue, ranking it third among their challenges (Figure 46). Notably, 85% of surveyed smallholders who think that the issue was serious owned land that was smaller than 4.9 hectares, underscoring the link between land size and capital constraints among smallholders (Chapter 4). In the FGD discussions, smallholders voiced constraints in purchasing basic agricultural inputs, such as fertilisers and pesticides, and meeting long-term requirements like replanting and upgrading farm technology. Continued and targeted support remains essential to address these limitations, especially to ensure that smallholders maintain sustainable practices.

Figure 46: Ranking of challenges faced by surveyed smallholders



Smallholders' expectation for basic cost support arises from what they see as uncontrolled price hikes for key input materials like fertilisers, which increase with CPO price movements. These deemed rapid price movements place a significant financial burden on smallholders, especially ones with small land size who are price takers and unable to purchase in bulk and negotiate better terms. Therefore, despite instances where global fertiliser prices decline (Figure 47), these changes may not necessarily be enjoyed by smallholders.

Figure 47: Monthly palm oil prices vs fertiliser prices, 2014-2024



Source: IFPRI Food Security Portal

While smallholders consistently express the need for government support, our FGD reveals they are pragmatic in their expectations, often requesting modest, targeted assistance rather than comprehensive subsidies. Extension officers validate this measured approach:

> *"(...), (as for) the subsidy assistance, if they can't get the full amount, getting half or even 20 to 30 percent would be fine... at least it would cover the cost of the fertiliser."*
> **(Extension Officer)**

> *"Targeted subsidies should be continued, especially for smallholders with plantations sized between 5-10 hectares."*
> **(Extension Officer)**

Additionally, not all smallholders expected input cost support. Some see the bigger picture, requesting that support should be more structural, involving support in terms of technology adoption and infrastructure development as those were beyond the capabilities of individual farmers.

> ***"There's no need to provide monthly assistance (...), support should be given in terms of technology and the food sector to increase smallholders' income."***
> **(East Malaysia)**

> ***"Even our roads are not usable. But they're giving aid for 'side things', like livestock..."***
> **(Peninsular)**

These discussions reveal that smallholders are not passive recipients of existing support schemes. They have critical views on support delivery and question whether it aligns with realities on the ground. However, we find that smallholders often lack control over key policies, which stems from limited representation at policy-making platforms. They are acutely aware of this when some voiced that smallholders from associations should be appointed ***"as senators or agriculture committee members, not those from unrelated fields" (Peninsular)*** (more in Chapter 8).

The feedback from smallholders on existing support schemes can be divided into aspects of design and delivery of the support programs:

Design Issues

- **Replanting scheme in the form of loan (maximum 12-year tenure)**
  The majority of smallholders interviewed in this study, particularly older ones, were hesitant to take up replanting schemes offered as loans, limiting the program's effectiveness. This reluctance stemmed from the age range of smallholders, which either disqualifies them from long-term loan eligibility or deters them from committing to loan repayment plans due to financial and personal considerations.

- **Replanting scheme eligibility**
  Smallholders who chose to replant using their own capital were excluded from future assistance because they were not registered as part of formal replanting programs. This approach penalises proactive efforts and discourages self-initiated investments.

Delivery Challenges

- **Cluster-based support delivery**

  Smallholders deemed delivery of support through 'clusters' instead of to individual smallholders as ineffective. However, clustering was a more effective mechanism to encourage group pressure in various aspects, such as to comply with standards and to share technologies.

- **Perceived favouritism**
  Support was often perceived as being directed toward "selected smallholders", creating scepticism about favouritism to well-performing smallholders. This is a classic dilemma in cases of limited resources. Although rewarding high-performing smallholders makes sense to encourage compliance and yields, it risks marginalising underperforming smallholders who may need support the most. This creates a cycle of exclusion and underperformance.

- **Lack of awareness**
  Many smallholders were unaware of available support programs, relying on informal word-of-mouth channels to learn about them. This is addressed through cluster-based support delivery and TUNAS officers to relay information.

7.2. Extension Services

Extension services in agriculture refer to educational and technical support given to agricultural smallholders (Chapter 6). This service is a key part of the nation's effort to boost agricultural education and research since the First Malaysian Plan (1MP). Agricultural schools and Universiti Pertanian Malaysia (UPM) (later known as Universiti Putra Malaysia) were established to overcome the shortage of qualified extension officers. The aim in 1MP was to have 1 extension officer for every 500 acres, 1 field supervisor for every 4 extension workers, and 1 professional specialist for 2-3 field supervisors. Such pyramid structure alludes to the top-down approach to develop agricultural sector involving smallholders.

This arrangement is still reflected in oil palm extension services which are undertaken by MPOB through field officers referred to as *Pegawai TUNAS Zon (PTZ)* or zonal extension officers. There are currently 49 TUNAS offices and 196 officers (Table 7).

Table 7: Number of TUNAS offices and officers by State

Zone	States	Number of TUNAS Offices	Number of TUNAS Officers
South	Johor	9	48
Middle	Selangor, Negeri Sembilan, Melaka	5	17
North	Perak, Kedah, Pulau Pinang, Perlis	5	35
East	Pahang, Terengganu, Kelantan	6	19
Sabah	Sabah	12	36
Sarawak	Sarawak	13	41
Total		**49**	**196**

Source: Persidangan Kebangsaan Pekebun Kecil Sawit 2024

The effectiveness of extension services is hindered by resource limitations. Smallholders often highlighted that TUNAS officers were overstretched – ***"it's hard to ask them to come as there's not many of them"*** – as they cover large geographic areas compared to RISDA officers, who operated within more localised boundaries. This resource gap reduced smallholders' reliance on MPOB offices and led them to seek assistance from other entities, such as RISDA or local NGOs like WWF Malaysia.

> ***"(...), WWF also help us as we understand, it is not easy for one TUNAS officer to cover the whole of Tawau"***
> **(East Malaysia)**

MPOB also acknowledges this challenge. While the ratio of TUNAS officers to smallholders has improved from 1:2000 in 2002 to 1:1539 in 2018, this improvement masks an increased workload for each officer. Their responsibilities now extend beyond technical briefings, farm visits, and demonstrations to include disseminating information on government support schemes and implementing those schemes (MPOB 2018; 2020). Resource constraints also limit the penetration of smallholder programs. These programs are often held at the district level rather than locally (***mukim*** level), making participation difficult for many smallholders.

Beyond resources, TUNAS officers acknowledge challenges in building trust and establishing their expertise, especially among elderly smallholders. Here, the age gap can in certain cases influence smallholders' perception and reception towards TUNAS officers' technical advice, despite the officers' substantial training.

Finally, a key challenge for extension services is coordinating the various roles played by various agencies, to be able to leverage on their major strengths. There are three prominent agencies that service the smallholders with extension services namely MPOB, RISDA and FELDA (Figure 48). MPOB is currently the primary provider of extension services for ISHs. Historically, RISDA also played a parallel role, supporting both rubber smallholders and smallholders who transitioned their land use to oil palm. Under the 5MP and 6MP, RISDA supports rubber smallholders to replant their holdings with either rubber or other high-yielding crop, and oil palm was a popular choice. This also shifted smallholders into a mix of rubber-only, oil-palm-only and rubber-and-oil-palm smallholders. An agency realignment shifted responsibility for oil palm smallholders entirely to MPOB, while RISDA now focuses exclusively on rubber smallholders.

Figure 48: List of support provided by various agencies on the ground

Source: PNBRI's analysis

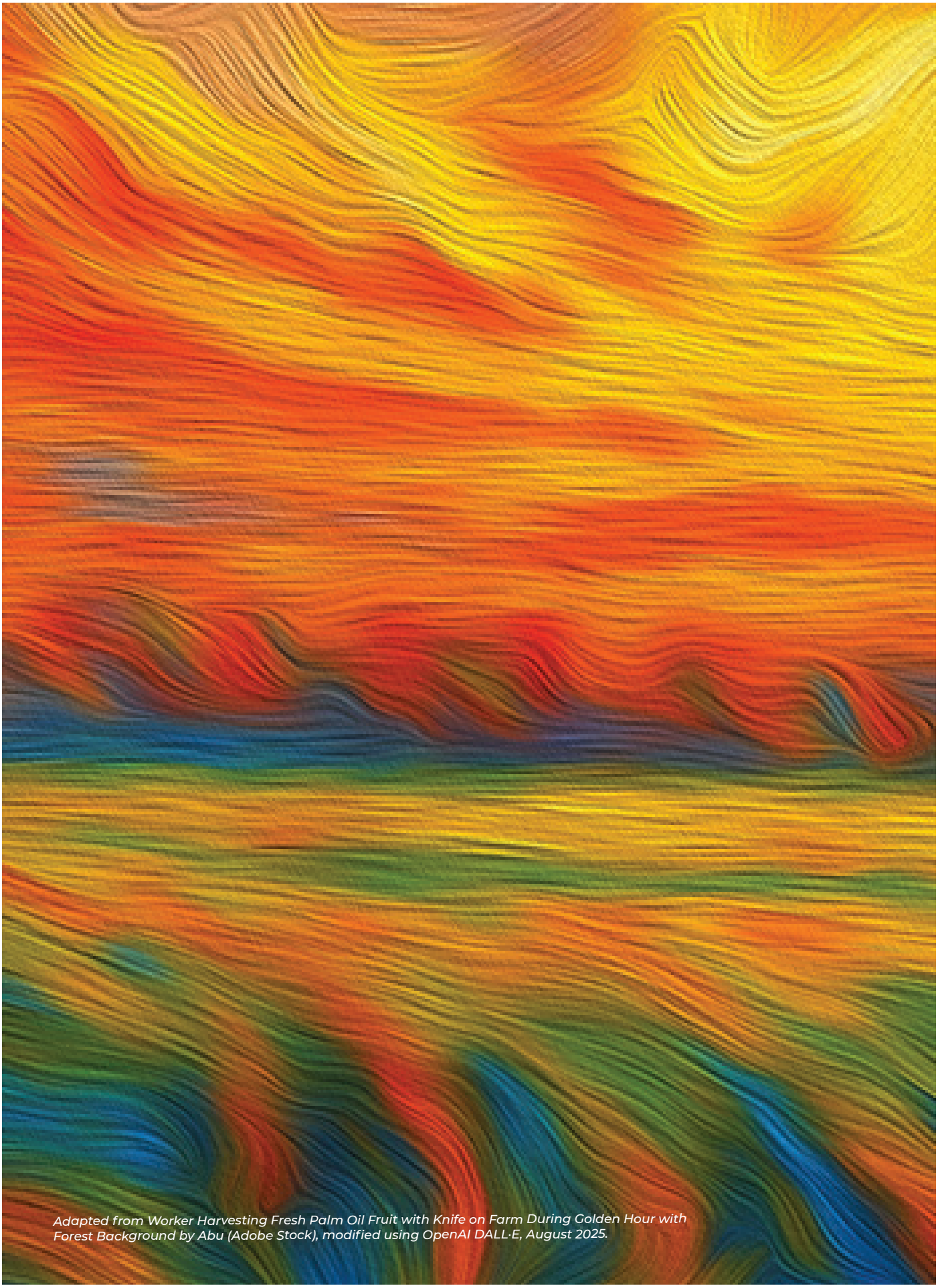
Another agency, FELDA, provides comprehensive management services to organised smallholders within its schemes. These agencies operate under different governing ministries, adding to the complexity. MPOB falls under the Ministry of Plantation and Commodities (MPC), while RISDA and FELDA are overseen by the Ministry of Rural and KPW.

Amidst the comprehensive services on the ground, there are both service overlaps and missed opportunities in extension services provisions. In the FGD discussions, smallholders note that each agency brings unique strengths in technical knowledge and support, but these distinct approaches create coordination challenges for addressing smallholders' specific (and sometimes new) requirements. For example, due to differing jurisdictions, one of our respondents claimed that MPOB TUNAS officers were not allowed to provide him with technical assistance in replanting efforts, even when he preferred such assistance. This was due to his status as an organised smallholder managed by one of the agencies.

There was also a reported opportunity for additional support beyond planting activities. While numerous schemes address upstream activities, such as planting and input subsidies, smallholders expressed interest in exploring opportunities in expanding market access and venturing into downstream activities. However, being aware that one agency alone cannot be expected to provide multiple kinds of support, one smallholder suggested:

> ***"(...), if possible, assign (just) one agency (...) because they have staff in every sub-district and state."***
> **(Peninsular)**

This feedback underscored the opportunity for an integrated approach to extension services, where support, whether upstream or downstream, is rendered based on each agency's strengths.



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

7.3. State-provided Infrastructure

Beyond MPOB as the official caretaker of ISHs, smallholdings are reliant on the local infrastructural and regulatory ecosystem to thrive.

7.3.1. Agriculture Infrastructure

The success of oil palm cultivation in Malaysia has been closely tied to investments in rural development, particularly from the 1960s onwards. There was significant public expenditure on rural infrastructure development, including roads, utilities, and land development. Quoting Tun Abdul Razak in one of his key speeches, "rural roads are the bloodstreams to our rural economy." Similarly, oil palm cultivation is highly dependent on transportation logistics since oil palm FFB requires immediate processing (ideally within 24 hours). This illustrates how the requirements of oil palm cultivation, particularly land and logistics, complement and are intertwined with the needs of rural development.

Rural infrastructure, especially roads, still features prominently in the national agenda and policy signalling. Spending on agricultural roads is singled out in Budget speeches of recent years, to show that these measures aim to benefit smallholders:

> Budget 2024: *"Upgrade, construct, and maintain roads in smallholder plantations or "Jalan Ladang Pekebun Kecil" (JLPK) nationwide to facilitate transportation of agricultural inputs and commodity products"*

> Budget 2018: *"The Government cares for paddy farmers, farmers, smallholders, fishermen and others in the agriculture sector [...] About RM500 million is allocated to improve irrigation infrastructure and upgrade plantation roads."*

Budget 2017: ***"(...), a sum of RM20 mil is provided to upgrade estate roads, to facilitate oil palm smallholders."***

The planning for JLPK specifically was transferred to MPIC from 2013, with 168 projects completed since, amounting to 361 km built (MPOB 2020). This project is budgeted under MPC and undertaken by the Department of Irrigation and Drainage or *Jabatan Pengairan dan Saliran* (JPS) as the implementing agency.

Despite these expenditures, the infrastructure experience of ISHs is complicated by uneven development and climate change. In states where oil palm planting competes with the rapid expansion of industries and residential areas, such as Selangor and Malacca, smallholders reported bearing the brunt of worsening flooding from "rapid developments" such as "new highways". They also reported being deprioritised when it comes to flood adaptation as irrigation and drainage improvements depends on the availability of local funding.

7.3.2. Wildlife Attack

Wildlife protection in Peninsular Malaysia is governed at the Federal level through the Wildlife Conservation Act 2010, which empowers the Department of Wildlife and National Parks (PERHILITAN) to undertake proper implementation of wildlife protection. Sarawak enforces the Wild Life Protection Ordinance 1998 and Sabah enforces the Wildlife Conservation Enactment 1997 in their respective states. Summary of the acts governing wildlife protection as per Governing acts and agencies related to wildlife protection and conservation in Malaysia (Table 8).

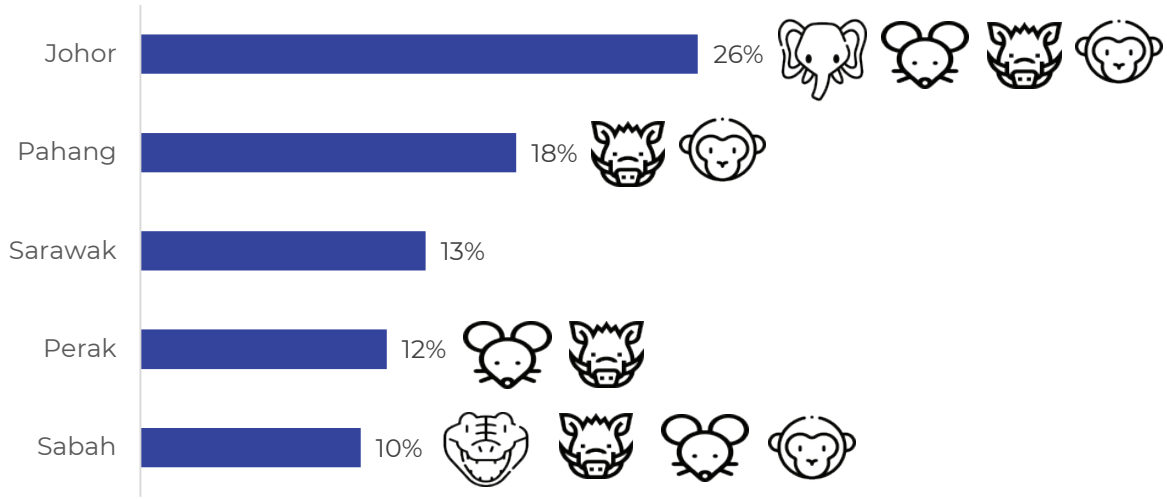
Table 8: Governing acts and agencies related to wildlife protection and conservation in Malaysia

State/Region	Governing Act	Implementing Agency
Peninsular Malaysia	Wildlife Conservation Act 2010	Department of Wildlife and National Parks (PERHILITAN)
Sarawak	Wild Life Protection Ordinance 1998	Forest Department Sarawak
Sabah	Wildlife Conservation Enactment 1997	Sabah Wildlife Department

Source: Persidangan Kebangsaan Pekebun Kecil Sawit 2024

The problem of wildlife attacks varies by state and region, with some areas facing more severe challenges (Figure 49).

Figure 49: States where smallholders report wildlife and pest attacks, % to total respondents



Wildlife conflicts posed serious challenges for smallholders, with the severity varying by region and the animal species involved. As habitat destruction drives greater overlap between wildlife habitats and agricultural areas, smallholders increasingly faced threats from wildlife attacks. Animals like wild boar walk for miles to search for food as their natural ecosystem was affected. This creates a stalemate as noted by smallholders:

> ***"these elephants, there's nowhere to send them to anyway..."***
> **(Extension Officer)**

Monkeys, rats, and wild boars were particularly destructive during the early stages of oil palm cultivation, damaging young plants, consuming fruit, and destroying leaves. In Sabah, the growing crocodile population further heightened safety concerns for farm workers, especially during flood seasons.

> ***"Recently, there are more crocodiles in estates, wherever there are swamps. The crocodile population in Sabah has increased."***
> **(East Malaysia)**

As reported by some FGD respondents, efforts to seek assistance from the Department of Wildlife and PERHILITAN could not be met due to limitations, such as staffing shortages and budget constraints. As shared by an extension officer:

> ***"(Upon making the report), their answer is (always) the same (...), not enough staff, they don't have a big budget."***
> **(Extension Officer)**

One smallholder even observed that wild animals caught in urban areas were released back into rural areas near smallholder farms, which became a problem for smallholders.

> ***"They catch them (monkeys) in Tanjung Emas we heard. Then they release them here (Lenga)"***
> **(Peninsular)**

Such actions can be attributed to local regulations against the killing of wildlife, supported by monitoring by wildlife conservation NGOs. Local efforts by ISHs to mitigate the damage caused by wildlife include the offering of incentive payments for hunting and for trapping specific animals, but this may be ignorant of the prevailing laws protecting wildlife. This has created tensions between smallholders, wildlife authorities, and conservation organisations.

> ***"The local Yang Berhormat offer payment of RM30 per wild boar, RM10 for each monkey. But we have interventions by NGOs, they do not allow killing these animals."***
> **(Peninsular)**

To adapt, our respondents shared how they employed a variety of self-initiated measures, including installing zinc barriers and solar-powered electric fencing to deter wild boars, but these solutions can be costly.

7.3.3. Land Administration

Land is the most important factor in oil palm production. Oil palm smallholders are landowners, acquiring land either through family inheritance, land purchase, or land settlement agreement with the government. There are also smallholders who lease land for planting, typically to expand their current operations.

Land in Malaysia is governed by the National Land Code 1965 at the Federal level, which acknowledges each state's power and prerogative in land administration matters. As such, discussions around land administrations are State matters. Land titles are registered and administered at the Land Office under the purview of the respective State.

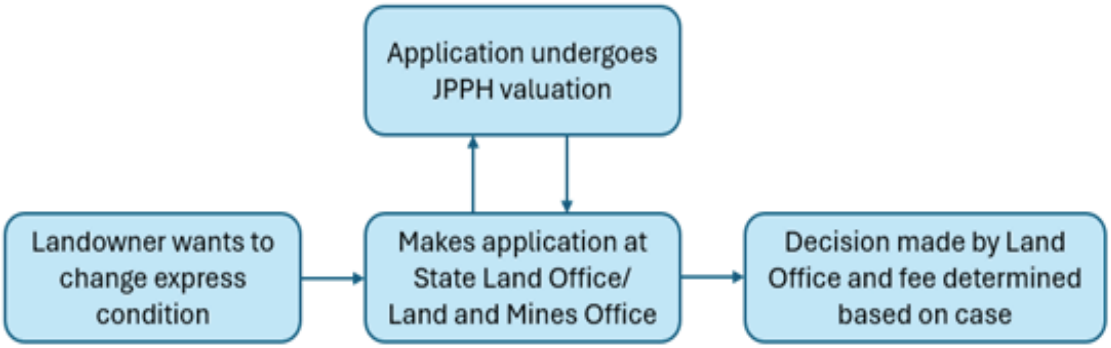
Under Section 52 of the National Land Code 1965, all titled land falls under three main categories (JPPH 2019):

1. Agricultural
2. Buildings
3. Industrial

Landowners must only undertake activities that are permitted for the registered land use as registered in the land grant. Aside from these land use categories, each land title also states the express condition of the land (***syarat nyata tanah***), which stipulates the permitted activity, for example, rubber planting, palm oil planting, or broader categories like ***tanaman kekal (industri).***

They may apply to the State Authority to change the category of land use or express condition of land typically with a fee (Figure 50).

Figure 50: General process of changing express condition of land



Source: PNBRI's analysis

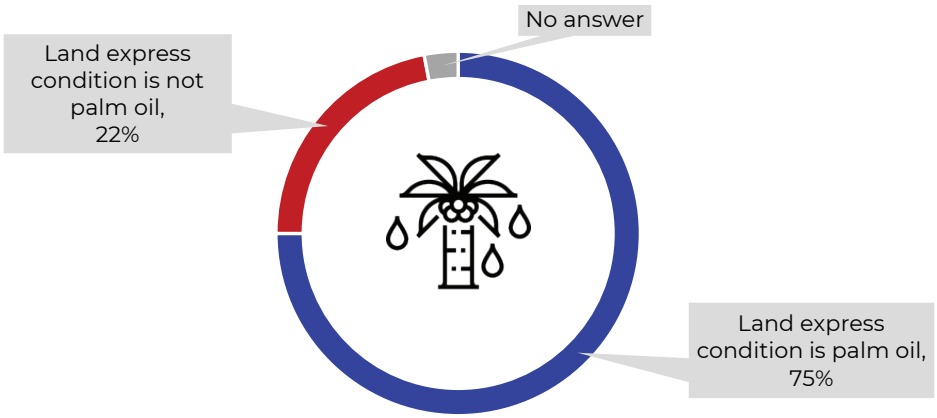
There has been concerns over land tenancy of smallholders, with case studies informing us of tenure insecurity (Majid Cooke, 2012) and unequal access to land, typically against large capital (Effossou et al. 2022; Khatun et al. 2020; Ruysschaert et al. 2019).

Among our respondents, we found that land ownership was not a major issue. 95% of surveyed smallholders owned their farmland, 83% with grant, while 11% did not hold their grant. Only a small percentage of smallholders, notably from Pahang (9%), Selangor (5%), and Terengganu (6%) do not own their oil palm land. Notably, Sarawak and Terengganu smallholders might have ownership but around 40% did not have the grant. These smallholders might still be applying for the land grant, which still allows them to be licensed and get certified.

Land ownership is also the basis for the persistence of smallholding in Malaysia. The current structure of smallholding land in Malaysia is partially a result of the land resettlement and amalgamation through agencies like FELDA and FELCRA which opens rural land. These programs also meant that some lands are 'locked' in smallholding in the case of FELDA.

However, the express condition of land (*syarat nyata tanah*) is a bigger worry. While 75% respondents' land was meant for oil palm, 22% planted oil palm on land that was not meant for oil palm planting (Figure 51). MPOB noted that 42,053 smallholders face this issue as of 2020 (MPOB 2020).

Figure 51: Distribution of respondents having palm oil land express title (%)



Having the wrong express condition of land only applies to a minority (22%) of smallholders, but it remains a cause for concern as incorrect land express condition disqualifies smallholders from (1) selling through proper channel, (2) getting replanting support, and (3) obtaining certification. TUNAS officers shared their worry that this will be an issue that will crop up in later stages such as when smallholders want to be MSPO certified or want to apply for replanting schemes

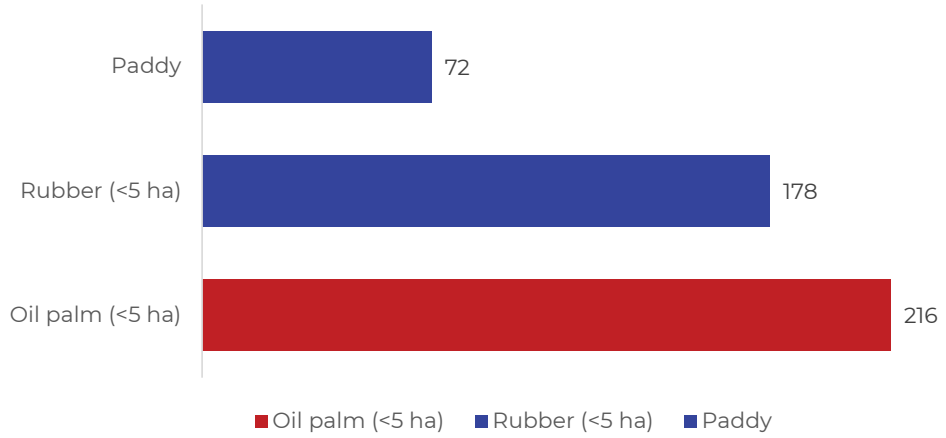
> ***"When rubber planting does not give good yield, smallholders switch to oil palm (...), but illegally. When the land express condition is not (for planting of) oil palm, it will be a problem when they reach out for MPOB schemes."***
> **(Peninsular)**

> ***"Smallholders will face problems when they want to replant... the land grant (only) allows for rubber planting but they have already planted oil palm."***
> **(Peninsular)**

Some smallholders were unsure of the procedures to make such conversion, which is a situation mitigated by MPOB's advice to smallholders. However, when smallholders reported that the process to be time-consuming and involved "high cost", it points to two real issues.

Firstly, land which allows for oil palm typically command higher annual land tax compared to other crops. Taking the example of a 4 hectares (~10 acres) oil palm land, in Melaka such land will incur 21% more tax annually to rubber planting and 3 times more than paddy (Figure 52). While this may be a small sum, when conversion happens, smallholders who have started planting ahead of application need to also pay retrospective charges. When we factor in smallholders' income for those who own less than 4 hectares, this may be a deterring factor.

Figure 52: Annual agriculture land tax for a 4-hectare land in Melaka (RM/year)



Source: PNBRI's analysis

Secondly, some smallholders faced issues with the inheritance process. For farmed land undergoing estate division, all intended recipients must often agree and, in some cases, be present together at the land office to complete the conversion process.

> ***"(...), some grants can be under many names, (...) passed down to multiple heirs. This complicates land conversion process at the land office."***
> **(Extension Officer)**

Additionally, some land could not be converted due to food security policy, in particular involving converting paddy land to other uses. In some states, there are strict rules over changing the crop types. For example, extension officers in Pahang pointed out that for areas in Rompin and Maran, smallholders were unable to do conversions due to state-specific restrictions.

Recommendations

Towards optimising the support given to smallholders, including minimising overlaps and coordinating better across multiple agencies, the following are recommended:

(x) Realign smallholder agencies roles based on value chain expertise

Currently, agency support roles are organised by smallholder subgroups, creating a fragmented system of assistance. MPOB provides technical and replanting support exclusively to ISHs, while FELDA services are limited to FELDA settlers, and RISDA assists only rubber planters who also plant oil palms. A more effective approach would be to realign these agencies' roles based on their specific expertise along the value chain, allowing smallholders to benefit from specialised knowledge regardless of their classification (Figure 53). This entails regrouping assistance based on upstream, midstream, and downstream activities. For example, FELDA smallholders may also benefit from training that happen in the independent smallholding area in the vicinity of its land blocks ("rancangan"), while ISHs may officially and traceably sell their FFBs to RISDA-run ramps.

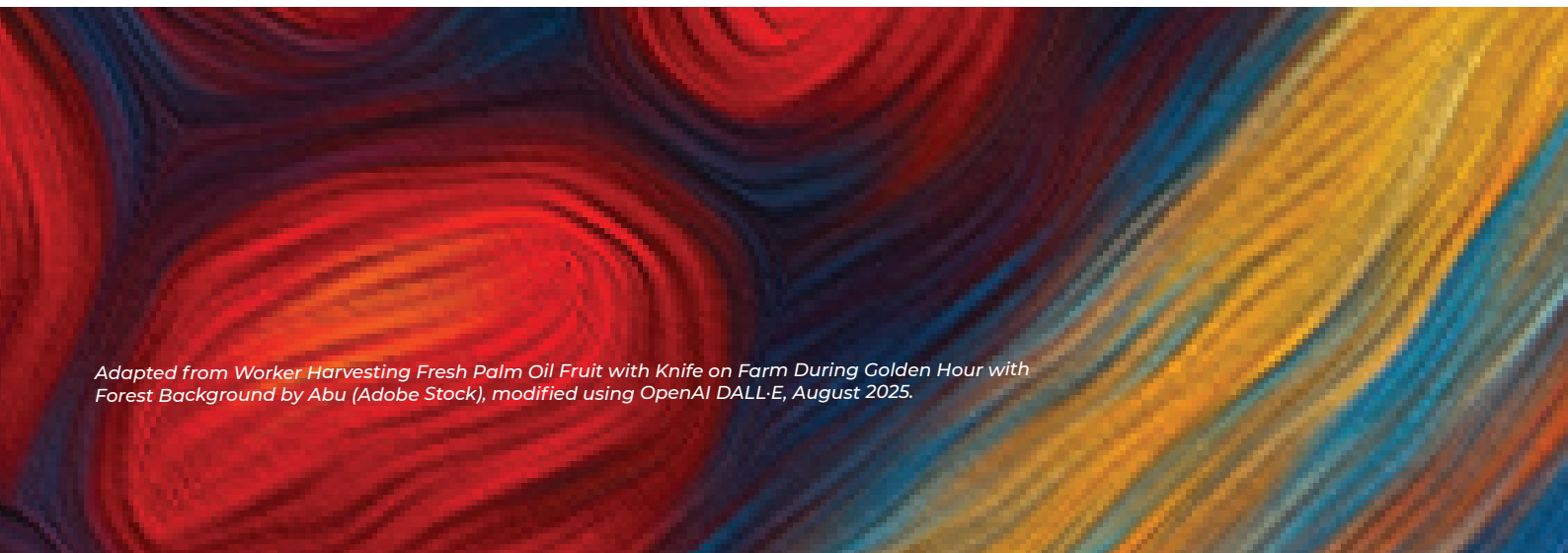


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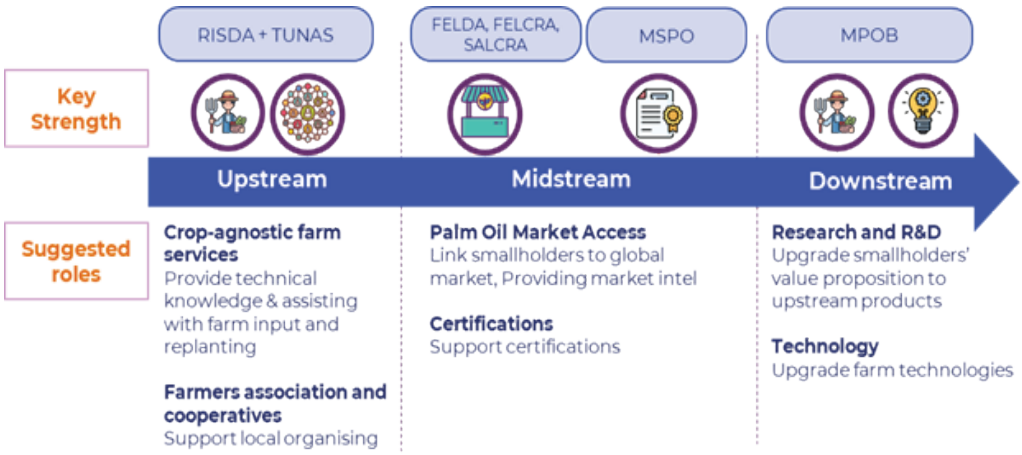
Figure 53: Proposed realignment of agency roles



Source: PNBRI's conceptualisation

It is well recognised that these different agencies are under the purview of different ministries and jurisdictions, namely the Ministry of Rural and Regional Development (KKDW) for FELDA and RISDA, and the Ministry of Plantations and Commodities (MPC), thus such re-demarcation may entail significant changes in the respective Acts and inter-ministerial jurisdictions. Since we could already see overlaps and cross-institutional support being provided by the agencies to smallholders outside of their purview, such re-demarcation can be designed to take effect at the logistical and operational level only.

A more radical change will involve a total re-demarcation by changing the agency's role to be crop-agnostic and based on upstream, midstream, and downstream expertise. This may take a longer structural planning between KPK and KKDW.

Summary of Chapter 7: Institutional Support Towards Sustainability

This chapter aims to understand **how identified institutions support and shape smallholders' attitude and performance regarding sustainability.** The chapter identifies three key institutional supports vital to smallholders' sustainable practices: (1) support schemes, (2) extension services, and (3) state-provided infrastructure. Support schemes provide financial aid for planting, replanting, intercropping, and technology adoption, significantly easing costs and allowing sustainable practices among smallholders. Similarly, extension services by TUNAS officers offer technical knowledge and skills to smallholders, enabling sustainable farm management. State-provided infrastructure addresses critical needs like human-wildlife conflict management, land resources, and agricultural facilities, fostering an enabling environment for sustainable production.

These institutions' effectiveness is hindered by three issues:

1. Extensive support schemes allow for sustainable practices, but it also creates **high dependence** on said support. Any attempt to reduce or stop these support schemes may stop sustainable practices.

2. Extension services' effectiveness is **limited in resources.** At the same time, such resources are spread across different agencies and is **concentrated only in planting.**

3. **Uneven development in certain localities** pose challenge for smallholders who are deprioritised. This is **exacerbated by climate change-related issues (e.g. flooding) and human-wildlife conflicts;** issues which are outside of palm oil agencies prerogative.

These issues point to a **possible policy recommendation to reorganise and coordinate better among the various institutions in their respective roles** of providing support to oil palm smallholders and smallholders of intersecting crops (such as rubber) in general. This could realistically be done by redesigning the support packages provided at the logistical and operational level.

Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

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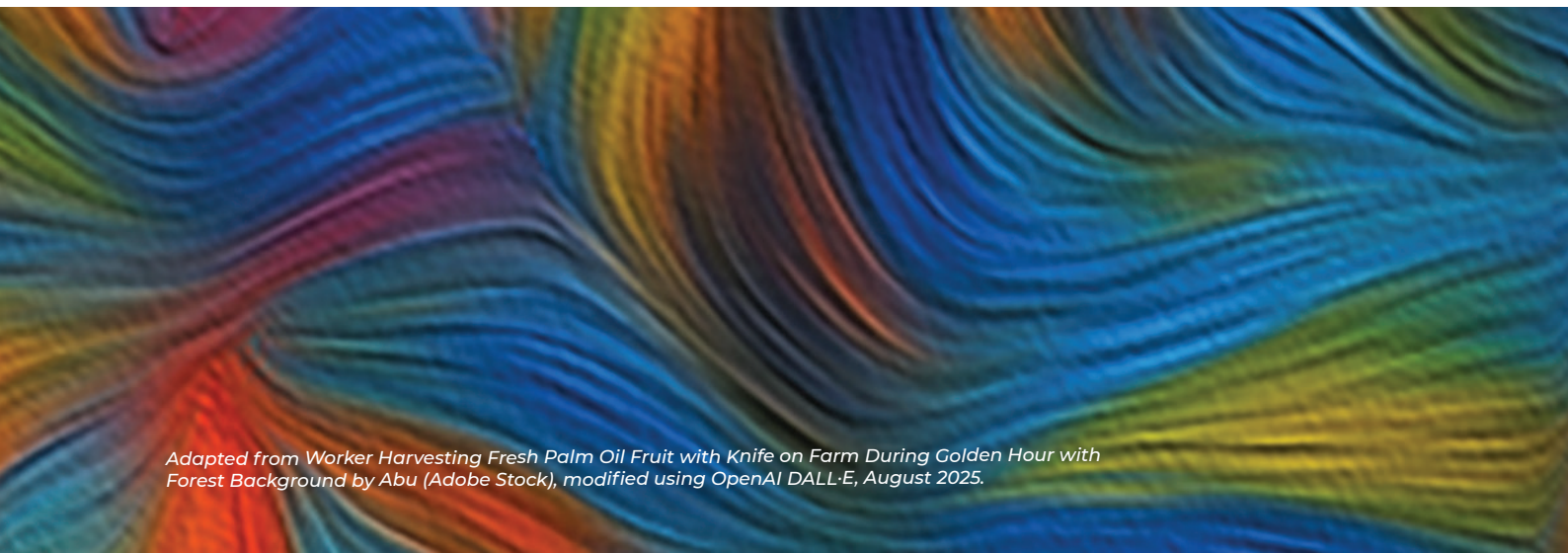
Chapter 8:

Organisational Capacity and Collective Action

This chapter aims to analyse Malaysian independent oil palm smallholders' propensity to organise and take collective action, to then understand how this propensity influence smallholders' sustainability attitude and performance.

> ***"The relatively easy part of capacity development is providing the human capacity, the education, the skills and the knowledge required for development. The hard part of capacity-building is the development of the organisational and social capital."***
> **(Stiglitz 1999: 22)**

Smallholders organisational capacity refers to "the enabling factors that allow (smallholder) organisations to perform its functions and achieve its goals" (Cox et al 2018). In agriculture, this often take the form of farmers organisations and cooperatives. Meanwhile, collective action is defined as "***action*** taken by a group, either directly or on its behalf through an organization, in pursuit of members' perceived shared interests" (Oxford Reference 2024).



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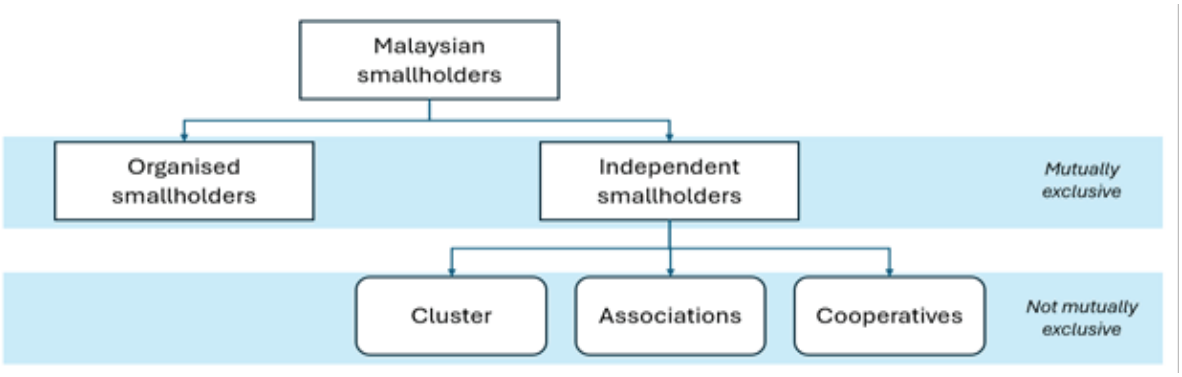
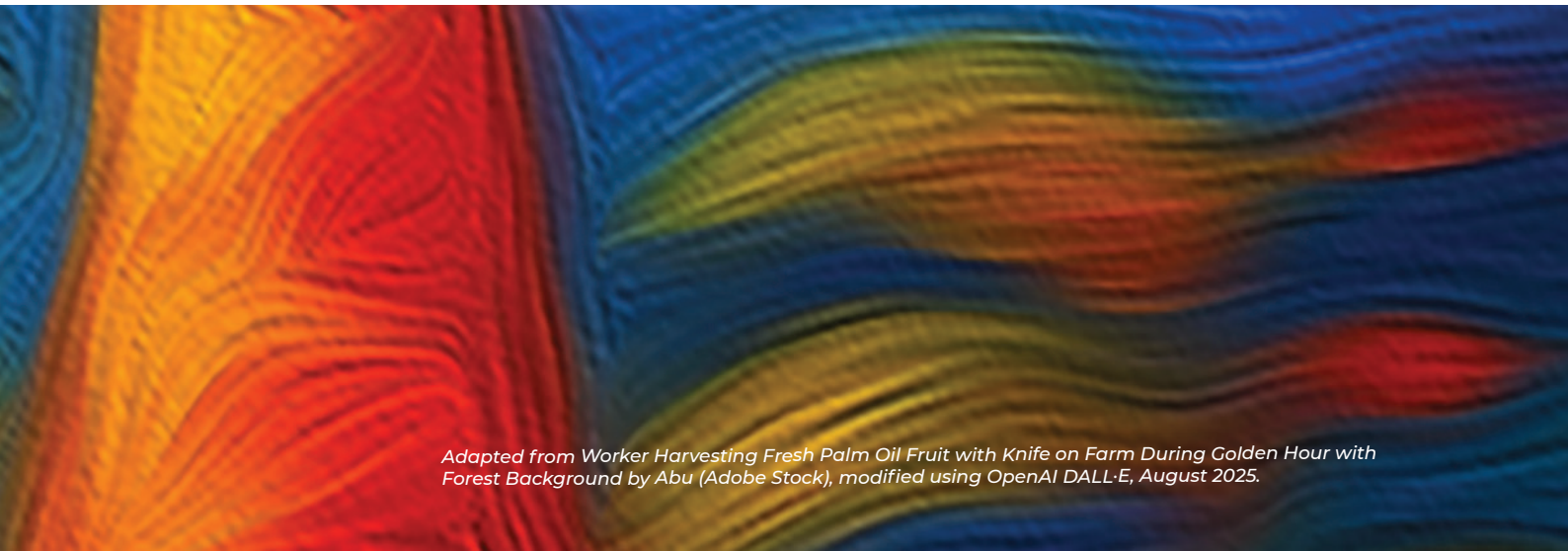
8.1. Modes of Organising

There are various modes of organising for Malaysia oil palm smallholders, which may arise organically or institutionally imposed (Figure 54). As farming is a traditionally household activity, farmers typically organise around the nuclear and extended family. Over time, some are formalised into family companies or cooperative. Community-level organisation may also arise between neighbouring farms and friends. At the national level, farmers organisations have been used for various – often developmental – reasons to organise and link to local farmers.

Figure 54: Modes of organising



Source: PNBRI's analysis



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As stated in Chapter 7, organised smallholders are 'institutionalised' smallholders. 'Organised smallholder' is a term used in Malaysia for smallholders who are institutionalised under FELDA, FELCRA, SALCRA, and any other governmental agencies. On the other hand, for Malaysian independent smallholders, there are **3 known modes of organising:**

1. Clusters (***Kelompok***)

   A cluster is a **loose form of organising** as it does not involve legal or commercial obligations. In Malaysia, clusters are formed purely for certification purposes. The SPOCs is a form of cluster set up by MPOB to organise smallholders for MSPO certifications. Currently 162 SPOCs have been formed across the country (Senawi et al. 2019b). RSPO certification also uses clustering based on the principle of "collective responsibility system" (Hutabarat et al. 2019). Local NGOs and social enterprises, such as WWF Malaysia, Wild Asia, and Pertaniaga assist in organising smallholders into clusters and group schemes to qualify for RSPO certification (refer to Box 3).

   To facilitate SPOC's formal clustering, MPOB also leverages existing local smallholder clusters managed by cooperatives, mills, estates, or dealers (Senawi et al. 2019b). These pre-existing networks accelerates the effort for organising smallholders, streamlining support and coordination.

   Beyond formal clusters such as SPOCs, informal commercial clustering also emerges organically and cater to specific needs within the value chain. For instance, in Kedah, a youth group has organised themselves to take on harvesting jobs. This group operates without a central leader or "***towkay***", instead dividing their earnings equally, earning RM100 per tonne of harvested oil palm. Such informal arrangements highlight the entrepreneurial spirit and collaborative potential within smallholder communities.

2. Association (***Persatuan***)

Associations are formal but non-commercial organisations registered under the Registrar of Societies (ROS), which requires annual general meetings of their members.

NASH is the largest independent smallholder association, which represents not only oil palm smallholders, but smallholders involved in other crops. Active since 1975, NASH is an example of a truly independent organisation as they are not directly funded by the government.

Another large association, Pertubuhan Peladang Kebangsaan (NAFAS) is the umbrella organisation looking over all local farmers associations or also known as ***Pertubuhan Peladang Kawasan.*** It is a government-linked farmers association governed by Farmers' Organization Act, 1973 and overseen by Lembaga Pertubuhan Peladang (LPP), an agency under the Ministry of Ministry of Agriculture and Food Security (Figure 55).

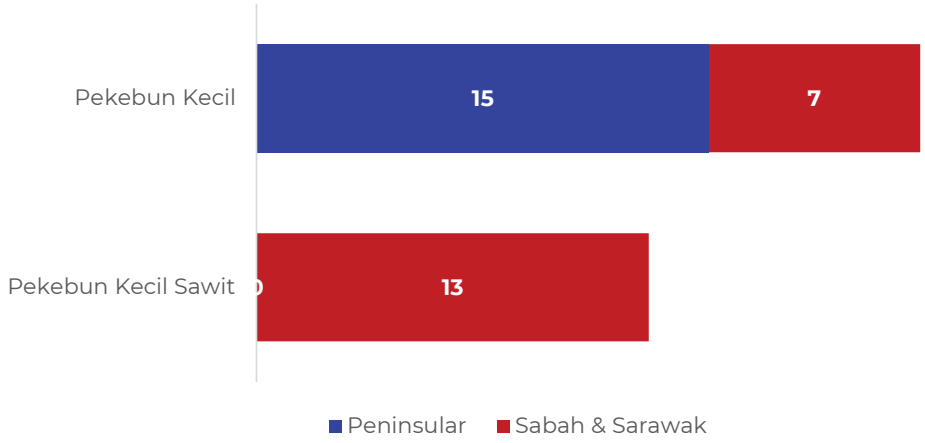
Both NASH and NAFAS are not exclusively focused on oil palm but cater to agricultural producers more broadly, and these associations' embeddedness with local smallholders will vary depending on local politics. However, their prominent roles in rural organising make them a well-known point of contact for oil palm smallholders.

Figure 55: The organisation of NAFAS from grassroot to federal level

Source: NAFAS website

Aside from these two national-level organisations, there are plenty of smaller associations that operate at the local level. Based on the ROS registry, there are 13 oil palm smallholder district-level associations, all of which are in Sabah and Sarawak. 22 district level associations are registered broadly as smallholders' associations, 68% based in Peninsular Malaysia (Figure 56).

Figure 56: Number of district-level smallholders association registered in ROS

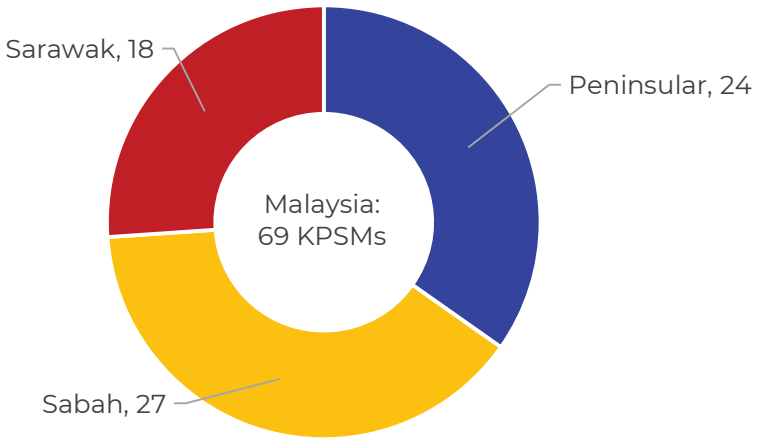


Source: Registrar of Societies (ROS) website

3. Cooperatives (***Koperasi***)

Cooperatives are organisations formed with a shared commercial interest among its members. The most prominent and promoted cooperative is KPSM, an MPOB-sponsored cooperative for ISHs. This program was funded under the 11th Malaysia Plan and has since formed 70 KPSMs across Malaysia (Figure 57) (Parveez 2022). Management of KPSM is undertaken by MPOB officers, with continuous effort to hand over management to cooperative members.

Figure 57: Number of KPSMs, by region



Source: G. Parveez, 2022

Other than KPSM, there are 209 oil-palm related cooperatives in Malaysia, involving 115 thousand hectares of planted areas (MPOB 2024b). Known ones are various Koperasi Pembangunan Tanah, and Koperasi Gabungan Pekebun Kecil run independently at localities. There are also family cooperatives such as Koperasi Wan Seman in Pahang, to manage family land within an extended family.

Cooperatives are also a preferred form of organising towards group certification. WWF Malaysia organises smallholders in Sabah through Koperasi Lestari Penanam Sawit Sabah Berhad (KLASS), Koperasi Landskap Kelapa Sawit Sabah Berhad (LKSS), and Pekebun Kecil dan Sederhana Sawit Lestari Sabah Berhad (KO-SALESA).

Measuring the extent of smallholder organisations was challenging due to the fluid and non-exclusive nature of their associations. When surveyed, 99% of smallholders identified themselves as "independent" and "non-affiliated" with any formal organisations. However, the FGDs told a more complex story: many engaged with local farmer groups, sent their produce to cooperatives, and benefited from various local organisations. This discrepancy highlighted a critical gap in the language used to describe smallholders' organisational affiliations. The binary categorisation of "independent" versus "organised" failed to capture the nuanced reality of smallholders who operate independently yet maintain connections with organisations. These "in-between" affiliations suggested that smallholders' engagement with organisations was more flexible and dynamic than formal definitions allow.

What was clear from the FGD was that smallholders were aware of the various modes of organising, such as associations (*persatuan*) and cooperatives (*koperasi*). This awareness was driven by active promotions from agencies encouraging membership in such organisations. We observed that Suruhanjaya Koperasi Malaysia (SKM) collaborated closely with agencies and NGOs to guide smallholders on establishing and managing cooperatives. For example, SKM officers regularly participated in extension programs to address questions.

Additionally, through the annual smallholders' conference, we observed that smallholders' awareness of cooperatives stemmed from their prior experiences with non-palm-related or occupational cooperatives, like Koperasi Guru, Koperasi Tentera, and others. They brought those experiences and leadership training into smallholding cooperatives. However, these experiences could also be a deterrent to organising if they have had bad experiences from past cooperatives or organisations in their localities.

Box 3: Models of NGO-led collectives for the purpose of certification

There are three different cases of non-governmental support for collectives formed for the purpose of RSPO certifications.

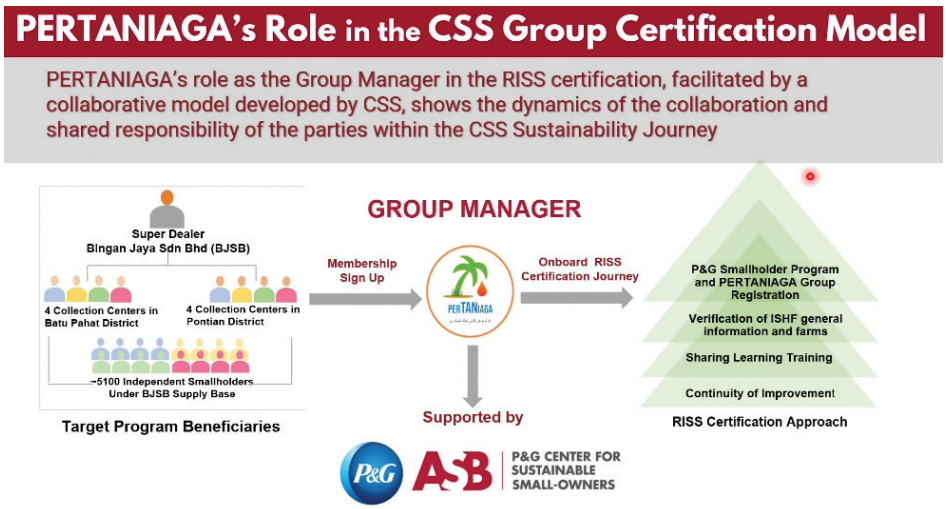
KLASS, LKSS, KO-SALESA, Sabah

- The formation of these three growers' cooperatives is facilitated by the Sustainable Palm Oil Team (SPOT) from WWF-Malaysia.
- SPOT serves as both an advisor and a co-manager for the cooperatives, providing strategic guidance and operational support.
- Funding for the program is through RSPO credits.

Name of cooperative	Year formed	Number of smallholders	Total area covered (Hectare)
Koperasi Landskap Kelapa Sawit Sabah Berhad (LKSS)	2019	25	302.8
Koperasi Pekebun Kecil dan Sederhana Sawit Lestari Sabah Berhad (KO-SALESA)	2022	37	204.6
Koperasi Lestari Penanam Sawit Sabah Berhad (KLASS)	2022	69	1,445
Total		131	1,952.4

Pertaniaga, Johor

- PERTANIAGA is an independent smallholder farmer association, officially registered under the Registrar of Societies Malaysia (ROS) on May 26, 2020. It is wholly owned by ISHs within the supply chain of oil palm suppliers for Bingan Jaya Sdn. Bhd.
- This model uses collection centres to serve as aggregators, streamlining the collection and distribution of oil palm produce from smallholders.
- As of December 2020, PERTANIAGA became a member of the RSPO under the Ordinary-Oil Palm Growers category.
- The program is funded by P&G as part of its corporate responsibility, and also as the final buyer of certified products.



Box 3: Models of NGO-led collectives for the purpose of certification

Wild Asia Group Scheme (WAGS) for Small Producers, Perak and Sabah

- Wild Asia Group Scheme for Small Producers (WAGS) provide technical assistance, training and capacity building for smallholders towards achieving RSPO standards.
- WAGS approach is localised, and they work with local mills and other local stakeholders within the value chain.
- The program is sustained through RSPO credits, which is negotiated directly with buyers through Wild Asia.

Project Location	Year formed	Total ISH-certified area (Hectare)	Total Non ISH-certified area (Hectare)
WAGS Sabah	2012	4,000	22,000
WAGS Perak	2013	2,000	600
WAGS Johor	2019	1,000	18,000
WAGS Selangor	2022	174	0
Total		7,174	40,600

The three models similarly parallel MPOB's extension services but have the advantage of being more adaptable to local needs. The funding model slightly differs, with Pertaniaga having the clearest funding channel through a large buyer. WWF-Malaysia and Wild Asia support their involvement and incentivise participating smallholders through RSPO credits.

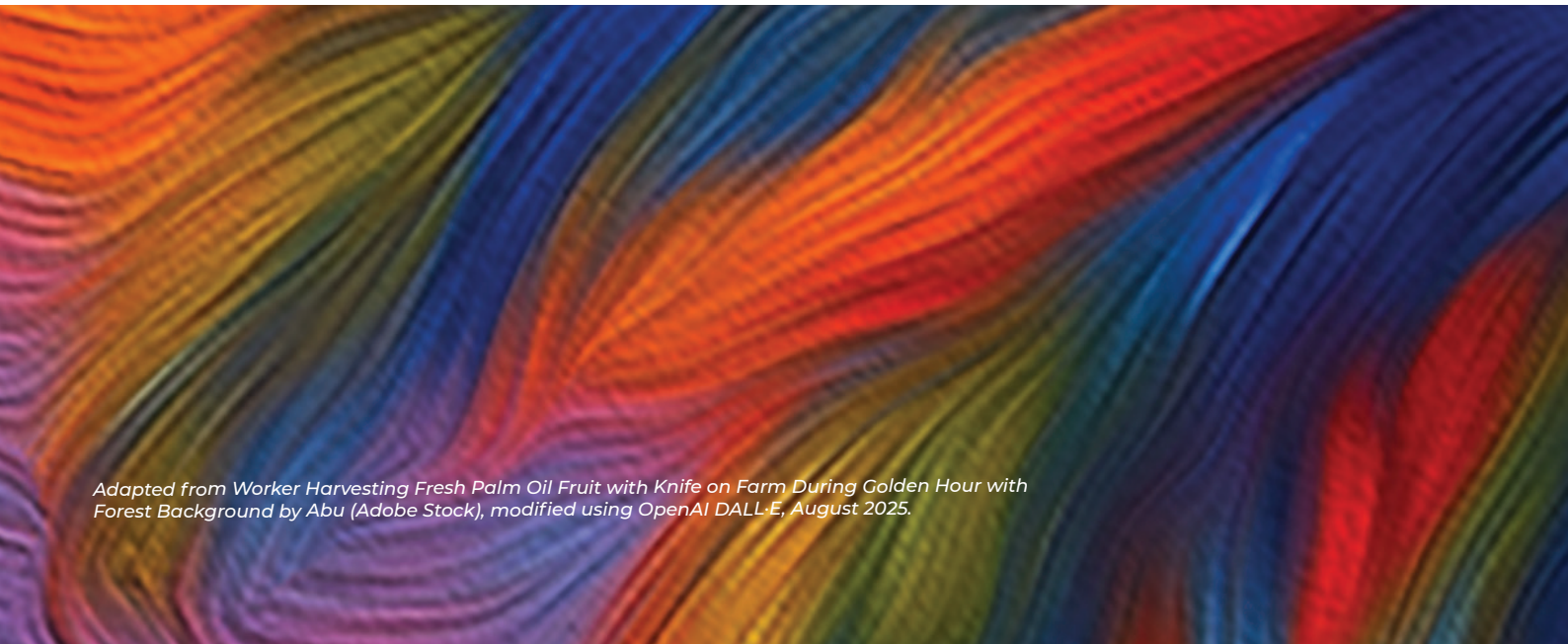
8.2. Reasons to Organise

It is important for ISHs to organise, due to **four reasons:**

8.2.1. Compliance and Certification

The foremost reason for smallholders to organise either independently or with external help was to obtain certification. Neither MSPO nor RSPO certifies smallholders individually; instead, they must be part of a collective. For ISHs who are not part of any organisations, this can be done by joining their local SPOC, which is managed by MPOB TUNAS officers . TUNAS officers also actively reach out to their local smallholders to join SPOC so that they can be certified. Smallholders who were already cooperative members recognised that formal organisations (like cooperatives) assist in compliance and certification, with some even encouraging others to join:

> ***"People will ask us, what's the benefit of joining [cooperatives], as we [Malaysians] like to 'wait & see'. Cooperatives are meant for RSPO certifications and sustainability, so that we are more responsible to the environment."***
> **(East Malaysia)**



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8.2.2. Access to Market

Organisations empower smallholders **to access the market on their own terms**, or at least with better conditions. By creating alternatives to private providers, often through cooperatives, these organisations enable smallholders to negotiate better conditions. Setting up a collection centre and obtaining a dealership license is easier through cooperatives, and smallholders were even able to secure government support through the KPSM program. As shared by one smallholder:

> ***"So when we have a cooperative, it is easier to get (a) dealership license (...), strong justification (to open one), because the dealership is managed by the smallholder themselves."***
> **(East Malaysia)**

From the FGDs, we find that smallholders deem cooperatives more favourably compared to private dealers, which are viewed as "dishonest". Through these cooperatives, smallholders can establish collection centres, which are considered more trustworthy:

> ***"Cooperatives dealerships are more honest than private dealerships – they have different pricing."***
> **(Peninsular)**

8.2.3. Communications and Knowledge

Organisations **host educational programs,** often with agency help, for smallholders. New smallholders found group learning especially helpful as they can rely on these connections for further learning.

Smallholders often begin their journey with little knowledge about oil palm cultivation, relying heavily on experienced peers for guidance. Participation in associations had proven invaluable for many, fostering a collaborative environment where knowledge and resources were shared. These associations often organise training programs in localities to equip smallholders with essential skills and practices. As one farmer remarked:

> ***"We were newcomers, learning everything from senior planters and friends here. It's been very helpful"***
> **(Peninsular)**

Associations also play a critical role in liaising with key organisations like the MPOB and RISDA, facilitating access to technical advice and resources. Smallholders reported gaining insights into proper planting techniques, fertiliser application, and overall plantation management. Smallholders shared that:

> ***"(...), since joining the association, we've gained maturity in how to manage inputs and received guidance on fertilisation."***
> **(Peninsular)**

Organisations were seen as a useful bridge between smallholders and government agencies, particularly in solving specific local issues faced by smallholders. For example, a cooperative reached out to the Lembaga Koperasi Sawit Kelantan dan Jabatan Timbang dan Sukat Kelantan to conduct operations independently of MPOB to address fraudulent practices at weighing centres, ensuring smallholders receive fair compensation for their produce.

Additionally, associations and cooperatives assisted smallholders in accessing machinery collectively:

> ***"It is okay that we cannot get subsidised machinery, if we can rent them"***
> **(Peninsular)**

Some smallholders also reported that they received input support (fertilisers) from the local associations.

8.2.4. Access to Labour

Sourcing labour was a significant challenge for both estates and smallholders in the oil palm sector. Smallholders who required labour beyond their household often rely on casual foreign workers. However, securing permanent staff required sufficient operational scale, primarily to distribute costs and meet the official requirements for hiring foreign labour. This challenge extended beyond farm work to include farm management, posing long-term risks to the sector's sustainability if younger generations are unwilling to take over family-owned farms.

Smallholders recognised cooperatives as effective tools to address these labour challenges. As formal, commercial entities, cooperatives provided the necessary scale to navigate bureaucratic processes for sustainable labour sourcing. In the FGD, smallholders saw the strategy of ***"combining lands and holdings into one application (for foreign labour)" (Peninsular)*** as a highly feasible option.

Cooperatives also offered the opportunity to outsource individual farm management responsibilities, reducing individual operational burdens. As noted by a smallholder:

> ***"The next generation can only rely on cooperatives to manage this. If the landowners themselves are not managing it, the children, on behalf of their father, can request the cooperative to take over. When the father is no longer around, the children might not be able to manage it. So, a cooperative is necessary."***
> **(Peninsular)**

These perspectives highlighted the critical role of cooperatives in ensuring the sector's resilience and addressing its labour-related challenges.

8.3. Propensity to Organise and Key Challenges to Organise

There is significant institutional partnership and financial support for smallholder organising. MPOB facilitated the formation of 70 KPSMs nationwide, providing manpower support to manage them, and offering funding of up to RM200,000 to establish collection centres. 69 KPSM dealerships were successfully formed across Malaysia as of 2023 (Utusan 2023). Additionally, an interest-free financing scheme is made available since 2019 to support FFB purchase, amounting up to RM300,000 for each KPSM, of which 16 KPSMs have utilised as of 2022 (Bernama 2022).

Meanwhile, in Sabah, cooperatives are also formed through the assistance of WWF, for the purpose of RSPO certification, introducing smallholders to the practice of collective organising.

> *"Our cooperative is still new and lacks experience (...), We are still learning how to manage the cooperative (...), We are in the process of organising our membership because not all members are involved full-time."*
> **(East Malaysia)**

> *"WWF also helped us understand the concept of a cooperative. Before this, we didn't know much about cooperatives."*
> **(East Malaysia)**

Farmers recognised that cooperatives at the district level are effective and important for the sector's continuity, seeing from the experience of existing models in rubber planting cooperatives.

> ***"In the long run, oil palm needs to be managed like RISDA, with cooperatives. It can't be done alone. Maybe there could be one cooperative per district."***
> **(Peninsular)**

However, despite a high level of awareness, 99% of surveyed smallholders did not identify themselves as part of any organisation. Importantly, formations of organisations tend to be externally dependent, either through government-linked or NGO-supported organisations, which involve external funding and for some, external manpower to manage. Some smallholders in the FGD voiced that they prefer to undertake farming through family, either formally through a family cooperative or informally arranged amongst family members to manage a consolidated land holding.

Additionally, assessing smallholders' propensity for organising and their capacity is challenging due to the lack of detailed categorisation. Officially, smallholders were divided into two broad groups: "organised" and "independent," each overseen by different agencies (Figure 54). However, beyond these categories, little is known about their affiliations—whether they were members of associations, cooperatives, or other informal networks. This lack of granular data hinders a comprehensive evaluation of their organisational capacity and the potential for collective action.

8.3.1. Strong Institutional Support Weakens the Need for Collective Action

As discussed in Chapter 7, smallholders benefit from various support schemes provided by federal agencies. Institutions like MPOB and SKM directly provide resources such as funding, training, technical assistance, and infrastructure directly to smallholders. This ecosystem of direct access often reduces the perceived need for collective action, such as pooling resources or advocating as a group. When institutional support dominates, smallholders may become reliant on these external bodies, fostering a passive approach in which individuals prioritise accessing institutional aid over mobilising their own networks and resources.

Additionally, **smallholders also recognised the limitations of grassroots organisational capacity in influencing national-level policymaking.** They acknowledged that meaningful change often requires representation at the federal level. For instance, they believed that executive representatives with agricultural backgrounds would better understand and address grassroots issues, providing a stronger voice for smallholders in national decision-making processes.

> ***"(...), appoint smallholders from associations as senators or agriculture committee members, not those from unrelated fields. Choose people who go to farms, so they understand the issues faced by smallholders. Even the Orang Asli community has representatives."***
> **(Peninsular)**

We therefore found a situation where change is still expected to be most effective through directly interfacing with the federal government, rather than forming counter movements.

8.3.2. Low Trust in Organisational Arrangements

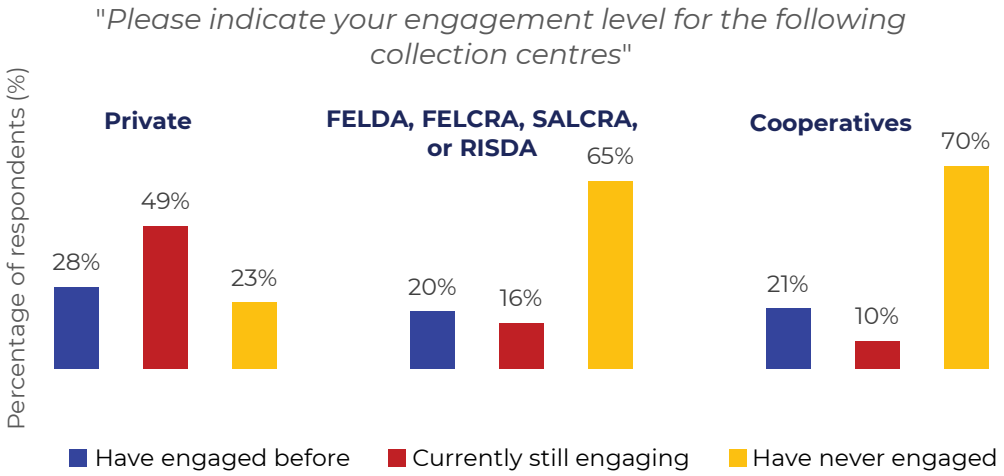
Trust is a key factor to form successful farmers organisations (see Suharno et al. 2015). Low propensity to organise among smallholders can be attributed to issues of low trust either from past organisational experience or observing the impact of local farmers organisations. We observed that smallholders had significant experience participating in associations and cooperatives that was not necessarily agriculture related, like teachers' cooperatives and local associations. Depending on whether these were good or bad experiences, such experiences teach them of the intricacies of being organised. Convincing other smallholders to join itself was no small feat and require years of track record to encourage further participation, as cooperative member shared:

> ***"Encouraging people to join cooperatives is not easy; we spent years working to persuade them. It takes time to prove the benefits. Once the cooperative grows, only then can there be enough economic scale to manage it like a company."***
> **(East Malaysia)**

The nature of collective action is managing the intricacy of group opinions: ***"having five to six owners means multiple opinions (banyak kepala)".*** This was why some smallholders who had tried joining cooperatives quit and decided to revert to working with family members, as one smallholder explained: ***"I tried joining a cooperative before, but I realised I wasn't interested in group work. It's better to stick with just family." (East Malaysia)***

Low trust can also be attributed to the observed low impact from collective action. Some smallholders noted that collective action did not necessarily result in better bargaining, and that they did not benefit from the alternative service offered from cooperatives' dealership. As highlighted in Chapter 5 (Figure 32), smallholders earn the least by sending their FFB to cooperatives collection centre. As many as 70% of surveyed smallholder had never sent their FFB to cooperative, and only 10% remained with cooperatives collection centres, compared to 49% for private collection centres (Figure 58).

Figure 58: Smallholders' experience in dealing with collection centres



Finally, smallholders could even view MPOB-supported cooperatives as "middlemen" between the government and themselves. In other words, KPSM could be misconstrued as additional bureaucratic layers, especially pertaining its role in delivering support schemes like the replanting assistance. One smallholder noted:

> ***"(...), when the government gives funding to MPOB, MPOB will channel to KPSM, so, KPSM will give the replanting (assistance) to the smallholders"***
> **(Peninsular)**

This sentiment may stem from the perception that such organisations, being government-linked, are not genuinely grassroots-based. This norm shapes smallholders' views of government-linked or government-supported organisations as extensions of the government, akin to agencies. Consequently, there was a preference for direct assistance rather than engagement through these organisations. It is crucial to foster the understanding that these organisations are independent entities—part of a third sector representing smallholders' interests rather than aligning them with government priorities.

8.3.3. High Absenteeism

Collective action is limited by high absenteeism, especially among next generation smallholders who have other main income source and no longer live near the farm. Absenteeism refers to situations where individuals who inherit or buy land for investment purposes reside elsewhere (Petrzelka 2014; Azima and Ismail 2011).

Absenteeism among ISH is difficult to quantify as it is not a required reporting metric. An older data from RISDA's 2013 census on oil palm smallholders reveals that from 154k smallholders, 41% are categorised as *"pemilik bukan pengusaha"* or absentee smallholders (RISDA 2013). While this data is outdated and only concerns smallholders under RISDA, it points to a potentially large group of absentee owners who are less active on the ground.

Absenteeism is also fluid and often concealed by the appointment of farm managers acting on behalf of the true owners. This is a common practice where ISH, who own or inherit farms, neither reside on the land nor have knowledge of farming practices. Instead, they typically hold other jobs or run businesses elsewhere, delegating farm management to a farm manager or local dealer. These managers handle farm maintenance and serve as the primary link to local actors within the plantation network.

Under this arrangement, farm income is often calculated net of the manager's fee, resembling the model used by FELDA settlers but with much less involvement or knowledge of farm management by the owners. For many, the farm serves as a passive source of income, with the final earnings being less significant than retaining ownership of the land and generating some yield. Such farms may join SPOCs to obtain certification, but neither the owners nor the managers actively participate in local organisations. Aligned with 8.3.1, being locally active may not be seen as necessary as qualified farms can access support schemes directly from MPOB, the federal agency.

Recommendations

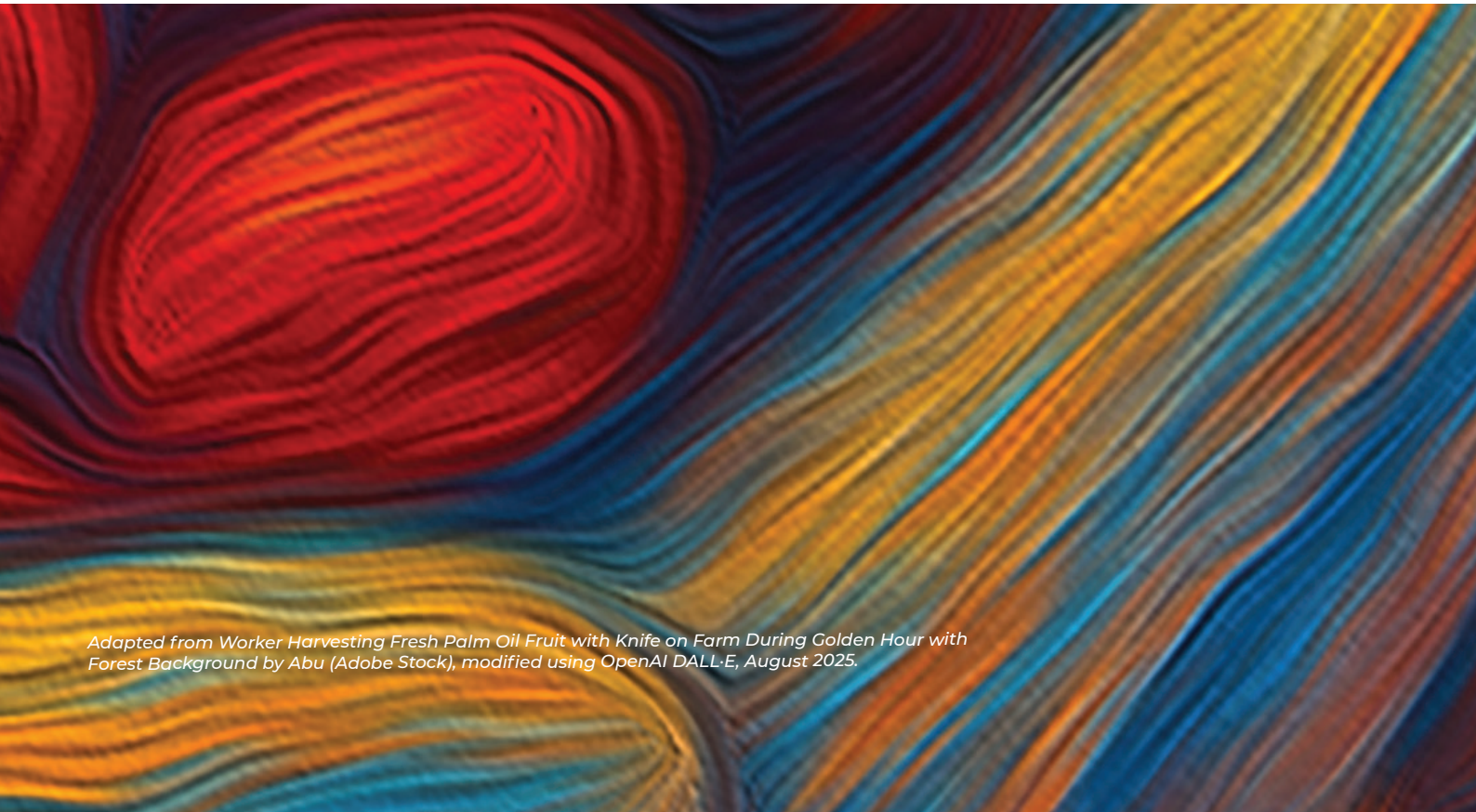
To better track, targeting and administer the governmental support and maximise impact on the most vulnerable smallholders, the following are recommended:

(xi) Promote "local champions" in sustainable practices to lead organisational development

The main challenge surrounding organisational capacity is building trust among ISHs towards local farmers organisations. We recommend overcoming this by promoting "local sustainable champions" in sustainable practices as local leaders.

Currently, smallholders who show commendable performance are already promoted by TUNAS officers as local role models. Such a program can be pushed further by providing local champions with leadership and organisational training to equip them with the necessary confidence to lead local collectives. As important "change agents," these individuals would be best utilised to inspire other smallholders to make the transition toward sustainable practices.

This recommendation is guided by the finding in **Chapter 6** that smallholders' access to knowledge about sustainable practices appeared to be partially from peers, online sites, and social media. This finding demonstrated the importance of peer influences and interactions within the local community.



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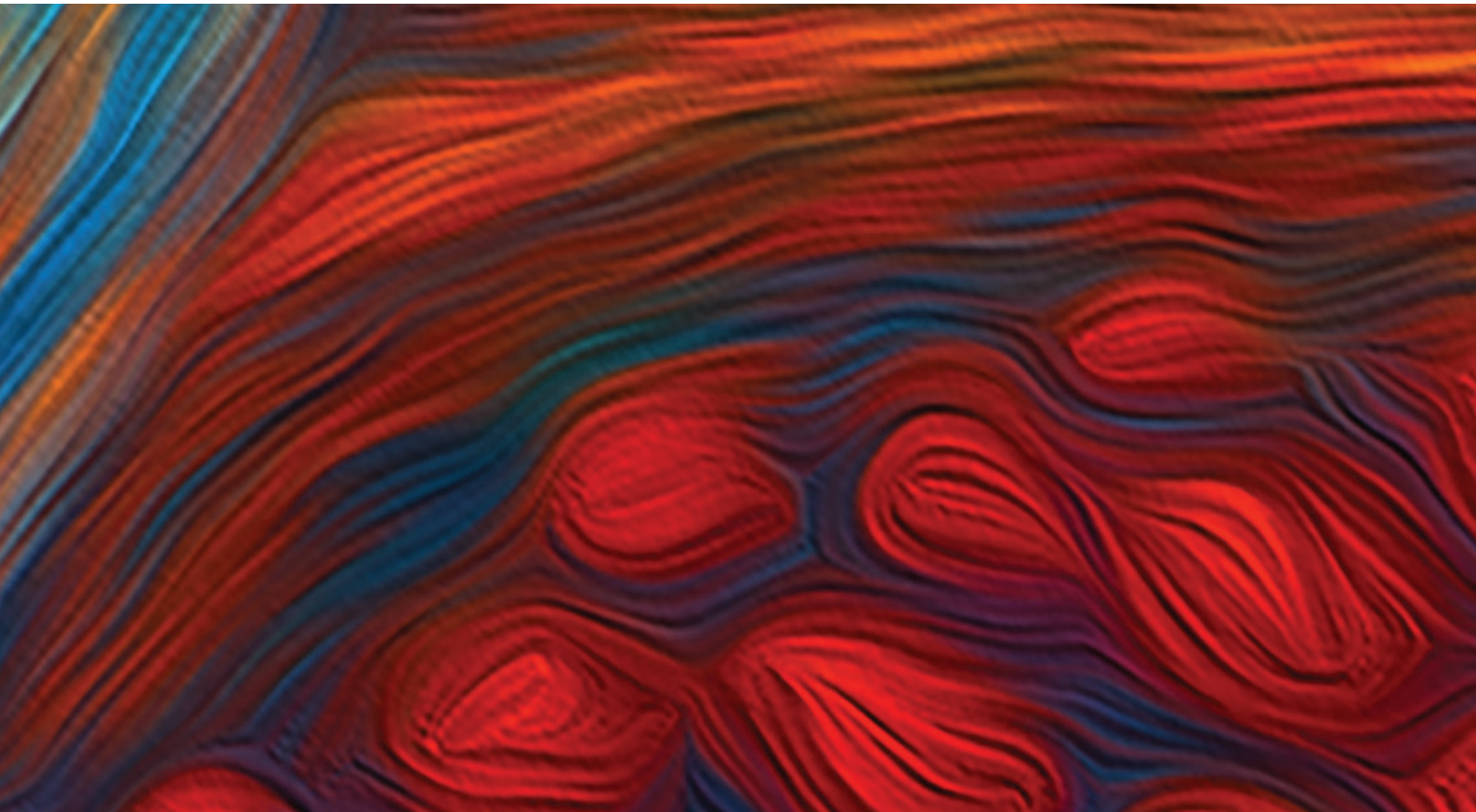
(xii) Introduce graduated incentive structures for government-supported organisations

Currently, MPOB and SKM's institutional support for KPSM, while well-intentioned, has created government-dependent organisations that ISHs perceive as middlemen representing state interests rather than their own, leading to low trust and participation.

We recommend managing KPSM through an **'autonomy framework'** that classifies KPSM along a graduated spectrum from fully government-managed to fully autonomous, based on measurable criteria such as funding sources, leadership selection, and decision-making independence. Such a framework can be pushed further by providing **graduated incentive structures** that reward cooperatives for achieving autonomy milestones such as transitioning from extension officer management to elected leadership or diversifying revenue beyond government grants, while repositioning government agencies from direct managers to technical advisors. This incentive structure may tie back to **Recommendation (vi),** on improving KPSMs' working capital to be able to compete with private collection centres.

As cooperatives progress toward self-governance, they would maintain access to government benefits but with increasing control over their operations. This framework would break the dependency cycle by creating clear pathways for cooperatives to evolve into authentic smallholder organisations capable of serving as an independent third force for sustainable development.



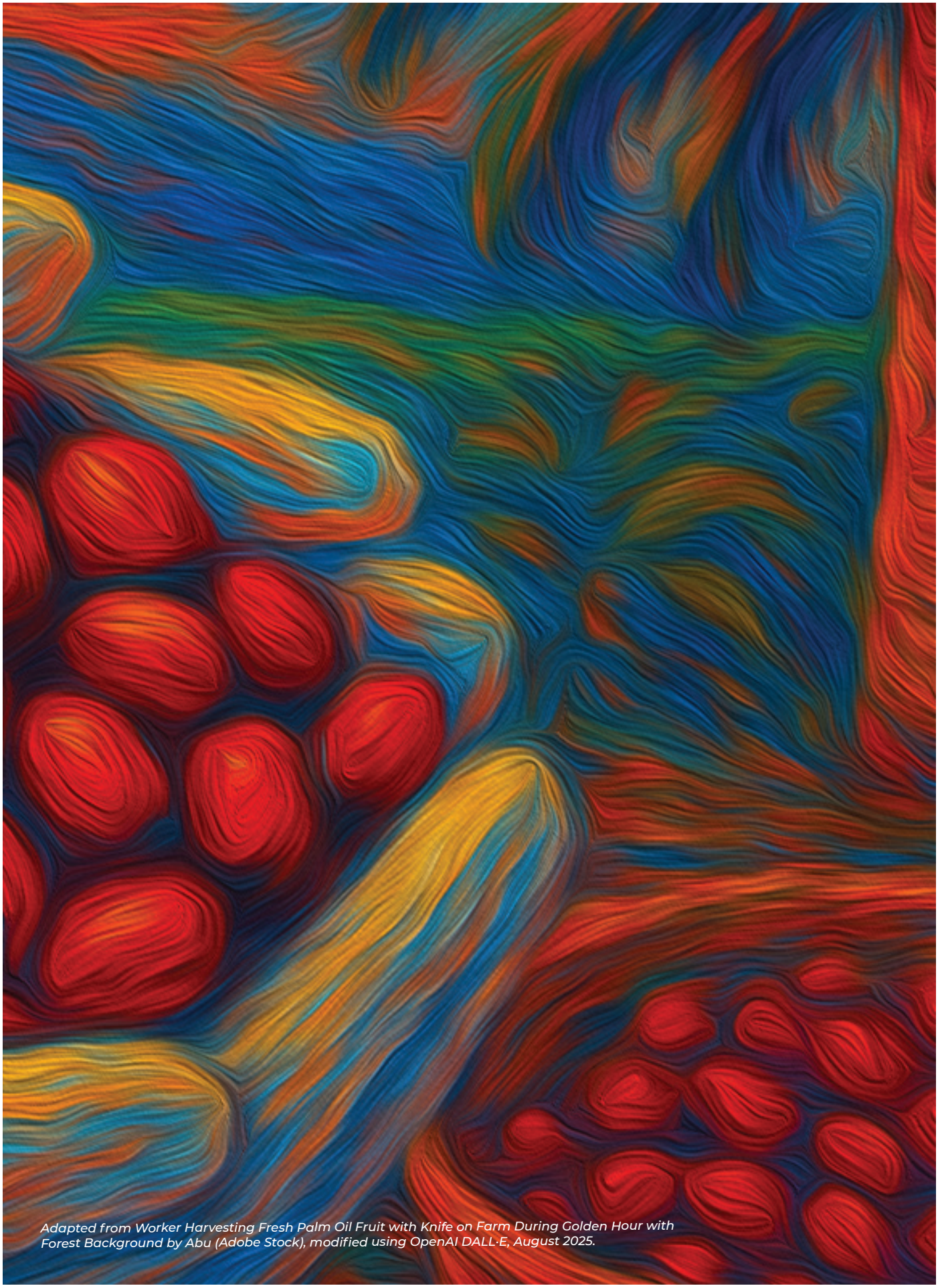
Summary of Chapter 8: Organisational Capacity and Collective Action

This chapter aims to analyse Malaysian independent oil palm smallholders' propensity to organise and take collective action, and to then understand how this propensity influences smallholders' sustainability attitude and performance.

The ability to organise and take collective action benefits smallholders' sustainability practices in that they are a key method for certification (i.e. by group certification), regardless of the certification standard. Additionally, being organised supports smallholders' ability to access the market on their own terms, obtain key information and knowledge for sustainable farm practices, and access a stable labour force for their farms.

Our analysis of organisational capacity revealed that MPOB and agencies such as SKM have established robust institutional frameworks to support smallholder organisations. These initiatives have successfully created numerous farmer groups and cooperatives, demonstrating the government's commitment to supporting collective action among ISHs. However, the current model has produced primarily government-linked organisations, and less autonomous farmer-led structures. Under such conditions, change is still expected to be most effective through directly interfacing with the federal government, rather than forming local organisations to represent their interests.

While KPSM is formed to provide a channel for ISHs to access the market fairly, some of their collection centres face competitive challenges in matching private sector service levels and pricing, suggesting room for capability enhancement including through fiscal support. Combined with the need to engage younger smallholders more effectively, there exists potential to strengthen the organisational ecosystem by fostering genuinely independent farmer organisations that can complement existing government and private sector actors in driving sustainable production.



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Chapter 9:
Compliance and Certification

This chapter aims to discuss the importance, the prevalence, and the challenges in obtaining sustainability certification among ISHs in Malaysia. Certification and compliance to its requirement have no longer become a luxury that can be afforded by large corporations, but have become a globally-shared imperative for all producers of palm oil, including smallholders.

In essence, sustainability certification represents a means to an end – which is the achievement of sustainable agricultural practices, or "sustainable development" as widely subscribed to globally – within and beyond the oil palm cultivation sector. In the context of independent oil palm smallholding, the goal of sustainable practices is for oil palm smallholders to produce certified sustainable palm oil (CSPO).

Certification is also a requirement under regulations applicable in buyer markets for biofuels, such as the Renewable Energy Directive II (EU RED II) and the United States Renewable Fuel Standard 2 (RFS 2) program. Currently, global demand centres and consequently Malaysia's key export destinations for CSPO are the European Union, but in the future, India and China are expected to increasingly demand increasing quantities of CSPO. In addition, the United States – a sustainability-sensitive buyer – has emerged as Malaysia's third-largest export market, overtaking India by Q3 2024[16].

[16] Agricommodity Pocket Statistics Q324 and Q423, Ministry of Plantation and Commodities

9.1. Sustainable Certification Standards for Smallholders

In general, the palm oil industry in Malaysia has moved towards sustainability through the implementation of best practices, sustainability certification schemes, and GAP. The certification landscape for ISHs is broadly marked by several standards, including the MPOB Code of Practice (CoP), MSPO, ISCC, and RSPO. The evolution of sustainability certifications available to smallholders in Malaysia has been marked by significant milestones and developments from 2007 to 2019 (Figure 59).

Figure 59: Evolution of sustainable certification standards for smallholders

Source: PNBRI's analysis

The MPOB CoP was introduced as early as August 2007, covering seven oil palm subsectors, from nurseries to estates, mills, kernel crushers, refineries, transporters, and bulking facilities. This was a set of guidelines designed to ensure the sustainability, quality, and safety of palm oil production in Malaysia. Within these frameworks, smallholders were also required to adhere to specific regulations embedded in relevant acts, such as the MPOB, Food, Environmental, and Occupational Safety and Health Administration (OSHA) Acts. These codes were introduced to provide a systematic approach to managing various aspects of the palm oil supply chain, from nurseries to refineries. Except for the CoP on nurseries, it is understood that the MSPO requirements have mostly superseded the CoP.

Subsequently, the MSPO certification was introduced, initially on a voluntary basis in 2013. Registered under Malaysian Standards[17] MS2530:2013, the scheme began to be implemented starting from January 1, 2015. However, it became compulsory in February 2017, and smallholders were given a three (3) year grace period to comply. At the time of writing, the MSPO is about to publish a new standard dubbed "MSPO 2.0".

In 2017, the ISCC initiated a smallholders certification scheme globally. The ISCC employs a group certification method where the certified unit is represented by a farmer group or cooperative. One of its purported strengths was its compliance with the European Union's legal requirements for sustainability and greenhouse gas emissions savings criteria for sustainable fuels (such as biodiesels), as well as the production of electricity, heating and cooling from biomass, as set out by the Renewable Energy Directive (RED II). RED II applies to all EU Member States (ISCC, n.d.).

The RSPO – a relatively established certification standard among large plantations – finally established its standards for smallholders in 2019. The RSPO standards for smallholders 2019 offer a dedicated certification pathway for smallholders. The focus is on ensuring sustainable practices and providing a framework for smallholders to organise and enhance their access to international markets. Currently, about 10 smallholder groups in Malaysia are RSPO-certified, collectively managing some 10.6 hectares of planted area.

Finally, the updated MSPO standards, dubbed "MSPO 2.0" known as MS2530:2022, was launched and came into effect on January 1, 2025. It replaced the 2013 standard with increased standards and more comprehensive guidelines surrounding the sustainability and ESG standards. One of the most important effects of the MSPO 2.0 is to make the certification of collection centres, mandatory and fully compliant by 1st January 2026.

[17] Malaysian Standard (MS) is a national standard developed by Standards Development Committee (SDC) within the Malaysian Standards Development System and approved by the Minister of Investment, Trade and Industry in accordance with Standards of Malaysia Act 1996 [Act 549]. (www.jsm.gov.my)

9.1.1. Brief Background of MSPO

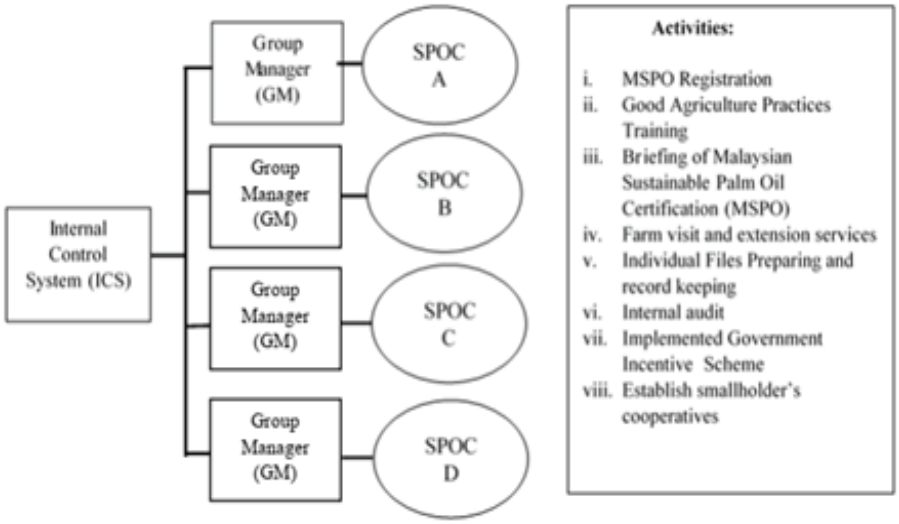
Achievement of maximum MSPO certification is one of the key flagship national strategies for the Oil Palm crop under the DAKN2030. Since ISHs fall under the purview of MPOB's developmental role, the agency became naturally responsible for guiding ISHs towards certification. The MSPO standards has four (4) parts comprising (i) general principles, (ii) requirements for ISHs, (iii) requirements for plantations and organised smallholders, and (iv) requirements and mills. MSPO certification became mandatory on 1st January 2020, aiming to improve traceability and address social responsibilities and safety measures. The certification process involves invitations to be certified and readiness assessments, briefing and training sessions, internal and external audits, followed by annual surveillance audits to maintain compliance and ensure continuous improvement in sustainability practices.

Despite its comprehensive framework, the implementation of widespread MSPO certification in its early days faces several challenges. One key issue was the low rate of certification among smallholders, with only 32.87% certified by September 2020, in its first year of implementation (Rahami et al., n.d.). The high cost of certification, ranging from RM1,000 to RM1,200 per smallholder (at the time), and limited financial resources posed significant barriers.

Additionally, smallholders' lack of awareness and knowledge about the certification process and its benefits (at that time) further impeded progress. Furthermore, the certification process can be complex and time-consuming due to prerequisite requirements such as legal land ownership, requiring consistent effort and support from the government and relevant agencies to overcome these hurdles and enhance smallholder participation in sustainable palm oil production (Rahami et al., n.d.).

Since then, significant progress has been made, with almost 81% of smallholders being certified sustainable with the MSPO standards as of 2024. This was a result of concerted efforts and fiscal allocation at the national level, where the costs and knowledge required for certification were borne by the government with the greater goal of achieving a fully sustainable palm oil supply chain for Malaysia. For certification and subsequently administration, groups of 1,000 to 1,200 smallholders in a committed boundary – often referred to as the 'polygon' – are organised into SPOCs (Figure 60). Through the SPOCs, smallholders receive an array of support and incentives towards certification including training, monetary incentives, direct provision of equipment and materials, among others. In just four (4) years, the compliance rate among smallholders has as a result grown to more than 80% by 2024 (Table 9). The data below depicts the growth of MSPO certification among ISHs in Malaysia.

Figure 60: An illustration of the MSPO certification process



Source: (Senawi et al. 2019a)

Table 9: Number and total planted area (Ha) attributed to independent smallholding certified with MSPO

Year	Number of ISHs certified with MSPO (Ha)	Number of ISHs	%	Total planted area under independent smallholding certified with MSPO (Ha)	Total planted area under independent smallholding	%
2021	144,120	NA	NA	539,900	NA	NA
2022	186,932	213,460	87.6%	703,404	816,107	86.2%
2023	177,355	214,680	82.6%	655,186	822,073	79.7%
2024	169,317	210,891	80.3%	649,802	814,403	79.8%

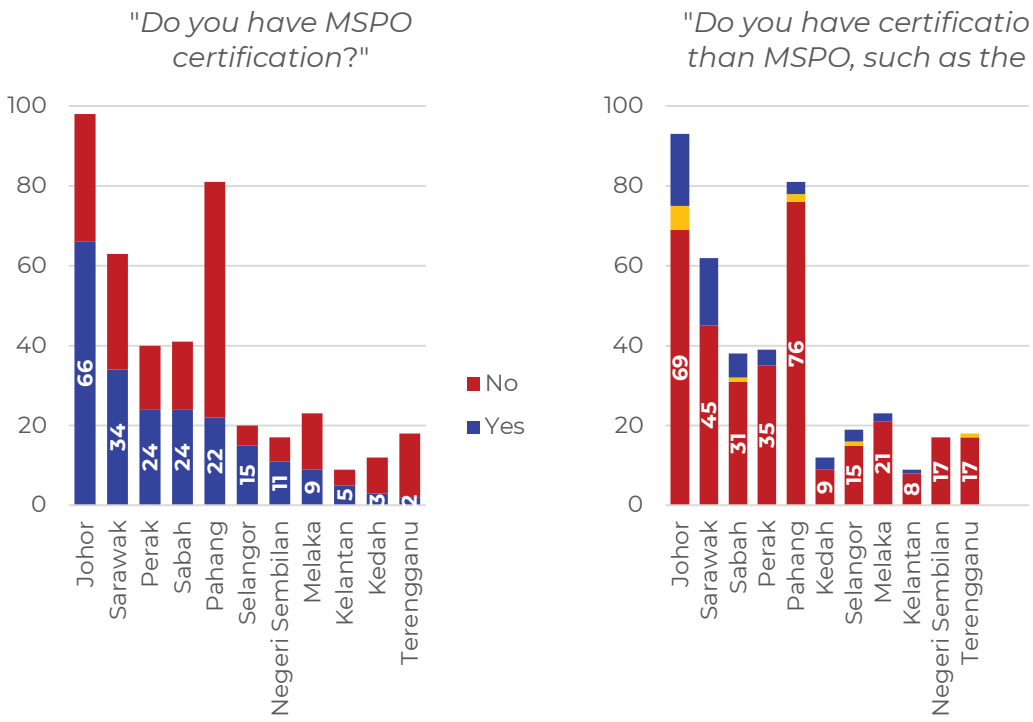
Source: MSPO (as of November 2024), MPIC Pocket Statistics (as of September 2024)

Compared to official administrative data, with about 81% certification (by 2024), there was a marked difference in the number of ISHs who were certified in our survey, at about 49% (based on self-reporting). This discrepancy could be due to multiple factors, such as:

- the limitations in our sampling;
- demographic factors such as age, level of formal education, and level of GAP training undergone by smallholders;
- behavioural factors that could have been at play during the survey, as well as;
- the way in which smallholders are certified, that is by way of group certification.

With the highest number of ISHs to begin with, Johor and Sarawak were unsurprisingly the states with the highest number of certified ISHs in our survey – both with the MSPO and RSPO certifications (Figure 61).

Figure 61: Number of surveyed ISHs with sustainability certifications



9.1.2. Brief Analysis of MSPO and RSPO

As discussed, the MSPO certification is mandatory for smallholders. In Malaysia, all activities from cultivation, milling, sale, purchase, production, move, storage, inspection, testing, to exportation and importation of oil palm product is licensed by MPOB in accordance with the Malaysian Palm Oil Board Act 1998 (Act 582) and Malaysian Palm Oil Board (Licensing) Regulations 2005 and Malaysian Palm Oil Board (Licensing) (Amendment) Regulations 2011. According to the Criteria and Guidelines on MPOB License Application (MPOB, n.d.) set out by MPOB (page 7, see Appendix 1 at www.pnbri.com.my) MSPO certification is a criterion for licensing, even for smallholders.

This is in contrast to the RSPO, which is a voluntary certification effort. RSPO is a business-to-business (B2B) initiative, providing a platform for ingredient buyers to channel premiums paid for the palm-based inputs that are sustainable. These are typically businesses who are interested in claiming environmental and social responsibility or domiciled in markets with sustainability regulations.

The most prevalent model for RSPO certification among ISHs is by group certification, typically assisted by a third-party group manager[18]. This proved to be similar to the way the MSPO certification process is being organised through SPOCs, as discussed earlier. In the case of RSPO, group managers may include civil society organisations, social enterprises, oil palm corporations, FFB dealers, and research organisations. Their roles in the sustainable value chain are mainly to represent international buyers or funders by organising independent smallholder groups, providing extension services to them and channelling funds from those funders towards supporting smallholders in getting certified.

These NGO-led initiatives may have emerged as a way for large corporations to directly ensure premiums trickle down to their target recipients. According to expert informants interviewed during this study, this was opposed to the previous practice of relying on mills to reach to smallholders. In addition, the willingness of large foreign corporations to expend CSR dollars onto smallholder certification programs can be indicative of the importance of smallholder inclusion in their respective sustainability agendas. Table 10 summarises the general differences between the two certifications for smallholders:

[18] See https://rspo.org/search-members/independent-smallholders/ for details of RSPO certified smallholder groups and their respective group managers.

Table 10: General differences between the MSPO and RSPO for smallholders

MSPO Part 2-1 for Independent Smallholders (MS2530:2022)	RSPO Standards for Smallholders 2019
Recognition: It is a nationally developed standard, but international recognition is still currently being worked on	**Recognition:** A commercially driven initiative, which already enjoys relatively widespread international recognition
Legality: Subject to the laws and regulations of Malaysia. Certification is mandatory including for smallholders as of January 1, 2020, and is made requisite to the licensing for any sale of FFB, including by smallholders.	**Legality:** Subject to laws and regulations of the respective domicile. Certification is voluntary.
Purpose: Designed specifically to account for the welfare of smallholders and improve smallholders' access to the sustainable palm oil supply chain, and traceability	**Purpose:** Designed to include smallholders; in the global sustainable palm oil "value chain"
Related costs: There are no membership fees. In fact, the direct cost is virtually zero for smallholders, where MPOB channels annual fiscal allocations to provide 100% of the monetary incentive on auditing fees, training, "Personal Protective Equipment (PPE)", storage of chemicals and fertilizer, and signage.	**Related costs:** Membership fees of approximately €500 annually for smallholders apply. For smallholder group scheme managers, a fee of between €250 to €2,000 annually apply, depending on the total smallholding land area under management.
Standards: 7 Principles; 33 Criteria	**Standards:** 8 Principles; 42 Criteria
Governance and standard setting body: MSPO, previously known as the Malaysian Palm Oil Certification Council (MPOCC)	**Governance and standard setting body:** RSPO, with international branches

Source: MPOCC (2021)[19]

The comparisons made above are fundamental and account for some of the issues encountered with the MSPO, particularly around the issue of its perceived benefits (in terms of premiums), compared to other certification standards. It is however primarily worth recognising that the MSPO essentially represents an attempt by the Malaysian government to systemically and radically improve the prospects of smallholders in producing CSPO (through certified FFBs) and thus be included in the sustainable oil palm supply chain.

[19] IChemE Palm Oil Processing Special Interest Group, Webinar "Malaysian Palm Oil Sustainability Certification Effort through MSPO – Getting the Right Fact on Palm Oil", Presentation by Abdul Rahman, H., CEO, MPOCC, October 4, 2021

There are several benefits of making the MSPO mandatory. Firstly, it has become a ground for concerted efforts for providing ISHs with formal farming education, training, and awareness. While extension services offered by MPOB traced back as early as 2002 (Shahrin Rahami et al., n.d.), the organisation of smallholders through SPOCs for the purpose of MSPO compliance have arguably improved the administration of these services.

Consequently, there is an argument to be made on how tying MSPO certification to licensing may improve the government's ability to collect and track smallholder data and traceability. The mandatory nature of MSPO has also encouraged FFB dealers or collection centres to join the certification process by volunteering as group managers (Senawi et al. 2019a). At the time of reporting, FFB dealers are not required to be certified, but they will be, with the implementation of MSPO 2.0.

Finally, as suggested by (Hidayat et al. 2015), while the social (particularly monetary) impacts of MSPO are not (yet) forthcoming, smallholders have at least been required to practice important minimum requirements, particularly in safety, health, and social responsibilities.

Being made mandatory is not without its challenges, thus MSPO could really benefit from added spending on marketing and communications. While other certification standards like RSPO and the ISCC offer prospects of a pricing premium on compliant FFB produce, the MSPO certification does not entail any direct monetary benefits. Its only (but important) benefit is the complier's ability to legally sell FFBs – without which smallholders in theory are impaired from even putting their FFBs into the regular (non-compliant) supply chain.

Another challenge is the constant struggle to prove its credibility in the international arena – where international buyers may understandably perceive government-backed schemes as lacking quality and partial to the national and social interests of the producing country.

9.2. Challenges for Certification for Smallholders

9.2.1. Perception as a Primary Challenge

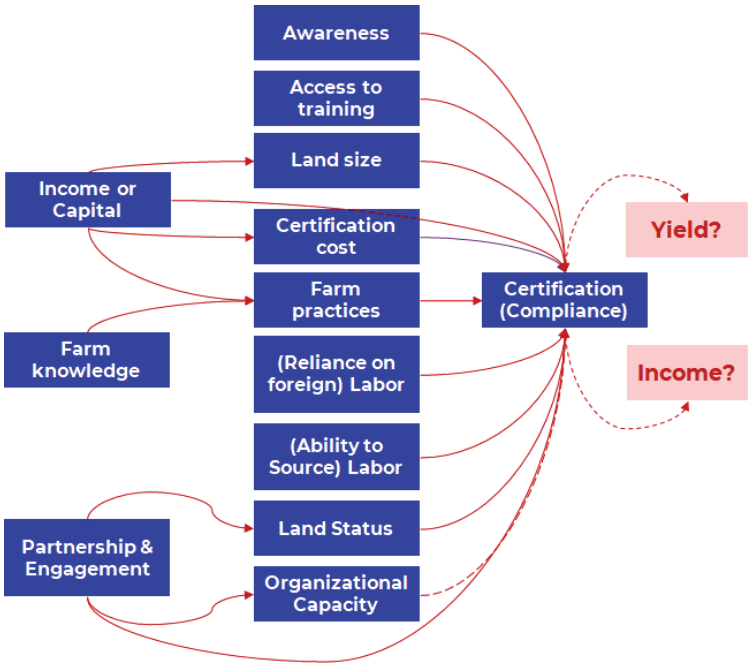
As discussed earlier, the official rate of MSPO certification among Malaysian ISHs have reached an impressive 81% by the end of 2024. However, one of the primary challenges that remained is that of perception over the benefits of MSPO. A handful of smallholders interviewed wondered why they did not experience any financial premiums from producing MSPO-certified certified fruits:

> ***"Was it not the case that if (I) could produce sustainable palm, (they) were supposed to give (me) sustainable palm prices?"*** **(Peninsular)**

This emphasises the importance of making support mechanisms towards certification not only accessible but also perceived as helpful and fair. MSPO may consider enhancing its communication about the benefits of certification and providing more targeted assistance to smallholders with specific concerns.

Having analysed and mapped the textual data from the nationwide focus group discussions (see Figure 62), **we found that even broadly across the study, linkages from compliance to MSPO certification requirements to its benefits were absent**. In other words, almost all smallholders interviewed only see the significant resources demanded of them for compliance but have yet to experience almost no benefits from being MSPO certified, neither in the form of higher yield nor higher incomes.

Figure 62: Excerpt from the adapted causal-loop diagram around Certification



Source: PNBRI's (Author's illustration).
Note: There are no loops around certification based on FGD data

In addition, our survey showed that 70% of respondents believed in the potential of certification, such as MSPO, to increase yield and income. However, the expectation of premiums from selling certified FFB outweighed this belief. In other words, even if they believed that certification could improve yields and income, it was more important for many of them that any certification process paid off monetarily.

If this perception persists, smallholders' access to the sustainable palm oil supply chain is likely to remain limited, jeopardising their ability to sell FFB and generate income, thus affecting their ability to re-invest into their farms and improve yields (as discussed in Chapter 4 earlier). The mechanism for supporting smallholders in obtaining certification and the distribution of premiums to smallholders must thus be thoroughly examined.

Firstly, this should not be seen as a shortcoming of the MSPO, nor as something surprising, for three main reasons:

- **Time:** higher yields from sustainable practices (if any) has yet to be seen because, for most smallholders, certification had only been obtained in the recent couple of years.
- **Design:** The MSPO, as a mandatory scheme, was never designed to accord any outright premiums from end buyers. Even if there were any, premiums would only be forthcoming in the future as the standard matures, gains international recognition, and accounting mechanisms that apportion and trickle down those premiums from end buyers down through the entire supply chain to the cultivators (including the smallholders) are mandated or normalised.
- **Supply and demand:** In the long run, the premiums accorded by CSPO over uncertified palm oil is unlikely to persist. Once every drop of palm oil supplied into the global supply chain is certified as sustainable, any price premium commanded by sustainable palm oil, compared to non-certified palm oil will likely dissipate. According to experts interviewed in this study, there was precedent in the case of large planter KULIM Berhad who used to pay an additional RM2.00 per tonne in premiums for oil sourced from MSPO-certified smallholders (SIRIM QAS International, n.d.). They have since discontinued, in line with increased MSPO certification among all smallholders.

Secondly and more importantly, these smallholder narratives demonstrate the need for better communication strategies among smallholders – particularly on the promises or perceived benefits of being MSPO-certified. As discussed earlier, the direct benefit of a mandatory-based certification such as the MSPO should theoretically be the ability to legally sell one's FFB produce, considering that MSPO certification is a prerequisite for licensing.

Our study identified two control measures that ensure only MSPO-certified and thus legal FFB fruits are directed to the oil palm mills. These are:

- the dealers or collection centres licensing, and
- enforcement, such as roadblocks and physical audits.

In theory, licensed collection centres are mandated to only accept FFBs from MSPO-certified ISHs. In practice, however, the incidence of illegal fruits and uncertified fruits still making it into the supply chain continues to occur, as claimed by some respondents who were interviewed.

> ***"There are(smallholders) who are not interested in being certified. Because at this point of time, sale or acceptance from these collection centres are still accepting (uncertified) palm fruits."***
> **(Extension Officer)**

> ***"tsk... the collection centres are still accepting if they want to sell those (stolen) palm fruits"***
> **(Peninsular)**

> ***"There is one more problem (of) theft. (Those) could be sold straight to the collection centres. If (we were to) follow the law, this cannot happen. (One) must present (his or her) license"***
> **(East Malaysia)**

This continues to pose a continued challenge in the ambition towards full traceability and a fully certified sustainable palm oil supply chain. While there has been strict enforcement on the part of MPOB, as described by one smallholder ***"if MPOB conducts roadblocks, they will ask for the license and (failing which) will forfeit those (non MSPO certified) fruits",*** others appeared to want to see more being done.

> ***"The authorities should control this (better), do not let collection centres accept stolen fruits, (they must) show the certificate first before buying those fruits".***
> **(Peninsular)**

Meeting such demands are not only necessary, but also nationally strategic, as greater enforcement could lead to greater consequences of not being MSPO certified, not complying to licensing requirements, and theft. In turn, the gap between the benefits that would be experienced by an MSPO certified smallholder and a smallholder who is not MSPO certified would be widened thus improving the perception over the benefits of MSPO among smallholders.

9.2.2. Who Found It Most Challenging?

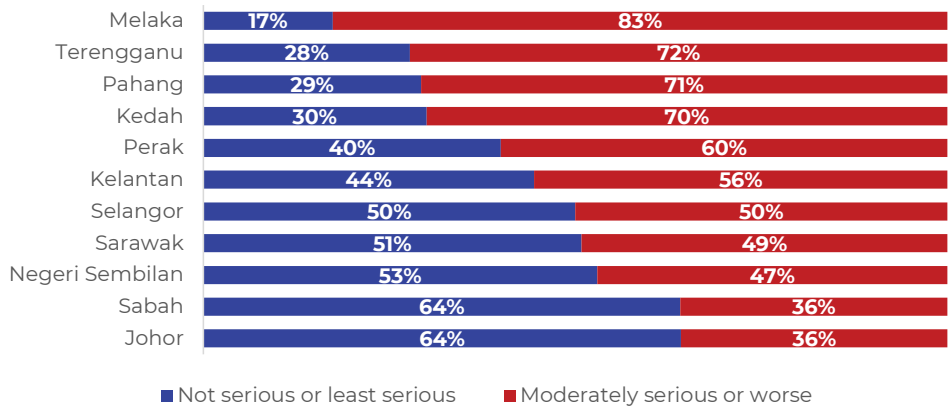
Our study found more mixed evidence: about half of the surveyed smallholders think that obtaining the MSPO certification was difficult. The other half who found it to be not as difficult may have found it so since full support is provided by the government, through MPOB, in obtaining the MSPO certification.

Among these five (5) states with the most smallholders in the sample, a higher proportion of smallholders in Johor (64%), Sabah (64%) and Sarawak (51%) found obtaining MSPO certification to not be a serious issue or is the least serious issue (Figure 63). This could suggest that greater access and reach of extension programs relating to certification had been rightly concentrated in the latter states given their relatively higher population of smallholders.

However, the two other states with the highest population of smallholders of Perak and Pahang, only 40% and 29% of smallholders found obtaining the MSPO certification as not serious or least serious an issue. In the case of Perak and Pahang, issues such as changing land titles and the express condition of the land may be more acute than in other states.

Figure 63: Seriousness of the challenge of obtaining the MSPO certification, by location

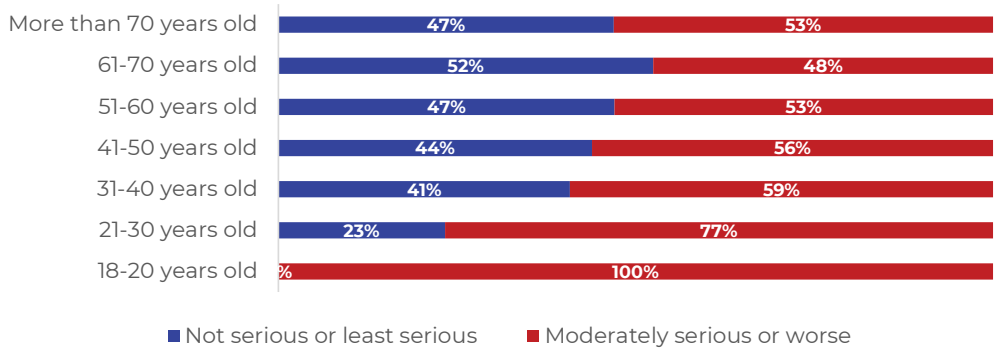
"Please rate 'the challenges in obtaining the MSPO certification' from Most serious to Lease serious", by Location



We also found that an inverse relationship held between how challenging the smallholders found MSPO certification to be, and their age (Figure 64). A higher proportion (more than half) of older smallholders aged between 61 and 70 years in our study did not find obtaining the MSPO certification to be a serious issue. In contrast, a lower proportion (only two in five) smallholders aged between 31 and 40 years old in our study found obtaining the MSPO certification to not be a serious issue. In fact, based on this data, the lower the age bracket, the higher the proportion of smallholders that found obtaining the MSPO certification to be a serious issue.

Figure 64: Seriousness of the challenge of obtaining the MSPO certification, by age

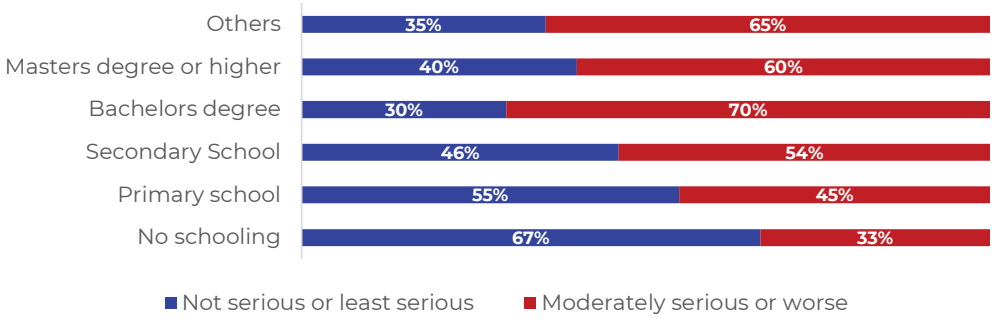
"Please rate 'the challenges in obtaining the MSPO certification' from Most serious to Lease serious", by age



The above may be corroborated with an adjacent finding among smallholders by education levels. While two in every three smallholders with no schooling found that obtaining MSPO was not a serious or the least serious issue, only 30% of bachelor's degree holders felt the same (Figure 65).

Figure 65: Seriousness of the challenge of obtaining the MSPO certification, by education level

"Please rate 'the challenges in obtaining the MSPO certification' from Most serious to Lease serious", by highest education level attained



These may indicate that extension services may (understandably) have been focused on older cohorts and those without education. In addition, younger cohorts of smallholders may suffer from the dead-end issues of inheritance preventing them from obtaining the right land status for MSPO certification.

9.2.3. MSPO Principle 3 and Land Legality Status

Principle 3 of the MSPO standards pertain to compliance to prevailing legal requirements, namely the laws and regulations of Malaysia. Among those are that smallholders are cultivating oil palm on land that legally belong to them – typically certified by the ability to present land grants that have the right land title (i.e. the legal owner) and the right express condition for planting of oil palm (i.e. the express condition).

The possession of these rights to the land was found to be key in this study. While interviewees cannot be said to represent the nationwide majority, the prevalence of land-related issues as barriers to certification was difficult to ignore.

This gap is testimonial to land legality being a common barrier for meeting Principle 3 of the MSPO compliance requirements among ISHs. The two most common barriers to obtaining the right land title and land use rights related to cost (in taxes and registration fees), and bureaucracy surrounding land administration. Smallholders interviewed in the study found **changing the title on the land grant to be difficult due to the compounding effect of time:**

> ***"It's just that for most of them, when there are many names on their land grant, (and) some of those names have passed away and bequeathed it (the land) to many inheritors, (that therefore) becomes the issue (that causes) the process for land title change to be difficult at the land office"***
> **(Extension Officer)**

> ***"The names on the old land grants, especially those that have not changed the express condition of the land, that is the first challenge for ISHs to apply for MSPO"***
> **(Extension Officer)**

The above compounds further the challenges in **changing the express condition of the land. In a which relates to taxes (as discussed in Chapter 8 earlier) and acreage-related costs.** While the government had been providing a lump sum payment of RM200 through MPOB to incentivise the land title change process, we found that it was the acreage-based fees that made it prohibitive.

> ***"MPOB the other day gave out incentives as the first payment (...), (but) that was only for registration fees. But (...), costs that are related to wide areas (...), (those cost) more than a thousand, (they could) get hit up to more than a thousand more than two thousand, that's where the challenge is"***
> **(Extension Officer)**

> ***"(...), to change the express condition, (even) two acres can already cost a thousand ringgit"***
> **(Peninsular)**

These fees are due to the respective land offices, which are under the purview of the state governments beyond the jurisdiction of the federal government, making the challenge even more complex.

Bureaucracy surrounding land administration was reported by some smallholders equally demotivating.

> ***"Even (at) the land office, the land issues cannot be settled"***
> **(Extension Officer)**

> ***"(...), must deal with the land office. That's what's making it difficult"***
> **(Peninsular)**

> ***"Involves many agencies and (...), can take up to 10 or even 20 years"***
> **(Peninsular)**

Due to the above, MPOB has reportedly been providing continuous support towards achievement of land legality status. The government, with the help of MPOB, had even utilised federal and state-level coordination platforms and the chief ministers' meetings as a platform to negotiate for bulk discounts or waivers on land-related fees for ISHs. There may be cause for renewing these conversations with leadership of respective states.

9.2.4. MSPO Principles 4 And 5 on Social Responsibility and The Environment

Past studies equally provide insights on the main challenges for ISHs to comply to the MSPO certification standards.

The most prevalent are non-compliance with Principles 4 on Social Responsibility, Health, Safety, and Employment Conditions, **and Principle 5** on Environment, Natural Resources, Biodiversity, and Ecosystem Services of the MSPO standards. Senawi et al. (2019) analysed reports from 40 audits under various SPOCs. While most reports showed compliance to legal and land matters, they found most of the major non-compliance incidences (which made half of the sample) relate to Principles 4 and 5. These include employee's safety and health, on using safety boots, helmet, goggle, face mask, apron, gloves and long-sleeve shirts during harvesting and fertilising activities (Senawi et al. 2019a). In addition, smallholders tend to know of responsible waste disposal methods but struggle with knowledge of protected species and their High Conservation Value (HCV) habitats.

The above findings were echoed by smallholders interviewed in this study:

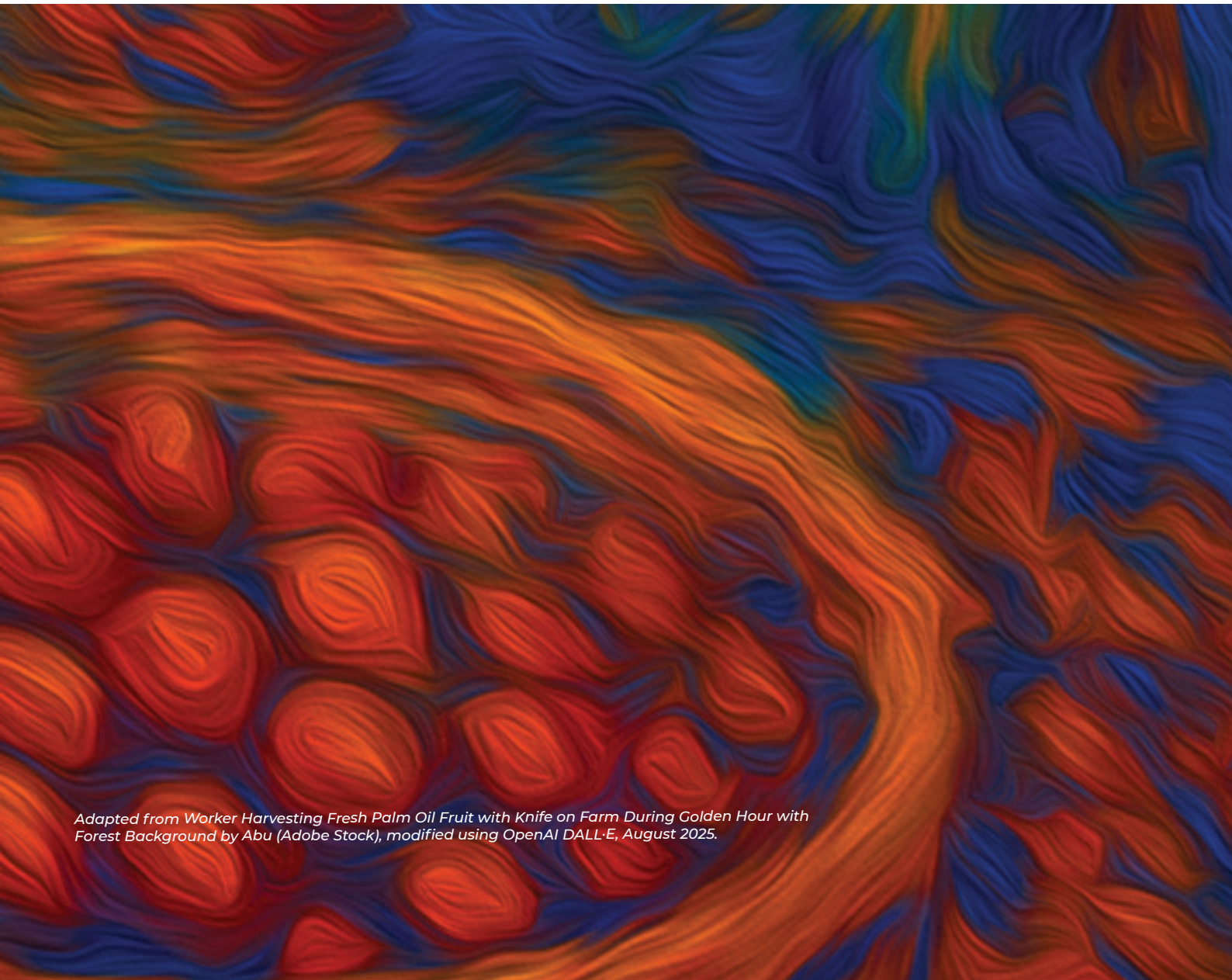
> ***"MPOB officers had demonstrated ways to (correctly) fertilise, wear certain attire (i.e. the PPE) but this is impractical for smallholders, (it is) warm."***
> **(Peninsular)**

> ***"(storage of pesticides) among smallholders, hardly. They will just keep them at home (...), if we kept it in the farm, another problem ensues, worried it would be stolen"***
> **(Peninsular)**

> ***"How could (I possibly) have a suitable storage facility (as) everything relates to costs. (All) I could (manage is to) just keep them behind the house"***
> **(East Malaysia)**

Similarly, Kannan (2021) analysed reports on 100 smallholders during the MSPO readiness assessment to find that again, Principles 4 on social responsibility, health, safety and employment conditions recorded a low level of compliance at only 24% (Kannan et al. 2020).

The length of time required for certification also presents a challenge. Yap (2021) analysed 60 SPOCs and found the most time-consuming step in the MSPO Pre Audit (Stage 1 Audit) to be the GAP advisory visit, which took 37 days or 29% of the time. Issues were mainly incomplete application forms, technical errors when filling in forms, high illiteracy rate among smallholders, and inability to follow manual guidelines (Yap et al. 2021). In the Certification (Stage 2) Audit, he found the most time-consuming activity to be the preparation of the audit plan and stakeholder consultation, which required as many as 52 days or 30% (Yap et al. 2023).



Adapted from Worker Harvesting Fresh Palm Oil Fruit with Knife on Farm During Golden Hour with Forest Background by Abu (Adobe Stock), modified using OpenAI DALL·E, August 2025.

Recommendations

To improve awareness and perception of smallholders on certification whilst easing adoption of certification and its requirements, we must first understand the attitudes of smallholders towards the legal status of their respective lands. During this study, four (4) distinct archetypes of ISHs were observed:

- ***Group 1:*** **Smallholders who were willing, to and have commenced,** the applications process, but encounter difficulties from bureaucracy
- ***Group 2:*** **Smallholders who were deterred** from pursuing land grant conversion for reasons including incidental costs such as variable fees relating to acreage, penalties relating to passage of time, and fear of bureaucracy
- ***Group 3:*** **Smallholders who were actively unwilling** because of inheritance-related disputes, tax implications of converting land use rights from another crop to oil palm, and because at present, they are still able to sell their illegal and uncertified FFBs
- ***Group 4:*** **Smallholders who were planting on land gazzeted for food security crops or newly** cleared land that have yet to be planted with oil palm.

Therefore, it would be efficient to focus land-related policy interventions towards groups 1 and 2. Because the key issues they faced are high levels of bureaucracy and high costs, the following are recommended:

(xiii) Introduce a one-off amnesty ("*Pemutihan*") period for smallholders at the state's land office

MPOB should restart the conversation with state land offices to expedite this "dead-end" issue of land conversion. Among new proposals to bring to the table is a one-off amnesty period where costs and related penalties are discounted or waived. Similar programs have been successfully applied in other policy areas, such as the Immigrations Department (JIM) on legalising of illegal foreign workers in Malaysia, and the Welfare Department (JKM) on legalising illegal private childcare facilities. The below could be the key components of such a one-off amnesty program:

- The introduction of a discount or waiver on acreage-based fees or time-based penalties;
- The fixing of the amnesty period; for example, a one-year period where processing is expedited for qualifying smallholders with the right paperwork;

- The creation of special lanes or counters dedicated to processing only applications by ISHs involved in commodities with certification implications, such as oil palm and MSPO, and;
- The assistance of MPOB's extension officers in the negotiations and bulk process processing of ISH applications at the land office

An additional negotiating component to bring to the state offices include **a comprehensive cost-benefit calculation** of loss of potential state revenue from granting the waivers may be made up with increased registration fee revenues and higher oil palm tax revenues.

(xiv) Strengthen enforcement against the sale of uncertified and unlicensed FFBs

Stronger enforcement is important to magnify the price differential or the benefits from selling certified and legal FFBs as opposed to uncertified FFBs. In addition to existing regulatory requirements for dealers to issue official purchase receipts to ISHs when buying FFBs from them, other methods to strengthen the enforcement of collection centre are, among others:

- Requiring collection centres to be MSPO certified to improve traceability and subjecting them to MSPO audits
- Encouraging cash payments through online platforms or DuitNow QR codes to ride on payment system to track FFB sale

(xv) Improve the reputation of the MSPO certification through communications strategies

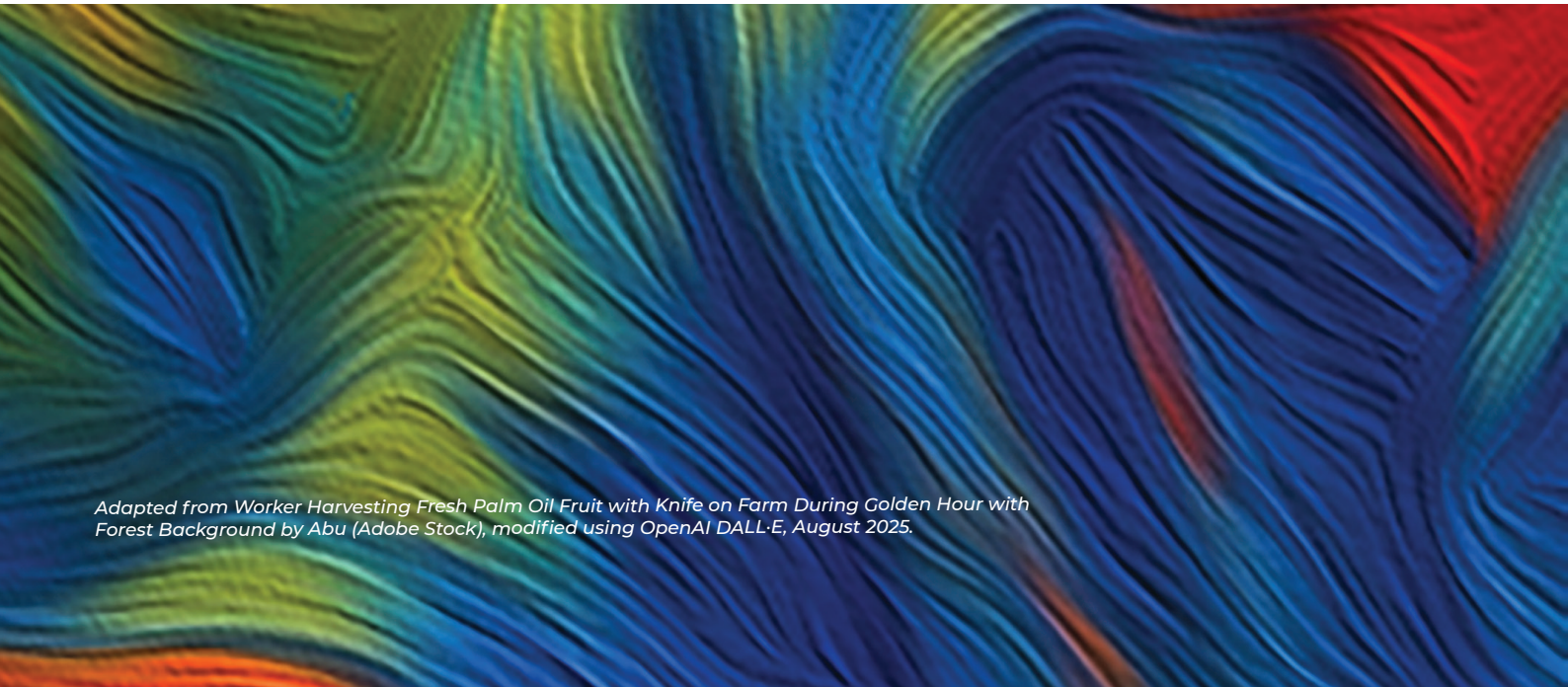
Based on our analysis, MSPO can only offer price premiums under three ideal-world scenarios.

The first ideal-world scenario is one where government-backed certification standards such as the MSPO have achieved status where it is globally celebrated. Though challenging, this has been increasingly possible, with continued international marketing and public relations efforts, particularly with the new and improvised MSPO 2.0 standards.

The second ideal-world scenario is another where large manufacturers, mills, and collection centres willingly carve out a portion of their revenues as "premiums" attributable to sustainability and successfully trickle it down through the supply chain to ISHs. This is arguably naïve given that selling prices of final products can be significantly influenced by supply and demand, and because large corporations have profit orientations. However, the sustained willingness of sustainability-sensitive buyers for fruits certified by globally recognised standards like the RSPO and ISCC should be cause for hope, for even nationally backed standards such as MSPO and ISPO.

A third ideal-world scenario is one where sustainability premiums would persist in the long run and can thus be promised as a defining feature of MSPO. However, as discussed earlier, this may be challenging to sustain over time due to market dynamics — particularly the increasing global supply of certified sustainable palm oil, which will put downward pressure on premiums. This emphasises the importance of combining certification with other value-added strategies, such as improved market access, branding, and productivity gains, to ensure long-term benefits for smallholders.

Whilst MSPO marketing efforts among global buyers, there is room for MSPO to also enhance its communication efforts among ISH communities, working with extension officers and NGOs to tune the language away from promises of 'premiums'. This is especially important among the ISH population who are reluctant to pursue and comply to certification, even with significant government support. Instead, the marketing language should move towards one that concerns the ability of the smallholders themselves to be able to participate in the global markets, rather than being left behind.



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Summary of Chapter 9: Compliance and Certification

In this final chapter, we discussed sustainability certifications as a means for the inclusion of smallholders into the Malaysian sustainable palm oil supply chain. Whilst there are many certification standards – beginning from the CoP, followed by the MSPO, ISCC for biodiesels, and the globally recognised RSPO – the focus was put on MSPO as the nationally mandatory certification with relatively higher certification rates of about 80% among smallholders in Malaysia.

We discussed how making MSPO mandatory can be advantageous, such as providing a platform to intensify and improve the administration of formal farming training and awareness, to collect data and improve tracking of smallholder activities, and to encourage participation of FFB dealers. We also recognised the challenges of doing so, which include the lack of direct monetary benefits and international recognition.

Amid the above contexts, our findings may be summarised as follows:

- **Awareness of the needs and the benefits of certification** among smallholders remain low, with some smallholders having the certification without being aware of what it entails.
- **Smallholders expect, but report of not having any benefits to certification**, potentially due to recency of the certification process and how the design of MSPO as a standard was never about the promise of premiums. This calls for a renewed communications strategy about the perceived and actual benefits of MSPO among smallholders.
- **Smallholders who find that obtaining the MSPO certification does not represent a serious issue or is the least serious issue** to them are mostly in Johor and Sabah, aged between 61 and 70 years old, and did not have formal schooling.
- **The main challenges for obtaining MSPO certification** among smallholders as found in the literature and concurred by our study are mainly Principle 3 on legal land status, Principles 4 on social responsibility and employment conditions, and Principle 5 on environment and biodiversity conservation.
- **It is recommended that** (i) a national level coordination is conducted to negotiate for a one-off amnesty program where Group 1 and Group 2 smallholders are assisted with land-related matters; (ii) strengthen enforcement against sale of uncertified FFBs to collection centers; and (iii) rethinking communication strategies on the MSPO – relating to smallholder self-narratives and the idea of premiums.

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Chapter 10:
Conclusion

Conclusion

To recap, the intention of this study was fourfold:

- Given continuous pressures from the global community towards Malaysian palm oil, we need to look beyond large integrated oil palm players towards smallholder farmers who are at risk of exclusion.
- Smallholding agriculture and its pursuers represent a significant feature of the Malaysian political economy, with significant fiscal resources allocated to them from many ministries.
- There is a case to be made for including smallholders into the palm oil supply chain as another social component of sustainability, as substantiated increasing interest among global FMCG brands to directly support the inclusion of smallholders into sustainable supply chains.
- Belanjawan 2025 and the MADANI GEAR-uP Initiative launched by the Ministry of Finance created an imperative for government-linked investment vehicles such as PNB, the funder of this research and substantial stakeholder in the palm oil industry, to support communities surrounding its businesses.

Thus, our theory of change arose – that if independent oil palm smallholders were supported to be included in the sustainable supply chain, they could reap its benefits. We sought to prove this theory with a grounded investigation of the smallholders' lived experiences without prior presumptions and by amplifying their narratives. To this end, we asked three research questions – the issues they faced, the solutions that they believed would work, and if there were any technological solutions that could support this goal.

The conclusion that emerges is a puzzle: despite being producers of one of the most lucrative commodity agriculture products, especially in recent years, most independent oil palm smallholders remained trapped in a cycle of weak economic livelihood and continued dependence on significant degrees of government support.

This puzzle may partly be explained by six (6) key issues found in this study: lack of economic viability due to small land size, low bargaining power to get market access, old age, being cash-strapped, low propensity for collective action, lack of infrastructure support, and general lack of readiness for voluntary sustainability certification.

The sheer extent of support accorded by the government to ISHs warrants a deeper analysis of the effectiveness of that assistance and incentives. We highlighted how smallholders face more complex system-level issues, often beyond the respective jurisdictions of MPOB, the Ministry of Plantation and Commodities and even the Federal Government, requiring a whole-of-government approach.

This report makes fifteen (15) recommendations directed towards the federal and state governments, local authorities, and statutory agencies – *beyond MPOB and the Ministry of Plantations and Commodities* – whose work may touch the lives of smallholders, summarised as follows:

- Given the ageing profile of oil palm smallholders, the next generation of independent smallholders must be primed to continue the business through an "Agroproneur Sawit Muda TVET program" consisting key modules such as financial literacy, business acumen, and MSPO or GAP modules. This is also expected to maintain Malaysia's export competitiveness.
- Punitive fertiliser prices makes the case for bulk purchasing of input materials, to optimise costs for smallholders who cannot achieve economies of scale. Alongside our recommendation on providing KPSMs with more working capital to compete with private collection centres, KPSMs can also be used as a vehicle for bulk purchasing of fertiliser.
- Increase smallholder bargaining power and decrease reliance on third-party collection centres by enhancing regulations, mandating transparency around their operations, and diversifying the farming support available to smallholders. This can be done by expediting the MSPO certification process on these centres (note that this is already mandated as of July 2025).
- Re-emphasise the importance of GAPs beyond fertilisation towards simple technology applications to increase adoption of other GAPs, such as record keeping.
- Enhance the effectiveness of the existing wide array of government support that appears limited by resource constraints can be done by re-demarcating the various agencies by type of support and expertise, rather than by type of target groups of smallholders.
- Provide "local champions" with leadership and organisational training to equip them with necessary confidence to lead local collectives towards the goal of encouraging smallholders to partake in collective action and organising at the local level and independence.
- Improve awareness, reduce smallholders' indifference, and improve the willingness of smallholders to obtain MSPO certification by easing land grant conversion processes, tune the language of MSPO away from the promise of premiums, and uplift the self-narrative among smallholders towards 'business ownership'.

Limitations

Admittedly, there are limitations to our methods, observations, and recommendations:

Firstly, the nature of some of these issues makes them typical across smallholders of other crops – food and commodity– rather than being exclusive to the palm oil industry. In those cases, it is hoped that this study would equally highlight the plight of these other smallholders beyond those involved in oil palm cultivation.

Secondly, while the research has been focused on amplifying the voices of the smallholders themselves, their perspectives – though authentic and often underestimated – can admittedly be limited by systems-level constraints on the part of the government, such as fiscal limitations, competing priorities, and larger-scale reforms that are taking place in other sectors that may affect the smallholders.

Finally, while our study has highlighted the voices of smallholders from the ground, some of the root causes of these issues may have been behavioural, on the part of the smallholders' preferences and willingness. While the government may offer multiple kinds of support, some improvements, like putting knowledge into practice and legalising one's land status, boil down to the smallholders' agency. As such, we were both careful to include recommendations that empower smallholders who have yet to be and recommend policies that ease pathways for already empowered and willing smallholders.

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Glossary

1MP	First Malaysian Plan
5MP	Fifth Malaysian Plan
6MP	Sixth Malaysian Plan
B2B	Business-to-business
BNM	Bank Negara Malaysia
CAGR	Compound Annual Growth Rate
CAQDAS	Computer-Assisted Qualitative Data Analysis Software
CLD	Causal Loop Diagram
CoP	Code of Practice
CoPN	Code of Good Nursery Practice for Oil Palm Nurseries
CPKO	Crude palm kernel oil
CPO	Crude Palm Oil
CSPO	Certified Sustainable Palm Oil
CSR	Corporate Social Responsibility
DAKN2030	Dasar Agrokomoditi Negara 2021 - 2030
DOSM	Department of Statistics Malaysia
ECERDC	East Coast Economic Region Development Council
EFB	Empty Fruit Bunches
ESG	Environmental, Social, and Governance
EU RED II	Renewable Energy Directive II
EUDR	Regulation on Deforestation-free Products
FELCRA	Federal Land Consolidation and Rehabilitation Authority
FELDA	Federal Land Development Authority
FFB	Fresh Fruit Bunch
FFBs	Fresh Fruit Bunches
FGDs	Focus Group Discussions
FMCG	Fast Moving Consumer Goods
FPM	FELDA Plantation Management
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
Ha	Hectare
HCV	High Conservation Value

ILO	International Labour Organization
IoT	Internet of Things
ISCC	International Sustainability and Carbon Certification
ISH	Independent Smallholders
ISPO	Indonesia Sustainable Palm Oil
JIM	Jabatan Imigresen Malaysia Jabatan Kebajikan Malaysia
JKM	Jabatan Kebajikan Malaysia
JLPK	Jalan Ladang Pekebun Kecil
JPPH	Valuation and Property Services Department
JPS	Jabatan Pengairan dan Saliran
KER	Kernel Extraction Rate
KESEDAR	South Kelantan Development Authority
KKDW	Kementerian Kemajuan Desa dan Wilayah
KLASS	Koperasi Lestari Penanam Sawit Sabah Berhad
KO-SALESA	Koperasi Lestari Penanam Sawit Sabah Berhad
KPSM	Koperasi Penanam Sawit Mantan
LCDA	Land Custody and Development Authority
LKSS	Koperasi Landskap Kelapa Sawit Sabah Berhad
LPP	Lembaga Pertubuhan Peladang
MPC	Ministry of Plantation and Commodities
MPIC	Ministry of Plantations Industry and Commodities (now known as MPC)
MPOB	Malaysian Palm Oil Board
MSPO	Malaysia Sustainable Palm Oil
MT	Metric ton
MT/ha/year	Metric tons per hectare per year
NAFAS	Pertubuhan Peladang Kebangsaan
NASH	National Association of Smallholders
NCR	Native Customary Rights
NDPE	No Deforestation, No Peat, and No Exploitation
NGO	Non-Governmental Organization
OER	Oil Extraction Rates
OPNCC	Oil Palm Nursery Certificates of Competency
PERHILITAN	Department of Wildlife and National Parks

PKO	Palm Kernel Oil
POME	Palm Oil Mill Effluent
PPE	Personal Protective Equipment
PTZ	Pegawai TUNAS Zon
R&D	Research and development
RED II	Renewable Energy Directive
RFS 2	United States Renewable Fuel Standard 2
RISDA	Rubber Industry Smallholders Development Authority
ROS	Registration of Societies Malaysia
RSPO	Roundtable of Sustainable Palm Oil
SALCRA	Sarawak Land Consolidation and Rehabilitation Authority
SKM	Suruhanjaya Koperasi Malaysia
SLDB	Sabah Land Development Board
SLR	Systematic Literature Review
SPOCs	Sustainable Palm Oil Clusters
SPOT	Sustainable Palm Oil Team
TA	Thematic analysis
TBSPK	Tanam Baru Sawit Pekebun Kecil
TSSPK	Tanam Semula Pekebun Kecil
TUNAS	Tunjuk Ajar dan Nasihat Sawit
USP	Unique Selling Point
WAGS	Wild Asia Group Scheme for Small Producers
WWF	World Wide Fund for Nature

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