

Pathways to Sustainable Livelihoods: Examining Resource Access and Power in Robusta Coffee Supply Chains in Sumatra, Indonesia

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This thesis is dedicated to my Mother, Dorreen Dunn, whose love, strength, and unwavering belief in me have been the foundation of everything I've achieved. You laid the foundations that have carried me through every stage of life, helped shape the person I've become, and still stand beside me with unwavering love and support. Your strength continues to give me the courage to face my fears and keep going when things feel impossible.

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Abstract

This research examines how smallholder coffee farmers in Lampung, Indonesia, perceive livelihood vulnerabilities, access to assets, the mechanisms and structural processes that shape benefit flows, and the outcomes that result. Lampung, Indonesia's largest Robusta-producing region, provides a critical context for exploring how access to resources and opportunities are distributed across a fragmented smallholder sector. Despite the importance of coffee to local livelihoods, few studies have centred on farmers' own perspectives, with most focusing instead on policy, certification, or market frameworks. This research was therefore needed to address that gap and to capture how farmers themselves understand access, exclusion, and uneven benefit flows.

Guided by an integrated analytical framework that combines the Sustainable Livelihoods Framework (SLF) and the Theory of Access (ToA), the study connects livelihood assets, strategies, and outcomes with the formal and informal mechanisms that determine who can derive benefits from them. This merged framework enables assets to be viewed not only as resources but also as strategies and mechanisms of inclusion and exclusion, linking farmers' perceptions to wider structures of power and governance in the coffee sector.

This research makes a unique contribution by exploring how farmers perceive and interpret their access to livelihood assets, the flow of benefits, and the actors and processes that shape them. It foregrounds farmers' voices to reveal the informal mechanisms and everyday strategies through which they navigate constraints and inequalities within coffee supply chains. By showing how formal structures, particularly Organised Farmer Groups, interact with informal networks and trust-based exchanges, the study demonstrates how access and exclusion are negotiated in practice. Addressing issues requires reforms that recognise the informal mechanisms underpinning livelihoods while also investing in infrastructure, extending support beyond formal groups, and rebuilding trust in certification and market initiatives. Overall, the study demonstrates that understanding smallholder livelihoods requires looking beyond asset availability to the mechanisms, relationships, and perceptions that govern their use. By situating farmers' perceptions within wider structures of power, the research offers both an analytical contribution and a set of lessons for promoting more equitable and sustainable coffee livelihoods.

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List of Acronyms

DFID- Department for International Development

FFS- Farmer Field Schools

HKm- Social Forestry program *Hutan Kemasyarakatan*

ICCRI- Indonesian Coffee and Cocoa Research Institute

LDC- Louis Dreyfus Company

OFG- Organised Farmer Group

RDKK- Group Needs Definitive Plan *Rencana Definitif Kebutuhan Kelompok*

SCOPI- Sustainable Coffee Platform Indonesia

SLF- Sustainable Livelihood Framework

ToA- Theory of Access

1 Introduction.

This research examines how smallholder coffee farmers in Lampung perceive livelihood vulnerabilities, livelihood assets and access, the mechanisms and structural processes that shape the flow of benefit, and the outcomes that result. It brings farmers' perspectives into focus within the context of Lampung's coffee sector, Indonesia's largest Robusta-producing province, and traces how access and benefit flows are shaped through relationships, institutions, and markets.

The study is motivated by the need to understand livelihoods not only in terms of what assets farmers have, but also how social and institutional arrangements shape whether they can use those assets to secure benefits. To do this, the research adopts an integrated analytical approach that combines the Sustainable Livelihoods Framework (SLF) with the Theory of Access (ToA). This integration guided both the design of the research tools and the analysis, with particular attention to livelihood assets, strategies, access mechanisms, structural factors and processes and vulnerabilities.

Aim and research questions

The aim is to explore how smallholder coffee farmers in Lampung perceive and experience access to livelihood assets, flows of benefits, and livelihood vulnerabilities, to understand how stakeholder relationships and institutional processes shape equitable outcomes in the coffee sector.

This study was designed to address a clear gap in existing research, which has largely overlooked farmer perceptions in Indonesia's Robusta coffee sector. The research questions were therefore developed to explore this, linking farmers' lived experiences to wider institutional, social and market processes.

At the core of the study is the following overarching question, which provides an integrative focus for the inquiry and frames the more specific sub-questions that follow:

How do smallholder coffee farmers in Lampung perceive and experience access to livelihood assets, benefit flows, and vulnerability, and what do these perspectives reveal about the roles and relationships of key stakeholders in shaping equitable outcomes?

1. *What vulnerabilities and benefit-flow mechanisms shape the livelihoods of coffee farmers in Lampung, and how do farmers understand and interpret these conditions?*
2. *How do farmers in Lampung identify and describe the key livelihood assets available to them, and what benefits do they perceive these assets provide?*
3. *How do farmers in Lampung understand the flow of benefits from key livelihood assets and which actors do they perceive as controlling access to these benefits?*
4. *What are farmers experiences of the livelihood strategies they use to gain access to assets and control over the flow of benefit?*
5. *What are the perceived outcomes of the strategies and current flow of benefit systems in Lampung?*

Methodological orientation and case design

The research is guided by a constructivist position, recognising that knowledge is created through social interaction; an interpretivist approach, focusing on how meanings are understood and interpreted; and a relativist ontology, which accepts that multiple realities can coexist depending on the standpoint of those involved. This aligns with the goal of understanding how farmers themselves interpret access, vulnerability, and outcomes. A case study design was chosen to support this orientation, allowing for an in-depth and context-specific analysis of smallholder coffee farmers in Lampung, Sumatra. Elements of grounded theory were used in the analysis to keep the findings closely connected to participants lived experiences while following a transparent coding process. Taken together, these choices create a strong methodological foundation for exploring how structures, relationships, and practices shape livelihood experiences.

Data collection and fieldwork

Fieldwork was conducted in key coffee-producing areas of West Lampung, Tanggamus, and Bandar Lampung between April and July 2023. Data collection combined semi-structured interviews, surveys and secondary data analysis. Secondary sources (policies, certification reports, research) contextualised and triangulated findings.

The integrated SLF–ToA framing informed both the development of data collection tools and analysis. Initial question categories were refined to align with the framework’s core areas: supply chain routes, roles and relationships of stakeholders, vulnerabilities, structural factors and processes, assets, strategies, access, and outcomes (see table 1 and table 2). This ensured emerging themes were identified systematically while remaining grounded in farmer perspectives.

Scope and use of secondary materials

While the study centres farmers’ perspectives, it also recognises the shaping role of policies, standards, and market forces. Chapters that examine structural factors draw more extensively on secondary materials to describe formal arrangements, which are then considered alongside participants’ accounts of how those arrangements are experienced in practice. This situates lived experience within wider institutional contexts without displacing the primary focus on farmers’ perspectives.

Structure of the thesis

The thesis is organised into twelve chapters.

- [Chapter 2 \(Literature Review\)](#) reviews existing research relevant to understanding smallholder livelihoods in Lampung. It is structured in three parts: first, research using the SLF and ToA to explore access to assets and strategies; second, studies on Organised Farmer Groups (OFGs) and their role in mediating access; and third, governance and power in the global coffee value chain. This review identifies gaps, particularly the lack of research centred on farmers’ own perspectives.
- [Chapter 3 \(Methodology and Methods\)](#) explains how the study is guided by a constructivist, interpretivist perspective, the case study design, and details the methods used. It describes survey, interview, the integration of the SLF and ToA frameworks, and considerations of reflexivity, ethics, and translation.

- [Chapter 4 \(Findings: Overview of Farmer Respondents\)](#) presents descriptive findings on farmer demographics, households, coffee types, and certification status. This provides context for interpreting subsequent findings.
- [Chapter 5 \(Findings: Supply Chains and Stakeholders\)](#) maps the actors and routes through which Lampung's coffee is traded. It shows the roles of collectors, exporters, domestic buyers, and OFGs, setting up analysis of how access and benefit flows are mediated.
- [Chapter 6 \(Findings: Vulnerability Context\)](#) explores shocks, trends, and seasonality affecting coffee farmers. It shows how environmental change, market volatility, and household pressures shape vulnerabilities.
- [Chapter 7 \(Findings: Structural Factors and Processes\)](#) examines policies, standards, and institutional arrangements, such as fertiliser subsidies, social forestry, and certification schemes. It highlights how these structures and processes shape access and exclusion.
- [Chapter 8 \(Findings: Perceptions of Livelihood Assets\)](#) presents farmers' perspectives on human, social, natural, physical, and financial capital. It uses survey and interview data to show how farmers assess assets, triangulated with other research.
- [Chapter 9 \(Findings: Perceptions of Livelihood Strategies\)](#) analyses agricultural and income diversification, value addition and market engagement, collective action, and social support networks. It examines how these strategies are perceived as ways of strengthening livelihoods.
- [Chapter 10 \(Findings: Perceptions of Livelihood Outcomes\)](#) looks at outcomes across the five capitals, using survey data and farmers' reflections to show how access and strategies shape improvements or constraints.
- [Chapter 11 \(Discussion and Key Findings\)](#) brings the threads together. It integrates evidence from across the findings chapters, structured around supply chains, vulnerabilities, structures and processes, assets, strategies, and outcomes. It reflects on how access and benefit flows are shaped, who controls them, and their implications for farmers.
- [Chapter 12 \(Conclusions and Next Steps for Further Research\)](#) summarises contributions, reflects on strengths and limitations, and suggests future research and policy implications.

The chapters that follow develop the analysis in detail, showing how access and benefit flows are experienced by smallholder farmers in Lampung and how these experiences are shaped through relationships, institutions, and markets.

2 Literature review.

This chapter reviews the main literature relevant to understanding smallholder coffee livelihoods in Indonesia and the wider coffee sector¹. It looks at how previous research has described access to livelihood assets and benefits within coffee value chains, the systems of governance that influence smallholder participation and the roles of Organised Farmer Groups (OFGs) in shaping farmers' opportunities and constraints. The review draws on research on livelihoods, access theory, coffee supply-chain governance, and collective action to show what is already known and where gaps remain. By bringing these areas together, the chapter provides the background for this study and explains how existing gaps helped shape its focus..

The review evaluates how key frameworks, particularly the Sustainable Livelihood Framework (SLF) and the Theory of Access (ToA), have been used in relevant studies to analyse the access and control of assets, as well as the broader social and institutional structures and strategies impacting access. The aim is to examine how these frameworks have been applied in existing research to understand livelihood systems and evaluate their relevance and adaptability for analysing conditions in the context of Lampung's coffee sector.

To further clarify how 'structures' are understood, Giddens (1984) provides a useful conceptualisation. He conceptualises structures not simply as external institutions or fixed systems, but as composed of rules and resources that shape social action. In this sense, structures both enable and constrain what actors are able to do, shaping the opportunities available to them while also limiting how they are able to act. Importantly, structures are not static; they are reproduced through practice, meaning that the rules and resources that organise social life are continually reinforced or modified through everyday interactions. This perspective is particularly relevant for understanding smallholder livelihoods, as it highlights how access to resources, markets, and support is shaped not only by formal systems such as policies, institutions, and certification schemes, but also by ongoing relationships with traders, group leaders, cooperatives, and other actors. It therefore supports a more dynamic understanding of structural conditions, where institutional arrangements and social relations interact to shape how benefits are distributed and accessed.

Giddens suggests that people are informed actors who are capable of shaping their own lives despite the pressures they face. Agency, in this sense, refers to the ability to influence change through action, even where choices are constrained by available resources and institutional settings. Actors draw on both their ability to explain their decisions and the practical knowledge developed through experience and routine to guide how they act in practice (Giddens, 1984). This is particularly relevant in smallholder farming contexts, where decisions are often shaped by experience, habit, and locally embedded knowledge. While structural conditions influence what is possible, farmers are not passive recipients of these conditions; they actively interpret, navigate, and respond to them. Giddens also highlights that actions can produce unintended consequences and that even those in relatively constrained positions retain some capacity to influence the systems within which they operate. In this sense, livelihood strategies can be understood as the result of farmers' agency, reflecting how they interpret and respond to the structural conditions and resources available to them. Considered alongside the SLF and the Theory of Access, this perspective

¹ Several papers in this literature review were translated from Bahasa Indonesia to English using Google Document translate, this is clearly stated in the bibliography.

supports an analysis that recognises the interaction between structural conditions and farmer agency in shaping access to livelihood assets and the distribution of benefits.

The review is structured in three main parts, each contributing to a clearer understanding of the gaps in this area of research. The first section focuses on access to livelihood assets, and the strategies farmers use to access them, highlighting research that employs the SLF and the ToA. It evaluates the insights these frameworks offer and their applicability to understanding smallholder conditions. The second section examines the role of OFGs in mediating access to assets. Drawing on studies from the Indonesian context, it explores how these groups influence access to human, social, physical, financial, and natural capital, and what is known about their effects on farmer agency, inclusion, and sustainability. The third section turns to governance and power within the global coffee value chain. It reviews key typologies of governance (e.g. Gereffi et al., 2005), classifications of power (e.g. Dallas et al., 2019), and the Powercube framework (Gaventa, 2009), assessing how these have been used to explore decision-making, influence, and control over resources. Together, these sections critically assess how existing research has approached the study of asset access, benefit flows, and farmer agency, highlighting the institutional and structural forces often overlooked in understanding farmers' own perspectives and signalling key areas where further inquiry is needed.

This literature review identifies a consistent gap: while the structural dynamics and institutional arrangements shaping smallholder livelihoods are well documented, there is far less insight into how farmers themselves interpret, experience, and respond to these conditions. Producer perspectives, on vulnerability, benefit flows, strategies for gaining access, and stakeholder roles, remain underrepresented.

2.1 Livelihood Assets and Strategies

Understanding the assets available to farmers and the strategies they adopt to sustain their livelihoods is essential for analysing both their resilience and continued vulnerabilities (DFID, 1999). Coffee farmers in Indonesia rely on combinations of five livelihood capitals, human, social, natural, financial, and physical, to manage production, navigate risks, and pursue income security. Yet these assets are often unevenly distributed and constrained by structural limitations such as small landholdings, limited credit access, and poor market connections. The extent to which farmers can access and utilise these assets, and adopt effective livelihood strategies, directly shapes their exposure to income insecurity, food insecurity, and environmental risks. In response to these challenges, farmers engage in a variety of active and passive livelihood strategies, including agricultural diversification, profit-sharing arrangements, participation in OFGs and certification schemes, and coping mechanisms like saving or reducing consumption (Bray et al., 2023; Fajri et al., 2024; Hartatri & Neilson, 2021; Irawan, 2023; Kaskoyo et al., 2017; Putra & Suprianto, 2020; Syafrial et al., 2022).

This section of the literature review focusing on assets and strategies is organised into two parts:

1. Sustainable Livelihood Framework (SLF):

The studies selected explore research focusing on livelihood capitals, asset access, and strategies within coffee farmer contexts. Research was selected for being recent, Indonesian-based, with priority to Lampung studies. Critical analysis of previous research enabled the identification of gaps in understanding farmers' own

perspectives: how they interpret key assets, assess benefit flows, and experience barriers to access.

2. Theory of Access (ToA):

As no Indonesian coffee studies apply ToA, research from other agricultural settings was analysed. These studies reveal important insights into how social relations, power dynamics, and institutional norms shape access, highlighting mechanisms that determine who can benefit from resources, even without formal rights. Analysis of previous research here demonstrates the valuable insights this framework can reveal to this research.

2.1.1 The Sustainable Livelihood Framework (SLF)

Assets

A foundational aspect of sustainable livelihoods for coffee farmers is their access to and control over a range of assets. These assets can be categorised into human capital, social capital, financial capital, physical capital, and natural capital (DFID, 1999). Figure 1 illustrates the SLF and the process of understanding livelihoods through the analysis of asset access (see Framework development: 3.4.1 more information). This section of the literature review presents and evaluates research investigating coffee farmers in Indonesia, focusing on the five capitals and the key assets for farmers.

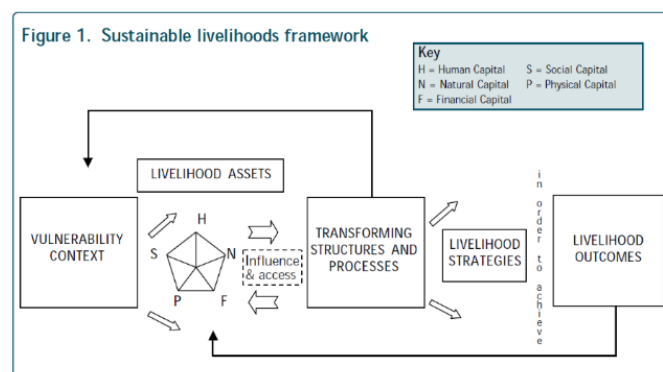


Figure 1 The Sustainable Livelihood framework (DFID, 1999).

The idea of capital as something broader than money or material wealth is also supported by wider sociological theory. Bourdieu (1986) argues that capital should not be understood only in narrow economic terms, because the social world is shaped by accumulated advantages that take different forms and are unevenly distributed. In his account, capital helps explain why some actors are better positioned than others to secure opportunities, mobilise support, and convert resources into beneficial outcomes. This is especially relevant to livelihood analysis because it highlights that inequality is not only a matter of income or property, but also of access to socially valued resources that can be accumulated over time.

Bourdieu identifies economic, cultural, and social capital as key forms of capital. Economic capital refers to resources directly convertible into money, while cultural capital includes socially valued knowledge, skills, and forms of competence, and social capital refers to the actual or potential resources linked to durable networks and relationships of mutual recognition (Bourdieu, 1986). This is useful here because it reinforces the idea that farmers' opportunities are shaped not only by financial means, but also by education, knowledge, social ties, and collective organisation.

Bourdieu also stresses that social capital can have a multiplier effect, increasing the value or usefulness of other forms of capital through the networks and relationships in which they are embedded. In this sense, the same knowledge, skills, or resources may lead to very different outcomes depending on whether they are supported by trusted relationships, recognised group membership, or access to influential networks. His discussion also points to the importance of recognition and legitimacy. Capital is not only possessed; it must also be recognised as meaningful and valid within particular social and institutional settings. This is particularly relevant in contexts where training, expertise, group membership, or certification only become beneficial when they are accepted and valued by buyers, cooperatives, or other institutions (Bourdieu, 1986).

Within the SLF, these broader ideas are translated into five livelihood capitals: human, social, natural, physical, and financial capital. These capitals represent the key resources that people draw upon and attempt to access, combine, and use in pursuing livelihood strategies and securing outcomes (DFID, 1999). In this study, the SLF remains the main framework for analysing assets because it provides a clear and applied structure for examining the resources coffee farmers draw upon in Indonesia. At the same time, the broader conceptual discussion of capital is useful because it underlines that livelihoods are shaped by both tangible and intangible resources, and by the unequal conditions under which those resources can be accessed, recognised, mobilised, and turned into benefits. This section therefore presents and evaluates research on coffee farmers in Indonesia through the five SLF capitals, while recognising that the concept of capital itself extends beyond a narrow economic definition.

Human capital, which encompasses skills, knowledge, education, and healthcare, is a crucial asset that directly influences a farmer's ability to manage farming operations, adopt innovations, and overcome challenges (DFID, 1999). Fajri et al., (2024) show farmers with greater knowledge and health manage production better, boosting productivity. Irawan, (2023) emphasises that access to education and training helps farmers strengthen their human capital, which allows them to improve productivity and livelihoods.

The importance of education and training in developing human capital is also highlighted by Hartatri & Neilson, (2021) who suggest that limited access to extension services and formal education hampers farmers' ability to adopt modern agricultural practices in Northern Sumatra. Mariyono et al., (2021) found Farmer Field Schools (FFS) in Sumatra, Java and Bali improve human capital by equipping farmers with skills for efficient practices. Enabling farmers to respond better to market conditions, improve productivity, and manage the risks associated with coffee farming, in this study livelihoods overall were improved by 40%. Similarly, Kaskoyo et al., (2017) discuss the positive impact of training in community forest programs in Lampung, where farmers gain knowledge and skills that strengthen their human capital, although access to such programs is limited in some areas. Accessible education and training programmes are crucial for empowering farmers and raising productivity.

Bray et al., (2023) offer a unique perspective by focusing on social capital and its role in enhancing human capital. Their Sumatra study shows certifications like 4C don't directly raise income but foster social networks for knowledge sharing. These networks build human capital by giving farmers access to new techniques and ideas. This aligns with Mariyono et al. (2021), who emphasise social networks amplify human capital benefits.

Putra & Suprianto, (2020) highlight education and skills as key human capital for improving livelihoods in Simalungun, North Sumatra. This research found that most farmers have limited access to formal education and training and levels of human capital are unsustainable. To reinforce this finding, Syafrial et al., (2022) found that for coffee farmers in East Java increases in human capital, measured in terms of education, farming experience, and availability of family labour, led to increased household expenditure on food. This shows a positive link between human capital and food security, highlighting the need to improve access in Simalungun.

Overall, these studies emphasise human capital's role in productivity, resilience, and livelihood sustainability in Indonesia. Research highlights the benefits of education and training, such as Farmer Field Schools, but notes barriers to equitable access remain (Hartatri & Neilson, 2021; Irawan, 2023; Mariyono et al., 2021; Putra & Suprianto, 2020). Additionally, social networks fostered by initiatives like certifications play an important role in facilitating knowledge exchange and indirectly enhancing human capital (J. Bray et al., 2023). However, existing research primarily evaluates these interventions from policy-driven or organisational viewpoints, with limited attention to how farmers themselves perceive and experience the benefits and constraints associated with human capital access. Little is known about how farmers interpret the role of education, training, or social networks in shaping their ability to access and utilise human capital, or how these interpretations influence the strategies they adopt. This gap highlights the need for research that focuses on the lived experiences of farmers, as understanding how they assess and navigate barriers to human capital could provide more contextually relevant insights for designing equitable livelihood support interventions.

Social capital, which includes networks, social relationships, affiliations, and associations, is a key asset for smallholder coffee farmers (DFID, 1999). It plays a vital role in enhancing resilience, improving access to resources, and supporting farmers in overcoming economic and environmental challenges. Hartatri & Neilson, (2021) highlight that cooperative membership provides coffee farmers in Sumatra with essential access to resources such as credit, market information, and training opportunities, which help improve productivity and resilience. They emphasise that cooperatives and social networks help farmers navigate economic pressures. In addition, local collectors, family members, and friends play a crucial role in providing financial support, further underlining the interdependence of social and financial capital (Hartatri & Neilson, 2021). These findings suggest social capital enhances human capital and access to financial and physical assets.

Irawan, (2023) reinforces the significance of community-based support networks, showing that farmers who can organise and engage collectively within their communities are better positioned to face economic and food insecurity. This research suggests leveraging social networks is essential for improving livelihoods. This is particularly important for smallholder farmers in Indonesia, where limited access to formal financial services and training opportunities makes social capital a vital source of support. Strong local networks give farmers knowledge and market links, helping them mitigate risks and improve livelihoods (Irawan, 2023).

Kaskoyo et al., (2017) examined social capital in Lampung community forest programmes. They argue social capital benefits from community forestry were uneven, with poorer farmers benefiting least. Although group numbers rose overall, poorer farmers' networks decreased. Trust rose in the middle wealth group but fell among the poor (Kaskoyo et al.,

2017). It is interesting that within this study there were different outcomes for different wealth groups suggesting that original financial capital impacts social capital outcomes.

Bray et al. (2023) find certification in Sumatra may help farmers build social capital. The authors note that social capital is the most crucial form of capital for farmers, a finding supported by Fajri et al., (2024) who stated that social capital was the main factor influencing sustainable coffee farming in Centra Aceh. However, Bray et al (2023) caution that without proof social capital raises production, investors may hesitate to support it. While social capital plays a key role in improving farmers' access to resources, Bray et al. (2023) emphasise that the benefits of certifications on social capital are not evenly distributed, with some farmers gaining more from these networks than others, depending on the strength and nature of their pre-existing social and OFG connections.

Fajri et al. (2024) highlight the importance of social networks in Aceh, Sumatra. Their study shows that while fewer farmers joined OFGs or attended OFG meetings, they still relied heavily on social capital to support sustainable coffee farming. This suggests social capital, even outside formalised groups, plays a significant role in sustainability. In their research, trust and social norms, such as cooperation, religion, knowledge, participation, and tolerance, emerged as the key elements of social capital outside of joining OFGs (Fajri et al., 2024).

Putra & Suprianto, (2020) found low participation in formal OFGs in East Java. The authors argue this limits farmers' ability to leverage social capital effectively that could lead to better livelihood strategies and income improvements. Syafrial et al., (2022) further demonstrates the significance of social capital in East Java, farmers with higher social capital, measured through group participation, relationships with fellow farmers, engagement in social activities, and access to market information, experienced increased household expenditure on food, indicating improved food security outcomes. Mariyono et al., (2021) add to this discussion by showing how Farmer Field Schools (FFS) in Java, Sumatra and Bali, strengthen social capital through enhanced group participation, knowledge exchange, and networking opportunities, thus positively influencing farmers' overall livelihood strategies.

Social capital is a crucial asset for smallholder coffee farmers, enabling them to access resources, mitigate risks, and enhance their livelihoods. Hartatri & Nielson (2021), Irawan (2023), and Kaskoyo et al. (2017) emphasise the role of networks, cooperatives, and community engagement in improving farmers' resilience to shocks in Indonesia. Social capital facilitates access to financial, and human capital, improving productivity and food security. However, as Bray et al. (2023) and Fajri et al. (2024) note, the benefits of social capital are unevenly distributed, and stronger, more interconnected social networks offer greater advantages in terms of access to resources and support.

Despite these insights, existing studies rarely explore how farmers themselves perceive the role and value of social capital in shaping their access to benefits and responses to livelihood challenges. The literature primarily focuses on programme outcomes or institutional designs, with limited attention to farmers' interpretations of how and why social relationships facilitate or constrain benefit flows. This gap is particularly relevant to the guiding questions of this research, including how farmers identify key assets, interpret benefit flows, and perceive the influence of different actors on access. Current literature offers limited insight into how farmers themselves make sense of the informal mechanisms and trust-based interactions that shape social capital.

Natural capital, which includes access to land, water, and natural resources, is essential for coffee farming (DFID, 1999). Kaskoyo et al. (2017) highlight the importance of community forestry programs such as Hutan Kemasyarakatan (HKm), in supporting sustainable livelihoods by granting farmers access to managed land and forest resources. Their study shows that, through participation in such social forestry programs, farmers in Lampung Province improve their access to natural capital, as well as human and physical capital. Prior to joining the HKm program, many farmers cultivated land within the forest illegally, which left them vulnerable to exploitation, especially from corrupt officials. Becoming part of the program removed this risk, offering farmers greater security and contributing to more sustainable livelihoods (Kaskoyo et al., 2017).

Irawan (2023) highlights the critical role of natural capital, particularly land, for smallholder coffee farmers in Bengkulu, Sumatra. This research shows that limited land access significantly restricts farmers' capacity to meet their livelihood needs. Similarly, Fajri et al. (2024) observed that farmers in Aceh Province, Sumatra, only have access to small land areas, which constrains their productivity, incomes, and overall livelihood sustainability. Putra & Suprianto, (2020) further supports these findings, noting that natural capital among coffee farmers in Java was generally rated at a medium level of sustainability, and farmers with particularly limited land access reported notably lower sustainability.

Hartatri & Neilson, (2021) also emphasise the constraints posed by small landholdings in Simalungun, Sumatra. They argue that restricted access to land and natural resources limits farmers' ability to diversify agricultural practices and enhance productivity. Consequently, limited natural capital constrains opportunities for income growth. They suggest that expanding farmers' access to natural capital is essential for improving resilience and sustainability in coffee production (Hartatri & Neilson, 2021).

Collectively, these studies highlight the fundamental importance of natural capital, especially secure and adequate land access, in sustaining and improving smallholder coffee farmers' livelihoods in Indonesia. While community forestry programmes like HKm clearly demonstrate the benefits of providing managed access to natural resources (Kaskoyo et al., 2017), widespread limitations persist due to small landholdings and insecure land tenure (Fajri et al., 2024; Hartatri & Neilson, 2021; Irawan, 2023; Putra & Suprianto, 2020). Expanding secure and equitable access to land and resources thus remains critical, as it directly affects farmers' productivity, resilience, and the long-term sustainability of coffee farming livelihoods. However, current research offers limited insight into how farmers themselves perceive the constraints on natural capital access or how they interpret the role of actors and institutions in shaping these conditions. Addressing this gap is crucial for understanding how farmers in Lampung view benefit flows and access mechanisms, key elements of the present study's inquiry into livelihood equity and sustainability.

Financial capital, including access to credit, savings, and wages (DFID, 1999), significantly influences the productivity and sustainability of coffee farming. Several studies highlight the financial limitations faced by Indonesian coffee farmers. Fajri et al. (2024) report that farmers in Central Aceh generally have a medium level of financial capital but specifically rate their income and savings as low, despite accessing some financial support from government programmes. Similarly, Irawan (2023) emphasises the considerable difficulties faced by smallholder farmers in Bengkulu, Sumatra, particularly in obtaining formal credit and financial services. These limitations severely restrict their ability to invest in farm improvements or expand production capacity. Bray et al. (2023) reinforce this point through

their study in South Sumatra, highlighting that although certifications offer opportunities to access premium markets, the associated upfront costs frequently exclude farmers who already have limited financial resources, further constraining their potential to improve livelihoods.

The challenges surrounding financial capital are further supported by Putra & Suprianto, (2020), who identifies that coffee farmers in Java experience low financial sustainability noting that farmers had limited savings and inadequate access to affordable credit. Similarly, Hartatri & Neilson (2021) outline the critical role cooperatives play in providing affordable credit to farmers in Simalungun, Sumatra. However, their study shows that formal financial institutions remain largely inaccessible to these farmers, who consequently rely heavily on informal sources such as local collectors and relatives. While these informal arrangements temporarily assist farmers, they typically lead to lower bargaining power, increased borrowing costs, and reduced profitability. Syafrial et al., (2022) echoes these findings among coffee farmers in Java, noting that limited access to affordable credit significantly restricts farmers' capacity to invest in productivity improvements and sustainable practices, thereby constraining their resilience.

In contrast, some studies highlight cases of improved access to financial capital. Kaskoyo et al. (2017) present a different perspective through their research on community forestry programmes (HKm) in Lampung Province. Their findings show that participation in formalised forest management initiatives enables farmers to access formal credit channels and additional financial resources. This improved access allows farmers to invest more substantially in their farming operations and diversify income sources, enhancing their overall economic sustainability. Nevertheless, they also caution that not all farmers benefit equally due to barriers limiting participation in these programmes. Similarly, although the study by Mariyono et al. (2021) focuses primarily on human and social capital through Farmer Field Schools (FFS). The research finds that enhanced knowledge and improved networks from FFS participation can enable farmers to utilise financial resources more effectively. Better agricultural practices and knowledge gained through these programmes potentially reduce farmers' economic vulnerability, although explicit evidence directly linking FFS participation to improved financial capital remains limited (Mariyono et al., 2021).

Overall, these studies illustrate the crucial role financial capital plays in shaping the productivity, resilience, and sustainability of coffee farming livelihoods in Indonesia. Farmers typically face substantial barriers to accessing formal financial services, including credit and savings facilities (Irawan, 2023; Putra & Suprianto, 2020; Syafrial et al., 2022). Cooperatives can significantly mitigate these barriers by providing critical access to affordable credit and resources; however, farmers' low participation rates and continued reliance on informal sources limit these potential benefits (Hartatri & Neilson, 2021). While targeted interventions such as community forestry programmes (Kaskoyo et al., 2017) demonstrate potential improvements in financial access, persistent issues around uneven distribution and limited participation highlight the ongoing need to address financial disparities for sustained livelihood improvements among smallholder coffee farmers. Notably, there remains a lack of research exploring how coffee farmers themselves perceive and navigate these financial constraints, including how they evaluate the risks, and trade-offs of relying on informal credit structures. This limits our understanding of how farmers assess the value and accessibility of financial capital and limits the ability to tailor financial interventions to the actual experiences and priorities of farmers.

Physical capital, including infrastructure, tools, equipment, and technology necessary for productive activities (DFID, 1999), is crucial for sustainable coffee production among smallholder farmers in Indonesia. Fajri et al. (2024) find that coffee farmers in Central Aceh generally have a high level of physical capital. Their assessment included housing status, ownership of equipment, and access to transportation such as motorbikes. Farmers typically owned their homes, had adequate agricultural equipment, and maintained basic processing facilities. This positively contributes to their productivity, enabling better farming practices and efficient management of coffee production (Fajri et al., 2024). However, an important insight from their findings is the absence of detailed exploration into how variations in physical capital specifically influence coffee productivity, representing a gap for future research.

Putra & Suprianto, (2020) categorises the overall physical capital among coffee farmers as being at a medium level of sustainability, while cultivation assets, such as farming equipment, were rated as low. The study in Java specifically highlights that livestock ownership among farmers was considered unsustainable, suggesting that livestock, as a physical asset, did not significantly enhance the sustainability of their livelihoods. Putra & Suprianto thus indicates clear limitations in physical capital, particularly concerning farmers' access to cultivation tools (Putra & Suprianto, 2020).

Syafrial et al., (2022) examines physical capital from the perspective of access to agricultural storage facilities and proximity to markets among smallholder farmers in Java. The study identifies that improved storage facilities directly enhance food security by reducing post-harvest losses, while proximity to markets facilitates efficient selling of agricultural produce. These findings emphasise the critical role of market infrastructure as a component of physical capital, indicating that investments in improved storage and market access could have substantial positive impacts on livelihoods and sustainability. Conversely, limited storage infrastructure and greater market distances pose considerable barriers, suggesting targeted infrastructure improvements could yield significant livelihood benefits (Syafrial et al., 2022).

Conversely, Kaskoyo et al. (2017) provide evidence of enhanced physical capital through participation in the community forestry programme, Hutan Kemasyarakatan (HKm), in Lampung Province. Their findings show improved housing conditions, increased motorbike ownership, and broader access to mobile phones, especially for poorer and middle-income groups. However, their research did not explore the critical area of farming equipment as a measure of physical capital, representing a missed opportunity to comprehensively assess HKm's direct impacts on agricultural productivity. This gap highlights the need for future studies to explicitly measure changes in farming-related physical assets to better understand programme effectiveness in improving agricultural livelihoods (Kaskoyo et al., 2017).

Overall, the studies reviewed highlight the significance of physical capital, particularly infrastructure, equipment, and transport, in shaping the livelihoods and productivity of smallholder coffee farmers in Indonesia. Adequate housing, transportation, and agricultural equipment positively support farming practices (Fajri et al., 2024), yet notable gaps persist, especially in cultivation assets such as farming tools and equipment (Putra, 2020). Additionally, limitations in storage facilities and market access highlight the need for infrastructure improvements to enhance farmers' food security and economic outcomes (Syafrial, 2023). While community forestry programmes (HKm) have improved certain aspects of physical capital, such as housing conditions and transportation assets (Kaskoyo et

al., 2017), low participation rates in formal farmer groups and cooperatives limit broader opportunities for collective resource access and sharing of physical assets (Hartatri & Neilson, 2021; Putra & Suprianto, 2020). Putra & Suprianto (2020) notes low engagement in farmer organisations, further restricting the collective capacity to overcome physical capital constraints. These insights underscore the importance of addressing both individual and collective barriers to strengthen physical capital and sustainability among smallholder coffee farmers. However, little is known about how farmers themselves perceive these barriers or how they navigate physical capital constraints in practice, limiting the development of context-specific interventions aligned with their lived realities.

The studies reviewed here highlight the critical role that human, social, financial, physical, and natural assets play in shaping the livelihoods of smallholder coffee farmers in Indonesia. Human capital, particularly education and skills, emerges as a key determinant of productivity and resilience, while social capital, fostered through community networks and group membership, supports resource sharing and collective action. Financial capital remains a significant challenge, with limited access to formal credit often pushing farmers to rely on informal sources. Physical assets, including infrastructure and agricultural tools, are essential for maintaining productivity but are often insufficient, especially among smallholders. Natural capital, primarily access to land and sustainable practices, also directly influences farmers' capacity to maintain viable coffee production.

Despite the breadth of research into these five asset types, a critical gap persists: the limited attention paid to farmers' own perspectives. Current literature often assesses asset distribution and impact through organisational or institutional lenses, without examining how farmers themselves identify key assets, interpret their value, or navigate barriers to access. The lived experiences, interpretations, and strategies of farmers, especially concerning informal mechanisms, social relationships, and perceived actor influence, remain underexplored. This gap is particularly relevant to this study's focus on how farmers in Lampung understand the flow of benefits and the mechanisms shaping access. By focusing on farmer perspectives, future research can uncover hidden or alternative access strategies, more accurately identify barriers, and contribute to interventions that align with farmers' lived experiences and enhance equity in resource access.

Strategies

The diverse livelihood strategies adopted by smallholder farmers in Indonesia reflect both their resilience and vulnerability in the face of persistent livelihood challenges. Farmers engage in a wide range of active strategies, including agricultural adjustments, diversification, migration, and profit-sharing, as well as collective approaches such as participation in OFGs, certification schemes. These strategies aim to mitigate risks, enhance income, and improve access to assets and markets. However, despite these efforts, many farmers continue to struggle with low incomes and limited capital, raising questions about the effectiveness and sustainability of current strategies without broader structural support (J. Bray et al., 2023; Hartatri & Neilson, 2021; Irawan, 2023; Kaskoyo et al., 2017; Putra & Suprianto, 2020). This section explores the range of active and passive livelihood strategies documented in the literature, highlighting both their potential and limitations in contributing to long-term livelihood security. It also identifies key gaps in existing research, particularly in understanding how farmers themselves perceive, experience, and navigate these strategies.

Active Livelihood Strategies

Agricultural diversification and Technology Adoption

Several studies highlight that farmers actively modify traditional agricultural practices to mitigate risks and improve productivity. Irawan (2023) identified active strategies in Sumatra, such as grafting, with approximately 80% of coffee farmers adopting this method, demonstrating a widespread and proactive shift to enhance agricultural output and reduce vulnerability to crop failure. This high level of adoption suggests that farmers are engaging with opportunities for increasing productivity.

Putra and Suprianto (2020) identified three main livelihood strategies among coffee farmers in Medowo Village, East Java: agriculture-based strategies (43%), mixed agriculture-livestock strategies (40%), and commercial business activities (17%). Despite this diversity in approaches, 51% of farmers still reported low incomes, indicating that diversification alone may not be sufficient to achieve livelihood security without additional support to strengthen livelihood assets. The finding that human, financial, and physical capitals were classified as having low sustainability further suggests that farmers are operating with limited resources, restricting their ability to make these strategies effective in the long term (Putra & Suprianto, 2020).

Hartatri and Neilson (2021) corroborated the widespread adoption of crop diversification strategies among smallholders in Sumatra, where farmers commonly cultivated citrus, potatoes, tomatoes, cabbage, and chilli alongside coffee. These practices aim to spread risks and secure multiple income streams, with coffee contributing an average of 42.3% to household income. This proportion indicates that coffee alone often cannot sustain livelihoods, compelling farmers to diversify economically. Irawan (2023) reinforces this observation in Bengkulu, Sumatra, where farmers similarly relied on income diversification through intercropping and off-farm employment. Both studies highlight that diversification is not merely a preference but a necessity driven by the financial volatility of coffee farming. However, while diversification strategies mitigate some economic risks, they also highlight that even with diversification, households are still at risk from things like falling crop prices or poor harvests, suggesting that diversification alone may be insufficient without targeted support mechanisms to stabilise incomes and enhance resilience.

Together, these studies demonstrate that diversification, whether through intercropping, livestock integration, or off-farm employment, is a widespread and necessary strategy adopted by smallholder coffee farmers to buffer against the economic instability of relying solely on coffee. Yet, the persistence of low incomes among many farmers, despite these strategies, points to systemic challenges such as limited access to capital and weak physical infrastructure, which constrain the effectiveness of diversification in delivering long-term livelihood security (Putra & Suprianto, 2020). While existing studies clearly document the presence of diversification, they often overlook how farmers themselves view these strategies, or how they assess their own capacity to sustain them. There is limited exploration of how farmers perceive the outcomes of diversification, the challenges they face in implementing such strategies, or the role that different actors play in shaping access to the necessary assets. This presents a critical gap in understanding how farmers in contexts like Lampung navigate, evaluate, and respond to livelihood vulnerabilities, issues central to this study's inquiry into benefit flows, asset access, and the perceived effectiveness of livelihood strategies.

Joining Organised Farmer Groups (OFGs)

The involvement in OFGs has been identified as a crucial strategy for strengthening farmers' livelihoods, particularly through enhancing social capital in Indonesia. Syafrial et al. (2022) found that participation in farming groups and social networks in East Java significantly improved household food security, demonstrating the value of social capital in accessing assets and mitigating risks. In their study, 63% of farmers participated in farming groups, highlighting the potential of OFGs as a mechanism for improving resilience. However, this finding is not consistent across contexts. Putra and Suprianto (2020) observed low and largely passive participation in OFGs in East Java, where many farmers were either not members or not actively engaged, limiting the groups' capacity to function as a platform for improving livelihoods. Fajri et al. (2024) further corroborate this, noting minimal participation in both farmer groups and cooperatives in Central Aceh, particularly pointing to a lack of trust in cooperatives due to negative past experiences. Even within Syafrial et al. (2022), only 24% of farmers were members of cooperatives, indicating that while OFGs may offer significant potential, actual participation remains uneven and constrained. Together, these findings suggest that while social capital through OFGs is a promising strategy, its effectiveness is highly dependent on the quality of participation, trust, and local group dynamics. Without addressing barriers to meaningful engagement, the transformative potential of OFGs for improving livelihoods may remain unrealised.

Certification schemes such as the 4C standard have been identified as important strategies for increasing access to markets and assets. Bray et al. (2023) found that although the direct economic benefits of certification were limited, significant indirect impacts through strengthened social networks were evident. Certification not only facilitated access to broader market channels but also enhanced social capital through knowledge exchange and improved access to material support (J. Bray et al., 2023). However, a critical insight is that participation in certification programmes often requires farmers to be members of OFGs raising the question of whether the observed benefits stem from certification itself or from farmers' group membership. This makes it challenging to disentangle the impact of certification from the social capital gains that might already arise through OFG participation.

Similarly, Mariyono et al. (2021) demonstrated that Farmer Field Schools (FFS), a form of non-formal education, significantly improved human capital by enhancing farmers' technical knowledge, farm management, and innovation capacities. According to their findings, participation in FFS contributed to a 40% improvement in overall livelihoods, indicating substantial impacts on farmers' wellbeing (Mariyono et al., 2021). Notably, the strength of this study lies in its participatory approach, which gathered direct feedback from farmers, increasing the credibility of the findings. Yet, as with certification, access to FFS is typically limited to those who are already part of organised groups or networks, making it difficult to isolate the effects of the training from the benefits of group membership itself.

In a similar vein, Kaskoyo et al. (2017) evaluated the Hutan Kemasyarakatan (HKm) community forest programme and found that participation enhanced farmers' human, natural, and physical capital while reducing reliance on exploitative relationships. HKm participation facilitated access to land and natural resources while fostering greater security and autonomy for farmers (Kaskoyo et al., 2017). Nonetheless, HKm, like FFS and certification, usually requires farmers to be part of a collective or community group before they can access these benefits. Thus, while these programmes contribute meaningfully to asset enhancement and livelihood improvement, their effectiveness is intertwined with OFG participation, complicating attempts to assess the independent impact of each strategy.

These studies underscore the strategic value of OFGs, certification schemes, and participatory training programmes in enhancing farmers' access to livelihood assets. Evidence from Indonesia suggests that OFGs can strengthen social capital and contribute to improved food security (Syafrial et al., 2022), while certification (J. Bray et al., 2023), Farmer Field Schools (Mariyono et al., 2021), and HKm programmes (Kaskoyo et al., 2017) offer complementary pathways to improving various capitals. However, the effectiveness of these strategies remains highly contingent on group participation, which is often uneven, limited, or passive (Fajri et al., 2024; Putra & Suprianto, 2020). Moreover, the overlap between programme benefits and OFG membership complicates efforts to isolate the impact of specific interventions. Despite the documented benefits, less attention has been given to how farmers perceive the value of OFG involvement or what influences their decisions to participate or disengage. This represents a notable gap in the literature, particularly in relation to understanding how farmers interpret access to livelihood assets, and the benefit flows they associate with collective strategies. Farmers' perspectives are important for understanding what drives or limits their participation and how support programmes affect them in real life.

Passive strategies

Passive strategies were observed predominantly as short-term safety nets rather than sustainable, long-term solutions. These strategies include saving, reducing consumption, and relying on external financial support such as loans or the liquidation of assets. According to Irawan (2023), these approaches offer immediate but temporary relief from livelihood pressures, allowing households to manage short-term shocks or periods of hardship. However, reliance on cutting costs or depleting existing resources raises concerns about the long-term resilience of these households. For example, reducing consumption may protect a family's finances in the short term but could compromise nutritional intake, health, and well-being, thereby undermining human capital in the longer term. Similarly, while asset liquidation and borrowing may cover urgent expenses, these actions can erode the limited assets and capital that farmers possess, making them more vulnerable to future shocks. The persistence of these passive strategies across contexts, as noted by Irawan (2023), suggests that farmers are often left without sufficient structural support or viable alternatives, forcing them into reactive coping mechanisms rather than proactive strategies for livelihood improvement.

The continued reliance on passive strategies, such as reducing consumption or liquidating assets, signals deeper systemic issues within the support structures available to smallholder coffee farmers. While these coping mechanisms provide short-term relief, they also gradually deplete essential livelihood assets and reinforce long-term vulnerability. This underscores the need to understand how farmers themselves perceive and experience these reactive strategies. Exploring farmers' interpretations of their asset limitations and the factors that shape their reliance on passive strategies is vital to identifying sustainable and equitable support mechanisms. Incorporating farmers' perspectives is essential to understanding the relational and contextual factors that shape participation and, ultimately, the equity and effectiveness of livelihood support.

Indonesian coffee farmers employ a range of strategies to manage risk and improve their livelihoods, including diversification, participation in OFGs, and passive coping mechanisms. While these approaches reflect adaptability and resourcefulness, their overall effectiveness is often limited by constrained resources and uneven participation. Programmes such as

certifications and training initiatives offer potential benefits, but their success is frequently tied to collective group involvement, making it difficult to isolate their specific impacts. Continued reliance on short-term coping measures also highlights the ongoing vulnerability of many farmers. A key gap in the literature is the limited understanding of how farmers themselves interpret these strategies. There's little exploration of how they assess the benefits, the challenges they face in sustaining their efforts, or the reasons why they may continue to rely on passive coping strategies. Without incorporating these perspectives, it's difficult to design support systems that are equitable and relevant to farmers' lived experiences. Exploring these interpretations is crucial for developing interventions that truly reflect and respond to farmers' needs.

2.1.2 The Theory of Access

The ToA, as conceptualised by Ribot and Peluso (2003), provides a comprehensive framework for examining how people gain, maintain, and control access to resources. In this framework access is defined as the ability to gain benefit from a resource. The ToA focuses on the social relationships, structural factors and power dynamics (i.e. mechanisms) that facilitate or constrain access to assets. This theoretical perspective shifts the focus from formal property rights to the broader social and structural factors that shape resource access, such as technology, knowledge, social identity and market access (Amuzu et al., 2022; Ribot & Peluso, 2003, 2020) (see Framework development: 3.4.2). While the application of the ToA to coffee farming in Indonesia is limited, relevant insights can be drawn from studies conducted in other contexts.

Access to human, social, natural, financial, and physical capital is essential for smallholder farmers, as these assets enable agricultural practices, training opportunities, and resilience. The ToA highlights that access to these resources is shaped not just by formal ownership but by social relationships, power dynamics, and economic interactions. This section presents research using the ToA, these studies examine how social and political factors influence their ability to benefit from key assets. While the studies discussed do not specifically focus on Indonesian coffee farming, they provide valuable insights into how farmers navigate access challenges.

Importantly, using this framework helps to explore the less visible, everyday ways that farmers gain or struggle to gain access to the resources they need. By focusing on farmers' own perspectives and experiences, the ToA supports this study's goal to better understand the specific challenges and opportunities they face. This can help to develop more fair and practical strategies that reflect the realities of smallholder coffee farming.

Access to Assets

Amuzu et al. (2022) applied the ToA to examine how certification incentives influence the distribution of benefits and burdens among rural cocoa farmers in Ghana. The study revealed that access to these benefits was shaped by complex social and structural factors, including gender relations, literacy levels, household size, and membership in farmer cooperatives. While cooperative membership facilitated access to collective resources and knowledge exchange, the distribution of benefits remained uneven, influenced by power dynamics between farmers, private firms, and state actors. Notably, certification programmes, while offering some advantages, also introduced new challenges and reinforced existing inequalities among farmers (Amuzu et al., 2022).

Specifically, the study found that farmers participating in certification schemes received financial benefits, such as premiums on cocoa sales and access to community development funds. However, these benefits were not equitably shared. Literate farmers and those with larger households were better able to adopt new practices and access information, while women often faced additional barriers related to gendered labour traditions. Furthermore, while certification schemes offered potential advantages, they also imposed new burdens, including increased labour demands and production costs. Although cooperative membership supported access to resources and knowledge, the overall distribution of benefits remained shaped by underlying power imbalances (Amuzu et al., 2022).

These findings are relevant for Indonesian coffee farmers, as they illustrate how access to resources and benefits is mediated by complex factors such as social ties, gender, literacy, and group membership. Understanding these dynamics highlights the need for research into how similar factors influence access among coffee farmers, ultimately guiding the development of more inclusive and equitable initiatives.

Milgroom and Ribot (2020), in their study of resettlement in Mozambique, use the ToA as a framework to analyse the complex social dynamics of displacement. They focus on how changes in resource access reshape authority, social relations, and community structures. The authors observed that social relations significantly influenced access to resources, even in the absence of formal land ownership. Resettled villagers who maintained kinship ties with the host community or had the ability to establish relationships with traditional landowners were better able to secure access to land and other resources. The study highlights that access to resources is not just about physical availability, but is socially mediated through various mechanisms, including lineage, social hierarchy, personal skills, and the ability to communicate respectfully to authority figures. These factors played a crucial role in determining how individuals and groups could benefit from resources in their new location, ultimately affecting the social organisation and authority structures within the resettled communities (Milgroom & Ribot, 2020). Applying this insight to coffee farming suggests that human capital, such as skills and knowledge, may not translate to improved livelihoods unless accompanied by the social capital needed to utilise those skills effectively.

In South Africa, Spierenburg used The ToA to analyse how power relations influenced access to land and resources when agricultural land was converted to game farming for wildlife-based tourism. The research emphasised that game farm owners who maintained connections with government officials and participated in collective networks could better secure and justify their access to land despite changes in land use. This underscores the critical role of historical power asymmetries and institutional relationships in maintaining land control, particularly when policy changes and land reform efforts threaten established ownership patterns (Spierenburg, 2020). Although not directly related to coffee farming, this study highlights the importance of The ToA in understanding the collective strategies used in maintaining access to crucial livelihood assets, and highlights how disconnected farmers may be disadvantaged when attempting to gain or maintain access to assets.

Ribot and Peluso revisited their original "theory of access" framework, reflecting on how various scholars have applied and extended their concept. They reaffirm that access is fundamentally about the ability to benefit from an asset, which extends beyond mere ownership or formal rights. The authors emphasise that access is shaped by dynamic power relations and social mechanisms. They argue that formal rights, including property rights, do not guarantee access, as not all formal claims are enforceable. This perspective underscores

the importance of understanding the complex social and political factors that influence resource access (Ribot & Peluso, 2020).

While the paper does not specifically discuss Indonesian coffee farmers, it does provide insights relevant to agricultural contexts. For instance, it mentions that having formal rights to harvest or plant does not guarantee the ability to benefit without access to labour or markets. In the case of Indonesia, the authors note how international forestry policies focused on export timber have excluded smallholders who lack formal land titles, undermining their competitiveness. This example illustrates how global policies can change local access patterns, potentially creating barriers for small-scale producers (Ribot & Peluso, 2020).

The ToA offers a valuable analytical lens for understanding the complex mechanisms that influence how smallholder farmers gain, maintain, and control access to livelihood assets. Studies from diverse contexts, including cocoa farming in Ghana (Amuzu et al., 2022), resettlement in Mozambique (Milgroom & Ribot, 2020), and land conversion in South Africa (Spierenburg, 2020), illustrate how access is shaped by social ties, gender, literacy, kinship networks, historical relationships, and institutional affiliations. These factors influence who can benefit from resources, even if they don't officially own them, showing that access depends heavily on social relationships and power dynamics.

Crucially, these studies show that even when programmes like certification schemes or OFG memberships are introduced to enhance equity, they can unintentionally reproduce or intensify existing inequalities. The findings also show that formal programmes often work through informal social rules and connections, which influence who actually gets the benefits. Ribot and Peluso (2020) emphasise that formal rights alone do not guarantee access. Whether individuals can benefit from resources depends on factors such as the enforceability of those rights, the role of institutions, and broader political-economic forces, like global market regulations and standards.

These studies collectively demonstrate how access is shaped not only by formal rights but by a range of informal, socially embedded mechanisms, such as kinship ties, literacy, social networks, and institutional relationships, that influence who can benefit from livelihood resources. They emphasise that certification schemes, OFG membership, and policy reforms do not affect all farmers equally, and can reinforce inequalities when existing power dynamics and social divisions go unaddressed. Importantly, several studies show that even when farmers can access relevant human capital such as skills, training, or knowledge, their ability to benefit from it is often dependent on their social capital and roles within social structures. This underscores a key insight for this research: the need to explore how farmers in Lampung perceive and navigate these informal structures. The ToA provides a critical lens for identifying which mechanisms farmers believe facilitate or block their ability to access key livelihood assets, how they interpret benefit flows, and how social and institutional actors influence those flows. By focusing on farmers' voices, this study aims to move beyond assumptions of uniform participation and benefit, uncovering the relational, contextual, and often invisible dynamics that shape livelihood outcomes in smallholder coffee farming.

In summary, the ToA offers a valuable lens for understanding how smallholder farmers gain, maintain, and control access to livelihood assets, not simply through formal rights, but through informal mechanisms shaped by social relations and power dynamics. Although the reviewed studies do not focus directly on Indonesian coffee farming, they provide crucial

insights into how access to assets such as human, social, natural, financial, and physical capital is shaped by factors like kinship networks, gender, group membership, literacy, and institutional affiliations. These findings demonstrate that formal programmes and rights alone do not guarantee equitable access; rather, benefits are filtered through informal norms, relational positioning, and uneven power structures. Applying this framework to coffee farming in Lampung can support a more nuanced understanding of how farmers perceive and navigate these mechanisms, contributing to the development of more inclusive and contextually grounded strategies for improving livelihood outcomes.

This section has explored the livelihood assets and strategies of smallholder coffee farmers in Indonesia, revealing both opportunities for resilience and persistent barriers to sustainability. Drawing on the SLF, it has examined the significance of five capitals, human, social, natural, financial, and physical, and how they underpin farmers' capacity to sustain livelihoods. Despite their centrality, these assets are often unequally distributed, with farmers facing entrenched constraints such as insecure land access and limited financial services. While farmers employ a range of strategies, such as diversification, participation in OFGs and certification schemes, their effectiveness is frequently limited by structural inequities and inconsistent access to necessary resources.

To deepen this analysis, the ToA has been used to illuminate how access to livelihood assets is mediated not only by formal rights but also by informal mechanisms, including social networks, institutional relationships, and broader power dynamics. This theoretical lens has helped to reveal how social relationships and local conditions shape who is able to access and benefit from resources. The reviewed literature, from cocoa farming in Ghana to land use in South Africa, demonstrates that even well-intentioned interventions like certification or training schemes can add to existing inequalities when they fail to account for informal norms and differentiated social positioning. While not centred on Indonesian coffee farming, these studies provide useful comparisons that highlight the significance of social capital, collective action, and institutional influence in shaping access to resources.

Importantly, this section has identified significant gaps in the current literature, particularly the limited attention to farmers' own perspectives. Most studies assess access and strategies through institutional or organisation viewpoint, overlooking how farmers themselves view benefit flows, decisions, and barriers. These gaps are directly relevant to this study's research questions, which seek to understand the lived experiences and interpretations of coffee farmers in Lampung. Integrating the SLF's attention to assets with the ToA's focus on relational mechanisms offers a more holistic understanding of access dynamics and livelihood strategies.

Together, these frameworks provide a powerful foundation for examining how coffee farmers in Indonesia engage with livelihood challenges. Future research that centres farmers' voices and perceptions will be essential to designing equitable interventions that not only expand access to key assets but also address the structural and relational factors that determine who is able to benefit from them.

2.2 Organised Farmer groups

OFGs in Indonesia play a central role in improving smallholder farmers' access to resources, markets, and institutional support. The four main types of OFGs, Farmer Groups (*kelompok*

tani), Joined Farmer Groups² (Gapoktan), Cooperatives, and KUBEs (Joint Business Groups), they facilitate collaboration, knowledge exchange, and resource pooling. OFGs contribute to access to of human, social, financial, and physical capital in rural communities. However, their structure, effectiveness, and outcomes differ widely depending on the local context. This section examines research highlighting the distinct functions and outcomes associated with each type of OFG, focusing on their role in enhancing farmers' livelihoods and identifying critical research gaps. In particular, it highlights the limited attention to farmers' own perspectives, the uneven distribution of benefits, and the need for greater insight into how OFGs shape environmental sustainability and long-term resilience.

The literature consistently identifies four types of OFG in Indonesia: Farmer Groups (kelompok tani) form the basic unit, supporting cooperation, supply chain connections and training, often farmers are members of a farmer groups as well as a member of a cooperative or KUBE. Joined Farmer Groups (Gapoktan) are created by several farmer groups across different villages joining together to combine harvests and improve collective sales to larger buyers. Cooperatives are legally registered, member owned organisations that aggregate and market coffee, manage certification, and connect farmers to domestic and export markets. KUBEs (Joint Business Groups) are not legal entities like cooperatives but they must be verified by village and sub-district leaders to access support from the government. They are formed from 5–30 micro-businesses joining together, their primary role is handling tasks such as cleaning, drying, and transporting coffee beans to roasting companies or exporters (Ibnu et al., 2018; Khaerah et al., 2023; Rifin & Naully, 2020). (see Findings: 5.1 for further details of OFGs in Indonesia)

2.2.1 The Role of OFGs on Human and Social Asset access and outcomes.

The concept of human and social assets is central to the work of OFGs in Indonesia, with several studies highlighting how these groups contribute to the development of farmers' skills, knowledge, and community networks (Ibnu et al., 2018; Khaerah et al., 2023; Kobak et al., 2024; Mahendrayanti et al., 2020; Rahmah et al., 2023; Rifin & Naully, 2020; Sulaksana & Dwirayani, 2021). Human assets, in this context, refer to farmers' skills, knowledge, and education, while social assets are concerned with the social networks and relationships that are built through OFG membership.

In rural Indonesia, farmer groups, Gapoktans (joined farmer groups), cooperatives, and KUBEs serve as platforms for building and strengthening both human and social assets. These groups facilitate access to assets including training, equipment, and market opportunities, contributing to human capital. Additionally, by fostering collaboration and community-building, they enhance social capital, creating networks, connections and mutual support, however the enhancement of social and human capital can vary across the different types of OFG and locations (Ibnu et al., 2018; Khaerah et al., 2023; Kobak et al., 2024; Mahendrayanti et al., 2020; Rahmah et al., 2023; Rifin & Naully, 2020; Sulaksana & Dwirayani, 2021).

Studies by Ibnu et al., (2018), Kobak et al., (2024), Mahendrayanti et al., (2020) demonstrate the importance of farmer groups as drivers of collective empowerment, offering training, knowledge sharing and opportunities to build social capital. These groups not only provide

² 'Joined Farmer Group' is the terminology used by the participants in this study. They described this kind of OFG as farmer groups 'Joining' together so this term was kept to reflect their intended meaning.

training but also facilitate access to markets and some provide financial resources, further enhancing farmers' livelihoods. However, these benefits were not always accessible to all members and all groups. For instance, Mahendrayanti et al., (2020) found that, while 56.7% of respondents viewed their group as a learning forum, 50% were unable to access learning resources, and only 26.7% saw the group as a means of developing cooperation with other stakeholders. This suggests that significant work remains to be done for groups to realise their full potential in terms of social and human capital development.

Research has shown that Gapoktans can offer organisational benefits, such as work schedule management, which allows members to better manage their workloads and support each other in ways that non-joined groups may not (Khaerah et al., 2023). Research in Papua highlights that although this form of collaboration is possible in non-joined farmer group it does not appear to be common place (Kobak et al., 2024). This highlights the role of Gapoktans in fostering social ties and collaboration among farmers, further enhancing social capital in rural communities (Khaerah et al., 2023).

Cooperatives play a significant role in the development of human and social assets, although research in this area remains somewhat limited. Rombaello et al., (2024) studied a cooperative in Tana Toraja, South Sulawesi Province, Indonesia, and rated the cooperative as "excellent" in terms of social and knowledge indicators. The research found that the cooperative facilitated knowledge exchange between members and across generations, as well as serving as a space to generate motivation and provide access to resources. The cooperative also acted as a route for access to the government, training, and extension services, with the implementation of policy through the cooperative being key to improving the quality and capabilities of its members. Interestingly, the study sample consisted of 90% female members and 10% male, which is unusual. While this provides insight into the composition of the cooperative, it may limit the generalisability of the findings.

According to Rifin & Naully., (2020), cooperatives help members gain access to both domestic and export markets, improving financial returns for farmers through direct export trade. While the social benefit of direct relationships with buyers (both domestic and export) is acknowledged, the research does not investigate the social connections and networks these relationships build, nor their broader impact on social capital.

By acting as collective organisations, cooperatives enable farmers to pool resources, share knowledge, and access markets (Ibnu et al., 2018; Rifin & Naully, 2020). However, despite these clear connections to social and human capital, research on cooperatives remains somewhat limited. Further exploration into how cooperatives strengthen social networks and contribute to community resilience would provide a more comprehensive understanding of their role beyond financial outcomes.

The KUBE despite their smaller financial capacity and more informal structure, may also play a role in building social and human capital. However, research on KUBEs remains scarce. Ibnu et al. (2018) note that KUBEs provide a platform for farmers to collaborate on tasks such as cleaning, drying, and transporting coffee beans. These groups can also access government support if registered with the Ministry of Social Affairs. However, the specific impact of KUBEs on human and social assets is not clearly identified in existing research.

A key reason for the lack of research on cooperatives and KUBEs may stem from the dual membership that many farmers hold in farmer groups and either a cooperative or KUBE. This

dual membership complicates the ability to untangle the specific benefits farmers gain from each organisation. This issue could have been a valuable area of focus in Rahmah et al. (2023), who conducted a study on the social life cycle assessment of farmer groups. Unfortunately, the study focused solely on farmer groups, with no mention of cooperative or KUBE membership, leaving a gap in understanding how these multiple affiliations interact and influence social and human assets.

The studies reviewed show that farmer groups, cooperatives, and KUBEs each play unique roles in the supply chain. The main difference lies in the emphasis of research: farmer groups and Gapoktan are more focused on social empowerment and collaboration, while cooperatives and KUBEs research are more geared towards economic outcomes and market access.

One important contribution from Khaerah et al. (2023) Robaello et al. (2024) and Mahendrayanti et al. (2020) is the recognition of the social benefits provided by these groups. These studies argue that farmer groups strengthen social ties which are important for improving farmers' well-being. In comparison, Rifin and Naully (2020) focus on the economic advantages of social capital, showing that access to global markets and direct relationships with buyers can improve farmers' financial outcomes. However, they give less attention to the social aspects of cooperative membership, particularly in terms of how these organisations directly influence social capital.

While the literature on human and social assets highlights the positive contributions of farmer groups, cooperatives, and KUBEs, several important gaps remain. Most existing studies focus on the immediate or structural benefits of group membership, such as access to training and market linkages, yet there is limited attention to the long-term effects of these organisations on social capital development and resilience within smallholder farming contexts in Indonesia. The Sustainable Livelihoods Framework (SLF) suggests that such assets play a vital role in enhancing adaptability and reducing vulnerability, but the extent to which OFGs contribute to sustainable livelihoods remains underexplored.

Critically, research to date rarely incorporates farmers' own perspectives on how these organisations shape their access to and use of livelihood assets. The ToA emphasises the importance of examining how power relations, social positioning, and institutional dynamics shape actual benefit flows. Yet, Ibnu et al. (2018) remains the only study in this literature set that incorporates farmer perspectives, and it does so without engaging with the SLF or ToA frameworks. As a result, the literature offers little insight into how farmers themselves interpret the value of OFGs, how they assess their effectiveness in accessing assets, or how informal mechanisms within these groups influence access assets and the ability to benefit from access.

2.2.2 The Role of OFGs on Financial and Physical Assets access and outcomes.

OFGs can play a central role in improving farmers' access to capital, market opportunities, infrastructure, and resources. They facilitate the pooling of resources, which enables farmers to potentially improve productivity, increase income, and enhance the physical infrastructure required for farming, they also enhance connections to markets and other stakeholders potentially improving selling options and bargaining power. However, research has shown that these benefits are not always equally distributed across OFGs in Indonesia (Hartatri et al., 2019; Ibnu et al., 2018; Khaerah et al., 2023; Kobak et al., 2024; Mahendrayanti et al., 2020; Rifin & Naully, 2020; Rombeallo et al., 2024; Sulaksana & Dwirayani, 2021).

In rural Indonesia, farmer groups, Gapoktans, cooperatives, and KUBE offer varied benefits in terms of financial support and physical resources, with each organisation serving a role in enhancing both financial and physical assets (Ibnu et al., 2018; Khaerah et al., 2023; Rifin & Naully, 2020).

Research highlights that some farmer groups can enhance financial assets by providing access to credit, however some groups were found to struggle with raising their own capital and instead relied on government support, cooperatives or other financial institutions (Mahendrayanti et al., 2020; Sulaksana & Dwirayani, 2021).

Khaerah et al. (2023) note that Gapoktans can offer loans to members, which increases their financial resilience. This ability to provide capital sets Gapoktan apart from non-joined farmer groups (as highlighted by Mahendrayanti et al. (2020)), which typically lack the resources to support their members in this way unless they access support from the government. Khaerah et al. (2023) also reveal that Gapoktan helps organise work schedules, facilitating cooperative labour and resource management, which in turn enhances the physical assets of farmers by increasing access to labour. This study however, found that accessing farming equipment (such as hoes and fertiliser) was difficult and the support offered to farmers in this area was categorised as “low”.

Cooperatives in Indonesia are particularly well-positioned to enhance financial assets due to their more formal structure and larger scale. They offer market access through direct connections to both domestic and export markets. According to Rifin & Naully (2020), cooperatives’ ability to engage in direct export helps farmers secure better prices by cutting out middlemen. This benefits farmers’ financial outcomes by improving their income and profits. However, the research by Rifin & Naully (2020) focuses primarily on the economic benefits and market access provided by cooperatives and does not fully examine the infrastructure support and physical assets cooperatives offer to their members. Further investigation into how cooperatives contribute to enhancing physical infrastructure, such as access to storage or transportation networks, would provide a more comprehensive understanding of their role.

In contrast, KUBEs provide a different model, especially for smallholder farmers who may not have access to the formal financial systems that larger cooperatives provide. Ibnu et al. (2018) describe how KUBEs facilitate collaborative work and improve physical assets by pooling resources for tasks such as cleaning, drying, and transporting coffee beans. These groups typically consist of micro-businesses, and although their assets and capital are smaller than those of cooperatives, they still provide services that support farmers’ physical infrastructure. However, due to their informal nature as non-legal entities, KUBEs face challenges in securing long-term funding and external investments (Ibnu et al., 2018). As Ibnu et al. (2018) note, KUBEs depend on government support and must be verified by village and sub-district leaders to qualify for government capital. This support is often essential for the group’s financial stability and ability to enhance physical resources, such as storage facilities and equipment.

The main distinction between KUBEs and cooperatives lies in their access to financial resources and scale of operations. While cooperatives can provide larger amounts of capital, including advance payments to members, KUBEs rely on contributions from their members or government support. As non-legal entities, KUBEs are smaller in scale and less able to access the formal financial system. Despite this, KUBEs still play an important role in

enhancing financial assets at the community level by pooling resources and providing market linkages that improve income and productivity for smallholder farmers (Ibnu et al., 2018).

The studies reviewed highlight that while farmer groups, Gapoktans, cooperatives, and KUBEs contribute to financial and physical assets, their focus differs. Cooperatives have a clear advantage when it comes to market access and financial capital. They can provide advance payments to members, improving financial capital (Ibnu et al., 2018; Rombeallo et al., 2024). However, these advantages are primarily accessible to farmers who are part of formalised structures such as cooperatives. In contrast, KUBEs and Gapoktans tend to be more flexible and often provide immediate assistance to farmers, such as loan access for household needs and resource pooling (Ibnu et al., 2018; Khaerah et al., 2023). However, the lack of formal legal status for KUBEs limits their ability to scale up and access large-scale funding, which in turn restricts their capacity to provide the same level of financial stability or physical infrastructure that cooperatives can offer. Khaerah et al., (2023) found that although Gapoktans were able to provide financial assistance they struggle to provide access to physical resources for farmers (Khaerah et al., 2023).

One common theme across all studies is the importance of collaboration and resource pooling. As noted in the study by Khaerah et al., (2023), Gapoktans can provide loans to its members, along with its organisational capacity to manage workloads and share resources. These are important assets that non-joined groups may not all have (Khaerah et al., 2023; Mahendrayanti et al., 2020). However, Ibnu et al., (2018) identified that farmers who were part of an OFG including non-joined farmer groups perceive benefits across all domains including economic and social and Kobak., (2024) identified a farmer group where collaboration and resource sharing was common place indicating that these physical and financial assets is accessible to single farmer groups, further research is needed in this area to fully understand this potential.

Similarly, Rifin & Naully (2020) show that cooperatives, through direct export, can secure better pricing for coffee, which directly impacts the financial assets of farmers. However, the studies also highlight the need for further research into the physical infrastructure offered by these groups, particularly in terms of storage facilities, transportation networks, and processing capacity, which are key to the successful integration of farmers into the wider market economy.

While the literature on financial and physical asset access highlights the potential benefits of farmer groups, cooperatives, Gapoktans, and KUBEs, several important gaps remain, particularly in relation to how these benefits are perceived and experienced by farmers themselves. Most existing studies assess asset access in terms of economic or organisational outcomes, with limited attention to how farmers understand and navigate these processes on a day-to-day basis.

This research addresses that gap by focusing on how smallholder farmers in Lampung perceive their access to financial and physical assets, including the benefits they associate with participation in farmer groups. The study also explores how these farmers use strategies to gain access to critical resources, such as credit, equipment, or fertiliser, and how they perceive the roles of external stakeholders in facilitating or constraining access to these assets. While prior research often describes the role of OFGs in facilitating market access or pooling resources, it rarely centres farmers' interpretations of these dynamics or examines how such support structures function from their perspective.

2.2.3 The Role of OFGs on Natural Assets access and Environmental Impacts

Research on the natural assets and environmental impacts of OFGs in Indonesia remains relatively limited. However, several studies highlight the potential role that farmer groups, Gapoktans, cooperatives, and KUBEs play in enhancing sustainability and natural resource management. These organisations can contribute to promoting environmentally friendly farming practices, such as organic farming, shade-grown coffee, and soil conservation (Kobak et al., 2024; Rifin & Naully, 2020; Rombeallo et al., 2024).

Kobak (2024) provides some insights into the role of farmer groups in environmental sustainability and natural asset management. This study highlights how organic fertilisers and the use of shade plants help preserve soil health and biodiversity, leading to both better coffee quality and more sustainable farming practices. While Kobak (2024) provides valuable insights into sustainable practices like shade-grown coffee, the study does not provide specific data on the long-term environmental outcomes or the role of the farmer group as a unique example of sustainable farming. The study's qualitative approach focuses on the potential of these practices, but quantitative data on environmental indicators, such as carbon footprint, soil quality and water usage, would offer a more comprehensive assessment of the use of natural resources and environmental impact of the practices. Further analysis of the role of the group in the decisions to action such practices would be of benefit to sustainable coffee research and also how these practices are funded.

In a similar vein, Rahmah et al. (2023) assess the social life cycle of coffee farming in West Java. They find that coffee managed by farmer groups scores highly in terms of social sustainability. However, their study does not sufficiently address the environmental or natural resources dimensions.

Cooperatives and KUBEs have not been widely studied for their environmental impact. Rifin & Naully (2020) focus primarily on the economic outcomes of cooperatives, particularly regarding market access and direct export opportunities. They suggest that the increasing demand for sustainable products through certifications could lead cooperatives to adopt eco-friendly practices, yet the study does not directly address how cooperatives implement environmental sustainability or promote sustainable farming practices. The absence of direct exploration into eco-friendly farming practices within cooperatives highlights a significant gap in understanding the role of cooperatives in natural resource management.

Similarly, Ibnu et al. (2018) discuss OFGs and perceptions of benefits. However, their research offers no substantial evidence on how OFGs contribute to environmental sustainability or farmer perceptions of environmental sustainability.

Studies into OFGs tend to centre on the social and economic benefits of membership. While this is valuable, it leaves a gap in understanding how OFGs contribute to environmental stewardship and natural resource management. There is a need for a more focused study on the environmental practices promoted within OFGs and how these contribute to long-term ecological sustainability. While many studies examine the environmental impacts of certifications, which indirectly involve OFGs as membership is often a prerequisite for certification, there is a lack of research specifically investigating the environmental impacts of OFG membership in isolation.

There is also limited exploration of how farmers perceive the sustainability of their own livelihoods when faced with changing access to natural assets. Most studies rely on

economic or ecological indicators to assess sustainability, without examining how farmers themselves understand or engage with environmental practices. Research that centres on farmer perspectives could provide important insights into the relevance and feasibility of sustainability initiatives within OFGs.

This study responds to these gaps by examining how farmers perceive access to natural assets and the environmental dimensions of their livelihoods. The research focuses on how farmers understand and engage with environmental conservation, and how they relate these practices to their broader livelihood strategies. In doing so, it highlights farmers' own interpretations of sustainability, their perceived responsibilities, and the role that access to natural resources plays in shaping environmentally conscious decisions.

OFGs play a significant role in shaping smallholder farmers' access to key livelihood assets in Indonesia. Through farmer groups, Gapoktans, cooperatives, and KUBEs, farmers can access training, markets and credit, while building social networks and collaborative practices. However, most existing literature focuses on the structural and economic functions of OFGs, often overlooking the ways farmers themselves experience, interpret, and navigate these organisations.

This review has highlighted several key gaps. First, few studies explore farmers' own perceptions of how OFG membership affects their access to human, social, financial, physical, and natural assets. Second, while frameworks like the SLF and the ToA offer valuable tools for analysing asset access and the mechanisms that shape it, they are rarely applied in this context. As a result, there is limited understanding of the power relations, social positioning, and institutional dynamics that influence the benefits of OFG membership and how. Third, there is limited research specifically exploring how OFGs influence farmers' access to natural assets or support environmentally sustainable practices, and even less that examines how farmers themselves perceive and engage with these practices as part of their broader livelihood strategies.

This study responds to these gaps by investigating the perspectives of smallholder coffee farmers in Lampung, focusing on how they perceive their access to key assets, the strategies they use, and the social and institutional actors that shape these processes. The study pays particular attention to how OFG membership is experienced and valued by farmers, how they perceive barriers to asset access, and how environmental sustainability fits into their livelihood concerns. By focusing on farmers' perspectives and applying both the SLF and ToA, this research provides a more nuanced, context-sensitive understanding of how OFGs are experienced by farmers and how they are perceived to support or hinder equitable and sustainable rural livelihoods.

2.3 Governance, Power, and Inequality in Global Coffee Supply Chain

The global coffee supply chain is an example of the transformations that have reshaped agricultural trade under globalisation. From producer-country regulation under international commodity agreements to corporate-led governance shaped by certification and consumer preferences, coffee offers a rich case for examining the distribution of power and the implications of governance structures. This section of the literature review investigates the governance of coffee value chains, with a particular focus on power relations, stakeholder roles in decision-making, and resulting inequalities.

It draws on key analytical frameworks, Gereffi et al.'s (2005) governance typology, Dallas et al.'s (2019) dimensions of power, and Gaventa's Powercube (2009, 2021), frameworks that have been used to map how power and authority operate across different supply chains. This review examines research focusing on how dominant actors influence standard-setting, decision-making, and value distribution, and how governance structures shape opportunities and create barriers for smallholder producers.

While the existing literature offers valuable insights into structural dynamics and institutional arrangements, it offers limited engagement with how power is perceived or experienced by farmers themselves. This review therefore also highlights significant gaps around producer agency, local interpretations of power, and the everyday realities of navigating governance systems, gaps which are addressed by the present research.

2.3.1 Governance Structures in Coffee Supply Chains

Gereffi et al., (2005) provide a typology of GVC governance, market, modular, relational, captive, and hierarchical, based on transaction complexity, codifiability, and supplier capabilities (see figure 2).

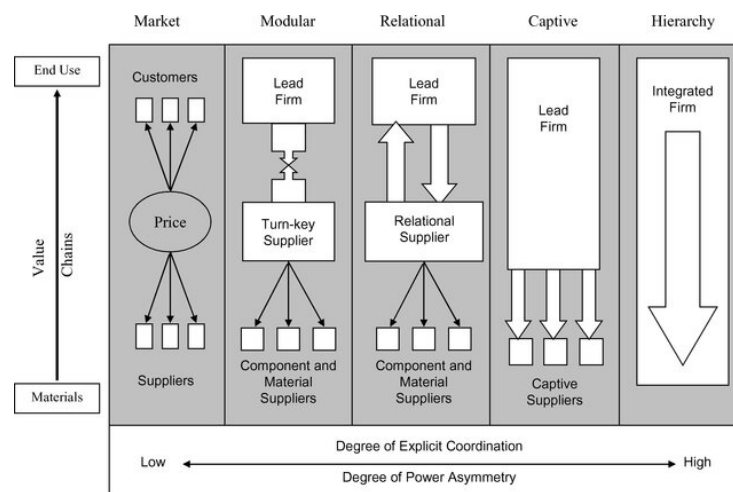


Figure 2 The five types of governance in supply chains (Gereffi et al., 2005).

Market governance allows businesses to exchange goods and services with minimal coordination and close relationships. Modular governance is where suppliers follow detailed customer requirements but maintain the flexibility to work with multiple clients. Relational Governance involves firms building strong, trust-based partnerships, relying on close collaborations and relationships to manage complex tasks. Captive governance involves lead firms exercising tight control over smaller, dependent suppliers, limiting their ability to operate independently. Hierarchical governance is where a single company manages production and processes internally, maintaining full control throughout the supply chain (Gereffi et al., 2005).

Coffee value chains exhibit a range of these governance types depending on the product segment and regional context. In Indonesia, governance varies by region and market. Suryaniadi et al., (2023) identify the Robusta coffee chain in Bogor as largely market-based, with price and volume acting as the primary coordination mechanisms. However, traders and processors hold underlying power by providing credit and influencing pricing. In contrast, Arifin, (2010) and Neilson, (2007) examine Arabica-producing regions where sustainability certifications, quality standards, and traceability systems introduce modular or captive forms

of governance. Here, lead firms (such as Starbucks) and certification bodies set standards that producers must follow, often with limited negotiation.

Neilson (2007) demonstrates that specialty coffee buyers often control multiple stages of the value chain through vertical integration and their own quality standards. These systems give buyers significant influence over how coffee is produced and evaluated indicating hierarchical governance systems. As a result, smallholder farmers have limited input into decision-making, and global firms' priorities tend to shape local production practices.

2.3.2 Power in the Coffee Value Chain

Power within global coffee chains is unevenly distributed, favouring stakeholders in consuming countries, particularly roasters, traders, and retailers. Grabs & Ponte (2019) trace this through three historical phases: the International Coffee Agreement (ICA) phase (1962–1989), post-ICA '*liberalisation*' phase (1989–2007), and the current '*diversification and reconsolidation phase*' (2008– present). In the current phase, this paper highlights that multinational buyers and roasters have bargaining power (control through direct negotiation), demonstrative power (setting standards by indirect influence), institutional power (collective influence through formal structures), and constitutive power (influence through collective norms), shaping how coffee is sourced, processed, and perceived (Dallas et al., 2019; Grabs & Ponte, 2019).

Gaventa's Powercube framework enriches our understanding by unpacking power across three interlinked dimensions: forms (visible, hidden, invisible), spaces (closed, invited, claimed), and levels (local, national, global) as illustrated in figure 3 (Gaventa, 2009, 2021).

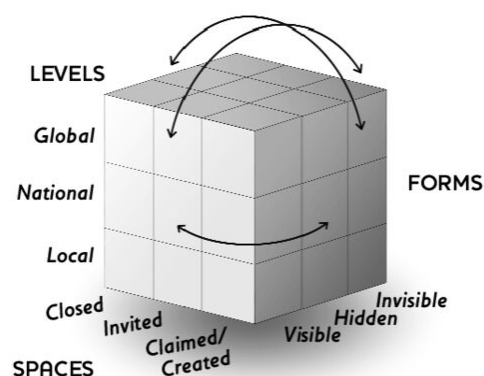


Figure 3 The Powercube (Gaventa, 2009)

Within coffee supply chains buyers exercise visible power through pricing mechanisms and standard-setting (Arifin, 2010; Gaventa, 2009). Hidden power operates through agenda-setting and exclusion, for example, when producers are omitted from decisions about what constitutes quality or sustainability (Arifin, 2010; Grabs & Ponte, 2019; Neilson, 2007). Invisible power shapes what producers see as normal or necessary, leading them to adopt externally defined standards for quality and sustainability (Brugger, 2017). Brugger, (2017), applying the Powercube to Fairtrade tea production in Nepal, finds similar dynamics. The study shows how producers adopt certification norms and quality standards defined by distant actors, often without fully considering the implications. This demonstrates how invisible power makes imposed systems seem normal, reducing the chances of resistance or

change. As Neilson (2007) shows, these corporate-led standards often remove producers from decision-making and overlook local perspectives, limiting their ability to influence how their own coffee is valued.

Neilson (2007) shows these dynamics in the specialty coffee segment, where discursive (an element of invisible) power enables Northern actors to define “quality” in ways that exclude producers’ knowledge and priorities. Similarly, Arifin (2010) highlights how sustainability standards created by buyers often bring in outside rules and ideas, which end up influencing how coffee is produced at the local level, an exercise of hidden and visible power.

The Powercube also emphasises the spatial dynamics of power. Within coffee supply chains decisions regarding sustainability standards and quality are frequently made in closed spaces dominated by large roasters and certifiers, without meaningful producer participation (Grabs & Ponte, 2019; Neilson, 2007). Occasionally, invited spaces open for dialogue with producers, such as sustainability workshops or NGO-led consultations, but these can serve more to inform or manage compliance than to enable meaningful influence (Arifin, 2010; Gaventa, 2009). Claimed spaces, where producers or cooperatives assert their own priorities, remain limited and under-resourced. In Indonesia, for instance, coffee-farmer groups and cooperatives have been revived in some areas like Sumberjaya, but many remain fragile due to financial capital shortages, limited member engagement, or top-down formation processes (Arifin, 2010; Suryaniadi et al., 2023).

While this literature provides valuable insights into the structural forms and mechanisms of power within global coffee supply chains, it offers limited understanding of how farmers themselves interpret and experience these dynamics. This study addresses that gap by focusing on farmers’ perceptions of power in the Indonesian coffee value chain.

Rather than empirically mapping how power operates through each dimension of the Powercube, this research draws on the framework conceptually to interpret how farmers perceive access, control, and influence within supply chains. The Powercube was not used as a formal analytical framework but served as a conceptual aid to support deeper understanding of power relations in conjunction with the SLF and ToA. It explores how producers identify key actors and their roles, understand decision-making processes, and reflect on their ability to influence or adapt to standards and rules set by more powerful stakeholders. In doing so, this study contributes a bottom-up perspective that complements existing literature, adding context-sensitive insight into the perceived hierarchies and exclusions that shape rural livelihoods in global markets.

2.3.3 Decision-Making and Stakeholder Roles

Grabs and Ponte (2019) observe that even in quality-focused segments, final assessments and purchasing decisions lie with roasters, who interpret and apply standards based on shifting consumer preferences through demonstrative power. This aligns with Gaventa’s notion of *closed spaces*, arenas where only certain actors are permitted to decide and influence key factors such as quality standards.

Neilson (2007) and Arifin (2010) document how producers are largely excluded from setting standards or interpreting sustainability, despite being central to its implementation. In these systems, even invited spaces often function as tools of control, reinforcing corporate narratives under the guise of participation. For example, capacity-building efforts such as

trainings often function as invited spaces in which information is transferred to align producer practices with externally defined standards (Arifin, 2010; Gaventa, 2021).

Brugger (2017) similarly observes that in the Fairtrade tea sector, training sessions and audit processes often serve to enforce conformity rather than to invite negotiation or local adaptation. These invited spaces are framed as participatory, but in practice they operate as mechanisms of top-down control, reinforcing buyer-led governance under the guise of empowerment.

In contrast, Suryana et al. (2023) report that in market-based chains, farmers retain some autonomy to choose buyers. However, this autonomy is constrained by unequal access to credit, market information, and infrastructure. Decision-making remains structurally tilted toward better-resourced intermediaries and processing firms.

In conclusion, decision-making within the coffee value chain remains predominantly controlled by roasters and other corporate actors, particularly within quality-focused segments. Through mechanisms such as demonstrative power and the creation of closed and invited spaces, these stakeholders maintain the authority to set and interpret quality and sustainability standards, often with limited input from producers. Although some market-based chains allow farmers a degree of autonomy in choosing buyers, this choice is constrained by systemic inequalities in resources and market access. While much of the literature explains how these decision-making structures operate, it rarely considers how smallholder farmers understand, experience, or respond to these dynamics in their everyday interactions with buyers and intermediaries.

This study addresses that gap by focusing on farmer perspectives on decision-making within the Indonesian coffee supply chain. It explores how producers perceive their role, influence, and ability to respond to or shape the standards imposed by more powerful actors. By centring these lived experiences, the research offers insight into the informal strategies and adaptations that producers employ in response to structural barriers. This contributes a bottom-up view that is often missing and highlights the need for governance frameworks that engage more directly with the perspectives and priorities of those most affected by supply chain decisions.

2.3.4 Inequalities

Persistent inequality is a defining feature of global coffee value chains. Grabs and Ponte (2019) show that while consuming countries' share of value has increased to nearly 80%, producing countries' share has declined to 13%. Certification and specialty markets have not substantially reversed this trend.

Arifin (2010) and Neilson (2007) argue that certification schemes, while offering access to high-value markets, often exclude smallholders who lack the resources to comply. This reflects hidden power in the Powercube, where rules appear neutral but systematically disadvantage certain actors. Producers may adopt externally imposed standards of quality and sustainability, even when these conflict with local knowledge or practices, illustrating invisible power (Grabs & Ponte, 2019; Neilson, 2007).

Suryana et al. (2023) find that only a small proportion of producers access premium value chains, while most remain in bulk markets with low returns. The governance structure in these cases sustains structural inequality by keeping high-value segments exclusive and inaccessible to the majority of producers. Neilson (2007) also highlights inequalities in

property control. While buyers capitalise on geographic branding, producers often lack legal frameworks and institutional capacity to secure Geographical Indications, limiting their ability to benefit from the distinctiveness of their coffee.

The Powercube's insight that power operates across levels is also evident here. Local inequalities, such as buyer and roaster dominance, are shaped and sustained by global governance systems, which set the terms of trade and certification. Without supportive institutional frameworks at national and local levels, producers remain unable to impact change.

However, while existing research successfully identifies structural inequalities and systemic exclusions, it provides limited insight into how these dynamics are experienced and interpreted by farmers themselves. There is a critical gap in understanding how smallholders perceive their position within value chains, and how they interpret the outcomes of these arrangements.

This study responds to that gap by exploring farmers' perceptions of inequality within the Indonesian coffee sector, particularly regarding access to assets. It highlights how producers view the existing arrangements and what strategies they use to navigate the processes. By focusing on perceptions, the research offers context-specific insights into the lived experience of inequality, insights that are often overlooked in broader structural analyses.

Governance within coffee supply chains is inherently complex and marked by persistent inequalities. Certification schemes and specialty markets, while offering potential inclusion, often reinforce existing power imbalances. Gereffi's governance typology provides a structural lens to understand coordination within value chains, highlighting the varying roles of market, modular, relational, captive, and hierarchical governance. Meanwhile, Dallas et al. (2019) present a complementary typology of power, illustrating how actors exert influence through bargaining, demonstrative, constitutive, institutional, and discursive power. Gaventa's Powercube further enriches this analysis by exploring how power manifests in visible, hidden, and invisible forms across different spaces and levels.

Empirical evidence from Indonesia demonstrates how power dynamics play out, with smallholders often confined to market-based or captive governance structures and limited participation in decision-making processes. Despite opportunities for dialogue, spaces for producer engagement can often be either closed or symbolic, offering little real influence. Without significant support for grassroots initiatives and structural reforms, smallholders remain at a disadvantage within systems shaped by more powerful actors.

However, while previous research offers valuable insights into structural inequalities and institutional arrangements, they offer limited insight into how farmers themselves understand and navigate these power dynamics. Much of the existing literature focuses on the organisation and distribution of power but rarely centres the lived experiences of smallholder farmers.

This study addresses these gaps by focusing explicitly on farmers' perspectives. Drawing conceptually on Gaventa's Powercube to complement the integrated SLF and ToA frameworks, it examines how producers perceive access, control, and influence within Indonesian coffee value chains. By interpreting how farmers understand decision-making, identify and understand the roles of stakeholders, and respond to barriers, the research offers a bottom-up view of power and relationships that complements structural analyses.

Such an approach is particularly relevant in contexts where producers have limited formal influence but may still exercise agency through informal strategies. By highlighting these perceptions and practices, the study contributes to more context-sensitive understandings of governance and inequality and underscores the need for governance models that engage meaningfully with the voices of producers.

In doing so, the research not only fills a notable empirical gap but also encourages future studies to integrate farmer perspectives more centrally in discussions of power, governance, and value chain development.

2.4 Conclusion: Literature Review

This literature review has examined existing research relevant to understanding how smallholder coffee farmers in Lampung, Indonesia, perceive and experience access to livelihood resources, benefit flows, and vulnerabilities. The review was structured in three interrelated parts: the first assessed research using the SLF and the ToA to explore how access to human, social, financial, physical, and natural assets is shaped and the strategies used to access these assets. The second evaluated the role of OFGs in mediating asset access and supporting rural livelihoods. The third reviewed research on governance and power within the global coffee value chain, highlighting the frameworks that help reveal the structures and exclusions shaping producer experiences.

Each section identified important contributions and persistent gaps. While the SLF and ToA have offered valuable insights into livelihood systems and mechanisms of access, few studies apply them directly to Indonesian coffee farmers. Even fewer explore these frameworks through the lens of farmers' own interpretations. Similarly, although research on OFGs highlights their potential to enhance asset access, most studies focus on structural or short-term benefits, offering limited insight into how farmers perceive the roles and impact of these groups. Finally, studies on governance and power provide robust structural analyses, but seldom capture how producers themselves experience, navigate, or respond to the inequalities embedded within global supply chains.

A consistent gap across all three areas is the lack of research that centres farmer perspectives. The literature has limited engagement with how farmers understand their own positions within livelihood systems, how they define and access key assets, perceive the roles of intermediaries and OFGs, and interpret the flow of benefits and influence in supply chains. This research addresses that gap by offering a context-sensitive, grounded account of how farmers in Lampung experience access, control, and barriers, contributing new insight into how more equitable and inclusive support systems might be designed.

3 Methodology and methods

This chapter outlines the research design, methods, and analytical approaches used to investigate smallholder coffee farmers' perceptions of livelihood assets, access, benefit flows, and vulnerabilities in Lampung, Indonesia. The study draws on a mixed-methods approach grounded in qualitative inquiry, guided by an integrated analytical framework combining the SLF and the ToA. Elements of Constructivist and Structured Grounded Theory were used to inform the analytical process and ensure that findings remained grounded in participants' lived experiences while following a transparent, systematic coding progression.

Data collection involved multiple rounds of semi-structured interviews, surveys, and document analysis, carried out in collaboration with local researchers from the University of Lampung, Dr Ibnu Muhammad and Dr Firda Sari. Their existing relationships with local institutions and farmer networks were instrumental in facilitating access to participants and field sites. I conducted fieldwork in key coffee-producing areas of West Lampung, Tanggamus, and Bandar Lampung between April and July 2023. The study also drew on secondary sources such as government policy documents and certification scheme reports to contextualise and triangulate the primary findings

This chapter outlines the methodological and analytical foundations of the research. It begins by presenting the overarching research aim and questions that guide the study. It then discusses the study's methodological positioning, including its constructivist epistemology and data driven, interpretivist orientation, and explains the rationale for using Grounded Theory. The chapter outlines the research methods used, including semi-structured interviews, surveys, and the integration of secondary data. It introduces the development of the research framework, explaining how the SLF, ToA, and elements of the Powercube informed the design of data collection tools. This is followed by a discussion of how the frameworks were integrated and applied throughout the research process. The final section addresses key methodological considerations, including reflexivity, positionality, ethics, limitations, and the use of AI tools, all of which shaped the design, analysis, and interpretation of the study. Together, these sections provide a comprehensive account of how the research was conceptualised, conducted, and analysed.

3.1 Research aim and questions

3.1.1 Research aim

This study aims to explore how smallholder coffee farmers in Lampung perceive and experience access to livelihood assets, flows of benefits, and livelihood vulnerabilities, in order to understand how stakeholder relationships and institutional processes shape equitable outcomes within the coffee sector.

3.1.2 Research questions

How do smallholder coffee farmers in Lampung perceive and experience access to livelihood assets, benefit flows, and vulnerability, and what do these perspectives reveal about the roles and relationships of key stakeholders in shaping equitable outcomes?

1. *What vulnerabilities and benefit-flow mechanisms shape the livelihoods of coffee farmers in Lampung, and how do farmers understand and interpret these conditions?*

2. *How do farmers in Lampung identify and describe the key livelihood assets available to them, and what benefits do they perceive these assets provide?*
3. *How do farmers in Lampung understand the flow of benefits from key livelihood assets and which actors do they perceive as controlling access to these benefits?*
4. *What are farmers experiences of the livelihood strategies they use to gain access to assets and control over the flow of benefit?*
5. *What are the perceived outcomes of the strategies and current flow of benefit systems in Lampung?*

3.2 Methodology.

This research is influenced by a relativist ontology, meaning that I see reality as something that varies depending on each individual's own experiences and context. Relativism acknowledges that different people can experience and interpret the same situation in different ways because their realities are shaped by their unique circumstances (Bhattacharjee, 2012).

This study is guided by a constructivist epistemology. Constructivism emphasises that we build our understanding through conversations, interactions, and sharing experiences with others (Bhattacharjee, 2012). For my study, this approach helps me understand how coffee farmers in Lampung perceive and describe their experiences in accessing resources and dealing with challenges.

I position my research as being influenced by an interpretivist paradigm. Interpretivism focuses on understanding the meaning behind people's actions and experiences. It recognises that the best way to understand social phenomena is by closely examining the perspectives and meanings that individuals themselves assign to their experiences and each individual may have different experiences and perspectives (Bhattacharjee, 2012; Haydam & Steenkamp, 2020). This aligns well with my study, as I'm specifically interested in the detailed experiences and personal views of coffee farmers about their livelihoods.

Overall, drawing on these methodological perspectives (a relativist ontology, a constructivist epistemology, and an interpretivist paradigm) has guided the study and supported a deeper understanding of the unique perspectives of farmers in Lampung regarding their access to resources, their experiences of vulnerability, and the roles of stakeholders.

My research approach initially used exploratory methods to gain a deeper understanding of coffee farmers' perceptions and experiences. It then moved to descriptive methods to clearly document farmers' livelihoods and their resource access. Finally, explanatory methods help explore how and why certain factors affect farmers' vulnerability and access to livelihood resources, and how these processes ultimately shape the livelihood outcomes that farmers experience.

While policies, standards, and market forces play an important role in shaping farmers' access to resources, this study focuses on how farmers themselves perceive and make sense of these influences. To support this, the research also presents the wider structural factors and processes in detail, including relevant policies and market dynamics to provide the necessary context. By combining this background with farmers' perspectives, the study can

explore both the structures that shape livelihoods and the subjective experiences through which farmers understand them.

3.3 Methods.

3.3.1 Grounded theory method.

I framed my research around Grounded Theory Methodology (GTM) to explore the perceptions and experiences of coffee farmers in Lampung, Indonesia. Grounded Theory is a data driven and flexible approach that allows data collection and analysis to take place simultaneously, supporting the development of theories that are grounded in participants' lived experiences (Charmaz, 2006; Urquhart, 2013). Although I held certain assumptions (see Methodological Considerations: 3.6), I deliberately avoided imposing them on the data and initiated coding as soon as it was collected. This study draws on elements from both Charmaz's Constructivist Grounded Theory and Urquhart's structured approach. While Charmaz (2006) emphasises the co-construction of meaning between researcher and participants, reflexive memo-writing, and interpretation of lived experiences, Urquhart (2013) provides a systematic model for coding and category development. Combining these perspectives allowed me to stay open and responsive to the data while maintaining analytical structure. I began with open, line-by-line coding to generate initial concepts, followed by focused (or selective) coding to identify the most significant patterns. These stages formed the substantive coding phase, which led to the development of core categories. Theoretical coding enabled the identification and understanding of the relationships between the categories.

While in the field, I used NVivo software to carry out line-by-line open coding of interview and survey transcripts. These open codes were grouped into broader code themes, and I examined relationships between them through constant comparison. Throughout the process, I wrote memos to capture reflections, analytical insights, also notes from informal discussions with stakeholders, these insights informed the direction of the study as it progressed. While I did not conduct theoretical sampling during fieldwork due to time and logistical constraints, I remained open to emerging findings and adapted my research questions to reflect the evolving understanding of participants' experiences.

Following the fieldwork, I continued the open coding and category development process, building on insights generated during data collection. I then moved into focused (or selective) coding once no new open codes or themes were emerging. This stage involved identifying the most significant and recurring codes and using them to develop core categories. The process was iterative rather than linear. As I worked through the data, participants' responses often revealed new layers of meaning or unexpected relationships. These insights required me to return to previously coded material to re-examine it with fresh understanding, deepening the analysis as new patterns emerged.

During the theoretical coding phase, I moved away from using NVivo and instead worked with Word documents to organise and analyse the data. I created separate documents for each core category, where I gathered key quotes, analytical insights, and memos. At first, I treated each category independently, but as I engaged more deeply with the material, I began to notice overlaps, patterns, and connections between them. Through this process, I identified relationships and interrelated concepts across categories. These connections marked the early stages of theory development, as I used the core categories to build an

understanding of how they influenced one another and how these relationships shaped the broader patterns observed in the data.

Through this ongoing process, the study generated grounded theories that explain how farmers in Lampung perceive and respond to access constraints, group participation, and livelihood vulnerabilities. Rather than aiming to build a grand or universal theory, these grounded theories remain closely tied to participants' own perspectives and lived realities. They provide the foundation for the findings chapters, offering insights into how structures, relationships, strategies, and perceptions shape the ways farmers manage their livelihoods and the outcomes they experience.

3.3.2 Case study design.

I adopted a sociological case study design with an interpretive approach which complement GTM. Interpretive case studies involve the collection of data from one or more study cases, and concepts and patterns can be explored through interpreting that data, contributing to theory development (Bhattacharjee, 2012). They provide an in-depth understanding, description, and analysis of a system or individual case, which may include events, groups, or individuals, situated in a particular location and time (Hancock & Algozzine, 2016).

In my study, the case was made up of smallholder coffee farmers in the Lampung region of Sumatra, Indonesia. The interpretive case study design enabled me to examine individual and collective perspectives, relationships, and the social structures influencing access to livelihood resources. This case fits the definition of a case study because it focuses on a specific place, farming system, and time. By studying a particular group of people within their real-life context, I was able to collect rich, detailed data from multiple locations and different types of stakeholders.

My research approach integrated exploratory, descriptive, and explanatory elements. The exploratory phase enabled me to investigate farmers' perceptions and experiences without preconceptions and to adapt the direction of the study as new themes emerged. The descriptive phase allowed me to document the key features of farmers' livelihoods, including how they accessed resources, participated in groups, and interacted with support systems. The explanatory phase then helped me examine how particular factors influenced vulnerability, inequality, and access to resources, and how these processes shaped livelihood outcomes. Together, these approaches reflect the flexible and layered nature of the case study design, allowing me to respond to the complexity of the real-world context while also uncovering patterns that contribute to theoretical understanding (Hancock & Algozzine, 2016).

3.3.3 Semi structured interview and survey development.

I used semi-structured interviews to explore farmers' perceptions and experiences in greater depth. Semi-structured interviews offer a flexible approach to data collection, combining a set of guiding questions with the freedom to explore new ideas as they emerge during the conversation. Unlike structured interviews, which follow a fixed script, semi-structured interviews allow for follow-up questions, enabling the interviewer to clarify responses and uncover deeper insights (Bhattacharjee, 2012, p. 76). This approach is particularly valuable in exploratory research where the aim is to understand individual viewpoints, personal experiences, and complex social dynamics in a real-world context.

I also used surveys to collect both quantitative and qualitative data from coffee farmers. Surveys are a commonly used method in social science research for gathering standardised information from a large number of respondents (Bhattacharjee, 2012). In this study, the survey included a combination of closed-ended questions, which generated numerical data, and open-ended questions, which allowed participants to share more detailed responses in their own words. This mixed-format approach enabled me to capture both the measurable aspects of farmers' livelihoods and the contextual, subjective insights. The survey responses were used alongside interview data to support comparison, identify recurring themes, and broaden the understanding of how farmers experience and navigate issues such as resource access, vulnerability, and group participation.

Both interview and survey questions were initially organised under broad guiding headings during the design phase. As the research progressed, these headings were refined to align more closely with the research framework and the emerging patterns in the data. The table below shows how the initial categorisation evolved into the final analytical categories used in this thesis (see Appendix 1 & 2 for interview guides and surveys).

Original headings	Revised headings
• P1 Decision making	• Roles and relationships of stakeholders • Structures and processes • Livelihood strategies
• P2 Resources	• Livelihood assets • Livelihood strategies • Access to assets • The vulnerability context
• P3 Empowerment	• Roles and relationships of stakeholders • Livelihood strategies
• P4 Connections	• Roles and relationships of stakeholders • Structures and processes
• O1 Environmental outcomes	• Livelihood outcomes
• O2 Economic outcomes	• Livelihood outcomes
• O3 Social outcomes	• Livelihood outcomes

Table 1 Original and revised headings used the development of the survey and interview guides.

Framework influence on survey and interview design

The design of the interview and survey questions was primarily informed by the integrated SLF and the ToA. These frameworks shaped the overall structure and thematic focus of the research tools, particularly in identifying key areas such as livelihood assets, strategies, access mechanisms, and vulnerability.

In addition to these main frameworks, the Powercube (Gaventa, 2006) served as a supplementary influence during the early stages of question development. Although not used as part of the final analytical framework, it helped make me aware of the different forms, levels, and spaces of power that might be experienced within the coffee supply chain. This was especially useful in shaping questions related to stakeholder relationships, decision-

making, and perceptions of agency. The Powercube offered a valuable lens through which to consider how visible and invisible forms of power could shape farmer experiences, even if it was not explicitly applied in the interpretation of findings.

Interview question development

I initially developed the interview guides using the integrated SLF and ToA as a foundation. The questions were structured around the original thematic headings used during the design phase (see table 1) which guided the early focus of the interviews. Different scripts were created for farmers, farmer group leaders, traders, and government officials to reflect their roles and experiences within the coffee supply chain (see Appendix 1- Interview guides). As data collection and analysis progressed, these original headings were refined and reorganised to better align with the core areas of the research framework and the themes that emerged from the data (see table 2).

Revised Framework-Aligned Categories	
1	Supply chain routes
2	Roles and relationships of stakeholders
3	The vulnerability context
4	Structural factors and processes
5	Livelihood assets
6	Livelihood strategies
7	Access to assets
8	Livelihood outcomes

Table 2 Revised Framework-Aligned Categories

Each interview began with introductory questions to help build rapport and understand the participant's personal and professional history within the coffee sector. This was followed by a discussion using a visual supply chain prompt to explore participants' perceptions of how the coffee supply chain is structured and how roles and relationships are experienced (see Appendix 3-Supply chain discussion prompt). The prompt was kept deliberately simple so that it encouraged open discussion rather than directing participants toward specific answers. This was followed by questions focusing directly on perceptions of vulnerabilities.

The main body of the interview was structured around the five capitals of the SLF: human, physical, social, natural, and financial. Within each capital, open-ended questions were designed using SLF and ToA framework to elicit insights about vulnerability, access to assets, mechanisms, stakeholder relationships, and decision-making. I adapted follow-up questions based on participants' responses to explore emerging themes in more depth. This flexible structure allowed rich, context-specific data to be gathered, while still ensuring consistency across interviews for later comparative analysis.

Within the group leader interview guides there were additional questions focusing on the organisation of the groups and the impacts certifications have on the group. The government interview guides had additional questions focusing on policy and programs they had in place to support coffee farmers.

Although the interview questions were originally organised using headings such as 'Decision Making', 'Empowerment', 'Resources', and 'Connections', these were later realigned during analysis to fit more closely with the eight core categories that emerged through coding and theory development (see Table 1 for comparison of original and revised headings).

Survey question development

I developed the survey questions using the integrated SLF and ToA as the foundation. Separate versions of the survey were created for farmers, farmer group leaders, and traders to ensure the content was relevant to each group's role and experience (see Appendix 2-Surveys). A survey was not designed for government officials or researchers because they did not produce coffee themselves.

The survey began with a section on participant background information, including age, education level, type of coffee produced or traded, and geographic location. While the surveys were ultimately analysed using the eight framework-aligned categories (see Table 2), they were initially designed around the original thematic headings (Table 1). The survey questions were organised under the five capitals of the SLF, human, physical, social, natural, and financial capital. Within each capital area, the questions were designed to gather information on vulnerabilities, access to assets, mechanisms, stakeholder relationships, and livelihood outcomes.

I included a mix of closed and open-ended questions. Closed questions provided standardised data such as multiple-choice answers and numeric values (e.g., kilograms of coffee produced per year), while open-ended questions allowed participants to elaborate on their experiences and perspectives in their own words. The surveys were initially drafted in English and then translated into Indonesian using Google Translate. Members of the research team reviewed the translations for accuracy and clarity. The survey instruments were also piloted during the early stages of fieldwork to identify any issues with wording, structure, or comprehension.

The pilot study

Pilot studies are commonly used in social research to test and refine data collection tools before full implementation (Van Teijlingen & Hundley, 2001). My pilot study took place in Sekincau, West Lampung, on the 7th and 8th of May 2023. During this phase, I completed 14 surveys and conducted 3 semi-structured interviews.

The pilot revealed several challenges, particularly in relation to language and clarity. Some survey questions were difficult to translate into Indonesian or caused confusion due to the phrasing used. The enumerators provided verbal feedback on these issues and offered suggestions for clearer wording. Based on their advice, I adapted and rephrased several questions to improve understanding and consistency across translations.

This pilot was also my first opportunity to work closely with the translators and test the interview guides in practice. It helped me estimate the average interview duration and assess the clarity and relevance of the questions. One challenge that emerged was the tendency for some responses to be interpreted rather than directly translated. I addressed this with the research team and clarified the importance of maintaining participants' original phrasing during translation.

The pilot also highlighted where survey and interview tools could be refined. The survey was adjusted to capture clearer contextual information and include more detailed questions on decision-making, infrastructure, and farming practices. The interview guides were significantly shortened and restructured to allow the semi-structured format to flow more naturally, reduce repetition with the survey, and focus more directly on access to resources,

mechanisms of inclusion/exclusion, and decision-making spaces. The final versions were also aligned more closely with the integrated SLF and ToA framework.

A list of key changes following the pilot are provided in Appendix 4.

3.3.4 Secondary data.

Alongside primary data from interviews and surveys, I also drew on a range of secondary data sources to inform key parts of the research. These included government policy documents, academic literature, certification scheme publications, and newspaper reports. This material was particularly important in shaping the findings presented in the “Structural factors and Processes” chapter, which focuses on the broader institutional, regulatory, and organisational structure of coffee production in Lampung.

Unlike other findings chapters that centre on participants’ perceptions and lived experiences, this section relies more heavily on secondary sources to explore how systems such as import-export regulation, agricultural standards, and government support mechanisms are formally structured. These secondary sources provided critical insight into how processes and structures are designed to function, complementing and sometimes contrasting with participants’ accounts of how they are experienced in practice.

Secondary data was also used for triangulation, to compare and cross-check the findings that emerged from participants’ accounts. For example, policy documents were reviewed to understand formal government support mechanisms, which were then set against participants’ perceptions of what support was actually received.

These documents helped me better understand the wider systems that shape farmers’ experiences. They provided important background information that supported my analysis of the structural factors and connections between stakeholders within the coffee supply chain. In this way, the secondary data was both a valuable source of information in its own right and a useful way to compare formal systems with what participants said about their lived experiences.

3.3.5 Data collection.

The study area.

Data collection was carried out between April and July 2023 in Lampung Province, located in Sumatra, Indonesia (see Figure 4 & 5). Lampung is the country’s largest producer of Robusta coffee, with production spread across several districts (Noer, 2022). For this study, data was collected from three main locations: West Lampung, Tanggamus, and Bandar Lampung. Bandar Lampung, the provincial capital, also serves as the main export point for coffee, with shipments leaving from its port.



Figure 4 Study area, Lampung.

(Source <https://www.freeimages.com/vector/free-vector-map-of-indonesia-5384236?ref=365psd>)

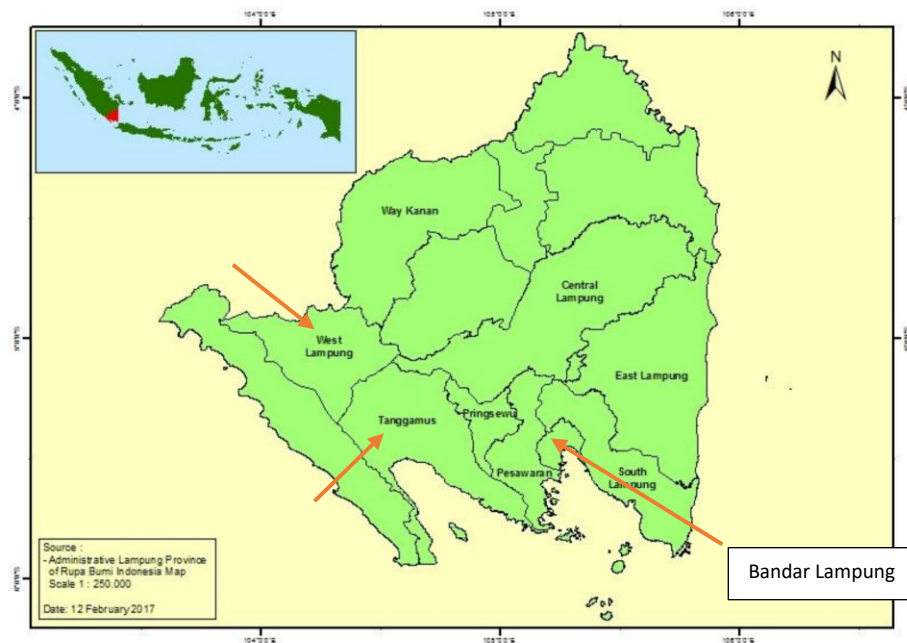


Figure 5 Lampung provinces. West Lampung, Tanggamus and Bandar Lampung.

Map from (C. Wulandari et al., 2019)

Fieldwork was conducted in several stages between May and July 2023 across multiple sites in West Lampung, Tanggamus, and Bandar Lampung. A combination of surveys and semi-structured interviews were carried out with different stakeholders, including farmers, traders, farmer group leaders, government officials, and one coffee researcher. Table 3 below summarises the timeline, locations, respondent types, and number of interviews and surveys conducted in each phase of the study.

Dates 2023	Location	Types of Respondents	No of Surveys	No of Interviews
1 (pilot) 6-7 May	Sekincau, West Lampung	Farmers	14	3
		Traders	3	2
		Farmer group leader	0	0
2 27-28 May	Sumba Jaya, Sukapura, West Lampung	Farmers	20	5
		Traders	4	1
		Farmer group leader	0	0
3 17-18 June	Ulu Belu and Wayharong, Tanggamus	Farmers	20	2
		Traders	2	2
		Farmer group leader	1	0
4 1-3 July	Pampangan, Kebon Tebu, Liwa, Sekincau, West Lampung	Farmers	34	1
		Traders	6	3
		Farmer group leader	4	2
		Government officials	NA	1
5	Bandar Lampung	Traders/ Domestic fine Robusta café owners	2	2
		Government officials	NA	3
6	Online interviews	Researcher ICCRI	NA	1
TOTAL			110	28

*Table 3
Summary details of interviews and surveys collected and the locations.*

Sampling

This research used a Criterion Purposeful Sampling strategy to identify participants who could provide rich, relevant, and diverse insights into Robusta coffee production in Lampung Province, Indonesia. Purposeful sampling is widely used in qualitative research because it enables researchers to select information-rich cases that are particularly insightful for understanding the focus under study (Coyne, 1997). Criterion sampling involves selecting all cases that meet pre-established criteria (Suri, 2011). Participants were selected based on their direct involvement in the Robusta coffee sector and their location within Lampung province. This included farmers (both certified and non-certified), traders, roasters, farmer group leaders, and government officials. My aim was to explore a variety of perspectives and experiences across different stakeholder groups in the coffee supply chain.

Initially, I intended to use theoretical sampling in line with Grounded Theory Methodology, where emerging data would guide further sampling to refine and develop theoretical categories (Charmaz, 2006; Coyne, 1997; Urquhart, 2013). However, due to time constraints I was unable to fully implement theoretical sampling during the data collection phase.

To access participants, I relied on local researchers from the University of Lampung, Dr Ibnu Muhammad and Dr Firda Sari, who had previously conducted research in the region. They facilitated introductions to village leaders, who helped identify and invite eligible farmers and traders to participate. Access followed the formal procedures required by the Indonesian government, including official stamped letters from the University of Lampung and signed approvals from village authorities.

Elements of snowball sampling were also used. For example, some farmers and traders suggested additional contacts, including traders in the region, and in several government interviews, additional officials joined the conversation once the interview was underway. This informal referral process fits with the snowball technique where existing participants help recruit others through their social networks (Suri, 2011).

Efforts were also made to contact representatives from certification bodies, such as Rainforest Alliance and 4C, prior to and during fieldwork. While informal discussions took place with Rainforest Alliance staff, it was not possible to conduct a formal interview, and 4C representatives were unreachable despite repeated attempts.

All participants were given detailed information sheets and signed consent forms, in line with the ethical requirements of the University of Hertfordshire and the Indonesian research ethics process (see Appendix 5, 6 & 7 for consent forms and participant information sheet).

Visits to village leaders.

I made three informal visits to a village leader in Sekincau during the early stages of fieldwork. During these visits, parts of the conversation were translated for me, and I took notes afterwards to record key points. However, since these discussions were not conducted as formal interviews and no consent forms were completed, I did not include this material in the formal data analysis. Instead, the insights gained from these visits helped to shape my understanding of the local context and informed the development of my research approach throughout the fieldwork.

The fieldtrips.

Travelling to the remote target areas of Lampung required journeys of between seven and nine hours by 4x4 vehicle. The early stages of travel were relatively smooth along highways and main roads; however, conditions worsened significantly as I approached the coffee-producing regions. The roads became increasingly congested with motorbikes, cars, and large trucks often veering into oncoming lanes at speed. These challenges were further intensified by poor road conditions, including numerous potholes, cracks, and long stretches of unpaved terrain.

I collected primary data during four field visits, each lasting between two and three days. These visits were supplemented by online interviews and additional surveys and interviews conducted in Bandar Lampung. Each fieldtrip followed a similar structure: researchers from the University of Lampung coordinated with a local guide or village leader, who helped organise for farmers and traders in the area to gather at a community location, such as a village hall or the home of the village leader.

At each location, a member of the University of Lampung team introduced the research and myself to participants before translating my short presentation, which outlined the study's purpose and explained the survey and interview process. Initially, three to four enumerators administered surveys in Indonesian to farmers and traders, recording their responses in the same language. Participants who expressed interest in being interviewed were then invited to take part in a follow-up interview with me and a translator once their survey was complete. These interviews were recorded using a dictaphone to ensure accuracy and capture detail.

Additional survey and interview data were gathered through visits to local traders recommended by earlier participants. In these cases, the enumerator first conducted a survey, followed by an interview that I carried out with the support of a translator, which was also audio-recorded. Further interviews were conducted with government officials in both Bandar Lampung and West Lampung, arranged in advance by a member of the research team and held within government offices.

The interviews.

The interview process followed a consistent structure across participants. With the support of a translator, I began each interview by thanking the participant for their time and explaining the purpose and procedure of the discussion. Permission to audio-record was requested and granted by all participants. Each interview was labelled with a unique identifier that matched the participant's completed survey and consent form, which was also used for any supplementary field notes. I opened each interview with broad, open-ended questions about how the participant became involved in coffee farming or trading. These initial questions provided contextual background and helped ease both the participant and the translator into the conversation.

The interviews were semi-structured, guided by a flexible set of core questions that I adapted based on participants' responses (see Appendix 1 – interview guides). This approach supported the exploration of relevant themes while allowing space for unexpected insights to emerge. Interviews typically lasted between 45 and 90 minutes and were recorded using a dictaphone, with additional notes taken to capture observations and contextual details. One interview with a researcher from the ICCRI was conducted via Teams and did not require a translator, as the participant spoke English fluently. Similarly, two interviews with Domestic fine Robusta café owners were conducted in English without translation. All interviews were audio-recorded with consent, and after each field visit, I uploaded the recordings to my secure OneDrive account for safekeeping and later analysis.

The survey.

During data collection, I was supported by a team of enumerators from the University of Lampung who assisted with administering the surveys. To prepare them for the fieldwork, I conducted a training session during the pilot visit, providing a detailed explanation of each survey question and guidance on how responses should be accurately recorded. This session also allowed enumerators to ask questions and suggest improvements to the clarity and presentation of the survey, which helped refine the final version.

Before administering the survey, the enumerators explained the participant information sheet and consent form in Indonesian, and participants who agreed to take part signed the form and confirmed their consent by ticking the appropriate boxes. The enumerators read each survey question aloud in Indonesian and recorded participants' responses in the same language. While most questions were understood clearly, some required further clarification, which the enumerators were usually able to provide. When additional explanation was needed, they consulted a translator, who relayed the question to me. As fieldwork progressed, the enumerators became increasingly confident in addressing queries independently. Once completed, paper surveys were returned to me for safekeeping. Participants who chose not to take part in a follow-up interview were thanked for their time, while those who did stayed in a communal area, often engaging in informal conversation and enjoying refreshments while waiting.

Informal discussions and observational data.

Prior to formal data collection, a number of informal conversations took place with individuals working within the coffee industry, including researchers, certification personnel, and employees of large coffee-buying companies.

During the fieldwork period, additional informal discussions and observations were documented in the form of written notes. These included conversations with a researcher

from Louis Dreyfus Company (LDC) who declined a formal interview, several employees of Rainforest Alliance, and local village leaders. Where possible, handwritten notes were taken during or immediately following these discussions.

While these notes provided valuable context and helped to clarify certain ideas and themes, they were not treated as primary data due to the absence of formal consent from the individuals involved.

Translation and transcription of surveys and interviews.

All surveys were completed in Indonesian and subsequently translated into English. Translation was carried out using a combination of Google Translate and collaboration with members of the research team. Google Translate proved to be highly accurate for short and straightforward responses; however, in cases of ambiguity or unclear phrasing, a member of the team was consulted for clarification.

Interview recordings were transcribed using the Microsoft Word transcription tool. The researcher then reviewed each transcript against the original audio recording and manually edited the text to ensure accuracy and coherence.

Data cleaning

Transcriptions generated using the Microsoft Word transcription tool were reviewed by the researcher and cross-checked against the original audio recordings. In some cases, it was not possible to accurately determine what was said due to poor audio quality or discrepancies in translation. In such instances, I noted in the transcript that the content could not be reliably transcribed.

Survey translations were conducted using Google Translate. Where the translation was unclear, clarification was sought from a member of the research team. If the content remained unclear, due to illegible handwriting or untranslatable language, those data points were left blank and excluded from the analysis.

One survey response was identified as an outlier. A participant had been recorded as owning a 500-hectare farm, which is significantly larger than the sample average of 1.5 hectares. As all other responses from this participant, such as coffee volume and sale prices, were within expected ranges, it was assumed that the land size entry was a recording error made by the enumerator. This data point was excluded from calculations of average farm size, while the remaining responses from the participant were retained in the dataset.

Data regarding farm ownership from the survey was not used, due to indications of misunderstanding among participants. Farmers were asked whether they owned their land, and, if not, whether they would like to own it. However, many respondents answered 'yes' to both questions, suggesting that the question may not have been clearly understood.

3.3.6 Data analysis.

Coding

I followed Urquhart's (2013) structured model for coding and category development. This process involved several distinct phases, using NVivo software for data management and analysis. I also drew on supplementary tools such as Microsoft Word to support visualisation and pattern recognition. The coding process unfolded as follows:

(See Appendix 8 for code book)

- **Open coding:** I began by coding interview transcripts and qualitative survey responses line by line in NVivo. Codes were analytical rather than purely descriptive, encouraging interpretation and comparison from the outset. This initial phase helped identify significant elements in the data and shaped early research directions. Theoretical memo writing began during this phase and continued throughout the analysis (Urquhart, 2013).
- **Focused (or selective) coding:** Once no new open codes were emerging, I moved to focused coding, again using NVivo. I concentrated on the most relevant and frequent codes, grouping them into broader categories to reduce redundancy and enhance clarity. Although this stage was more targeted, I regularly returned to earlier codes as new insights developed. Memo writing continued to support analytical thinking and document decisions during this phase (Urquhart, 2013). During this phase, the original framework headings in Table 1 provided a guide for organising some of the codes, though they were not applied as a rigid structure.
- **Theoretical coding:** In this stage, I examined the relationships between the core categories developed during earlier phases. I used NVivo's query tools to explore and detect patterns and analyse how categories related to each other. Memo writing supported the development of a deeper understanding of the data, enabling the identification of links and patterns in the data (Urquhart, 2013). The information was then organised and annotated in Microsoft Word, which helped me identify overarching patterns and refine emerging ideas. I brought together quotes, memos, reflections, and developing patterns into Word documents, using this process to shape and consolidate the categories and findings. In this phase, the updated framework categories in Table 2 served as a guide for organising data, though they were not applied as a rigid structure.
- **Memo writing:** Throughout all stages of coding, open, focused, and theoretical, I maintained theoretical memos (see Appendix 9- Example memos). These documented emerging insights, coding decisions, and reflections on relationships between categories. Memo writing acted as a bridge between coding and theory construction, enabling deeper engagement with the data (Urquhart, 2013).

Challenges and Limitations

Some challenges were encountered while using NVivo and applying the grounded theory approach. In the early stages, the complexity of the software required a period of familiarisation. Issues also arose with interpretation during open coding, particularly when initial codes appeared similar or overlapped. These challenges were addressed through regular review of codes and reorganisation.

A further limitation was my tendency to code too extensively during the open coding phase. I initially coded almost everything, including material that was not directly relevant to my research focus. While this reflected an effort to remain open to emerging insights, it ultimately resulted in unnecessary time spent analysing related but not central content. Many of these early codes were not used in the final analysis, highlighting the importance of maintaining a clear focus during coding while balancing grounded openness with research aims.

Despite these challenges, NVivo proved to be a valuable tool for managing and analysing a complex dataset, supporting a grounded and iterative approach to theory development.

Quantitative data

Although NVivo has the capacity to analyse quantitative data, I found it to be more effective for qualitative analysis in this study. Quantitative data was analysed separately using Excel, which allowed for the organisation, extraction, and comparison of numerical information across participants. I used Excel to create comparative bar charts, radar charts, and other visual tools to help identify trends, patterns, and outliers within the data. These visualisations supported a clearer understanding of differences between groups and aided in highlighting notable findings.

This quantitative information was then cross-referenced with the coded qualitative data in NVivo to identify relationships and deepen understanding of the emerging findings. Using both tools in parallel helped to triangulate the data and enrich the overall analysis.

3.3.7 Ethical approval.

This project involved the study of human participants and required ethical approval in accordance with the standards of the University of Hertfordshire, The Indonesian Government through the Ethics Commission for the Social and Humanities Field National Research and Innovation Agency, in addition to gaining research visas and local/regional permissions to conduct research in Indonesia.

Only essential personal information was collected and this was kept confidential. All published data was presented anonymously. Questionnaire and interview participants were asked to sign two consent forms, one from the University of Hertfordshire ethics committee and one from the Indonesian Research Ethics Committee on Social Studies and Humanities, National Research and Innovation Agency. Each participant was also given a participant information sheet with contact details and further information about the study, documents were all translated into Bahasa Indonesian and clearly outlined the purpose of the study and how the data would be used, (see Appendix 5, 6 & 7). Interview participants were also asked for permission to record the discussion using a dictaphone and to use anonymous quotes. Participants were informed that they could decline recording or withdraw from the study at any time.

Digital recordings were saved on an encrypted laptop and backed up to a password-protected University of Hertfordshire OneDrive account. Once the recordings had been transcribed, hard copies were destroyed.

Written documents, including questionnaires, transcripts, and notes, did not contain any identifying information such as names. Each participant was assigned a unique identifying code, which was used on all written documents. The list of identifying codes was stored digitally on an encrypted and password-protected laptop. Written documents were destroyed after the data had been uploaded to the encrypted laptop and OneDrive.

3.3.8 Use of Artificial Intelligence (AI)

During the research and writing process, I used artificial intelligence (AI) tools, including large language models. Specifically, ChatGPT, Perplexity, and Elicit, to support specific stages of the project. Initially, I experimented with ChatGPT and Perplexity to search for relevant academic literature. However, I found that the results were not consistently accurate or verifiable, and therefore I did not rely on either platform for sourcing or citing academic papers.

I used Elicit AI as a literature search tool. Elicit allows users to pose research-focused questions and returns summaries of relevant academic papers along with links to journal articles. While I found the summaries to be broadly accurate, they were not used as sources of data or directly cited. Instead, Elicit was used to locate potentially relevant literature, particularly including studies published in non-English languages or in less visible journals that may not appear in conventional database searches.

The primary use of ChatGPT in this project was to support the rewording and editing of my own written text. I used the tool to improve clarity, structure, and flow in sections I had already written. Importantly, all conceptual, analytical, and interpretive work, including coding, theory development, and analysis, was carried out independently. AI tools were not used to generate findings, conduct data analysis, or develop theoretical claims.

3.4 Framework Development

This section outlines the integration of the SLF and the ToA to develop a comprehensive framework for analysing perception of sustainability in farming communities. The purpose of this integrated approach is to capture the complex interplay between livelihoods, relationships, and access mechanisms, focusing specifically on coffee farmers in Lampung. By combining the SLF and ToA, this research not only addresses the resource-based dimensions of sustainability but also highlights the socio-political and relational factors that influence farmers' access to resources.

The integrated framework draws on both primary and secondary data to provide a holistic understanding of vulnerabilities, assets, strategies, access mechanisms, and outcomes within farming communities. The accompanying flow chart (Figure 6 also Appendix 10) visually represents how these frameworks are applied together, demonstrating how the SLF and ToA complement each other in capturing both structural and relational dimensions of access and livelihoods. This comprehensive approach enables a nuanced analysis of how farmers access and utilise resources, as well as how power imbalances and social structures shape their ability to sustain their livelihoods.

3.4.1 The Sustainable Livelihood Framework (SLF)

The SLF has evolved as a conceptual approach aimed at understanding and improving livelihoods, particularly within rural contexts. This framework is significant in the field of rural development and poverty alleviation, helping to structure the complex interconnections between livelihood strategies, assets, and outcomes.

The concept of sustainable livelihoods emerged from the work of Robert Chambers and Gordon Conway in the early 1990s, building on ideas developed throughout the mid-1980s. According to Chambers and Conway (1992), a livelihood is defined as the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is considered sustainable when it can cope with and recover from stresses and shocks while maintaining or enhancing its capabilities and assets, without undermining the natural resource base (Chambers & Conway, 1992).

Scoones, (1998) expanded on the concept of sustainable livelihoods by developing a framework that facilitates the analysis of livelihood sustainability. The framework identifies five key capitals that underpin sustainable livelihoods: human, social, natural, physical, and financial capital. These capitals represent the resources that individuals and communities draw upon to sustain their livelihoods. While this thesis uses these capitals in the SLF sense,

this broader understanding of capital also aligns with sociological perspectives that view capital as extending beyond purely economic resources. Bourdieu (1986), for example, argues that capital exists in multiple forms, including social and cultural as well as economic capital, helping to show why resources such as relationships, knowledge, and recognition can also shape people's opportunities and advantages. Scoones also outlined four main livelihood strategies that people may adopt: agricultural intensification, agricultural extensification, livelihood diversification, and migration. The outcomes of these strategies are assessed based on five key indicators: the creation of working days, poverty reduction, enhancement of well-being and capabilities, livelihood adaptation and resilience, and the sustainability of the natural resource base (Scoones, 1998).

Building on these foundational concepts, the UK Department for International Development (DFID) adopted and expanded the SLF in the late 1990s. DFID's approach focused on practical implementation, creating guidance sheets that emphasise putting people at the centre of development (DFID, 1999). DFID aimed to enhance the sustainability of livelihoods by improving access to education, natural resources, financial resources, and supportive policy environments. The framework also aimed to increase the effectiveness of development assistance by integrating local perspectives and building partnerships at multiple levels.

The SLF developed by DFID is structured to facilitate a comprehensive understanding of how poor communities sustain their livelihoods. It is divided into several components: vulnerability context, livelihood assets, transforming structures and processes, livelihood strategies, and livelihood outcomes.

1. Vulnerability Context. The vulnerability context encompasses external shocks, trends, and seasonal variations that affect people's livelihoods. These factors can impact access to assets and influence the livelihood strategies that individuals or communities can pursue (DFID, 1999).
2. Livelihood Assets. Central to the SLF is the concept of assets or capitals, represented in the asset pentagon. The five types of assets are human, social, natural, physical, and financial capital (see table 4). These assets are the fundamental building blocks through which individuals and communities pursue various livelihood strategies (DFID, 1999).
3. Transforming Structures and Processes. Transforming structures and processes include institutions, policies, and social norms that shape access to assets and influence livelihood strategies. This component highlights the role of governance and institutional dynamics in either enabling or constraining livelihood improvements (DFID, 1999).
4. Livelihood Strategies. Livelihood strategies are the combination of activities that people undertake to achieve their livelihood outcomes. These strategies vary depending on the context and the available assets. Strategies may include agricultural intensification, diversification, or migration (DFID, 1999; Scoones, 1998).
5. Livelihood Outcomes. Livelihood outcomes are the achievements or results of livelihood strategies. These may include increased income, reduced vulnerability, improved well-being, and sustainable use of natural resources (DFID, 1999).

The SLF provides a structured way to understand and improve rural livelihoods that can be adapted to research goals and used across a range of contexts. Developed initially by Chambers, Conway, and Scoones, and later refined by DFID, the framework remains an important framework for development planning and poverty reduction strategies. The framework has been used and adapted to investigate the outcomes of various interventions and programmes, including certification schemes globally. For example, Bray & Neilson (2017) adapted the framework to review studies on the impacts of certification schemes. Bacon (2005) used the vulnerability context to explore risk levels for certified farmers, identifying positive links between certification and reduced vulnerability. Parrish et al. (2005) also found positive associations between certification and the five capitals, though different market conditions led to varying outcomes across these capitals.

Table 4 The 5 capitals of The Sustainable Livelihood Framework. Adapted from DFID (1999)

Human capital	The skills, knowledge, health and labour. Factors such as labour can vary in quality and quality between households. Human capital can be increased through training programmes or removing barriers to access them.
Social capital	The social resources include networks and connectedness that enable access to wider groups, increasing trust and enabling people to work together. Also membership of formal groups, relationships of trust reciprocity and exchanges.
Natural capital	The natural resources that can be useful in achieving livelihood outcomes.
Physical capital	The infrastructure and equipment available to people and changes to the environment that enable people to have a livelihood. This can include transport, roads, shelter, energy, access to information and tools.
Financial capital	The financial resources available to people. There are two types of financial capital: available stocks and regular inflows of money. Available stocks include savings, cash, livestock, and jewellery. Regular inflows of money refers to earned incomes, pensions, remittances and regular reliable payments.

3.4.2 The Theory of Access

The ToA, as articulated by Ribot & Peluso (2003), provides a conceptual framework for understanding how individuals and groups benefit from resources. Unlike property theory, which focuses on legally or socially sanctioned rights, the ToA centres on the ability to benefit from resources, whether those benefits are legally recognised or not. This approach shifts the focus from property as a set of rights to access as a set of powers, encapsulated in what Ribot and Peluso (2003) term a "bundle of powers" rather than a "bundle of rights".

The ToA originated as a response to the limitations of conventional property theory. Ribot & Peluso (2003) define access as "the ability to derive benefits from things" (p. 153). This includes a wider array of social relationships and mechanisms that enable or constrain resource use, beyond just property rights. Ribot and Peluso (2003) argue that access involves not only legal claims but also social, economic, and political factors that influence how resources are obtained and maintained.

Ribot & Peluso (2003) outline two main types of access mechanisms: rights-based and structural and relational mechanisms. Rights-based mechanisms include legally or socially sanctioned claims, while structural and relational mechanisms encompass a broader set of factors such as access to technology, capital, markets, labour, knowledge, social identity, and

authority. These mechanisms form the strands within the "webs of power" that shape who can benefit from resources.

Ribot & Peluso (2020) later revisited and expanded the theory, emphasising the importance of power relations in shaping access. They note that power emerges from social relationships and ongoing struggles, forming what they describe as "webs of powers" that shift over time and across contexts (Ribot & Peluso, 2020)

To apply the ToA, researchers should first identify the resource or benefit in question. The next step involves mapping the mechanisms through which access is gained, maintained, or controlled. This process requires analysing both rights-based and structural mechanisms, such as legal entitlements and social relationships. Following this, it is essential to understand relationships between actors who have control over access and the actors looking to maintain or gain access, as these relations may involve cooperation, competition, conflict, or negotiation. Analysis of the relationships between those who have control and those who are looking to gain control can enable the identification of hierarchies and webs of power entitled "fluid multi-layered social hierarchies" (Peluso & Ribot, page 301, 2020). This enables the analysis of class divides and differentiation between social groups (Peluso & Ribot, 2020). By focusing on the "bundle of powers" rather than fixed rights, researchers can capture the dynamic and context-specific ways that access is facilitated or restricted (Ribot & Peluso, 2003)

The ToA has been widely applied in examining natural resource governance and rural development. For instance, Hansen et al. (2020) discuss how the theory has been used to understand resource access struggles, such as elite control and market exploitation. In a practical application, (Amuzu et al., 2022) use the theory to analyse cocoa certification schemes in Ghana, highlighting how certification programmes can act as access mechanisms. The study found that private sector incentives often benefit more powerful actors while creating new challenges for smallholder farmers.

The ToA provides a nuanced approach to understanding how benefits from resources are derived, maintained, or controlled. By focusing ability to derive benefit rather than legal entitlement, it enables a more comprehensive analysis of how social, economic, and political factors influence access. As demonstrated in various applications, the theory remains relevant for analysing contemporary resource governance and the complex relational dynamics that shape access to benefits.

3.4.3 Integration of the SLF and ToA

In this research, the SLF and the ToA have been integrated to develop a comprehensive framework for analysing sustainability in farming communities, with a focus on coffee farmers in Lampung. By combining these two frameworks, this study offers a holistic lens that captures the interconnected dimensions of livelihoods, relationships, and access mechanisms. This approach addresses the complexities of sustainability in a way that no single framework could achieve independently.

At the centre of this integrated framework lies a comprehensive understanding of sustainability that accounts for the dynamic interplay between assets, relationships, and access. Merging these frameworks develops a tool for analysing not only resource-based dimensions of sustainability but also the socio-political and relational factors that underpin it. This integrated approach provides a robust means of identifying pathways to more

inclusive, equitable, and sustainable development in farming communities. It highlights the importance of addressing power imbalances between stakeholders, enhancing access mechanisms, and leveraging social and institutional structures to support livelihoods within complex, interconnected systems.

The SLF forms the foundation by identifying and categorising the assets (natural, human, social, physical, and financial) available to farmers, examining how these assets are utilised to build livelihood strategies. The SLF also highlights how structures and processes, such as government policies, import regulations, private sector standards, and certification schemes, shape access to these assets, influence decision-making, and impact livelihood outcomes.

The ToA complements the SLF by focusing on how stakeholders derive benefits from valuable assets. Simply possessing an asset does not guarantee the ability to benefit from it. This theory examines the mechanisms through which stakeholders gain, maintain, and control the flow of benefits. It includes formal mechanisms, such as OFG membership and certification schemes, as well as informal channels, like social networks and trust-based relationships with traders and farmers. This relational and structural focus bridges gaps left by the SLF by explaining how farmers' ability to benefit from available resources is shaped by social and institutional factors.

Integrating the SLF and the ToA provides a multi-dimensional approach to understanding the complexities of farmers' livelihoods. The SLF offers a structured lens for analysing the resources that sustain livelihoods, highlighting the importance of human, social, natural, physical, and financial assets. Meanwhile, the ToA deepens this analysis by exploring the relational and structural mechanisms that govern how farmers gain and maintain access to these essential assets.

Together, these frameworks create a comprehensive and nuanced understanding of the agricultural systems that sustain farmers' livelihoods. They provide insights into how resources are distributed, the role of relationships in shaping access, and how exclusionary practices or inequalities can hinder sustainable development. By combining these frameworks, it becomes evident that addressing power imbalances, enhancing access to resources, and fostering inclusive decision-making are crucial for achieving long-term sustainability. This integrated approach offers a pathway to understanding and tackling the interconnected challenges faced by farmers, with implications for more inclusive, equitable, and sustainable agricultural policies and practices.

3.5 Utilising the frameworks together.

The flow chart below and Appendix 10 illustrate how each of these frameworks can be applied to analyse both primary and secondary data, offering a holistic and comprehensive understanding of vulnerabilities, assets, strategies, access mechanisms, and outcomes within a community.

The SLF is used to identify the vulnerability context by examining trends, shocks, and seasonality that may impact farmers' livelihoods. Secondary data from previous research, government policy documents, and certification publications are utilised to contextualise these vulnerabilities. Primary data (interviews with stakeholders) are used to understand the key resources of importance to farming communities by combining the SLF and ToA framework approaches. The next step involves identifying the structures and processes that influence access to key resources, including formal structures (such as organisations and

institutions), policies, standards, regulations, and cultural processes (including norms, roles, and relationships). These insights are then linked to perceptions from primary data, capturing how farmers view supply chain routes, vulnerabilities, risks, and decision-making processes.

The ToA complements the SLF by focusing on how farmers gain, maintain, and control access to resources and benefits. The ToA and the SLF are used to first identify the key resources and benefits relevant to the community. The analysis then shifts to examining the access mechanisms that influence the ability to derive benefits from these assets. These mechanisms are classified into rights-based and structural categories, involving legal entitlements as well as social relationships. The flowchart illustrates how perceptions of key assets (such as human, physical, natural, financial, and social assets) and strategies (how farmers access and utilise assets) are gathered from primary data, reflecting farmers' lived experiences.

By integrating both frameworks, the flow chart demonstrates how primary data (perceptions from farmers) and secondary data (e.g. policy documents and previous research) are analysed together to understand the lived experience of farmers. This integrated analysis captures not only the structural and institutional factors but also the farmers' perceptions of supply chain routes, vulnerabilities, decision-making processes, assets and strategies. Ultimately, the framework guides the analysis towards identifying livelihood outcomes, such as the impacts of access on social, economic, and environmental sustainability, while also suggesting pathways to improve livelihood outcomes.

This comprehensive approach allows for a nuanced understanding of how farmers perceive access to resources and the barriers they face. It highlights the interconnectedness of livelihood strategies, access mechanisms, and the socio-political structures that influence their sustainability. By combining these perspectives, the framework helps to develop more inclusive, context-sensitive interventions that address the complexities faced by farming communities.

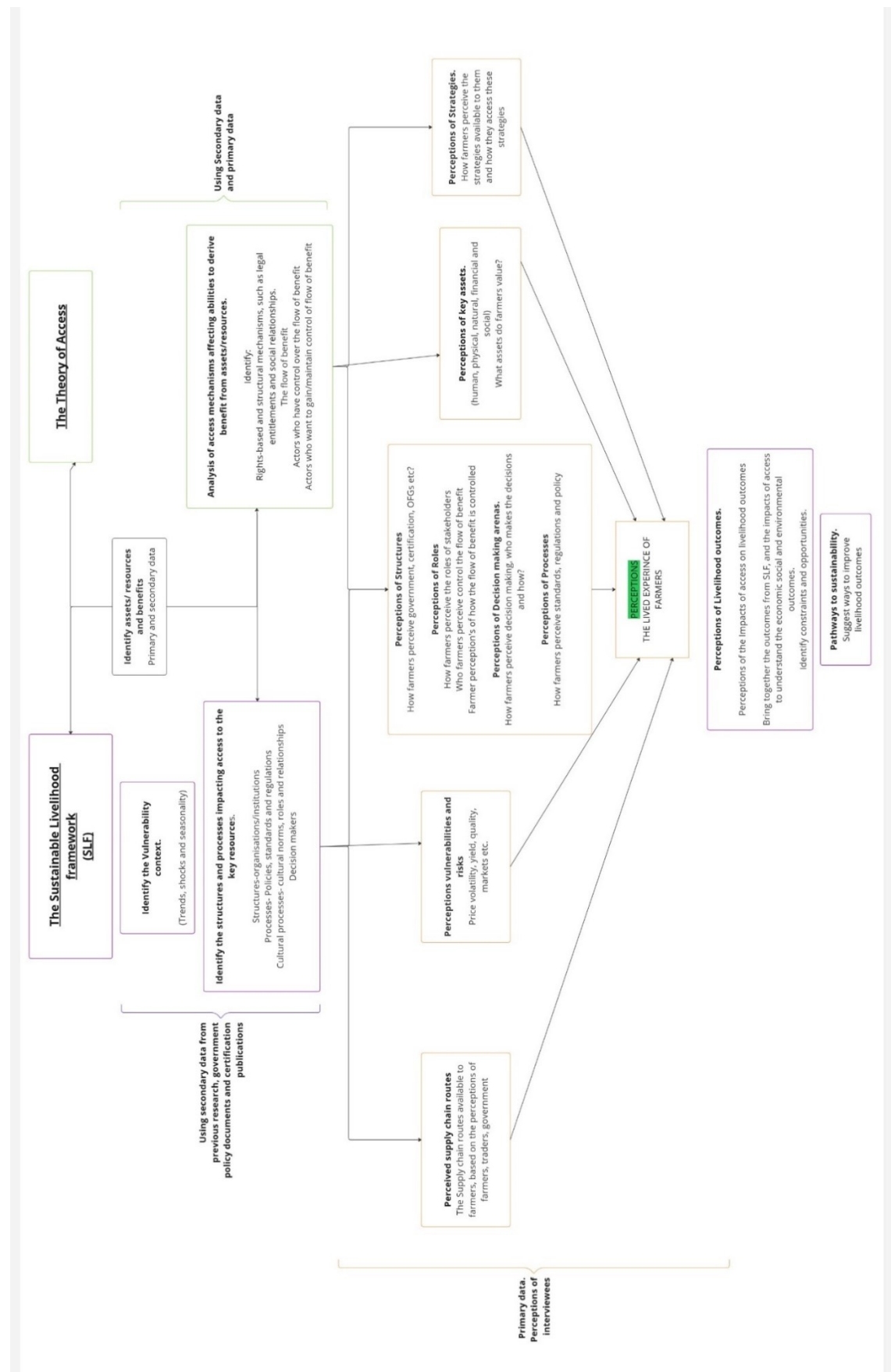


Figure 6 Integrated Framework design. Researcher's own design.

3.6 Methodological Considerations

In undertaking this research, I recognised that I entered the field with assumptions about the role of certification. I had initially expected both international and national schemes to act as significant gatekeepers to markets and to strongly shape farmers' opportunities. However, it became clear that this was not always the case, and my focus on certification needed to be broadened to capture the wider picture, including the roles of other stakeholders I had not anticipated at the outset.

My identity as a foreign academic and outsider may have influenced participant responses, particularly regarding trust, rapport, and perceived power imbalances. To address this, I engaged in reflexivity through memo writing and regular discussions with my supervisor, which helped me critically reflect on my role and positionality. I also adopted a reflective approach to data analysis, recognising how my presence and identity may have shaped responses to sensitive questions, such as those related to income.

Throughout the data collection communication challenges with collaborating researchers were resolved through face-to-face meetings and clarification of roles and aims, ensuring the research process remained transparent and collaborative.

Grounded Theory was appropriate for this study because it enabled an open-ended, exploratory approach to understanding farmers' lived experiences and perceptions in a context that has received little prior research attention. This flexibility was valuable across stakeholder groups, offering a systematic yet adaptable way to capture diverse views (Urquhart, 2013). Grounded Theory supported a deeper understanding of the research area, guiding the study through the complexity of the coffee sector without imposing predetermined structures.

The integration of the SLF with the ToA was necessary to capture dimensions of livelihoods that neither framework could address alone. The SLF provided a clear structure for analysing assets, strategies, and outcomes, which helped to design interview and survey tools that examined human, social, natural, physical, and financial capital. However, while the SLF identifies what resources are important and the strategies used, it offers less insight into how and if farmers are able to derive benefit from them. ToA addressed this gap by highlighting the mechanisms, legal, structural, and relational, through which access to assets and benefits are mediated, making it possible to explore power relations and institutional barriers within the coffee supply chain. Together, the two frameworks offered a more comprehensive analytical lens: the SLF anchored the research in tangible livelihood assets and outcomes, while ToA enabled interpretation of the social and political processes shaping access to benefits from those assets.

Using the integrated framework also guided the organisation of data during coding, ensuring that both assets, strategies and access mechanisms were examined in relation to one another. One challenge was balancing the broad scope of the SLF with the detailed focus of the ToA, as combining them sometimes made the analysis more complex. For example, supply chain connections could be described as social capital in the SLF, as a livelihood strategy when farmers relied on groups or networks for support, and again in ToA when analysing how membership acted as a mechanism of access to resources or markets. I framed the analysis so each framework contributed something distinct. Nonetheless, the integration proved valuable for linking farmers' perceptions of assets to broader structures

of access and control, providing a richer explanation than either framework could have offered in isolation.

The interpretivist paradigm aligned closely with the aims of this study, as it prioritised understanding meaning and perception rather than seeking objective measurement. This perspective positioned farmers' subjective experiences at the centre of the research, recognising that different individuals may interpret the same conditions in different ways. It shaped the use of qualitative methods, such as interviews and open-ended survey questions, which enabled participants to describe their livelihoods in their own terms. It also guided the coding process, where emphasis was placed on identifying themes and categories that reflected participants' perspectives rather than fitting responses into predefined structures. In analysis, this encouraged interpretation of findings in relation to the meanings farmers attached to their experiences, rather than reducing them to purely quantitative indicators.

The sampling strategy aimed to capture variation across certification status and location, and included both certified and non-certified farmers from several districts. This reflected my initial assumption that certification would be a key factor shaping access to assets and markets. However, independent farmers were underrepresented, in part because they were harder to identify and contact, likely due to being less connected within local networks. This gap limited the extent to which fully independent perspectives could be incorporated, although many participants who were currently in groups had previous experience of farming independently and were able to reflect on both positions. Access to farmers was largely facilitated through the existing contacts of researchers at the University of Lampung, which ensured feasibility but also shaped the pool of participants. These limitations mean that findings should be understood as reflecting the perspectives of farmers who were more networked or connected, while independent farmers may face additional challenges not fully captured here.

Interviews and surveys were conducted in Bahasa Indonesia and later translated into English for analysis. Some challenges arose where local terminology did not have direct translations, such as words used for specific farming tools; these were clarified in discussion with the research team to ensure accuracy. In rare cases where handwriting was unclear in survey responses, the data was excluded. Transcription also required considerable editing, as automated transcriptions were not always accurate. To address this, I listened to the original recordings alongside the transcripts and made manual corrections, which improved the reliability of the data used for coding and analysis.

The study was initially designed with the intention of using theoretical sampling to follow emerging insights during fieldwork. However, this was not feasible due to time constraints and the delay between data collection and coding, which limited the ability to adjust sampling in real time. Instead, a purposive strategy was used, drawing on contacts provided by researchers at the University of Lampung and complemented by elements of snowball sampling. While this approach ensured coverage across certification status and location, it limited the flexibility to target participants based on categories emerging during analysis, as would be expected in a full grounded theory design.

Data collection and analysis were ongoing, with insights from early fieldwork shaping later stages. The pilot study was especially useful for refining survey and interview questions, for example clarifying key words and question phrasing. As fieldwork progressed, new themes began to surface. For instance, the role of OFGs as gatekeepers to assets emerged mid-way,

which led me to adapt later interviews to explore this dynamic in greater depth. Returning to earlier data with these fresh insights also improved coding, as I was able to revisit transcripts and identify links, such as between OFG membership and supply chain connections, that were not evident at first. This step-by-step process kept the study open to farmers' perspectives and responsive to the unfolding picture of their livelihoods.

4 Findings: Overall Context

The following chapters (4–10) present the empirical findings of this study. Together, they build a picture of coffee farmers' livelihoods in Lampung, examining the assets they rely on, the strategies they adopt, the vulnerabilities they face, and the outcomes they achieve. Each chapter focuses on a different dimension of the research, but the chapters are closely connected.

Chapter 4 introduces the farmer respondents and provides demographic context. Chapters 5 to 9 then examine perceptions of supply chains and stakeholders, vulnerabilities, structural factors and processes, assets, and strategies, chapter 10 explores livelihood outcomes. This structure mirrors the research framework, allowing the findings to be analysed from multiple but complementary angles.

All interview quotations have been translated from Bahasa Indonesia into English. In some cases, pronouns were rendered as "he" or "they" depending on the translator's interpretation and clarifying comments have been added in square brackets where needed. Repeated words have also been removed to improve readability while keeping the meaning intact. Where quotations have been shortened, an ellipsis indicates the omitted text.

There are instances where the same finding appears across multiple chapters, for example as an asset, a strategy, or an access mechanism. These overlaps are intentional and reflect both the different ways farmers themselves described their experiences and the structure of the analytical framework guiding this study. The integrated use of the SLF and the ToA means that the same issue can be examined from several perspectives: as an asset that farmers rely on, as a strategy they adopt to strengthen their position, and as a mechanism that shapes whether and how they can access benefits. This repetition highlights the multiple roles that key aspects of livelihoods can play and allows analysis from different angles. This provides a fuller understanding of how assets, strategies, and mechanisms interact to shape experiences and outcomes.

The findings draw on different forms of data, with each chapter making use of the most appropriate sources for its focus. Chapter 4 introduces the farmer respondents using survey data, providing demographic and contextual information about the sample. Chapter 5 on supply chains relies mainly on interviews, with triangulation from surveys and existing research. Chapter 6 examines vulnerabilities, drawing on interviews and secondary literature to situate local experiences in broader patterns. Chapter 7 on structural factors and processes makes extensive use of secondary data, including policies, standards, and institutional documents, and combines this with interview perspectives to show how these structures are understood in practice. Chapter 8 focuses on perceptions of livelihood assets, drawing on interviews and surveys to cross-check patterns across the sample and other research to triangulate findings. Chapter 9 addresses livelihood strategies using the same mixed approach, with triangulation between interview, survey data, and wider research. Finally, Chapter 10 examines livelihood outcomes, relying mainly on survey data to provide an overview of patterns across farmers, while also being compared with findings from earlier chapters to strengthen validity.

This design means that interviews provide depth and insight into farmers' perspectives, surveys capture wider trends across the population, and secondary data and other research add further context and triangulation. Presenting the findings in this way allows both depth

and breadth and ensures that the analysis reflects not only individual experiences but also broader structures and patterns.

4.1 Overview of Farmer Respondents

The data presented in this section relates exclusively to the farmer survey participants (see Table 3 in Section 3.3.5 for full survey details). The findings are based on self-reported data from farmers and provide an overview of demographic and household characteristics, participation in OFGs and certification schemes, and the types and volumes of coffee they produced in 2022. Together, these descriptive results establish a profile of the surveyed farmers, offering contextual background for interpreting later sections.

Table 5 Demographic and household characteristics. Own data.

Category	Value
Total farmers surveyed	88
Gender	81 male, 7 female
Average age of farmers	45 years
Average years of coffee farming	24 years
Average farm size	1.5 hectares (outlier removed see Data collection: 3.3.5)
Average household size	3.5 people
Average number of children	2.1 children

Table 6 OFG membership and certification details. Own data.

Category	Value
OFG membership*	80 members
- Stated farmer group only	72 farmers
- Also in a cooperative	2 farmers
- Also in a KUBE	5 farmers
	*8 farmers did not state type
Independent farmers	8 farmers
Certified farmers	28 farmers
Non-certified farmers	60 farmers

The survey results show that most of the respondents were members of OFGs, with a small number reporting membership in cooperatives or KUBEs, and none identifying Gaptokan membership. Given these low numbers, it was not feasible to make meaningful comparisons between different group types. Moreover, farmers themselves did not explicitly comment on distinctions in how these groups functioned. Insights into differences between organisational

types were instead drawn through triangulation with secondary sources and interviews. This limited differentiation in farmer responses may also suggest that participants were not always fully aware of the formal distinctions between group categories.

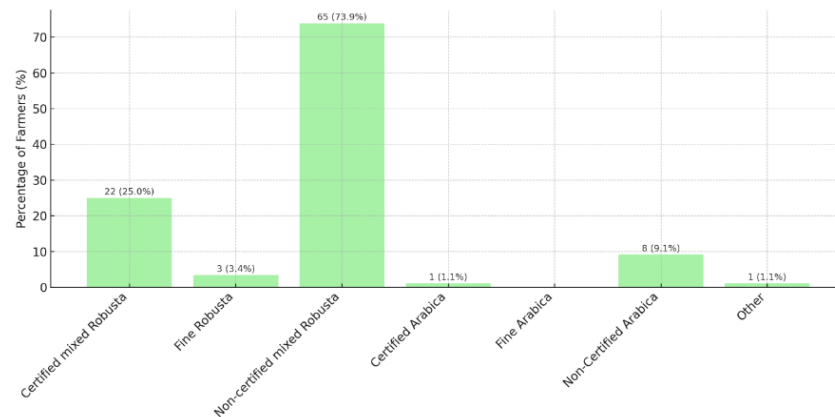


Figure 7 Types of coffee grown in 2022. Own data

In this study 73.9% of farmers produced non-certified mixed Robusta, 25% produced certified Robusta and 3.4 % produced fine Robusta, 10% of farmers also produced Arabica coffee and 1.1% sold arabica and Robusta mixed (70% Robusta and 30% Arabica) (see Figure 7). Farmers reported producing more than one type of coffee.

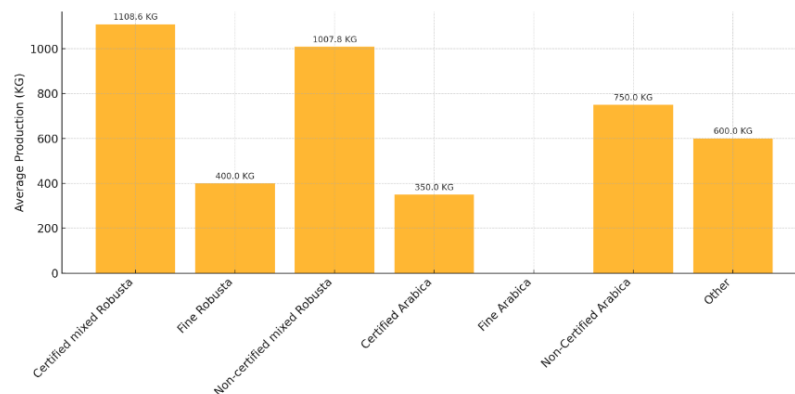


Figure 8 The average amount of each coffee type produced annually in 2022. Own data

Farmers were asked to report the total kilograms of coffee they produced in the previous year (2022). All farmers who produced fine Robusta also grew either certified or non-certified mixed Robusta (See Figure 8.)

5 Findings: Supply chains and stakeholders

This section provides an overview of the coffee supply chain in Lampung, Indonesia, focusing on the roles and interactions of various stakeholders and OFGs, including farmers, traders, processors, exporters, and certification bodies. Drawing on interview and observational data, it outlines the key supply chain routes available to coffee farmers. The section also distinguishes between the different pathways, domestic, export, and government-supported, each with its own set of actors and requirements. By examining these routes, the section offers a deeper understanding of the complex network that connects farmers to both local and international markets, emphasising the opportunities and challenges within Lampung's coffee industry.

5.1 Stakeholders

Table 7 outlines key participants, farmers, traders, processors, exporters, and certification bodies, and their functions in production, trade, and processing. The information reflects stakeholder perspectives and experiences within the Lampung sector (further detail in Chapter 7).

Table 7 The roles of stakeholders. From own data and where stated, secondary data.

Stakeholder	Role
Farmer	Small holder farmers who produce coffee.
Local Trader/collector (the terms 'trader' and 'collector' were used interchangeably in this study)	Village traders/collectors operate on a small scale, mainly sourcing coffee from individual farmers, though sometimes from OFGs. In Lampung, they also provide loans in cash or resources, usually repaid at harvest.
Large trader/collector	Large traders/collectors operate on a wider scale, sourcing substantial coffee volumes from smaller traders, collectors, or OFGs across villages and regions. They sell to companies, using certification and traceability stamps obtained from OFGs. In addition, they provide loans to smaller traders, who may pass them to farmers, or in some cases lend directly to farmers.
Processor	Third-party processors, who handle green beans for a fee including roasting, play a key role in the coffee supply chain. They are often large companies, buyers, or exporters such as Louis Dreyfus Company (LDC) and Olam.
Company	These companies act as intermediaries for large buyers, trading and establishing agreements with OFGs. They purchase coffee, verify stamps and certifications, and ensure sustainability compliance. In some cases, they also process green bean coffee.
Large buyer	Large buyers purchase coffee in bulk through companies, supplying both international and domestic markets. They may also process green beans to add value before reaching consumers. Nestlé and Olam are examples of large buyers operating in this role.
Exporter	Exporters send Indonesian coffee to international markets and may also act as large buyers and processors, adding value before export. Examples include Indo Jaya, Brindo Jaya, Kapal Api, and Olam.
Domestic fine Robusta café owners. (2 participant's in this research)	Coffee shop operators purchase specialty coffees and fine Robusta directly from farmers or groups, often through direct trade agreements. Many own roasting equipment and create blends using advanced techniques to offer unique coffee experiences.

Certification	Global schemes set sustainability standards for environmental, social, economic, and quality aspects of coffee production. In Lampung, Rainforest Alliance and 4C certify farms and OFGs for adhering to sustainable practices (4C Services GmbH, 2020; Rainforest Alliance, 2022).
Extension workers	Extension workers, employed by government, companies, or large buyers, engage directly with farmers to share information on coffee production. They provide guidance on funding, training, and help farmers understand and meet production standards and quality requirements.
Importing country	Consuming countries that purchase coffee from Indonesia.

Table 8 outlines the definitions and roles of different OFGs in Indonesia and table 9 provides additional information about levels of formality and access routes (further detail in Section 2.2) Based on secondary sources and policy documents, it shows how groups range from informal farmer groups to formal cooperatives and business groups, each contributing differently to the coffee sector.

Table 8 Types of OFG from secondary data where stated.

Organised Farmer Group type	Role
Farmer Group	Farmer groups in Indonesia were initiated by the government in 1979 to distribute support and later negotiate coffee production in protected forests. Formalised under Ministry of Agriculture regulation (Law 82/2013), they typically consist of about 30 members from the same village. Their aims include fostering cooperation, sharing knowledge, tools, and credit, and improving coffee quality. Certified farmers often belong to both farmer groups and cooperatives or KUBEs, while uncertified farmers usually only join farmer groups. Groups are led by elected leaders and sustained through community village leader, government support and member contributions (Ibnu et al., 2018) Registration with the government or certification of these groups increases their recognition and grants easier access to government support (Sulaksana & Dwirayani, 2021).
Joined Farmer group Gapoktan	Gapoktans are farmer groups that have joined together to combine harvests from multiple farmer groups in different villages, this enables them to sell to companies and large traders due to higher volume. They aim to increase production scale and improve market access (Khaerah et al., 2023). The participants of this study in Lampung referred to these larger groups as 'Joined Farmer Groups'.
Cooperative	Agricultural cooperatives in Indonesia were first established in 1973 as Village Unit Cooperatives (KUD), created to provide farm credit, distribute inputs such as fertiliser, and support marketing. Their role expanded through government decrees, positioning KUDs as central rural economic institutions. However, their monopoly led to inefficiencies and contributed to the collapse of the clove agribusiness. After the monopoly was dismantled in 1999, many struggled to adapt to competitive markets, though specialised cooperatives began to

	emerge, particularly in the coffee sector and regions linked to global value chains (Rifin & Naully, 2020). Under Law 25/1992, cooperatives aim to improve economies of scale, production efficiency, and members' bargaining power. They provide services including input supply and credit. At least 20 individuals must contribute initial capital to form a cooperative, which must also be registered with the Ministry of Cooperatives and Small and Medium Enterprises. Income is shared equally among members, while additional funds can be raised through loans. Although farmer group membership is not required, most cooperative members also join groups to access government support such as agrochemicals and rural development programmes (Ibnu et al., 2018). Cooperatives connect directly with domestic and export markets, often selling roasted coffee. Member-owned and democratically managed, they facilitate certifications, strengthen bargaining power, disseminate information, and share risks (Rifin & Naully, 2020).
KUBE/KUB	KUBE (Joint Business Groups) were established by the Ministry of Social Affairs in 1983 to improve livelihoods by strengthening micro-businesses through integration into larger operations. They vary in size: small groups have 5–7 micro-businesses, medium 8–15, and large 16–30. Smaller than cooperatives in assets and capital, KUBEs usually pay farmers only after receiving payment from buyers. As non-legal entities, they rely on member contributions or external support, mainly from government. Their primary role is handling tasks such as cleaning, drying, and transporting coffee beans to roasting companies or exporters (Ibnu et al., 2018). KUBEs are linked to farmers through groups, requiring farmers to organise before joining. To access government support, they must be verified by village and sub-district leaders, qualifying them for capital from the Ministry of Social Affairs (Ibnu et al., 2018). KUBEs also act as intermediaries, adding value before coffee reaches exporters. (Yunanto & Kristanti, 2024).

Table 9 OFG levels of formality and access routes

Type of group / farmer position	Level of formality / recognition	Typical access routes to financial assets	Typical access routes to other assets and support	Main implications for farmers
Farmer group (formal)	Registered with government and more easily recognised by external stakeholders.	Internal group savings and loan systems exist but vary between groups. Possible access to government-linked bank schemes, and potential links to cooperatives.	Greater access to government programmes, training, subsidised fertiliser, agrochemicals, machinery, land access.	Stronger access to formal support, though benefits may still depend on leadership, group capacity, and external recognition.
Farmer group (informal)	Not registered and less formally recognised by external stakeholders.	Internal group savings and loan systems exist but vary between groups. Weaker access to institutional credit, and greater dependence on personal funds or traders.	Some support may come through local relationships or occasional invitations, but access to formal government support is weaker than formal farmer groups.	More limited and less secure access to formal support, with a greater risk of exclusion from official routes.
Joined Farmer Group, Gapoktan	Grouping of multiple farmer groups, with greater scale and potentially greater visibility.	Internal group savings and loan systems exist but vary between groups. Formally registered Farmer groups within the Gapoktan can access government linked bank schemes, and potential links to cooperatives.	Improved market access through aggregation, stronger links with larger traders or companies, and support for labour coordination and resource management,	Greater scale can improve market access, bargaining power and financial resilience, though access to equipment and inputs may still be uneven.

Cooperative	Highly formalised, legally registered.	Stronger access to formal credit, member contributions, loans, and direct market-based income opportunities	Increased market links, certifications, training, bargaining support, and input supply	Can improve members' bargaining power, provide access to credit and input supply, support certifications, and connect farmers more directly with domestic and export markets.
KUBE/KUB	Non-legal entity, but may be locally verified for support.	Member contributions and external support, mainly from government; smaller in assets and capital than cooperatives	Support for cleaning, drying, transport, and value-added handling, with intermediary links to buyers or exporters.	Supports small-scale collective business activity and value addition, but relies heavily on member contributions and government support.
Independent farmer / outside recognised OFGs	No formal group recognition.	Personal savings and trader or collector loans are often more accessible than government or institutional credit.	More limited access to training, fertiliser, machinery, certification, and formal programmes, though support may come through informal ties.	Greater autonomy in theory, but often more exclusion from formal support and stronger dependence on traders, which can reduce bargaining power.

5.2 Supply chain routes

This section presents the supply chain routes available to coffee farmers in Lampung, based on interview and observational data gathered during the research. It outlines the various pathways through which farmers can sell their coffee, from local traders and farmer groups to large-scale buyers and exporters. Within these supply chains, all OFGs perform a similar function of consolidating coffee to sell to the next buyer in the chain. As a result, they have been categorised under the collective title of OFG or Joined OFG.

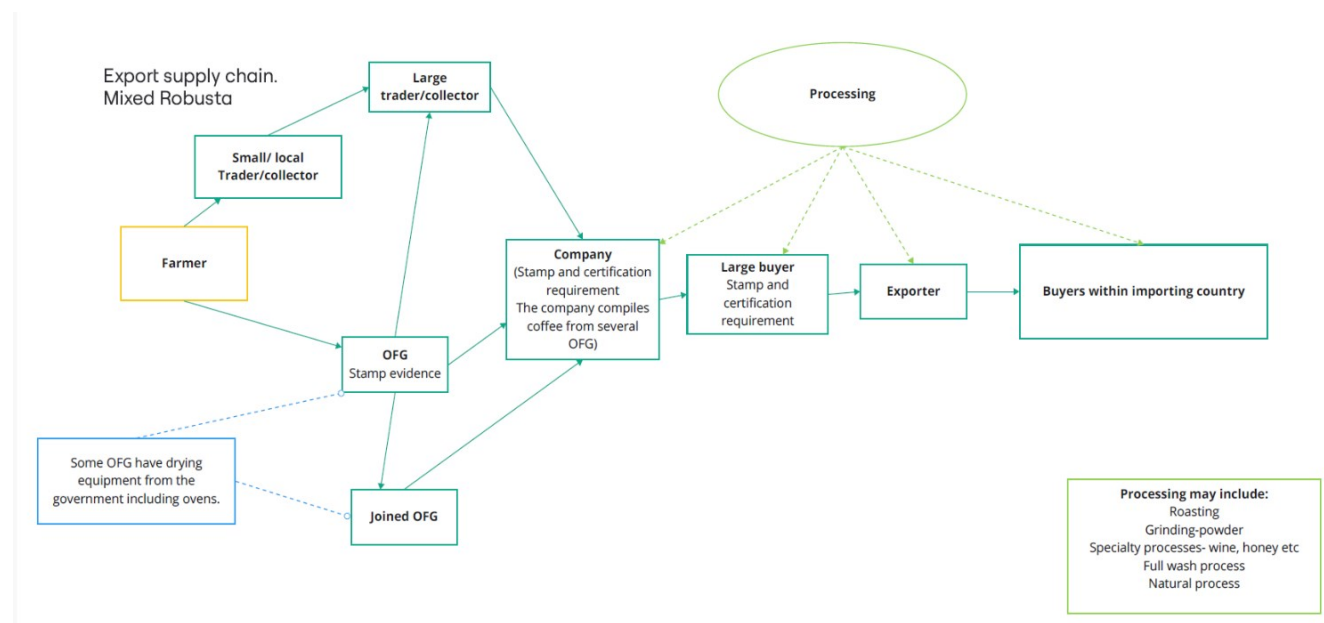


Figure 9 The export supply chain for mixed Robusta. Own data

Figure 9 illustrates the export supply chain for Mixed Robusta coffee in Lampung. It begins with smallholder farmers who produce the coffee and sell it to small or local traders/collectors or through an OFG. The coffee is then sold to larger traders/collectors or companies. The companies and large traders will collect any certification or traceability stamps that are required to then sell to the large buyer. The coffee is then exported to importing consuming countries. Processing takes place by companies, large buyers, exporters and importing countries which adds value to the coffee.

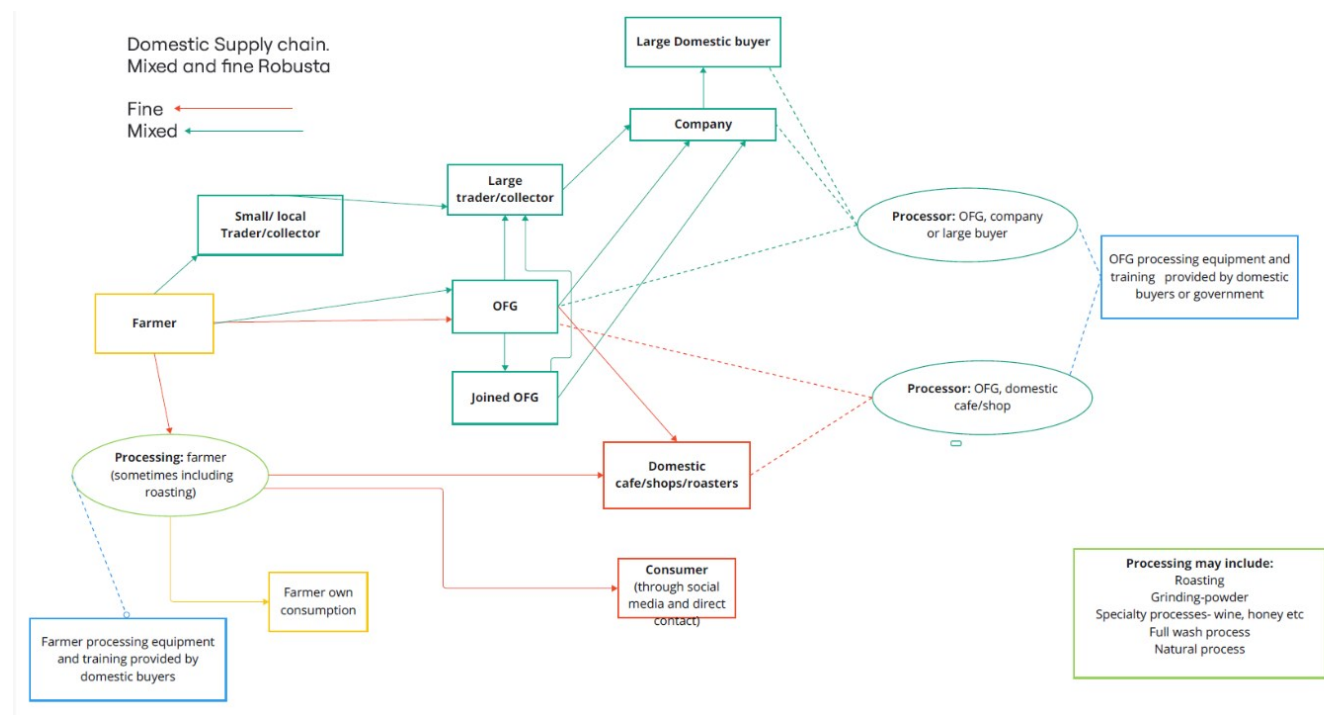


Figure 10 The domestic supply chain for mixed and fine Robusta. Own data

Figure 10 illustrates the domestic supply chain for both mixed and fine Robusta coffee in Lampung, showing the flow of coffee from farmers to consumers. Both mixed and fine Robusta coffee can be sold through OFGs and small traders, in a similar fashion to the export market. It is then sold to companies and onto large buyers. Fine Robusta is unique as it offers a direct route to Domestic cafes/shops/roasters or even directly from the farmer to the consumer.

6 Findings: Vulnerability context.

The vulnerability context refers to the external environment in which individuals and communities operate, encompassing the trends, shocks, and seasonality that influence their livelihoods. These factors, often beyond the control of individuals, they can destroy assets, reduce opportunities, and heighten risks. Shocks such as natural disasters, economic downturns, or conflict, trends like population growth or environmental degradation, and seasonal variations in employment or resource availability all shape the situation. These factors are not always negative, for example economic variations can move in favourable directions (DFID, 1999). Understanding the vulnerability context is vital for identifying the external factors that affect livelihood strategies and outcomes.

In this section secondary data will be used to understand the vulnerabilities facing coffee farming communities in Indonesia. Primary data from interview and surveys with farmers, traders and government officials will be used to understand how farming communities perceive these risks and the strategies they use to reduce vulnerabilities.

6.1 Shocks

6.1.1 Price volatility

Price volatility in the global coffee market significantly impacts farmers in Lampung, Indonesia, creating substantial challenges for their livelihoods (Erry Prasmatiwi et al., 2023; Hutabarat, 2016). Studies have shown that fluctuations in global coffee prices are directly transmitted to local markets, exposing farmers to unpredictable income variability and financial instability (A. E. Wulandari et al., 2019). This uncertainty not only affects farmers' household incomes but also influences export volumes and domestic coffee prices, amplifying their vulnerability to external market forces (Zikria, 2020).

High price fluctuations exacerbate the precariousness of coffee farming as a livelihood. When prices plummet, farmers may struggle to cover production costs, leading to reduced investment in farming inputs and lower yields over time. Conversely, during price surges, farmers may expand production unsustainably, further exposing themselves to long-term risks associated with environmental degradation and market saturation (Ambinakudige & Choi, 2009). These dynamics highlight how global market trends directly shape the vulnerability context for coffee farmers in Lampung.

Farmers in Lampung tend to view price volatility primarily through a local lens. While there is some awareness of the influence of global market dynamics, farmers largely attribute price fluctuations to factors such as product quality and decisions made by local traders. One farmer (P003) noted, she recognises that lower production levels can lead to price increases and is aware of the corresponding rise in the price per kilogram of coffee for local producers.

“She thinks that the coffee price is rising this year. That 30,000 compared to last year with only 24.500 rupiah. But the production, the production of the coffee remains low, that’s why the price is higher”

Farmers identified moisture content as a significant factor influencing prices. They discussed experiences of trader exploitation, noting that they may need to approach alternative traders to secure a better price. Statements from two farmers below explain the importance of moisture content and that price offers and quality assessments can vary between traders, indicating inconsistencies in grading practices and pricing standards.

“So the most dry that the farmer able to fulfil is 18 percent, but the requirement is 11 or 12. So if they cannot fulfil the 12%, the trader cut the price.” (P015)

“It will be different yes because the trader will have arguments about the quality one and the other will give the different quality for the same coffee.” (P001)

One farmer noted that, despite efforts to improve the quality of his coffee, he felt unable to influence the price he received.

“the price is not my decision even though I improve the quality.” (P001)

While farmers in Lampung are aware of price volatility within the global coffee market, their primary concern lies with the prices they can secure on a day-to-day basis from local traders and buyers. They recognise that factors such as moisture content and coffee quality play a role in determining the prices they receive.

Traders, however, discussed the influence of global markets, asserting that prices are determined by the London Stock Exchange and New York markets. They expressed a desire for the government to establish standard prices, rather than continuing to rely on global market fluctuations. The following quotes illustrate the traders' belief that government regulation is necessary, as they feel they have little control or influence over global pricing.

“We have to set the rules from the government itself, about the price setting, the price is suddenly increasing and it will affect some of the actors in the industry, because nowadays the price is so unpredictable. So maybe it's better when the government take their role to take the responsibility to set the price for the industry.” (TR009)

“He expects the government to be involved in regulating the price, but he wants the fairness for all, the traders and farmers.” (TR017)

“The coffee price decided in London. Changes every day. Price change everyday, decided in in London. It's in London so we cannot do anything.” (TR016)

To cope with price volatility in Lampung farmers adopt strategies such as market diversification, income diversification, value addition strategies (fine Robusta and roasting), collective action and mixed cropping (see Findings: Chapter 9). While these strategies help mitigate risks in the short term, their effectiveness often depends on farmers' access to resources, knowledge, and supportive institutional frameworks to have meaningful impacts long term. Without targeted interventions, such as the promotion of price-stabilisation mechanisms or improved market access, farmers remain highly susceptible to the volatility of global coffee markets.

6.1.2 Weather and Climate change

Weather anomalies and climate change are shocks that severely affect coffee farmers in Lampung, Indonesia, undermining both production and livelihoods. Extreme weather events, such as prolonged droughts and excessive rainfall, have led to significant declines in coffee yields. For example, in 2014, heavy rains caused extensive crop damage, reducing Lampung's

coffee production by 50% (Priyambodo, 2014). Highlighting the immediate vulnerability of coffee farmers to weather variability.

Climate projections indicate that rising temperatures and altered rainfall patterns will further reduce suitable coffee-growing areas in Lampung, potentially shifting production to higher elevations (Sarvina et al., 2022; Syakir & Surmaini, 2017). El Niño events, characterised by droughts, have been associated with production declines of up to 10%, while La Niña events, marked by excessive rainfall and longer wet seasons, have caused declines of up to 80%. Rising temperatures have contributed to increased prevalence of pests, such as the coffee borer and leaf rust, which can lead to production losses of up to 50% (Syakir & Surmaini, 2017). Underscoring the susceptibility of Lampung's coffee farmers to both gradual climate shifts and acute weather-related shocks.

Farmers in Lampung highlighted the impacts of climate change and weather variability on both yield and income, identifying this as a significant concern. The quotations below illustrate the range of challenges expressed by farmers.

"So the yields, the production is very low, very plummeting. Drastically, but the price is higher. About 30% the price high increased. 60% drop in production... I cant do anything, I can do nothing. Because it only depends on the weather climate." (P015)

"The rain is too much, when the coffee is bearing the fruit, they are hit with the rain and it falls." (P001)

Farmers expressed the need for assistance, training and resources to deal with the changes in weather. One farmer stated that she wanted to learn how to increase yields in these changing weather conditions:

"And they really want to have training and how to increase the production, not only count on the using of fertiliser, but also other things that maybe they can use. How to make a strong coffee tree coffee, because of heavy rainfall the coffee still produce the fruit. [He wants training on] how to produce or to create a strong and good coffee tree." (P003)

Farmers have turned to strategies such as cultivating climate-resistant coffee strains and practising mixed cropping (see Findings: Chapter 10). While these approaches help mitigate some risks, their adoption is often constrained by limited access to resources, training, and institutional support. This highlights the need for systemic interventions, including climate-resilient strains and grafts, access to affordable adaptive technologies, and capacity-building programmes, to strengthen farmers' resilience and reduce their vulnerability to climate-induced shocks.

6.1.3 Pests and disease.

Pests and diseases have a significant impact on coffee farmers in Indonesia, with climate change exacerbating the situation (Sujatmiko & Ihsaniyati, 2018). As temperatures rise, the impact of diseases and pests can intensify. For example, the coffee berry borer has a longer lifespan in warmer temperatures, leading to increased impacts on coffee (Niken Zahra Afifah et al., 2025). Increases in leaf rust and coffee borer has been found to reduce production by

50% in Indonesia (Syakir & Surmaini, 2017). Pests and diseases present significant risks to coffee production, and climate change is amplifying these risks.

In Lampung, farmers are aware of climate change but seem limited in their understanding of its indirect links to the increase in pests and diseases. They discussed the direct impacts of climate change, the connection between climate change and the rise in pest and disease risks did not appear to be a significant concern for them. One farmer stated he believed coffee was able to withstand local pests:

“pests that affect the different kind of plants that we introduce here, coffee is tough and then they're familiar with how to handle it.” (P023)

Farmers discussed the issue of weeds and grass and the negative impacts of chemical pesticides, particularly the impacts they perceived on soil quality. However, their main concern regarding coffee productivity was the availability of fertilisers (see Findings: 8.4.1).

“it affects this stem and the soil, so the coffee bean is just a lot more healthier because they don't use a lot of chemical from the pesticides and the fertiliser and also if they use pesticides it gets dry.” (P026)

The government in Indonesia discussed their active programmes focusing on pests and disease. This includes education programmes and organic methods of pest and disease control.

“we educated farmers how to control the pests or the disease of their crops.” (GOV002)
“the farmers kill the ants were using their insecticide or pesticide so then it affects the tree the coffee tree... There is also sometimes disease but not too significant.” (GOV002)

However, it was believed that due to increases in production the farmers were less concerned about the pests.

“the different varieties [of coffee] even though they attract pests, they give a big production give a higher production...even though there are some pests due to the production being higher some farmers just neglect the pests.” (GOV002)

Overall, disease and pest impacts did not appear to be perceived as significant by the participants in this study. This contrasts with research in this area, which suggests that these issues are significant and will worsen as climate change intensifies (Niken Zahra Afifah et al., 2025; Sujatmiko & Ihsaniyati, 2018; Syakir & Surmaini, 2017).

6.2 Trends

6.2.1 Technological advancements.

Technological advancements, including internet access, social media, and mobile phones, have increasingly enabled farmers to access real-time market information, engage with stakeholders, and develop markets. This connectivity facilitates informed decision-making, broadens market opportunities, and supports the adoption of innovative agricultural

practices (Abdul Wahib et al., 2023; Mohd. Arif & Pungky Syah Banar, 2019). Technologies offer significant potential to reduce vulnerability by enhancing productivity and livelihoods by bridging information gaps and improving market integration.

However, challenges persist. Limited digital literacy and inadequate infrastructure in rural areas hinder the effective utilisation of these technological resources (Akbar & Wijaya, 2024). Furthermore, the digital divide, exacerbated by disparities in access to internet connectivity, and digital skills, risks widening inequalities among farmers (Johan et al., 2024). Those without access or the ability to navigate these technologies face greater barriers to market participation and innovation, increasing their vulnerability relative to more digitally equipped peers.

In Lampung, both farmers and traders make use of digital technologies, including mobile phones, internet resources, WhatsApp, and social media to engage with other stakeholders, share market and farming information, and, in the case of fine Robusta producers, to market their products (see Findings: 9.2.6). Two traders (TR001 and TR011) noted that the widespread availability of export price information has made it increasingly difficult for traders to manipulate coffee prices, as farmers now have direct access to up-to-date market data.

*“Due to their technology make it easier.
Back then they [farmers] don't know about the price, so maybe there is some
trader rate being cheating on them.” (TR001)*

*“Nowadays is faster due to the internet I think the farmers already
know the price set by the big company, so it's a bit difficult for the
traders to set more price.” (TR011)*

Notably, farmers in Lampung producing fine Robusta have begun utilising social media platforms to market their products to broader audiences. This shift has enabled them to bypass traditional intermediaries, such as traders and middlemen, and instead engage directly with cafés and end consumers.

*“So using social media posting, you send sample to deliver to the
café, to institution, every prospective consumer you send the
samples and if they like it they buy it.... He cooperates with his sons
and daughters and younger generations using Instagram and
facebook.” P078*

In addition to digital technologies, advancements in agricultural practices, such as grafting techniques, have also demonstrated potential to improve productivity. Shoot grafting, for example, has been adopted to rejuvenate unproductive coffee plants, significantly enhancing production efficiency (see Findings: 9.1.2). Research conducted in Bengkulu Province revealed that farmers employing grafting techniques achieved technical efficiency levels above 90%, compared to 62% for those using traditional methods (Silamat et al., 2024). Furthermore, a study in South Sumatra documented increases in yield after the adoption of grafting technology, from 886.16kg to 1,753 kg (Novita et al., 2023). These findings suggest that grafting can improve productivity, potentially increasing farmers' incomes and reducing their exposure to external shocks, such as market price fluctuations or climatic variability.

Farmers in Lampung described practices of sharing scions with one another, including approaching unfamiliar farmers to request cuttings (*stek*) for grafting onto their own coffee plants. An official from the Plantation Department acknowledged collaboration with farmers to improve harvest outcomes, while emphasising that it is the farmers who have conducted the research and identified suitable practices based on their specific environmental conditions.

“Farmers have local wisdom. They know about the climate and then they know which clone that suits to the climate, so they able to predict which month the coffee will harvest. They [farmers] do experimental also the government they can help the farmers they want to improve income along the year, so they can plant specific clone for that harvest here, specific clones to harvest here, and specific clone to harvest here so they can harvest for longer time.”
(GOV004)

Despite these advantages, the adoption of grafting techniques is influenced by multiple factors, including farmers’ perceptions, the availability of quality scions, and access to adequate training (Novita et al., 2023). Demographic factors, such as age, experience, and knowledge levels, also play a critical role in decision-making. Moreover, government support, access to financial resources, and credit facilities significantly impact the ability of farmers to adopt such practices (Silamat et al., 2023). Importantly, as these resources are often unevenly distributed among farmers, the benefits of grafting technologies may not be equitably realised.

While these technological advancements offer opportunities to reduce vulnerability through increased productivity and income, they are also shaped by external factors beyond the control of individual farmers, such as infrastructure development, government programmes, and market forces. Without targeted interventions to address resource inequities and expand access to training and financial support, these trends risk exacerbating the vulnerability of already marginalised farmers in Lampung.

6.2.2 Market Dynamics

Market dynamics, encompass the long-term shifts in consumer demands and the dominance of and dependence upon intermediaries in supply chains play pivotal roles in shaping the livelihoods of coffee farmers in Lampung, Indonesia.

The growing domestic market in Indonesia has shown a consumer preference for Robusta and more specialised processing and brewing techniques (Ashardiono & Trihartono, 2024). In Lampung this provides opportunities to farmers to access the domestic market and potentially achieve higher prices and potentially reduce their economic vulnerability (see Findings:9.2). Access to the assets required to produce the quality coffee demanded and access markets are not equally distributed therefore offering potential pathways to resilience for some, while exacerbating vulnerabilities for others (see Findings: Chapter 8). As one farmer stated, *“they must be famous in the eyes of the government so they get attention.”* (P078).

Changes in global consumer demand can also shape the livelihoods of coffee farmers. Consumer demand for sustainably sourced coffees and certifications have led to farmers adapting their farming methods and becoming certified (A. Wahyudi et al., 2020). Being certified can open access to markets and potentially higher prices (Arifin, 2022; Wahyudi et

al., 2020). However achieving the standards required can be challenging and costly and does not always result in increased incomes (Ibnu, 2023). One farmer group leader in Lampung explained that he didn't feel being certified brought any significant benefits

“certification bring new planting method, like shade tree. I don't think that it really matter that the kind of activities because I didn't feel that any effect from the certification.” (CK004)

However, farmers in Lampung did acknowledge the importance of training and knowledge and certifications were a valuable source.

“I haven't felt the role of 4c certification in this supply chain, but I feel experience from Rainforest alliance that helped me to do a connection technique also the agroforestry and shade trees.” (P035)

Adapting to market demands in this way can open opportunities such as market access and access to assets such as training (see Findings: 8.1.1). Farmers do not all access the benefits equally therefore certification has the potential to impact the livelihoods and vulnerabilities of farmers in Lampung.

In Lampung, local market structures compound these challenges. Many farmers are dependent on intermediaries, such as traders for selling their coffee, often they obligated to these traders because of debts. This reliance limits farmers' bargaining power and increases their vulnerability to exploitation, like research findings in West Java (Yudha, 2021).

Moreover, access to markets and stakeholder support is uneven in Lampung, with independent farmers often excluded due to the lack of OFG membership and certifications. With growing demand from international buyers for certifications and OFG membership (Chiputwa et al., 2015; Pierrot et al., 2010) this has the potential to significantly affect farmer livelihoods as some buyers will not buy coffee without verifications (stamp) of OFG membership or certifications. These barriers further entrench inequalities within the coffee sector, with some producers facing greater income instability compared to larger, well-connected operations.

To navigate these market dynamics, Lampung farmers employ various strategies, including diversifying their income sources, participating in OFGs, becoming certified and adopting practices such as stamp forgery. However, the effectiveness of these strategies depends on access to resources, social connections, training, and institutional support (see Findings: Chapter 9). Without systemic interventions, such as improved market transparency, better access to financial services, and equitable value chain participation, the livelihoods of Lampung's coffee farmers will remain at the mercy of volatile market forces.

6.2.3 Low yield

Declining coffee yields in Lampung are the result of interconnected factors, including the ageing of coffee trees, soil degradation, and insufficient fertiliser application (Asnawi et al., 2020; Wardani et al., 2021). As coffee trees age, their productivity naturally declines, producing fewer cherries and lower-quality yields. Replacing these ageing trees with new saplings requires significant financial investment and a temporary loss of income during the maturation period, which is often unfeasible for resource-constrained farmers (Novita et al.,

2023; Otieno et al., 2019). Without replanting efforts, the continued reliance on ageing coffee trees perpetuates a cycle of declining productivity and economic vulnerability.

Soil degradation further compounds the issue, as nutrient-depleted soils are unable to support healthy coffee plants. Heavy rainfall exacerbates soil erosion, stripping away nutrient-rich topsoil and leaving the land less productive. This degradation directly impacts yields, creating a long-term barrier to sustainable coffee production (Cerretelli et al., 2023; Santana et al., 2025).

Adding to these challenges is the insufficient application of fertilisers, largely due to financial constraints and rising input costs. Many smallholder farmers in this research stated they cannot afford to purchase fertilisers in the recommended quantities. Farmers in Lampung explained how they were unable to access fertiliser because of the cost

“Yeah, it's not directly to my technique, but because the fertilisers expensive to chemical inexpensive, so I don't use much fertiliser in my plantation, but it's not intentional. Yeah, so reducing chemical use of the fertiliser is not actually my directive but because I cannot afford.” (P001)

“If the fertiliser is more accessible and it's more accessible and cheaper than this now they hope that it can increase the production of the coffee.” (P029)

The lack of proper fertilisation prevents soils from recovering lost nutrients, further reducing yields over time. These interconnected issues, ageing trees, soil degradation, and insufficient fertiliser use, highlight the systemic nature of low yields in Lampung, which not only undermine farmers' incomes but also increase their vulnerability to external shocks such as price volatility and climate variability.

To address this issue, some farmers in Lampung utilise a loophole in government policy by accessing subsidised fertiliser intended for staple crops and applying it to their coffee farms. This fertiliser is made available through OFGs, particularly where members also cultivate staple crops (see Findings: 9.3). However, access to these subsidies is unevenly distributed, further reinforcing inequalities within the coffee supply chain.

6.2.4 Regulation changes

Government regulations, evolving growing standards, and policy changes significantly influence the livelihoods of coffee farmers in Lampung, Indonesia (Arifin, 2010) (see Findings: Chapter 7). While these systems are often designed to promote sustainability, enhance market access, or improve quality, they can also introduce new challenges and vulnerabilities, particularly for smallholder farmers with limited resources to adapt, some of these challenges will be discussed in this section.

This research has revealed that alterations to government regulations and the development of programmes can have a substantial impact on farmers in Lampung. These changes can affect access to critical resources, with direct consequences for livelihoods, such as modifications to the allocation of subsidised fertilisers and land access programmes (see Findings: 7.1). In response to these barriers, farmers in Lampung have employed strategies such as exploiting policy loopholes and engaging in illegal farming activities within restricted

areas. A trader and coffee farmer described how he personally claimed land and noted that many others have followed suit. He explained the process of compensating individuals to clear land in order to assert ownership.

“There is a lot of people, they open the forest. And now he [the trader] joined them to compete with them, grab some land in the forest... It’s not officially certified land, he just claim it so it belong to him because he paid someone, its unofficial.” (TR014)

A government official from the Forestry Department acknowledged their awareness of the illegal clearing of forest land and stated that, in response, they have developed Social Forestry programmes to regulate this activity. To qualify for participation in these programmes, farmers must be members of an OFGs (See Findings: 7.1).

“So I think it's like bottom up so they do the survey but and then they come with the idea because there are already many farmers do farming in the forest.” (GOV003)

Regulatory frameworks governing agricultural production, environmental protection, and trade can have profound effects on coffee farming. In Indonesia, recent policies aimed at reducing deforestation and promoting sustainable land use have placed stricter limits on land conversion and farming practices in protected areas (European Commission., n.d.-c; Ministry of Environment and Forestry Republic of Indonesia, 2021b; Petroni & Hoppe, 2024). While these regulations align with global sustainability goals, compliance often requires significant financial and technical resources, which smallholder farmers may struggle to access. Farmers who cannot afford to adapt risk losing access to their land or facing penalties, further exacerbating their vulnerability.

Similarly, trade policies and export regulations, including certification and standard requirements directly impact farmers' market access and profitability. For example, shifts in consumer preferences have increased demand for certified coffee, which require substantial investments in achieving certification standards, infrastructure, and training (Arifin, 2010; Chiputwa et al., 2015; Pierrot et al., 2010). Farmers unable to meet these standards are often excluded from lucrative markets, further entrenching income disparities.

The adoption of international growing standards, such as those established by certification programmes like Rainforest Alliance and 4C become increasingly prevalent in global coffee markets (Chiputwa et al., 2015). While these standards offer potential benefits, including premium pricing and improved environmental practices, they also pose challenges for small-scale farmers (T. Wahyudi & Jati, 2012). Meeting certification criteria often involves changes in practices which require knowledge and financial investment (Sayekti & Prihandono, 2023). Farmers who lack access to training or credit may find it difficult to achieve certification, leaving them disadvantaged in competitive markets.

Farmers in Lampung have reported challenges, particularly with the administrative requirements and inspections associated with certifications and standards. For some, the administrative process acts as a barrier to obtaining certification and accessing broader markets.

“the problem is the farmers are not really familiar with the administration and bureaucracies of the administrative. There is some form that this should be fulfilled by the farmers and they

don't like that... They inspect with a list and risk of farmer keeping the pesticide at home...based on what the farmer say when they interview and they're checking everything, including at home. Then the farmer doesn't like it." (P078)

6.3 Seasonality

6.3.1 Agricultural Cycles

The coffee production cycle in Lampung is characterised by distinct periods of planting, flowering, and harvesting, all of which are shaped by seasonal variations in rainfall and temperature. Participants in this research emphasised that the harvest season represents the main opportunity to generate income, as this is when crops can be sold. However, they also reported that during the off-season income sources decline, while production costs such as fertilisers and pest control continue. Farmers explained that this imbalance between income and expenditure creates financial strain, often forcing them to reduce essential spending or to rely on credit, most commonly provided by traders.

During this research in Lampung, government officials from The Plantation Department outlined how they support farmers to increase their harvest opportunities. Combining their knowledge to potentially increase harvests to three per year instead of one. While this innovation has the potential to mitigate the risks associated with reliance on a single harvest, it was not a topic raised by farmers during interviews. Instead, farmers focused on the use of grafts and strains as a means of enhancing resilience to environmental conditions.

For those farmers with access to government programmes supporting grafted strains, the dependency on a single harvest and the associated financial vulnerabilities could be significantly reduced. However, this technology did not appear to be accessible to the farmers participating in this study. Consequently, the reliance on a single annual harvest remains a substantial risk, exposing farmers to prolonged periods of financial strain and heightened debt accumulation.

In Lampung farmers deployed livelihood strategies such as income diversification and crop diversification to overcome these vulnerabilities. However, incomes from coffee still accounted for a significant proportion of household incomes so farmers were still dependant on coffee and vulnerable to seasonal harvest risks (See Findings: Chapter 9).

6.3.2 Seasonal Price Fluctuations

Seasonal variations in supply and demand significantly influence global and local coffee markets, creating fluctuations in market prices that impact farmers' incomes. During harvest periods, the oversupply of coffee beans often leads to a decline in prices, while off-season scarcity typically drives prices higher. While some farmers can mitigate this challenge by delaying the sale of their coffee to capitalise on higher prices later in the year, many farmers in Lampung lack this option. The immediate need to cover living expenses forces most farmers to sell their coffee immediately after harvest, despite the lower prices available during this period (Erry Prasmatiwati et al., 2023).

6.4 Conclusion: Vulnerability context

The vulnerability context for coffee farmers in Lampung is shaped by a complex interplay of shocks, trends, and seasonal variations. Price volatility in global coffee markets and extreme weather events related to climate change expose farmers to significant income instability

and financial strain. While strategies like market, income and crop diversification offer some resilience, the lack of consistent support, access to technology, and limited infrastructure leave many farmers highly vulnerable to both market fluctuations and climate-induced shocks.

Technological advancements, such as mobile connectivity and agricultural innovations like grafting, present promising opportunities to reduce vulnerability. However, these technologies are not equally accessible, with disparities in resources, training, and infrastructure further exacerbating inequalities among farmers. Similarly, shifts in global consumer demands and certification requirements offer market opportunities but also present barriers for smallholders who struggle to meet the costs and standards.

Seasonal variations in coffee production also play an important role, with the reliance on a single annual harvest often leading to financial strain during the off-season. Seasonal price fluctuations compound this vulnerability, forcing many farmers to sell at low prices immediately after harvesting due to their immediate financial needs. To address these challenges, targeted interventions are needed to improve market access, support price stabilisation, and enhance access to adaptive technologies. A more inclusive approach to policy and technological support is essential to ensure that all farmers, regardless of size or resources, can withstand the external shocks that threaten their livelihoods.

Farmer perceptions revealed in this study add further depth to this picture of vulnerability. Farmers tended to frame price volatility in local terms, often attributing fluctuations to trader practices and quality assessments, rather than to global markets. Climate risks were widely acknowledged, with many farmers expressing concerns about erratic rainfall and declining yields, though pests and diseases were often downplayed as less pressing issues. Certification was viewed with uncertainty, while some valued the training and knowledge it provided, many doubted its financial benefits and expressed frustration with the bureaucratic requirements. Across these themes, inequalities of access were a recurring concern (discussed further in Findings: Chapter 8).

Taken together, these findings suggest that while farmers in Lampung are acutely aware of the vulnerabilities they face, their interpretations of risk, market dynamics, and institutional support sometimes contrast with the official or institutional view of these challenges. This underscores the importance of recognising farmer perspectives to fully understand the lived dimensions of vulnerability in the coffee sector.

7 Findings: Structural factors and processes

Structural factors and processes are central to shaping the opportunities and constraints faced by coffee farmers in Lampung. Within the Sustainable Livelihoods Framework, these refer to the wider social, institutional, and organisational setting that shapes how assets are accessed, used, and turned into benefits, and that influences the livelihood strategies open to people (DFID, 1999). DFID identifies structures such as levels of government and the private sector, and processes such as laws, policies, institutions, and culture. Following Giddens (1984), these structures are understood as composed of rules and resources that shape social action. In this sense, they are not simply sources of constraint, but both enabling and constraining, shaping what farmers can do while also creating uneven opportunities through which benefits may be accessed. These structures are also reproduced through everyday practices, as farmers, traders, and other actors engage with and respond to existing rules, relationships, and institutional arrangements. In this research structural factors include government institutions, private corporations, traders, certification bodies, and domestic market actors. Processes such as regulations, certification and import standards, market mechanisms, relationships and cultural practices influence how farmers engage with these structures and the extent to which they benefit from them.

This section examines how structural factors and processes interact to shape livelihoods, drawing on interview data from farmers, traders, and government officials, alongside relevant policies and research. It highlights how formal systems, such as government programmes, certification schemes, and private corporations, offer opportunities but also create barriers, particularly for independent farmers and those outside recognised OFGs. At the same time, informal processes, including trader practices, cultural norms, and community leadership, continue to influence access to resources and markets.

By exploring both the perceived strengths and weaknesses of these structural factors and processes, this section considers how they affect productivity, sustainability, and equity in Lampung's coffee sector. The findings underscore the ways farmers interpret and navigate these systems, revealing both opportunities for inclusion and the barriers that perpetuate inequality. Through this analysis, the section provides insight into how existing structural factors and processes might be reformed to support more inclusive and sustainable livelihoods.

7.1 The Government

The roles of the Government

The government plays a crucial role in shaping the livelihoods of coffee farmers in Lampung through its institutional structures and programmes. Policies and regulations established by the Indonesian Government significantly influence access to key resources, directly impacting livelihoods. This research found that farmers' experiences of government roles were highly uneven, with access largely conditional on OFG membership and visibility.

This research found that the government provides training, supply chain links, machinery, and financial assistance to support productivity and sustainability. Yet these resources were restricted to OFG members (see Findings: 8.2.1 & Findings: 9.4.3). Their uneven distribution helps explain farmers' mixed perceptions of government, ranging from seeing it as inactive to viewing it as a vital source of support. Such perceptions were shaped by whether farmers could access resources and meet the eligibility criteria.

Farmers in this study stated that the government was not prioritising coffee or did not see it as having a significant role in the sector, farmers felt other staple crops were prioritised. Quotes from a farmer group leader and other farmers, provided below, highlight that many did not view the government's involvement as crucial to coffee production.

Speaker 1 "What does the government do?"

Speaker 2 "Nothing" (CK004)

"the governments, it doesn't seem any help from the government, but he doesn't know why" (P001)

"Not real role. Government is here only I believe the role of government is give the permit, permission to this [large buyer]." (P018)

However, farmers also spoke about receiving training and information from the government through extension workers, who are viewed as key sources of knowledge and expertise. This training was provided through OFGs, and only members of these groups had access to it (see Findings: 8.1.1).

There was some scepticism regarding the government's involvement and its interactions with OFGs. One leader expressed concerns, stating that he believed the government was collaborating with corrupt members of the military police. Other farmers shared similar sentiments, indicating that their interactions with extension services were limited to when new programmes were being promoted (see Findings: 8.1).

Additionally, some farmers viewed the government as a source of equipment and supply chain connections. For those who had been able to access these resources, this was how they perceived the government's role. However, this support was only available to farmers who met the criteria to access the resources, limiting its reach and impact (See Findings: 8.4.3 & Findings: 8.2.1).

A central issue that emerged in discussions about the government was access to subsidised fertiliser, which farmers viewed as a key responsibility of the government and a source of significant frustration. While government officials stated that subsidised fertiliser for coffee was no longer available, many farmers in this research felt that providing such support remained an important part of the government's role. These farmers struggled to access both fertiliser and subsidised fertiliser, further exacerbating their frustrations.

"I want to government to help supply fertiliser supply and the price stability. I want give government give the farmers more knowledge, more training, he said it's the government should be the one that puts responsibility on the training." (P018)

"My opinion so to increase the farmer prosperity I think the government should support by providing fertilisers because it's difficult to find fertiliser. So the condition of the farmer is poor and like me." (TR016)

This research found that independent farmers, in particular, struggle to access government training and support, as these services are primarily channelled through OFGs. This is supported by interview data from Government officials and farmers in this research, also

supported by policy documentation (see Appendix 11- Policy). Furthermore, farmers felt the government's prioritisation of staple crops like rice and maize marginalises coffee farmers, deprioritising their primary livelihood. These restrictions often force farmers to depend on informal channels, such as traders and collectors, and accessing informal and potentially illegal routes for resource access perpetuating cycles of debt and dependency.

Beyond resource distribution, the government's influence extends to shaping market dynamics through regulatory and decision-making processes. The mixed perceptions surrounding the government's role, ranging from inactivity to being a crucial resource provider, suggest that these policies' effectiveness is hindered by uneven resource distribution and weak monitoring. This research found that farmers often feel that the government's involvement in coffee production is minimal or prioritises other crops which is a source of frustration and tension for farmers. Furthermore, while government partnerships with private corporations have enhanced market access and training opportunities for OFG members, such benefits are not universally accessible. To foster more equitable outcomes, it is critical to address the perceptions of farmers, strengthen institutional frameworks, ensure inclusive access to government resources, and improve monitoring and support mechanisms.

Government processes

The policies affecting coffee farmers in Indonesia aim to enhance sustainability, improve productivity, and ensure quality within the coffee sector (see Appendix 11- Policy). For example, the Technical Guidelines for Good Coffee Cultivation (Regulation No. 49/2014) promote environmentally sustainable practices, including no burning policies, soil fertility management, and the use of certified planting materials. These guidelines encourage farmers to adopt practices that balance economic viability with ecological integrity, improving productivity while preserving environmental sustainability (Minister of Agriculture of the Republic of Indonesia, 2014). Additionally, the Post-Harvest Coffee Handling Guidelines (Regulation No. 52/2012) establish standards for harvesting, sorting, and processing coffee, enabling farmers to meet both local and international market requirements (Minister of Agriculture of the Republic of Indonesia, 2012).

Farmers in Lampung did not specifically discuss their awareness of policy requirements, but they were conscious of efforts to improve agricultural practices. They recognised that local and regional government offices were actively involved in educating farmers about these practices. Additionally, farmers understood that meeting these standards could result in higher prices or access to broader markets.

"They give advices from the office of the forestry. About the quality they recommend like certain quality so that the farmer can get higher price." (P029)

The Social Forestry Programmes (Regulation No. 9/2021) grant local communities, including coffee farmers, legal access to forest resources, integrating agroforestry practices into community-managed systems. This policy seeks to enhance local welfare while maintaining ecological balance, by granting people the rights to farm and manage forested areas. This programme is only available to those within registered farmer or community groups.

Farmers in Lampung independently monitored the moisture content, cleanliness, and overall quality of their coffee, recognising that these factors directly influenced the prices they

achieved. One farmer group leader highlighted the importance of cleanliness and moisture content for standard coffees, noting that quality control was typically reserved for specialty coffees. He further explained that farmers assess moisture content by biting dried coffee beans, a method that many participants in this study reported using.

“Of course, most of the farmers groups know the standards for the good quality coffee, the dryness, how they put the coffee in the floor and the cleanliness of the coffee... No, there is no quality control that is special for inspect the quality. Only the individual farmers.” (CK002)

Speaker 2: “Yeah, it's confidence. We have experience, what is this difference between the you say, the machine and then the manual. The farmer experience is not really different.”

Speaker 1: “How do they manually test?”

Speaker 2: “They bite it...Not much different. This is it's very rare that the farmer miss the testing is really correct most of the time they correct.” (CK002)

This research found that pesticide levels are tested by farmer groups in Lampung, with occasional testing also carried out by the government. These tests are mandatory only for coffee intended for export and are not required for domestic coffee in Indonesia. While government officials discussed the monitoring of pesticides, neither farmers nor farmer group leaders mentioned it as a quality measure or a factor influencing the prices they achieved. This raises concerns about the rigor and prioritisation of these inspections and whether independent farmers' coffee undergoes similar scrutiny. Importing countries also inspect pesticide levels, and in the past, coffee from Indonesia has been rejected due to pesticide contamination (see Findings 7.5).

“They also have another, the farmer group do the test. But then the buyer still find that it is more than its level average level.” (GOV002)

“I don't think there's any check on stuff on domestic. Unless they're going to send it abroad then it's checked. Unless they're going to send it export. The quarantine will check, Yeah if it stays in Indonesia there is no check.” (GOV002)

The Social Forestry Programmes (Regulation No. 9/2021) grant local communities, including coffee farmers, legal access to forest resources, integrating agroforestry practices into community-managed systems. This policy seeks to enhance local welfare while maintaining ecological balance, by granting people the rights to farm and manage forested areas. This programme is only available to those within registered farmer of community groups. (Ministry of Environment and Forestry Republic of Indonesia, 2021b). Similarly, the Lampung Provincial Regulation No. 43/2015 focuses on local coffee governance by establishing systems for certification, quality control, and sustainability practices that directly influence coffee production and trade including geographical indicator certification (Governor of Lampung, 2015).

In this research, interviews with government officials revealed that all applications for social forestry are accepted, possibly reflecting the government's commitment to managing and

regulating farming activities in forested areas or that there is a lack of stringent standards. Government officials stated that they actively monitor the crops grown in forested areas, with specific restrictions on palm oil cultivation. If farmers violate these regulations, they risk losing their permission to farm in the forest.

“There is no rejection for those who want to get or to do farming, and the social forestry, community forestry.” (GOV003)

Interestingly, the policy was developed in direct response to farmers cultivating land in these areas without permission. To monitor this activity, the government established a set of policies that include restrictions and regulations designed to oversee and manage the situation.

“So before this regulation issue, actually the activity is already implement it before long before this regulation... it's like bottom up so they do the survey but and then they come with the idea because there are already many farmers do farming in the forest.” (GOV003)

However, farmers and traders in this study also discussed the continued practice of illegally claiming land for coffee farming (See Findings: 8.3.1). This discrepancy between government policy and on-the-ground practices raises concerns about the effectiveness of the monitoring and enforcement mechanisms.

Policies like the Regulation on Subsidised Fertiliser (No. 41/2021) highlight systemic gaps. While this policy aims to improve agricultural productivity, it excludes coffee farmers, prioritising staple crops (Ministry of Agriculture Republic of Indonesia, 2021). Some farmers access subsidies through loopholes within the policy, but this is only possible via OFGs, leaving independent farmers reliant on black-market or full-price fertiliser. This research found that farmers did not appear to be aware they were accessing the subsidised fertiliser through a loophole and did not seem to be aware of the change in regulations. This indicates significant gaps in communication between the government and farmers (see Findings: 8.4.1, Findings: 9.1.1 & Findings: 9.4.3). This research found that while such loopholes exist and are being accessed (intentionally or not), they exacerbate inequalities, restricting access for farmers outside formalised groups.

In addition to the policies impacting farming and processing the Indonesian Government have developed national standards to ensure the quality and safety of the coffee traded domestically and internationally. The Indonesian National Standards (SNI) for coffee aim to ensure the quality, safety, and compliance of Indonesian coffee in domestic and international markets. The SNI policies for coffee beans (SNI 01-2907-2008) set general quality requirements, including limits on moisture content (12.5%), impurity content (0.5%), and the absence of live insects or foul-smelling seeds. Coffee beans are also classified by size, with separate standards for Robusta and Arabica beans, as well as a detailed defect value system that assigns specific points for defects like black seeds, broken beans, or stones (Nabilah, 2022). SNI standards are enforced by the National Standardization Agency of Indonesia (BSN) and are mandatory for domestic trade and export clearance (Minister of Industry of the Republic of Indonesia, 2019; U.S. Department of Agriculture, 2019).

“So there's two type of certification, that's for the plantation and also for the product like for 4C and Rainforest for plantation, the

plantation that certified whether following the good agricultural practise or not. And the other one is like cupping test about the how good the quality, the certification for product based on the SNI that's fine usually. And then for 4C that's not matter, fine or asalan yeah. This is the plantation that certified whether the farmers following guideline or not and the product can be asalan or fine Robusta.” (GOV004)

Interestingly, farmers in this research did not mention SNI certifications or standards. Instead, they primarily referred to 4C or Rainforest Alliance certifications, suggesting that the reach of SNI certifications is limited among farmers. This may be due to the SNI certification focusing on cupping quality and as this research has identified in other areas, farmers have a more localised and farm-based view of coffee production.

In this research interviews with government officials from the Department of Agriculture, The Forestry Department and Plantation Department, provided information regarding programmes and initiatives to support access to resources. These include agreements with banks to provide farmers loans, supporting farmers with stakeholder connections and providing roasting equipment to fine Robusta farmers (see Findings: 8.1, Findings: 8.2, Findings: 8.3, Findings: 8.4 & Findings: 8.5).

Taken together, these policies, covering land access, fertiliser subsidies, cultivation practices, and product standards, demonstrate the wide regulatory framework shaping coffee production in Lampung. However, this research found persistent gaps between the formal intent of these policies and the way farmers perceive or experience them in practice.

7.2 Private corporations

The roles of private corporations

In Lampung, private corporations, including companies, large buyers, and exporters, significantly influence coffee farmers' livelihoods by shaping market access, price determination, and resource availability. While governments regulate supply chain operations, large multinational companies have increasingly gained control over markets. Historically producer-driven, the coffee market is now buyer-driven, with buyers retaining the greatest financial gains from coffee production (Utrilla-Catalan et al., 2022).

In Lampung, companies such as Louis Dreyfus Company (LDC) and Olam play a central role in the coffee supply chain. These organisations purchase coffee from OFGs, ensuring that all necessary standards and documentation are met, including proof of origin stamps and certifications.

This research found that companies, large buyers and exporters in Lampung often serve as key actors in the coffee supply chain, providing technical assistance and market access to farmers, but primarily through OFGs, findings supported by Arifin et al, 2022. The initiatives typically focus on improving coffee quality and productivity through certifications and standards that align with market demands, enabling OFG members to potentially secure better prices and access wider markets. However, these benefits are often inaccessible to farmers unable to meet buyers' requirements, such as large quotas, certifications, or verification stamps of origin and farming methods (Arifin, 2022). This creates disparities between farmers with sufficient resources to meet these demands and those without, while

also undermining sustainability efforts through practices like stamp forgery (see Findings: 9.3.2).

Farmers in this research explained the challenges they face in meeting the quotas required to sell to these buyers. To overcome these challenges farmers resort to selling to smaller traders and collectors and forging stamps. This involves collecting coffee from farms that not OFG members or certified but the OFGs stamp the coffee to state it came from their member farmers. A farmer group leader explained that companies demand large quotas, which his OFG struggles to fulfil. He further noted that he was promised a higher price for the coffee but ultimately did not receive it. This situation highlights a sense of distrust and suggests potential tensions between farmers and private corporations (see Findings: 9.3.2).

“Its very complicated because company like LDC and Olam they want big lot of coffee... usually big buyer needs about 10 tons.” (CK004)

“He’s not satisfied with it because they [company] promised a fee, the company promised a fee for the farmers... No they have not received the fee. The fee per kilo is 50 rupiah.” (CK004)

Farmers in Lampung stated that private corporations can provide access to resources such as equipment and training. Farmers perceived that access is restricted to those who can meet the standards they require and those within OFGs. Farmers stated that they provide seeds and equipment including drying tarps and grass cutters. The private sector is also seen as a source of training and knowledge, particularly for improving quality of the coffee to achieve the standards required.

“give training, especially the Rainforest, Nestle, Regenta, another company, give training for the farmers, how to produce technical cultivation to produce good coffee, but they don't serve the market they don't give advice on the market. They don't solve the marketing for them”. (P036)

“LDC all the production plantation likes, seeds, equipment, good equipment for the plantation.” (P078)

Farmers in Lampung understand the private sector as a market that prioritises both high volume and high-quality coffee. They believe that access to this market is determined by factors such as OFG membership, the ability to meet quotas, certification stamps, and the moisture content of the coffee. As one farmer stated, coffee that does not meet the required standards will be rejected.

“They have tester ...Nestle have tester and then they test the moisture, the dryness of the coffee bean and if its not the standard they reject here.” (P015)

Farmers do not feel they have direct access to private corporations, instead relying on OFGs as intermediaries to sell to this sector. Many farmers believe that the private corporations controls access to critical resources, and while those who can meet the required standards may benefit from valuable training and equipment, the financial gains from selling to the

private sector are often unclear. This lack of tangible financial benefits may contribute to tensions between farmers and stakeholders.

Farmers have expressed frustration over their inability to meet the required standards, citing limited access to resources such as drying ovens (See Findings: 10.4). To promote a more equitable coffee sector, private corporations should extend their engagement to include smaller OFGs that struggle to meet quotas. Furthermore, collaboration with independent farmers to develop traceability systems would allow these farmers to remain independent while gaining access to broader markets.

Private corporation processes.

This research found that in Lampung private corporations, including large buyers, companies, and exporters, play a central role in shaping coffee production through quality, traceability, and sustainability standards. These standards, often tied to certification schemes, reflect international market demands and importing country regulations. Farmers must comply with these requirements to access global markets, often necessitating certification, infrastructure investments, and traceability stamps to verify product origin and quality.

In Lampung companies such as Louis Dreyfus Company (LDC) act as intermediaries between OFGs, traders and the large buyers, and exporters. They facilitate training and technical assistance to farmers, supporting compliance with traceability, and certification standards. Companies will collect verification stamps from OFGs to prove the coffee complies with growing standards, they also develop agreements with traders who collect the coffee from approved OFGs. This collaboration ensures large buyers such as Nestle can show they have done due diligence to attain these standards while offering farmers opportunities to enhance their practices and access premium markets. However, this system disproportionately benefits OFG members, leaving independent farmers excluded.

Farmer strategies to navigate these requirements, such as stamp forgery, were widely discussed (see Findings: 9.3.2). While mentioned in 7.2 as a response to quota challenges, here it is emphasised for its systemic impact: it undermines sustainability goals and reduces trust in certification and traceability systems.

The standards necessary to access private sector markets are shaped by the requirements of importing countries and consumer preferences. These standards are typically enforced through certifications or compliance with import regulations, which can vary between countries. Farmers recognise that certifications are a critical requirement for gaining access to large buyers and companies, such as Nestlé, and this access is generally available only through certified OFGs. As the quotes below illustrate, certifications are not only seen as a means of accessing these markets but also as a source of training and a mechanism for ensuring quality, including adherence to agricultural practices.

“if Nestle have contract with the farmer group then, certification play a role. To ensure that how coffee grow and then also to see how farmers use pesticide or not and they have good agricultural practices or not they also need to fulfil their certification requirements. But for the independent farmers, they don't have like that. They have the items, the only requirement about the moisture, moisture level, dryness level.” (P015)

“I heard about certification and I know the certification is through Nestle and then Nestle give training to the farmers to fulfil the standard of Nestle.” (P018)

“They have partnership between the certification, certification company like Nestle, Nescafe, Indolam and now it's Brindo Jaya, have a partnership with the farmer group. Not to the farmer individually but to the farmer group and Nestle, Nescafe, Indolam and Brindo Jaya have this partnership to increase the quality. They have a certificate they want only high-quality coffee.” (P029)

Private corporations, including large buyers, companies, and exporters, play a critical role in shaping the coffee production landscape in Lampung through their establishment of quality, traceability, and sustainability standards. These standards, often associated with certification schemes, align with international market demands and importing country regulations, providing farmers with opportunities to access premium markets upon meeting these requirements. However, this system tends to favour farmers within OFGs while independent farmers are often left out. Moreover, challenges such as the practice of forging traceability stamps undermine the credibility and effectiveness of the system, compromising its sustainability goals.

To ensure a more inclusive coffee supply chain, it is crucial to improve access for independent farmers, address forgery practices, and strengthen monitoring of standards to build trust and enhance the system's overall integrity.

7.3 Traders and collectors

The roles of traders and collectors

This research found that traders and collectors play a pivotal role in the coffee supply chain. This research supports findings that farmers often have close relationships with traders that have been built up over time (Feryanto, 2022). Traders and collectors act as intermediaries between coffee producers and international and domestic markets. Farmers in this study stated they often lack direct access to large buyers, require fast payment or are already indebted to the traders so they are obligated to sell to them. In Lampung interview data showed these intermediaries buy coffee from several farmers and sell it on to buyers requiring large volumes, this can include larger traders or private corporations. This process is often the preferred method for farmers due to factors such as distance, cost, using cash transactions and the ease of the transaction, a finding supported by Rosiana & Feryanto, (2022).

Farmers in this Lampung study stated that the prices that farmers receive are often influenced by the bargaining power of traders and collectors, who can either provide a fair price or exploit their market position. As such, traders and collectors contribute significantly to the overall price farmer achieve. Statements from the farmers below illustrate the importance of trust between farmers and traders but that occasionally traders can exploit their position and try to manipulate the weight of the coffee or offer lower market prices which farmers did not always feel were fair. Farmers stated that when this happened they would simply not return to that trader in the future. Several farmers in this research stated they would like the government to intervene and set regulations and set prices for traders to avoid exploitation.

“when she already weighed the coffee, like in in her house, it's like 1 tonne and then when that brought to the trader, it's less than one ton and that's what you are worry about the cheating or something that doing by the trader, that's why some trader she trusts and that she always sells the coffee.” (P003)

“Every trader gives the different price. Yeah, it's depend on the quality, depending on the cleanness, cleaning coffee and honesty.” (P015)

Shorter, more direct supply chains without intermediaries have been found to increase profit margins for farmers (Hadiguna et al., 2019), but within this study in Lampung intermediaries were a significant member of the supply chain that farmers rely upon. Farmers in this study state that traders and collectors act as key sources of credit or support for farmers, especially in areas with limited access to financial services, as one farmer stated:

“They need something from the trader they can ask the trader”. (P001)

This dependence can strengthen the role of intermediaries, as farmers may be bound to them through informal contracts or debt arrangements, a finding shared in research conducted in West Java (Yudha, 2021). Farmers in Lampung revealed mixed perceptions of these arrangements with traders. Some farmers perceived positive relationships with farmers and stated they support the farmers at times of need. For some farmers prices for coffee are negotiated as part of the loan agreement before harvests so they are always aware of the prices of the coffee in the agreement.

“with the trader, they usually borrow the money in the guarantee is the result of the coffee... they harvest and they pay the trader... This one is also help the farmers, the collector trader, they help the farmer with the pesticide with the fertiliser and they actually borrow it, they lend it to the farmers and then they pay it back after the harvest.” (P023)

“They have the term ‘bejoin’ they have this partnership between the trader and the farmer, then the farmer gets the money first but the produce is not like you know sold to the trader when it's harvest time...No complain, they just accept it and they're happy with it. They're always happy with the price because it's always informed first, so they know what to expect.” (P026)

However, this research in Lampung showed that some farmers perceived this dependence as a limitation and affected farmers' ability to negotiate better prices or access new markets. Some farmers called for interventions from the government to regulate traders and collectors as they felt the prices needed to be set so farmers would not be exploited and that debt to traders needed to be controlled.

“They want government to take action to intervene with the trading mechanism because the farmers always have debt to the traders.” (CK002)

Traders in Lampung explained that they often find this arrangement challenging, as farmers expect high prices like what they may achieve from large buyers. One trader explained below they don't require the same standards as large buyers so do not offer the higher prices:

“Sometimes he struggles with the farmers produce, because of course they want higher price. But if the farmer wants the money to be fast, they sell it to him because no qualification is needed this is the mixed one, and if they want to sell it to them (nestle), it has to be like high quality it takes more time to process.” (TR008)

A larger trader in Lampung explained that they often incur losses when issuing loans to smaller traders, who in turn provide loans to farmers. Due to reductions in yield and the low quality of coffee, these loans may result in financial losses. As one trader described, he feels that he loses money whenever he provides loans.

“I think the most challenging is the decrease in price and also productivity and coffee. As a big trader, I have a big capital that some small trader have a loan from me, I give them a loan and then the small trader give another loan to farmers. So when the productivity is lower, the farmer cannot pay back for the loans and I feel like I got nothing from it, my money is gone.” (TR016)

Farmers in Lampung therefore have diverse experiences with traders and collectors. Many value them as a fast and straightforward market route and as vital financial support between harvests, while others feel exploited or limited by dependency and debt.

Trader and collector processes.

Traders and collectors play an important intermediary role in the coffee supply chain, connecting smallholder farmers to the larger market (Utrilla-Catalan et al., 2022). Their processes typically begin with informal agreements made with farmers and OFGs, which may arise as part of loan arrangements or as a social obligation based on long-term relationships (Andriadi et al., 2019; Fauzi et al., 2023; Siska et al., 2024).

Traders and collectors then aggregate coffee by purchasing beans directly from farmers or OFGs, which are subsequently sold to larger traders, exporters, or other significant buyers. This aggregation process enables traders and collectors to handle the large volumes of coffee often required to access these larger markets.

Bargaining and price setting takes place between traders/collectors and farmers or OFGs. They negotiate the prices that farmers will receive for their coffee, influenced by local market dynamics, the traders’ relationships with producers, and broader supply-demand trends (Andriadi et al., 2019; Fauzi et al., 2023). This often results in a price-setting system that can favour the intermediary, especially in areas with few buyers, where farmers have limited options to negotiate better prices (Andriadi et al., 2019; Yudha, 2021).

This research in Lampung found that in addition to the financial transaction, traders and collectors also offer credit and support to farmers, often in exchange for guaranteed future coffee supplies, a finding supported by research in Aceh province (Andriadi et al., 2019). In Lampung this research found farmers had mixed perceptions of these arrangements, some believed it limited their bargaining power at times of sale and others saw this as a vital line of support and prices were negotiated fairly. Research conducted in Empat Lawang Regency, South Sumatra, found that such agreements were frequently broken or altered by collectors or traders. The study revealed that initial agreements, which were made to repay the debt in cash, were changed by the collector, who insisted on being paid in coffee after the harvest and at a price lower than the market rate (Siska et al., 2024).

Traders and collectors often build long-term relationships with farmers. These relationships may be based on informal contracts or agreements, where farmers commit to selling their coffee to specific traders in exchange for credit, or other resources (Andriadi et al., 2019; Fauzi et al., 2023; Siska et al., 2024). In Lampung some farmers described having close relationships with traders and collectors and feeling they want to thank these stakeholders for support during times of need, the following quote from a farmer in Lampung illustrates this social obligation:

“He has to thank the small collector for the daily needs. They lend the money, they borrow money from here (small collector). But they are so thank you, so they half the production, they split production, some to Kube and some for the collector.” (P035).

These processes help ensure a stable flow of coffee to the market, and routes of credit for farmers between harvests. However, they can also limit farmer bargaining power and ability to diversify their market options.

7.4 Certifications

The roles of certifications

Consumer awareness of sustainability issues has led to an increase in demand for sustainability sourced foods and traceability (Arifin, 2010). Often certifications provide this evidence to consumers by providing a set of standards that certified farmers need to adhere to. The impacts of certifications on environmental, financial and social outcomes has revealed mixed results (Astuti et al., 2015; Beuchelt & Zeller, 2011; J. Bray & Neilson, 2018; Campera et al., 2021; Caudill & Rice, 2016; Dietz & Grabs, 2021; Imron et al., 2022; Schuit et al., 2021; Takahashi & Todo, 2017; Utrilla-Catalan et al., 2022; Vanderhaegen et al., 2018).

Certifications Including Rainforest Alliance and 4C (see Appendix 14- Certification Standards) are active in Lampung, participants in this study were not certified by any other programme. Certification schemes provide training and technical support, they aim to enable farmers to adopt better agricultural practices, improve quality, and meet global standards (often required for export/import) (Arifin, 2022; A. Wahyudi et al., 2020). In Lampung these benefits are typically targeted at OFGs, although non-members may occasionally access training informally (see Findings: 8.1.1). This research found that farmer perceptions of the benefits and roles of certification vary.

The financial costs and administrative procedures can affect the decision to pursue certification, particularly for farmers with limited resources (Arifin, 2022; Astuti et al., 2015; Ibnu, 2023). In Lampung some farmers stated that the administration procedures required could create barriers for some farmers:

“the problem is the farmers, not really familiar with the administration and bureaucracies of the administration. There is some form that this should be fulfilled by the farmers and they don’t like that.” (P078)

In Lampung, certification processes that require traceability, farming, and sustainability standards are also contingent upon OFG membership. Certifications offer training, guidance, and monitoring through the OFG. However, farmers who remain independent cannot access certified markets without resorting to stamp forgery (see Findings: 9.3.2). As a result,

certifications do not hold significant value for these farmers, as they are not obligated to meet the required standards to access non-certified markets.

“if Nestle have contract with the farmer group then certification play a role... but for the independent farmers, they don't have like that. The only requirement about the moisture, moisture level, dryness level.” (P015 non-certified OFG member)

The perceptions of the benefits derived from becoming certified is very mixed in Lampung. Several farmers perceived certifications as a source of knowledge and training. They described learning new techniques from certifications and that this training was available to certified farmers and non-certified farmers.

“I feel experience from Rainforest alliance that helped me to do a connection technique also the agroforestry and shade trees.” (P035)

“I know the certification is through Nestle and then Nestle give training to the farmers to fulfil the standard of Nestle.” (P018)

Others, however, doubted whether certification improved livelihoods.

“Yeah, it says there's no real impact from the certification or company.” (CK002 non-certified group leader)

“He understand the certification bring new planting method, like shade tree. He said that I don't think that it really matter that the kind of activities because he didn't feel that any effect from the certification.” (CK004 certified group leader)

While certification schemes aim to enhance sustainability and equity, their limited reach and inconsistent impact undermine their potential. Farmers often perceive certifications as offering insufficient financial rewards to justify the associated costs, opting instead to focus on alternative livelihood strategies, this is supported by Bray & Nielson's (2018) findings that producers valued training and price information above that of the price premium itself. Research in Lampung supports this research finding that farmers associate training and knowledge with certifications rather than financial gain. To address these challenges, certification bodies should strengthen direct engagement, reduce certification costs, and expand access to training and market opportunities.

Certification Processes.

The global coffee trade is increasingly influenced by buyer-driven regulations and sustainability which shape the coffee supply chain, especially for producers in coffee-exporting countries. In Indonesia's coffee-producing regions like Lampung, sustainability certifications such as Fair Trade, 4C and Rainforest Alliance can play an important role in connecting local farmers to international markets. As global consumer demand for ethically produced coffee grows, these standards have become essential for coffee producers aiming to access developed export markets (Arifin, 2010). The certifications, detailed in Appendix 14, establish standards for environmentally sustainable practices, social equity, and economic outcomes for producers.

Within the Lampung study, only Rainforest Alliance and 4C certifications were observed. Rainforest Alliance, which merged with UTZ in 2018, addresses environmental, economic, and social challenges in agriculture. Its standards cover farm management, traceability, sustainable practices, and working conditions, with a strong focus on deforestation, biodiversity, and climate change adaptation. Certification requires monitoring and reporting, including income tracking and supply chain traceability (Rainforest Alliance, 2022). In Lampung, certified farmers practised methods that supported both environmental protection and community livelihoods.

4C certification seeks to raise social, economic, and environmental standards in coffee farming. It establishes baseline requirements in business management, human rights, working conditions, and environmental care, while addressing biodiversity, water management, and soil fertility. It also promotes fair labour and provides farmers with access to services and market information to improve income and sustainability.

Together with schemes like Fairtrade and Organic, these certifications help Indonesian coffee meet international market standards often required by companies and exporters, though only Rainforest Alliance and 4C were observed in Lampung.

In Lampung farmers produce asalan (mixed) Robusta and petic mira (fine) Robusta, certifications such as Rainforest alliance and 4C are only available for mixed Robusta farmers, as one farmer explained:

“for fine Robusta I cannot say that I'm certified because I just received the guide and the training from the rainforest [Rainforest Alliance]. Because I just get the training and they find me the market.” (P035)

While certification creates access to export markets, costs and administrative burdens pose challenges. As one trader explained

“It was easier than before the qualification because everything is OK if it's wet if its dry now, they have to sort the coffee and it's so hard now because with the qualification, the farmers still need to provide their family, but have no income because maybe because of the bad weather, the quality of the coffee is low.” (TR008).

This research identified that stamp forgery was widespread, with non-certified coffee often being sold as certified. This reflects how restrictive certification processes can push some farmers and OFGs to circumvent the system (see Findings: 9.3.2). Additionally, the study found limited engagement between certification bodies and farmers, with only 6.5% of farmers reporting direct contact with certification organisations. This indicates a significant opportunity to improve farmer engagement and raise awareness about certification support.

In Summary, certification processes like Rainforest Alliance and 4C link Lampung farmers to international markets but impose substantial costs, exclude independent farmers, and create loopholes that undermine sustainability. Strengthening direct engagement, reducing costs, and expanding support are crucial if certification is to become a more equitable and effective system.

7.5 Importing countries

The roles of importing countries

Research into coffee supply chains highlights the significant influence that importing countries exert on prices, primarily through the concentration of market power. This imbalance results in retail prices rising while export prices fall, a phenomenon often referred to as the “coffee paradox” (Fitter & Kaplinsky, 2001; Kang & Kennedy, 2009). In Indonesia, where approximately 90% of coffee is exported (Ramadhillah & Masjud, 2024), importing countries have a substantial impact on the livelihoods of farmers, particularly in Lampung, due to their influence on both prices and standards.

Importing countries are not only consumers of coffee but also act as intermediaries, buying coffee from producing countries, processing the coffee to add value then re-exporting the product to other markets. The coffee market is largely controlled by two major markets: the New York Exchange for Arabica coffees and the London Stock Exchange for Robusta coffees. These markets operate under two systems: physical markets and futures markets (Utrilla-Catalan et al., 2022).

Beyond their influence on pricing, importing countries also shape the coffee supply chain by enforcing various standards and certifications that coffee must meet to enter their markets. These regulations focus on product quality, environmental sustainability, and ethical trade practices. For instance, the European Union's Deforestation Regulation (EUDR) mandates that companies ensure coffee imports do not contribute to deforestation, promoting sustainable sourcing and environmental responsibility (European Commission., n.d.-c; Petroni & Hoppe, 2024). Certifications, though voluntary, are increasingly becoming essential for producers seeking access to specific buyers, as consumer preferences shift towards products that meet environmental and social criteria (Pierrot et al., 2010). This shift is driven by growing concern over the environmental and social impacts of agriculture, particularly in luxury goods such as coffee, cocoa, and tea (Chiputwa et al., 2015).

Despite the influence of importing countries on key livelihood factors such as pricing and standards, farmers in Lampung did not discuss the role of these stakeholders in the supply chain. This suggests that farmers are either unaware of the impacts of importing countries or maintain a more localised view of the supply chains (see Findings: 6.1.1).

Importing countries play a pivotal role in shaping the coffee supply chain by influencing pricing structures, enforcing quality and sustainability standards, and responding to consumer demand for ethically sourced products. These regulatory actions help define the global coffee market. However, farmers in Lampung tend to adopt a more localised view of the supply chain, focusing primarily on the day-to-day demands and the prices they can achieve. In contrast, traders in Lampung have a broader, global perspective and recognise the role of importing countries in price setting.

Importing country Processes.

Approximately 90% of all coffee produced in Indonesia is exported (Ramadhillah & Masjud, 2024). In 2023, Robusta accounted for 78.78% of Indonesia's coffee exports. The top five importers of both Arabica and Robusta were the United States, Egypt, Malaysia, India, and Italy (BPS-Statistic Indonesia, 2024). Coffee imports in these and other markets are regulated to ensure safety, quality, and compliance with national and international standards. Requirements typically include food safety laws, labelling, and phytosanitary certification,

alongside controls on pesticide residues, contaminants, and packaging. Some markets also demand additional certifications, such as halal in Muslim-majority countries or sustainability schemes to meet consumer expectations. The European Union has introduced further rules on traceability and deforestation-free supply chains. Collectively, these frameworks shape market access for Indonesian coffee and highlight the importance of certification, compliance, and transparent supply chain management (see Appendix 12-Importing country standards and regulations).

Importing country processes play a significant role in shaping the coffee trade by establishing stringent standards for safety, quality, and traceability. These regulations, which vary by country, ensure that coffee imports comply with consumer expectations and environmental requirements, such as pesticide limits and deforestation regulations. While farmers in Lampung were generally unaware of the direct influence of importing countries on their pricing or standards, traders recognised the global market fluctuations and regulations that impact them. Government officials highlighted the complexity of international negotiations, such as those regarding pesticide levels, which involve multiple stakeholders and can influence coffee exports. Understanding these processes is crucial for improving farmer awareness and ensuring compliance with international standards, ultimately enhancing access to global markets for Indonesian coffee.

7.6 Domestic Fine Robusta buyers

Roles and processes of Domestic Fine Robusta buyers

Domestic fine Robusta buyers, including coffee shop owners and roasters, are an emerging but significant influence on coffee farmers' livelihoods in Indonesia (Ashardiono & Trihartono, 2024). Domestic fine Robusta café owners interviewed in this study explained that they establish direct trade routes that bypass traditional intermediaries. Unlike exporters and larger buyers who focus on mixed Robusta, domestic fine Robusta buyers prioritise red cherries, emphasising quality and encouraging farmers to adopt improved agricultural practices. This direct trade model enables farmers to achieve higher product standards, benefit from transparent negotiations, greater bargaining power and often secure higher prices.

"Yes the exporter, quota, quantity, the price the exporter makes the decision. Except the fine Robusta they because they sell to the cafe. It's personal relationship with their own marketing, their own distribution." (P078)

In addition to financial benefits, these relationships support capacity-building within farming communities. Coffee shop owners interviewed in this study stated they often provide training, equipment, and feedback to farmers to enhance product consistency and quality. However, the fine Robusta market remains niche, limiting its accessibility to relatively few farmers compared to the mixed Robusta market.

Challenges to scaling up direct trade routes include limited farmer knowledge, resource constraints, and logistical barriers. During data collection, the price of mixed Robusta was similar to fine Robusta, discouraging some farmers from pursuing the additional work required for fine Robusta production. Additionally, the limited volume demands of fine Robusta buyers prevent these trade routes from fully replacing traditional sales to traders and collectors. It is important to note that fine Robusta producers can also sell their fine

Robusta to local traders and collectors who then sell to coffee shop owners but interview data shows they are able to achieve higher prices with direct trade to coffee shop owners.

“No, the problem is export this exporter they don't ask for the fine robusta they just ask for the asalan. And so the demands come from the cafe mostly so very limited coffee growth for establishing the province so the market also limited.” (P078)

To maximise the impact of this emerging market, targeted interventions are needed to raise farmer awareness, improve access to buyers, and strengthen infrastructure supporting direct trade relationships.

Interviews with government officials in this research revealed that interventions are taking place to encourage the production and trade of fine Robusta coffee, also to provide fine Robusta OFGs with roasting equipment. This is to enable farmers to increase their incomes from coffee, however this may conflict with agreements with coffee shops (See Findings: 9.2.3).

7.7 Cultural Roles and Processes.

Village Leadership

Village leaders play a critical role in organising community activities and facilitating access to resources (Rinto Z.W. Abidjulu et al., 2024). In Lampung, leaders acted as intermediaries between farmers and external stakeholders, including government bodies and researchers. Their influence extends to mobilising community participation, with 62.5% of farmers in this study attending village meetings. These meetings serve as forums for discussing communal issues, sharing market trends, and exchanging farming methods, contributing significantly to social capital and collaborative efforts.

Intergenerational knowledge transfer

Intergenerational knowledge transfer is important in shaping coffee farming practices, with families passing down traditional techniques such as post-harvest processing (Irmeilyana et al., 2020). While this ensures the continuity of locally adapted methods, the increasing complexity of modern coffee production presents challenges. This research found that stakeholders perceived younger farmers as more likely to adopt innovative practices, whereas older generations were thought to rely on traditional methods, limiting adaptability to market demands. Bridging this generational gap through formal training and support could integrate traditional knowledge with modern techniques, ensuring long-term sustainability.

Social capital

Social capital underpins relationships between farmers, traders, and other stakeholders in Lampung. Informal trade relationships, built on trust and reciprocity, provide farmers with immediate market access, especially for those outside OFGs (Andriadi et al., 2019; Fauzi et al., 2023; Rosiana & Feryanto, 2022). However, these networks can expose farmers to exploitation, with some traders taking advantage of their limited bargaining power. This research in Lampung found that farmers who experience dishonesty in such dealings often cease relationships with those traders, reinforcing the importance of trust in sustaining these networks.

This research found that social capital also fosters collaboration and knowledge exchange among farmers, such as sharing grafting techniques and resources. While OFGs can facilitate these connections, farmers often build reciprocal relationships independently of formal groups. The low utilisation of OFGs for collaborative tasks, such as labour-sharing or direct market access identified in this research, indicates missed opportunities to fully capitalise on these social connections (see Findings: 10.3). Strengthening these peer-to-peer networks and encouraging greater collaboration within OFGs could enhance resource access and resilience, creating more equitable and sustainable systems.

7.8 Conclusion: Structural factors and Processes

The structures and processes governing coffee farming in Lampung present both opportunities and limitations for farmers' livelihoods. Government institutions regulate access to resources and establish quality standards, with policies such as the Social Forestry Management Programme offering land access. However, farmers consistently perceive the distribution of these resources as uneven, with independent farmers in particular describing exclusion from training, fertiliser subsidies, and equipment. A persistent theme in farmer accounts is the belief that the government prioritises staple crops like rice and maize over coffee, reinforcing feelings of marginalisation. The change to the subsidised fertiliser policy (Regulation No. 41/2021) exemplifies this, as many farmers were unaware of their removal from eligibility and described this as unfair. These perceptions underscore not only material barriers but also communication gaps between farmers and government institutions.

Private corporation actors, including companies and large buyers, play a powerful role in shaping coffee production through quotas, certification requirements, and traceability systems. OFG members may access resources, training, and markets through these systems, but farmers frequently described challenges in meeting quota sizes or certification demands, sometimes expressing distrust towards companies who they felt did not always deliver promised benefits. For independent farmers and small or less formal OFGs, the requirements imposed by companies often act as barriers, leaving them reliant on traders and collectors.

Traders and collectors remain pivotal intermediaries, enabling quick transactions and providing financial support through informal loans. Farmers valued these roles for offering immediate cash and support during difficult periods but also recognised risks of exploitation and dependency. Trust was repeatedly emphasised by farmers as central to sustaining these relationships, yet some described dishonest practices such as price manipulation or unfair weight assessments. Traders themselves highlighted the difficulties of issuing credit, with some reporting financial losses when farmers defaulted. These dynamics illustrate how traders and collectors are perceived as both vital lifelines and potential sources of vulnerability.

Certification schemes such as Rainforest Alliance and 4C provide access to training and international markets but are uneven in their reach and impact. Farmers described gaining knowledge from certification training, yet many doubted the financial benefits. Several participants expressed scepticism, describing the price premiums as too small to justify the administrative burden, and some traders and group leaders characterised certification as tokenistic. Independent farmers are excluded from certified markets without resorting to stamp forgery, which was openly acknowledged by participants as a way of bypassing restrictions. This highlights a striking disconnection between the intended purpose of certification systems and the ways farmers experience and navigate them in practice.

Importing countries exert substantial influence over pricing and standards through buyer-driven regulations, but farmers in Lampung rarely recognised this influence. Most described the supply chain in localised terms, focusing instead on the demands of traders, companies, and buyers within Indonesia. Traders, however, articulated a broader perspective, recognising that international market influence, such as price setting or traceability standards.

Domestic fine Robusta buyers offer new opportunities by bypassing traditional intermediaries and creating direct trade routes. Farmers involved in these relationships reported higher prices and valued the training and equipment provided by café owners and roasters. At the same time, the niche scale of the market and its limited demand mean that only a small number of farmers benefit, and the wider sector continues to depend on mixed Robusta production.

Cultural processes also remain highly influential. Village leaders were widely seen as intermediaries between farmers and external stakeholders, and intergenerational knowledge transfer sustains traditional practices such as post-harvest processing. Younger farmers were perceived as more open to innovation, while older farmers tended to rely on inherited methods, reflecting a generational divide in adaptability. Social capital built through trust and reciprocity enabled collaboration and informal trade, though some farmers emphasised risks of exploitation in these networks.

Taken together, these findings show that while formal structures such as government policies, certification schemes, and private corporation standards provide opportunities, they also create barriers that reinforce inequalities. Informal processes, including trader relationships, village leadership, and peer-to-peer collaboration, remain central to how farmers access resources and markets, often compensating for the shortcomings of formal systems. Farmers' perceptions highlight that exclusion, communication gaps, and unmet promises shape their engagement with structures and processes just as much as the opportunities offered. Addressing these issues requires not only reforms to policies and certification systems but also recognition of the informal mechanisms that underpin livelihoods in practice.

8 Findings: Perceptions of Livelihood Assets

This section explores the perceptions of the five essential livelihood assets: human, social, natural, physical, and financial capital. These assets are fundamental to the productivity and resilience of farmers, enabling them to navigate the challenges of coffee production. The quality and availability of each asset vary, with farmers relying on a mix of formal and informal strategies to improve their practices. Through interviews with farmers, traders, government officials, and other stakeholders, this research sheds light on how these assets are perceived, with a particular emphasis on the perceived role they play in enhancing livelihoods.

While human capital, comprising training, knowledge, and education, plays a key role in improving farming techniques and sustainability, the availability of social capital through networks and collective action also offers vital support. Additionally, natural assets, such as land and soil quality, are crucial for long-term productivity, while physical capital, including farming equipment and infrastructure, directly impacts operational efficiency. Financial capital, encompassing savings, credit, and loans, is essential for farmers' ability to invest in resources and manage their businesses effectively. This section examines the varying perceptions of these five capitals, highlighting their importance to coffee farmers in Lampung.

8.1 Human Capital

This section explores the role of human capital in the livelihoods of coffee farmers in Lampung, Sumatra, focusing on key assets such as training, knowledge, education, and health. Human capital, which refers to skills, knowledge, health, and labour, is a crucial factor in achieving livelihood outcomes (DFID, 1999). Access to this capital can vary, influencing farmers' ability to improve their production practices and overall resilience. This research investigates the perceptions of farmers, traders, and government officials regarding the human capital assets available to farmers, with a particular emphasis on training, knowledge, and education. The perceived quality and availability of these assets are examined using primary data collected through interviews with farmers, traders, government officials, and researchers, alongside secondary data to triangulate the findings.

8.1.1 Training

Training refers to formal training sessions delivered to stakeholders in the coffee supply chain. Interview data shows that it is believed that the government, certifications and private corporations provide training to coffee producers.

Several studies have stressed the importance of training in Indonesia and the need for improvement. Training is needed to improve production and quality as well as prepare for future changes such as climate change (D. F. S. Hartatri & Neilson, 2021; Sarirahayu & Aprianingsih, 2018; Sarvina et al., 2021; Yudha, 2021). Recent studies highlight efforts to improve Robusta coffee quality and farmer livelihoods in Indonesia. Training programs focusing on post-harvest processing have enhanced coffee quality, with farmers in Buleleng, Bali, Indonesia achieving fine Robusta scores of quality (Suryaniadi et al., 2023).

Previous research has identified that farmers can access training through connections to other stakeholders. Often these connections are facilitated by OFG (see Findings: 8.2.1 & Findings: 9.4.3). The findings of Ochago et al. (2017) underscore the critical role of membership in OFGs and access to agricultural training. Their study revealed that coffee

farmers in Uganda were more likely to engage in learning opportunities and group activities when they had access to extension services through an OFG. These services typically involve direct interaction with extension workers, whether from government bodies or other organisations. Alemu (2021) similarly identified that, among maize, haricot bean, and coffee farmers in Ethiopia, contact with extension workers had a significant positive impact on participation in training programs. Certification membership can also increase farmer training opportunities; however, the effectiveness of the training is dependent on factors such as local leadership and institutional effectiveness (J. G. Bray & Neilson, 2017) (see Findings: 9.4).

In Indonesia there is a lack of extension services, and this creates challenges for farmers (Sarvina et al., 2021). Hartatri & Nielson (2021) found that just 10.5% of farmers had access to extension services from NGOs and buyers and no farmers had access to government extension services. Concerns expressed by The Chairman of Commission IV of the House of Representatives of the Republic of Indonesia show that the government is aware of these issues (DPR, 2024).

In Lampung, farmers perceive training as primarily facilitated through government programs, certifications, and private corporation partnerships via OFGs. Members reported access to a range of training initiatives, covering areas such as pest management, the production of organic pesticides, grafting, coffee processing techniques, and trade practices. A leader of a farmer group commented:

“the farmer groups work very important, because guidance from outside, from the Olam or from the government come through the farmer groups, not individual. So since he became the member of the Farmer Group, his knowledge about the stek cultivation, join the coffee trees also develop.” (CK004)

The government offers training programmes aimed at enhancing agricultural production and farming practices, which include techniques such as grafting, planting methods, and the use of natural pesticides. An official from the Plantation Department explained that the government is collaborating with farmers to refine planting and grafting techniques. Additionally, a farmer shared that he had applied training provided by both the government and private companies to improve his practices.

“The programme is related to how to increase the value added and challenge about the competition between farmers. There's more programme for intensification. How to regeneration of the coffee tree. Do you know when the at the bottom there's the old one and then they put another entry the stek. This is about the length between one tree to another. So this is about how to plan coffee more in a good way. They put coffee like this in one row or in row and then there's a distance between one tree to another.” (GOV001)

“Some actors, for example the government Employee which is the interface [employee from dept of agriculture]. Or from the company industry, coffee industry influence them to try a new method. OK, in planting coffee, new method in planting coffee so they try.” (P002)

Government officials also outlined their efforts to encourage farmers to diversify into trading, thereby providing them with additional trading opportunities. However, the farmers in this study did not mention any training related to this, implying that they did not have access to this particular asset. A government official from the Plantation Department clarified that the government is actively working to share trading knowledge with farmers.

“So the farmers to be seller/ trader the farmer need special knowledge to have good judgement about the quality of the coffee with grades the coffee and also to calculate the moisture, the dryness of the coffee, so the government will give training for them to improve the knowledge to become the trader and also they give. You see some of the farmers to become trader they need machinery and the dryer and also the huller and the breaker, cherry breaker. But most of the support from the government is to improve the knowledge first, to become a trader and then they have to have good judgments in which grade the coffee and in which price will be given to the coffee.” (GOV004)

Farmers, domestic fine Robusta café owners, and government officials reported that fine Robusta farmers receive targeted training to improve product quality and processing. Training covers processing, roasting, and farming methods that enhance quality. It is provided by both the government and café owners but remains exclusive to fine Robusta farmers, with government-led sessions limited to OFG members. A government official from the Plantation Department explained:

“The orientation now is for the roasting, to get better price for the farmers because the green bean price is from London. Yeah, so it's not, for the local farmers is not enough to improve the economic conditions. So they work now with either with group or individual to make them able to roast.” (GOV 004)

Domestic fine Robusta café owners, however, offer training to both OFG members and independent farmers. This training is specifically tailored to achieving high-quality coffee, emphasising the farming techniques required by the café owner (see Findings: 9.4). One domestic fine Robusta café owner stated:

“But the process this is about the knowledge the all the process knowledge, this one I give to the farmer and then they make processing only they make processing and then I buy direct to the farmer... I teach all our farmer and then give some like a machine maybe. Machine for the pulping coffee and then they make the coffee and directly send to me there.” (TR010)

Rainforest Alliance and 4C certifications provide training to coffee producers in Lampung, covering organic inputs, grafting, and good agricultural practices. Farmers expressed mixed views: some valued the training, while others saw little benefit from certification. As the quotes below show, certifications are recognised as a training source, but perceptions of their impact and effectiveness remain mixed.

“certification helps them to know how to increase the production process, like the water content, they know this one is good, or this one is bad.” (P026)

“People that teach us [grafting], especially from Rainforest alliance.” (P035)

“Repeatedly give training...Rainforest, Nestle, Regenta, another company, give training for the farmers, how to produce technical cultivation to produce good coffee, but they don't serve the market they don't give advice on the market. They don't solve the marketing for them.” (P036)

In Lampung, extension workers act as intermediaries between farmers, the government, and private companies. Farmers and officials explained their role as relaying farmers' needs up the supply chain while passing on information, including training and programme details, from government and companies. Extension workers engage with farmers mainly through OFGs, but access is uneven, and farmers expressed distrust and mixed views of their effectiveness, as illustrated in the quotes below:

“Of course, the way but if there is a government employee officer [extension worker]. They come to the farming group, they can share the idea and then the official will give the idea, send an idea to their leader.” (P003)

“The representative of the farmer come out with the extension officers, they come to us to give guidance on the qualification, but of course in the end I think the extension official have collaboration with the military police just to play the farmers so I don't trust.” (CK004)

“So the extension worker passes the information to like their boss and then like nothing ever happened.” (P029)

Farmers expressed dissatisfaction with the training programs available to them, highlighting notable gaps in the training they could access. The critique was primarily directed at the Indonesian government. One OFG member stated: *“There's no guidance from the government, we rely only on the private [sector]” (P035)*, while another remarked: *“I want the government to give the farmers more knowledge, more training” (P018)*. The farmers emphasised the need for additional training to ensure the sustainability of coffee production, particularly in areas such as soil quality improvement, production enhancement, addressing climate change-related weather challenges, and improving the health of coffee trees. An OFG member (P002) specifically mentioned a desire for training to *“make the soil good again, soil condition.”*

It is important to note that the dissatisfaction expressed by farmers may not solely stem from the existence or quality of training programs, but rather from issues related to the accessibility of such training. Although all participants were OFG members, other factors may have hindered their ability to access training provided by the Indonesian government such as remote location of their group or the lack of connections with other stakeholders.

Training represents a key asset for coffee farmers, enhancing their human capital through knowledge and skills that improve production quality and sustainability. Formal training, typically delivered by government bodies, private corporations, and certification organisations, covers crucial areas such as pest management, organic pesticide production, and post-harvest processing. Members of OFGs have structured access to this asset, benefiting from training provided directly to their groups. While training is available through a combination of public and private sector initiatives, access remains uneven, with some facing challenges in obtaining the same level of training, often relying on informal knowledge networks instead.

8.1.2 Knowledge

Knowledge represents an important asset that influences the sustainability and productivity of coffee farming, as it significantly improves understanding and supports informed decision-making regarding coffee cultivation, marketing strategies, and other associated areas (Kabita et al., 2021).

Informal knowledge transfer is critically important in Indonesia and has been found to be significant in the improvement of agricultural practices. Informal knowledge sharing through face-to-face contact or social media can increase farmer confidence and increase the adoption of new farming techniques (Ihsaniyati et al., 2024; Istiqomah et al., 2024). Rugerinyange and Buyinza (2023) found that coffee farmers in Uganda primarily relied on informal, word-of-mouth communication to obtain market information. Farmers viewed this method as reliable because it came from trusted sources, such as other farmers and traders. Although focused on market information, the study highlights the importance of effective information transfer in agricultural communities, showing that informal channels can play a crucial role in dissemination (see Findings: 9.4).

Research conducted in Europe focusing on knowledge sharing in organic practices has found that while online sources, including social media, can provide valuable information, they cannot replace the benefits of face-to-face interactions such as workshops and meetings where both successes and failures can be discussed (Bliss et al., 2019). A recent study identified various knowledge-sharing strategies used by fine Robusta farmers, who are actively encouraging and supporting their peers through social media in the production of high-quality Robusta coffee (Ihsaniyati et al., 2024). This indicates that social media is a growing mechanism for the dissemination of information and market development.

In Lampung farmers discussed knowledge sharing within OFG meetings, within these meetings knowledge is shared between farmers and from other stakeholders in the supply chain. These interactions allow farmers to gain knowledge on farming practices, market prices, and new innovations. Membership in an OFG not only provides access to external knowledge from other stakeholders but also fosters internal knowledge exchange from farmer to farmer. As a farmer pointed out:

“They expect it from the farmers group because there are a lot of discussion and the farmer group facilitate the education and those who are not joining the farmers group they only rely on their phone.” (P026)

Independent farmers, unlike OFG members, lack direct links to wider stakeholder networks, limiting their access to supply chain information. They rely mainly on personal ties with other farmers and traders, supported by technology such as mobile phones and the internet. While

offering less contact with diverse stakeholders than OFGs, this approach still enables them to access knowledge from peers and traders.

Knowledge sharing among farmers appears to be largely influenced by social relationships and available communication channels, such as mobile phones and community meetings. This finding aligns with the research of Rugerinyange and Buyinza (2023), who identified word-of-mouth as a significant means of disseminating market information. Similarly, in Lampung, it was found that farmers exchange knowledge through mobile phones and at non-coffee-related gatherings, such as village or religious meetings. There is also a notable sense of camaraderie among farmers, where the sharing of new insights and discoveries is a common practice.

Farmers and government officials discussed how farmers independently conduct research to identify suitable coffee plants for their specific environmental conditions. When they make such discoveries, farmers share this knowledge with others within their network. As one farmer described, this collaborative process is essential in identifying new and more successful scions (See Findings: 9.4).

“In the last 10 years they also experiment with the population, ... then finally found a suitable technique and suitable trees that fit with the environment and the ecology here...Its individual not through farmer groups...They're travelling a lot to see whether each is good and then ask for the colleague farmer for the clone...So they try to solve the problem and with the plant...because of the friendship it exists.” (P035).

Domestic fine Robusta café owners and farmers in this study explained that knowledge transfer occurs between them, forming part of bespoke agreements established through the domestic supply chain routes for fine Robusta. This transfer may take the form of formal training from café owners to farmers or informal exchanges of knowledge. The knowledge shared focuses on improving quality and using the farming methods necessary to meet the high-quality standards.

In addition to the knowledge transfer between domestic fine Robusta café owners and farmers, this research also identified knowledge transfer between other stakeholders within the fine Robusta domestic supply chain. Independent groups were formed in Lampung, and monthly meetings were held to facilitate the exchange of knowledge among stakeholders, such as roasting and brewing techniques. A domestic fine Robusta café owner explained that this group was developed independently but that it has now ended.

Speaker 2

“Actually we have some community here, like the one that I follow. It's some kind of barista and coffee shop community. So in around 2016 when this kind of coffee industry start to move. The manual brewing.

The community is called Capica L Kopi Di Lampung. So it's some kind of coffee community in Lampung.”

Speaker 1

“And these are groups for people who work in coffee?”

Speaker 2

"Barista and coffee shop owner the first step start the community but the first here the outside people like lecturer and then also work from the other industries also joining the community. So it's quite big in 2016 until. 2018. So we have some kind of community like workshop. And then I have a roasting workshop. Its a free class."

Speaker 1

"So it's a way of sharing knowledge?"

Speaker 2

"Yes, I forget why it went down...ended." (TR009)

Farmers in this study stated they also acquire knowledge from online platforms such as YouTube. For instance, one farmer noted, *"So I learn from many, many sources. I watch YouTube to do the thing to maintain the coffee but yeah, the result is not as expected"* (P018). This practice raises concerns among some stakeholders, especially government officials, who worry that farmers are adopting methods that may not align with the specific environmental conditions in Indonesia. An official from The Plantation Department remarked:

"For the behaviour of farmers now many young farmers, they are too innovative they see through YouTube or through media about the method to cultivate coffee in Brazil. They want to apply here like with what is thin space between coffee with so many, so many thousand coffee trees in one hectare and then it will be risky because in the five or ten years will be the root will be in competition and also the branch will be compete. And it will be not good for the future of the plantation because it's too crowded. That's to be a warning for the behaviour of our farmers like that to hold." (GOV004)

In conclusion, access to and utilisation of knowledge are perceived differently. The perceptions of the types of knowledge available are influenced by OFG status, the type of coffee produced, and access to technology. These varying perceptions of knowledge and use may have significant implications for the sustainability and productivity of coffee farming in the region, as well as for the different coffee-producing groups within it.

8.1.3 Education and health.

Within the SLF, educational and healthcare facilities are critical components of human capital, serving as essential assets that contribute to the resilience and sustainability of rural livelihoods (DFID, 1999). In this research the assets within this category include formal education, time spent in coffee farming (experience) and health care assets including medical centres.

Research has found links between education, experience and productivity, highlighting the importance of understanding farmer's ability to benefit from this asset. In Simalungun, North Sumatra Hartatri & Neilson (2021) identified that education and levels of experience impacts productivity. In their study sample the average age of farmers was 50.6 years old with an average experience of 11.62 years in coffee farming. Almost half of farmers in their study (46.12%) had high school level of education (SMA). Another study in Bengkulu, South Sumatra found participants had an average of 10 years coffee growing experience. And low levels of education with 12% of their participants having high school level (SMA) of education, 38.37% Junior high school (SMP) and 50% had not attended school or only

completed elementary (SD) level of education. The researchers propose that the low levels of education and experience lead to farmers being resistant to try new practices and deviate from the status quo (Irawan, 2023).

In Lampung, farmers were, on average, younger than farmers in Simalungun but had significantly more experience in coffee farming (24.14 years), suggesting that farmers in Lampung likely began farming at a much younger age. This may help explain the lower levels of education in Lampung, indicating that many farmers may have left formal education early to pursue coffee farming (see Figure 12). Research on coffee farming and education highlights complex relationships. Several studies suggest that increased coffee production can have a negative impact on children's schooling, particularly in poorer households (Carrillo, 2020; Fuentes-Vásquez & España-Eljaiek, 2023; Kruger, 2004) (See Findings: 10.2).

All participants in Lampung reported access to local primary schools, and most also to secondary schools. However, education costs were a major concern, often cited as a key household expense. Thus, while schools were physically available, economic barriers may limit full access for some farmers' children. These costs, though manageable for some, could restrict education for those facing financial instability, sometimes diverting youth labour to coffee production to support household income. Further research is needed to examine how educational expenses act as barriers to access and how this affects livelihood sustainability.

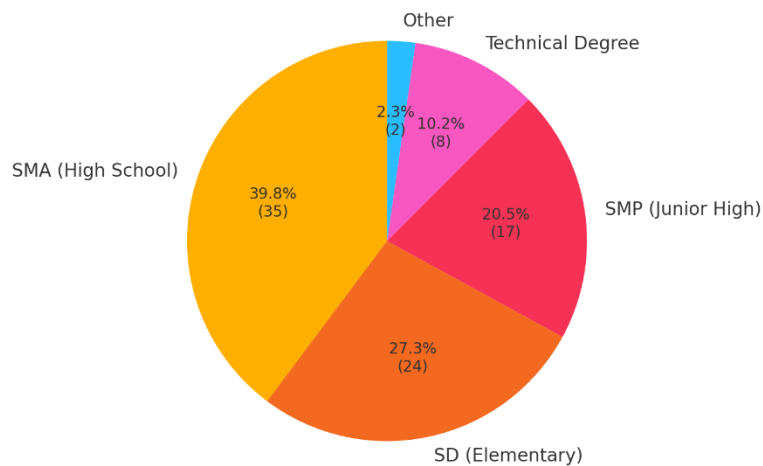


Figure 12 The levels of education. Own data

A recent study examining rural communities in Indonesia identified several key barriers that impede access to healthcare services. These barriers include a shortage of healthcare professionals, inadequate healthcare infrastructure, and low socioeconomic and educational levels within these regions (Anggraini, 2023).

Findings from Lampung suggest healthcare was generally perceived as accessible. Most participants (98%) reported local medical facilities, and costs were not seen as a major burden. This contrasts with education, where expenses were a key challenge, indicating healthcare is more accessible both geographically and financially, supporting community well-being. Further research is needed to assess whether this reflects genuinely high levels of access or farmers not utilising or prioritising healthcare.

Education and healthcare are fundamental assets contributing to human capital and the overall resilience of rural communities. In Lampung, primary and secondary education facilities are believed to be widely available within coffee-farming communities, though the associated costs are a major household expenditure, posing an economic barrier to full access for some farmers. By contrast, healthcare facilities are seen as more accessible, both geographically and financially, and generally do not present a comparable financial burden. This relative ease of access to healthcare supports the community's well-being and sustains its capacity for productivity.

8.2 Social Capital

Social capital involves the networks, formal and informal relationships and associations that facilitate opportunities and benefits. Social capital can include the interactions between people that enable them to work together, memberships (whether formal or informal) of groups and the trust developed that enables cooperation and shared risk (DFID, 1999).

This section examines social capital assets in the livelihoods of coffee farmers in Lampung, focusing specifically on supply chain connections (SCCs) and collective action. These key assets facilitate access to essential resources, markets, and knowledge. However, farmers' perceptions of SCCs differ, suggesting uneven access to and varying quality of these connections. Access to collective action as an asset is uneven, with independent farmers having limited opportunities to engage. The perceived quality and availability of these assets are examined using primary data collected through interviews with farmers, traders, government officials, and researchers, alongside secondary data to triangulate the findings.

8.2.1 Supply chain connections.

Supply chain connections (SCCs) play a critical role in the livelihoods of coffee farmers, shaping their access to resources, market opportunities, and the adoption of best agricultural practices. Research across various regions, including Vietnam, Mexico, Ethiopia, and Uganda, underscores the significance of social capital within coffee farming communities (Briones-Ruiz et al., 2021; Mawejje & Holden, 2014; Ruben & Heras, 2012; Truong, 2020).

Previous research indicates that OFG membership can enhance social networks and improve the welfare of farmers. Ibnu et al. (2018) found that farmers who were part of an OFG perceived stronger social networks, with these effects being more pronounced when farmers held dual memberships in different types of OFGs (see Findings: 5.1). Participation in community farmer groups was shown to have a statistically significant positive impact on welfare, especially when such participation was supported by external organisations (Amudavi, 2007). Strengthened social networks have been shown to potentially increase farmers' incomes and access to markets (Mawejje & Holden, 2014).

In the context of this study in Lampung, supply chain connections are defined as the relationships and interactions between stakeholders within the supply chain, with particular emphasis on the links between farmers and other key actors (see Findings: 5.1). In Lampung, several crucial SCCs exist, which can directly and indirectly influence access to other assets. This section will explore the SCCs identified by interview participants, particularly farmers, and examine how they perceive their impact.

Government and Private corporations connections

Connections with the Indonesian government are crucial for farmers, as the government controls access to several vital assets for coffee farming, including land and equipment. In

Lampung, farmers hold mixed perceptions of their relationship with the government. This research reveals that farmers have varied experiences in their interactions with the government, with some reporting positive experiences, while others express negative ones.

Farmers in this study have successfully secured support from the government in the form of equipment, training, and connections to other stakeholders (see Findings: 8.1 & Findings: 8.4). However, farmers in this research also expressed frustration with the government, stating that they did not feel valued or prioritised, that they felt the government played no role in coffee farming, and some reported that the government workers they interacted with were corrupt and sought to exploit coffee farmers (see Findings: 7.1).

From the government's perspective, officials stated that they are working with farmers to develop coffee production and improve the livelihoods of farmers through various initiatives, including the promotion of OFGs, training, and the provision of resources. Government representatives from the Plantation Department explained that some programmes are developed in collaboration with farmers, while others are designed by the government without prior consultation with the farmers, which may partly explain why some farmers feel the impacts of connections with the government and others do not.

“it is the government that suggests the farmers to do things, for example doing the harvesting, the red cherry picking. And if the farmers agree to do that, we will monitor what the farmers have done and if the quality of the product is increased and then they will help the farmers and invite them to the event. And then they prioritise the farmer group, you know, conduct everything that they told them to do.” (GOV001)

“So the initiative is from farmers, what they want to have or to get. The support from the institution, for example, when they want to reduce the use of chemical pesticide or herbicide, they ask for a machine, a lawn mower... [this information] Is from the extension staff, also the farmer group from the forum at village level.” (GOV001)

Farmer experiences partly align with this view. Some farmers reported that they can communicate their needs through extension workers, who then relay this information to decision-makers in the government. However, farmers expressed little confidence that this would lead to tangible action, and access to extension workers was unevenly distributed across Lampung (see Findings: 7.1, & Findings: 9.4.3).

The government aim to facilitate connections to other stakeholders, particularly private corporations such as exporters and companies. The quote from an official in the Plantation Department explains how the government select OFGs and production areas for private corporations to allocate support:

“[the government] invite the exporter to help provide the funding for the production, because they [government] have limited budget of course and also they invite the exporter to help them to give the whatever farmers need like machine like fertilisers...there's

companies LDC³ as a partner to provide agronomist who helps farmers guide the farmers to produce better. Since 2010, they ask LDC to provide, to help, to as partner to the government profile agronomist extension officer, they come to the farmers... Also SCOPI⁴ also contributes machinery to roasting machinery for roasting and put it in coffee school. That's an exporter that's SCOPI.” (GOV 004)

Significantly, officials in the Plantation Department stated that programmes and initiatives are primarily focused on high-producing areas. This refers to government programmes and also support and connections from private corporations. The selection process may further explain the mixed perceptions regarding this connection.

“There are five districts of central coffee and west Lampung is number one central production, so they implement those programme mostly to the central area of production.” (GOV001)

“Usually it's there's one exporter want to come to the farmers it's must be through them [government] and they report to the government, what is the intention, if the intention is about sustainability, for example to reduce pesticide or to improve product productivity. And then government will recommend it some area then we see from the map, which area that's needed to improve based on the intention of the goal of the exporter and then they assign them here to that area. And then if another exporter coming and then they also come to them, to the government and government they send to another area so there is to prohibit restriction conflict of interest among business.” (GOV004)

Domestic trade connections

Fine Robusta Farmers can tap into specialised SCCs (see Findings: 5.2), and this is not dependent on their OFG status. These networks are important for accessing resources aimed at improving the quality of their coffee. These SCCs are developed within the domestic fine Robusta supply chain and are created through direct trade agreements between domestic fine Robusta café owners and farmers (see Findings: 9.4.4). These SCCs can provide farmers with more bargaining power and decision-making influence and the lived experience of these connections was perceived as positive and mutually beneficial.

A significant factor that could influence these SCCs in the future is the government programme promoting roasting within fine Robusta OFGs. Currently, roasting is carried out by domestic fine Robusta café owners; however, if this arrangement changes and OFGs begin roasting themselves, it could potentially lead to disagreements within these SCCs. Furthermore, this research identified that fine Robusta farmers are increasingly selling directly to consumers and building connections with them through social media. Although

³ LDC-Louis Drayfus Company, a buyer, often acts as a middle company between large buyers and OFGs/traders.

⁴ SCOPI- Sustainable Coffee Platform Indonesia, in country element of the Global Coffee Platform, non-profit organisation (see [SCOPI - Sustainable Coffee Platform of Indonesia](#))

this market remains small, it holds potential for growth, offering farmers direct SCCs with consumers and reducing their reliance on intermediaries.

Traders/ collectors connections

SCCs with traders/collectors are a crucial connection for farmers. Traders/collectors not only provide quick avenues for selling coffee, but they also offer access to financial capital in the form of cash loans (see Findings: 8.5 & Findings: 10.1). Perceptions and experiences of these SCCs are also mixed, with some farmers describing positive relationships and others more negative.

Farmers frequently characterised this SCC as an essential asset during times of need, noting that traders/collectors were more responsive to their concerns when other stakeholders were not. When asked who listens to them in the supply chain, one farmer group leader explained:

“Of course this one [the trader] personal relationship with the farmers. They said it just in case every time they need something, they're urgent. Then they come here and they help.” (CK004)

However, some farmers perceive this relationship as exploitative. Some feel they have limited bargaining power due to being indebted to traders, while others believe traders/collectors take advantage of their position (See Findings: 7.3). The mixed perceptions and experiences can be attributed to the lack of regulation in this area, a situation that many farmers in this research have called on the government to address. The relationships between individual farmers and traders/collectors are highly personal and vary from case to case.

Certification connections

SCCs with certifications appear to be perceived as less impactful by farmers in Lampung compared to other SCCs. Farmers generally associated certifications with training opportunities and access to large buyers. Several farmers stated that their knowledge of grafting and other farming techniques were a result of certification-based training, which for many is a crucial factor in improving production. Others noted that certifications provided resources such as drying tarps to improve moisture content of their coffee (a requirement of large buyers). One farmer explained:

“Rainforest they come to the farmer group then offer the help. Then the farmer group invite the members to involved in the training and presentation, and then the farmer group they receive kind of certificates from the rainforest. They participate in the training for making compost making bio fertiliser. They get a free lunch.” (P036)

Certifications were viewed as a requirement for large buyers and a means of accessing large buyers and international markets, which can result in higher prices. Often farmers would refer to the large buyers themselves as the certification, e.g. Nestle instead of Rainforest Alliance. Suggesting the awareness of the certification was limited.

“Nestle only accept like they have a certification.” (P026)

SCC with certifications could play a more significant role in enhancing farmers' livelihoods if they were framed not just as a market access tool but as a key part of a comprehensive support system that includes training, technical assistance, and financial resources. By embedding certification into a more holistic support structure, farmers may view this SCC as a route to additional assets rather than a requirement for market access.

8.2.2 Collective Action

Collective action involves the actions of a group focusing on the shared interests of the members (Ochieng et al., 2018). Collective action is a strategy that can improve farmers ability to access markets and increase the incomes (Benson Mutai, 2012; Ochieng et al., 2018). It can enable smallholders to be more competitive and can create links to buyers (Ochieng et al., 2018).

In this research collective action is seen as both an asset and a strategy. In this section collective action will be discussed from an asset perspective and further analysis as a strategy will be discussed later (see Findings: 9.3).

Sirdey & Lallau, (2020) found that collective action developed within OFGs in Peru enabled farmers to build new partnerships. Similarly, Markelova & Mwangi, (2010) found that collective action developed through smallholder OFGs in Africa enabled access to new supply chains. They found that several factors influenced the success of collective action from OFGs including the types of markets and products, characteristics of groups, institutional arrangements, and the external environment. Sirdey & Lallau, (2020) also found that collective action increased visibility and ability to influence coffee related activities.

For farmers in Lampung collective action is an asset created through OFGs. This research identified that OFG members were able to utilise collective action to enhance their bargaining power and ensure better outcomes in their interactions with buyers. OFGs in Lampung have a greater number of options when it comes to selling their coffee, the group works on behalf of its members to access these buyers and negotiate better prices, one group leader explained that selling through an OFG creates avenues to approach several traders, the groups may approach several buyers to find the best price for their coffee.

“usually the trader will give lower price, so he find the other trader from the other village that give higher price, the cooperative they try to find this the buyer that gives higher price even though it's in another village” (CK002)

This study identified that some OFG members may be burdened by outstanding debts to traders, which can obligate them, either formally or informally, to sell their coffee to these traders rather than through their group. This limits their ability to negotiate prices and take advantage of the OFG collective action asset as these loan agreements are made between individual farmers and traders.

Collective action enables farmers to combine harvests to access additional buyers, such as companies that act as intermediaries for large buyers like Nestle. These buyers often require larger quotas that individual farmers cannot meet; by combining their harvests, OFG members can access these broader markets. An OFG farmer explained:

Speaker 2 "So then the farmers collectively send the coffee to the Nestle and they get the cash from this. They don't need to collectively; they can individually sell to this collector [small trader] and get the cash...This is more step [Nestle] because they have to collect the coffee and then the price some small, small different price."

Speaker 1: "OK. To go to Nestle they have to be part of the group?"

Speaker 2: "Yeah, collective. Yeah, but to here [traders/collectors] it I can individually go to this for the trader and get the cash even though this is less." (P018)

For independent farmers, collective action as an asset is limited as they do not operate within formal groups. This lack of organised collective action places them at a disadvantage when negotiating with traders or accessing resources, as they lack the influence and support that OFG members benefit from.

8.3 Natural Capital

Natural assets are the natural resources that people rely upon, natural resource stocks can include trees, land, and nutrient cycles (DFID, 1999). Research has found that access to natural capital can also improve market access (Benson Mutai, 2012). This asset can have direct and indirect impacts on achieving livelihood outcomes, for example trees may provide direct incomes for farmers and indirectly improve livelihood outcomes through erosion protection and nutrient cycles (DFID, 1999).

This study in Lampung finds that the natural asset of importance to farmers include land, soil quality and grafting branches. Access to natural capital is often facilitated through connections with other stakeholder. These connections are crucial for securing resources such as land. Additionally, human and physical assets, including training, knowledge and equipment, play an indirect role in enabling access to natural resources, such as grafting 'stek' branches. The perceived quality and availability of the natural assets available to farmers in Lampung is discussed here referring to primary interview data.

8.3.1 Land

Land is a vital natural asset required by farmers to cultivate coffee. There are a range of strategies that farmers can use to access land. Land as an asset is available to farmers through family inheritance, The Social forestry Programme and through illegal land claiming (see Findings: 9.4).

Almost half of the farmers in this study inherited their land from family. This finding aligns with the work of Irmeilyana et al. (2020), who observed that most farmers surveyed in Pagar Alam had inherited both land and traditional farming practices from their families. For individuals seeking additional land or lacking familial connections, the process of land acquisition can be considerably more complex.

"Part of the reason I moved from Jakarta to here is because I have inherited land of plantation. Yeah, from my parents." (CK002)

The Social Forestry Program refers to the forest management implemented by the Indonesian government that includes community forest, village forests, community plantation forests, forest customs and partnerships (Ministry of Environment and Forestry

Republic of Indonesia, 2021). Under this programme, land is made available to farmers who meet the government's eligibility criteria (see Findings: 7.1 & Appendix 11- Policy). A government official from the Forestry Department further clarified this process:

"The legal given by the department, this must be for those who are in the group, individually the permission is individually, but the person must be involved in the group... So there is certain conditions for those who want to get approved and get a legally to do farming in the state forest is the first one is they need to be in a group. So this office will facilitate those people who want to make the group to develop a group to build one group and there's also a space at the state forest for those for farmers to do farming, and the third one is they have a commitment for the commitment to do anything that regulate in regulation issued by the office." (GOV 003)

The official further elaborated that applications for Social Forestry land are never rejected and that continuous support is provided to OFG members throughout the 35-year period of farming on state forest land. This support includes small grants and connections with companies such as LDC, which offer access to human capital through training and workshops. Although there are restrictions on the use of agrochemicals and the types of crops that can be cultivated, the use of agrochemicals is not strictly monitored.

All farmers can claim land through unofficial and illegal routes if they have the social connections and the financial capital to pay. The development and expansion of coffee farms can lead to deforestation of natural forest areas, coffee expansion has been found to contribute to faster conversion of natural forests than other crops such as rubber (Otsuka, 2009). As one trader in this study explained

"There is a lot of people, they open the forest. And now he joined them to compete with them, grab some land in the forest...There is some people that open forest and he paid them...actually it's not belong to someone or the one that opened the forest, they want to him to pay for the effort...But not belong to him... he just claim it so it belong to him because he paid someone, its unofficial." (TR014)

Government officials stated that they are aware many farmers begin cultivating state forests without the necessary permissions. The Social Forestry programme was developed in response to this issue. The department aims to assist these farmers in becoming legally recognised by encouraging them to join groups, obtain official permission, and once authorised, access government support.

The quality of land was perceived as a significant issue for farmers in Lampung, with many believing the land had become depleted of nutrients due to limited access to fertilisers and the overuse of chemicals. Social connections with the government, private corporations, traders, and certification bodies can provide access to assets such as agrochemicals and training, which may help improve land quality. However, not all farmers are able to access these assets, as access is uneven (see Findings: 9.4, Findings: 10.5, & Findings: 10.4).

8.3.2 Grafting branches

Grafting, known locally as 'stek' is a technique used to improve the productivity of coffee trees by attaching scions⁵ which are branches taken from high-yielding varieties to older or less productive trees (World Coffee Research, 2023). This method is particularly important for rejuvenating coffee plantations with older coffee trees which is commonplace in Lampung, this extends the longevity and increases the yield without the need to replace the whole tree. Farmers in Lampung use a variety of clones and grafting techniques including Robusta to Robusta, Robusta to Liberica and Arabica to Robusta (Evizal & Prasmatiwati, 2020). Grafting is a much more attractive option to farmers because the alternative would be to replace their coffee trees which is costly and also takes time (Novita et al., 2023).



Figure 13 Grafted scion onto an older coffee trunk in Sukapura, West Lampung.

Research in Bengkulu Province, Indonesia, identified internal and external factors shaping farmers' adoption of grafting techniques. Internal factors had the strongest influence, including age, experience, perceived convenience, outcomes, and overall knowledge. External factors included government support, access to information (pamphlets and videos), credit availability, and perceptions of grafting (Silamat et al., 2023). These findings highlight how this natural asset is linked with social, human physical and financial assets.

Research in Lampung identified that human assets such as training and knowledge were perceived as important to farmers as the natural assets of grafting branches. Access to training regarding the grafting process is affected by access to social assets such as supply chain connections and strategies such as OFG membership (see Findings: 8.1, Findings: 8.2.1, Findings: 9.4.3 & Findings: 10.5).

"So since he became the member of the Farmer Group, his knowledge about the stek cultivation, join the coffee trees also develop so he more knowledge on coffee cultivation." (CK004)

⁵ Scions were referred to as 'clone', 'stek' and 'branches' by participants in this research.

Knowledge that is passed through informal networks, between farmers, family members and friends, is also significant to farmers in Lampung (see Findings: 8.1.2 & Findings: 9.4). This kind of knowledge sharing has been found to significantly improve the personal lives of farmers, farm practices and the production of coffee (Istiqomah et al., 2024). And this practice is perceived as significant to farmers in Lampung who rely on the knowledge and experience of other farmers to develop their grafting techniques.

Coffee farmers in Lampung explained how they share resources and local wisdom with other farmers, this is not dependent on OFG status and can often be between farmers in different regions. One farmer discussed the process of sharing and reciprocity between coffee farmers.

“They're travelling a lot to see whether each is good and then ask for the colleague farmer for the clone. So discuss with other farmer, for example, if they travel to some place and they get the clone and they try together some try together and they see why this is not good. And then they try to find the problem and ask why that's not good in that place. But then in other places, good so they try to solve the problem with the plant...Yes because of the friendship it exists.” (P035)

An official from The Plantation Department also explained how farmers work together to experiment and share this asset:

“So they put the farmer to learn by themselves to see the specific clone that suitable for the coffee and also protect them for the climate change. There's some clone that do not really affect it too much with raining. But in a specific region but the clone move to the other region will be different because different temperature, different soil. So it will be better to push the farmer to see which clones are really suitable for it. There's many, many farmers are so lazy and they will be here. They will be surrender with the climate change that's the problem.” (GOV 004)

Previous studies have identified that government support significantly improves the successful adoption of grafting practices (Silamat et al., 2023). However, farmers in Lampung perceive that they are practicing grafting and sourcing the natural assets independently, a view that is echoed by government officials. This suggests a missed opportunity to combine skills, knowledge, and resources, which could enhance the effectiveness of grafting methods and promote greater success in the region.

8.4 Physical Capital

Physical capital is an essential component of coffee farming in Lampung, encompassing the tangible assets that farmers rely on to enhance productivity, quality, and market access. This section highlights key physical assets such as subsidised fertiliser, farming equipment, traceability stamps, and infrastructure, which all play critical roles in supporting coffee production. The quality and availability of these assets can significantly influence the efficiency of farming operations, with access to modern tools, infrastructure, and resources directly impacting farmers' ability to succeed in the competitive coffee market.

8.4.1 Subsidised Fertiliser

Fertiliser is a critical physical asset for farmers in Lampung, and it was a key topic during the interviews. Farmers in this study expressed concerns about the nutrient deficiency of the soil, with several participants describing the land as "barren" (see Findings: 6.2). In Lampung, both full-priced and subsidised fertiliser are available. The subsidised fertiliser policy was introduced in 1969 with the aim of enhancing the productivity of the agricultural food sector (Irmalasari et al., 2024). The Indonesian government provides subsidised fertiliser at approximately half the price of the regular market rate (see Findings: 7.1 & Appendix 11-Policy). As one trader noted, the regular market price of fertiliser is *"more than twice the price of the subsidised."* (TR014)

During this research, government officials explained that, as of 2023, subsidised fertiliser would no longer be available to coffee farmers, with subsidies restricted to staple crops such as rice and maize. However, since many coffee farmers engage in mixed cropping, including staple crops, they are able to access subsidised fertiliser through the OFG by claiming it is intended for the staple crops. Despite this, the process remains challenging, and there is a lack of supply.

"Well, actually there is no subsidy there's no coffee. It is only for other farming. From this year there's no subsidy for coffee for fertiliser. Maybe because they have also farm, like planting corn or something, that's how they get it." (GOV001)

Farmers in Lampung were unaware of the regulatory change in 2023. They expressed frustration that staple crops were prioritised, and although a loophole existed for accessing subsidised fertiliser through staple crops and OFGs they were not informed that subsidised fertiliser for coffee was no longer available. One OFG member voiced their dissatisfaction with what they perceived as a restriction on fertiliser access:

"The government restrict to subsidise fertiliser, for coffee but they give it like they make it easy to access for like other crops like rice, they feel like this is very unfair because this is their main commodity here. They rely their lives on coffee but the government gives it to other crops. The government thinks that coffee is not really important, it's not like main or like a priority." (P029)

Findings in Lampung support Irmalasari et al's (2024) research that subsidised fertiliser is scarce and not accessible to all. Farmers in Lampung stated they struggle to access fertiliser, subsidised or full priced.

The official quota of subsidised fertiliser increased in 2024 from 6 million tonnes to 9.5 million tonnes, however the budget allocated to The Department of Agriculture has been declining (Irmalasari et al., 2024). The Chairman of Commission IV of the House of Representatives of the Republic of Indonesia recently stated that there are issues with the distribution of subsidised fertiliser throughout Indonesia and that there is a shortage of extension workers who are a vital connection between the government and OFGs (DPR, 2024).

Independent farmers face even greater barriers in accessing subsidised fertilisers. Without the backing of an OFG, they cannot apply for subsidised fertiliser at all, even if they do produce staple crops. This finding is supported by Irmalasari et al. (2024), who also found

that farmers without OFG membership and registration with the Group Needs Definitive Plan *Rencana Definitif Kebutuhan Kelompok* (RDKK) programme they are not able to access subsidised fertilisers, regardless of the crops they produced (see Findings 7.1 & Appendix 11-Policy). This lack of access puts them at a disadvantage, as they are forced to purchase fertilisers at market rates, which can be prohibitively expensive.

8.4.2 Sustainable/ environmentally friendly farming resources.

Chemical pesticides and herbicides are widely employed across various agricultural sectors to manage pests, diseases, and unwanted plant growth (Irmeilyana et al., 2022; Widyaningrum, 2023). However, the misuse of these chemicals in Indonesia, including improper dosages and the application of incorrect substances, has been shown to adversely affect both agricultural outcomes and the quality of coffee (Affandi et al., 2017). Research by Irmeilyana et al. (2022) in Pagar Alam, Indonesia, further revealed that improper herbicide use, including inaccurate ingredient selection and dosages, often leads to suboptimal results and, in some instances, damages cultivated crops. Additionally, Widyaningrum (2023) identified a substantial lack of awareness among food crop farmers in Indonesia regarding environmentally sustainable alternatives, highlighting the critical need for enhanced support from agricultural extension workers to address this issue.

In Lampung, training and resources focusing on more environmentally friendly forms of pesticides are provided through OFG networks and connections with stakeholders. Training and resources are provided through several stakeholders including the government and certifications, channelled through OFGs (see Findings: 9.4.3 & Findings 10.2).

The government provide resources and training to OFGs, they also organise events that can involve knowledge sharing and independent farmers are able to attend. The government are actively encouraging farmers to move away from chemical forms of herbicides and pesticides and are encouraging more natural and organic methods, one government official explained,

“So we need to educate the farmers. Again and again continue until they understand how to do it more sustainable, for example by telling them to use more like biological pesticide or herbicide, in new methods like workshop or training or something it's important to increase the production coffee.” (GOV002)

“ So the pest it's like a small insect...also ants, a group of ants like a like a nest. Yeah, the black one. Well, actually the end was in the large amount of groups of ants, and I think it's annoying the farmers, when they do harvesting and the farmers kill the ants were using their insecticide or pesticide so then it affects the tree the coffee tree. ...Their [government] support is in the form of giving the farmers information related to how to distract the ants from annoying the farmers by making a trap with bamboo. Making a trap made of bamboo and a dry leaf so the ants are going down instead of annoying the farmers.” (GOV002)

The government also provide training and resources to use an organic fungus as a form of pesticide, the government officials explained that due to the remote areas that farmers live it can be difficult to get this resource to them because it requires low temperatures. Those farmers in very remote areas of Sumatra may not be able to access this resource. The

government officials also explained that they can experience resistance from farmers to change from chemical to more organic methods

“when it's time for us [government] to introduce how the way to control the pest the farmer usually to keep quiet and listen. They [farmers] don't seem to be refusing, but it is the problem is when it's time for them to implement it in some implement and some are not implement it, but we cannot do anything related to that. It's just like depends on the farmer if they care about their plants, they will do it, but if they don't really care about coffee plant they were not.” (GOV 002)

Rainforest alliance provide similar training to farmers, this training is organised through OFG but any farmer can attend regardless of OFG status, as one farmer explains:

“Usually the Rainforest give facilitation like tools to produce own pesticide from fungi. Also usually meet the in the house of the head of the farmer group.” (P036)

Organic resources such as manure and compost are increasingly viewed as sustainable alternatives to chemical inputs in coffee farming. Some OFG members access these materials through collaboration, with groups converting coffee waste into compost for redistribution. This reduces reliance on chemical fertilisers while improving soil health and biodiversity in plantations. One OFG member explained:

“We want to implement zero waste from the coffee, so the skin of the coffee we will ferment it and put it back into the land and become a fertiliser. Moreover, we have this they have many cattle here so the waste can be used as the fertiliser.” (P003)

However, some OFG members can find access difficult as the resource is rare and expensive. Private corporations have provided support in the past but currently farmers are struggling to find suppliers, one group leader stated:

“We want to get the compost, but I'm not sure from who, from Olam⁶ or government, I'm not sure from where.” (CK004)

OFG members and independent farmers can access credit in the form of cash to buy agrochemicals or in the form of agrochemicals themselves from traders. However, this system is not without its drawbacks. The reliance on loans often ties farmers into agreements where they must sell their produce to the lender, typically at lower prices, thereby reducing their profit margins and perpetuating a cycle of dependency and debt.

8.4.3 Farming Equipment

Farming equipment is essential for improving efficiency and productivity in coffee farming. Equipment refers to the physical resources that may be required for any stage of the coffee production process. This can include farming equipment such as sacks and spades, drying equipment such as tarpaulin or drying ovens and equipment used in coffee processing such as roasting machinery.

⁶ Olam is a large buyer and exporter.

Some farming equipment is provided through government programs or development projects. Equipment can include pulpers and drying ovens. These programmes are available to OFGs only (see Findings: 9.4.3)

“Helping the farmers that include to the farmer group.... But the groups should be like already established for at least two years in order to get the help subsidised from the government...So government help them with providing some equipment like pulper. Then farmer can dry the coffee not traditionally, you know under the sun, but then put the coffee into the oven.” (GOV 001)



Figure 14. A pulper purchased with government support in Tribudisyukur, West Lampung. Belonging to an OFG producing mixed Robusta, certified and non-certified.



Figure 15. A pulper purchased with government support in Tribudisyukur, West Lampung. Belonging to an OFG producing mixed Robusta, certified and non-certified.

The Indonesian government has implemented a program aimed at encouraging OFGs producing fine Robusta coffee to expand their operations to include roasting in addition to farming. This initiative provides OFGs with the opportunity to apply for roasting equipment but this is not available to all OFGs equally as explained by a Government official from the Plantation department.

“And time to push the farmer groups to become rosters or to become traders like cooperative and if they become cooperative they have bargaining to get more of support from the government even higher because they are now in cooperative, they are legal entity, the government give more attention to them if they are in the cooperative rather than they are in the farmer group, so they push the farmer group to a higher rank, they become cooperative. They can be also become an independent trader if they have good financial capital.” (GOV004)

The Indonesian government also works with private corporations to provide equipment to select OFGs. Drying facilities and drying ovens were perceived as particularly important to farmers in Lampung as it allows them to access wider market if they can achieve the moisture levels required. As one farmer explained that access to a drying oven can lead to higher prices and access to markets:

“So the most dry that the farmer able to fulfil is 18 percent Yeah, but the requirement is 11 or 12, so if they cannot fulfil the 12%, the trader cut the price...They have tester ...Nestle have tester and then they test the moisture, the dryness of the coffee bean and if its not the standard they reject here.” (P015)



Figure 16. Solar Dryer Dome sign in Tribudisyukur, West Lampung. Belonging to an OFG producing mixed Robusta, certified and non-certified. Provided by the Indonesian Government in partnership with private organisations.



Figure 17. Inside Solar Dryer Dome in Tribudisyukur, West Lampung. Belonging to an OFG producing mixed Robusta, certified and non-certified. Provided by the Indonesian Government in partnership with private organisations.

For independent farmers, however, access to farming equipment is much more limited. The high cost of purchasing and maintaining equipment is often beyond the reach of individual farmers who lack the ability to gain support from other stakeholders. As a result, independent farmers are more likely to rely on traditional methods and sell unprocessed coffee which limits their ability to achieve higher prices, increase productivity or improve the quality of their coffee.

8.4.4 Traceability and certification Stamp

Coffee traceability has become increasingly important to buyers and consumers seeking transparency across the supply chain. Regulations aim to ensure products' origins and production methods are identifiable, covering both farms and processing facilities. Such systems support monitoring of safety and quality standards, making it possible to trace problems, such as elevated pesticide levels, back to specific plantations or farms of origin (Alamsyah et al., 2023). This highlights the critical role traceability plays in ensuring product accountability and consumer trust within the coffee industry, however Indonesia face challenges meeting the requirements for coffee exports which can lead to an undervaluation of coffee by importing countries (Nurhazizah et al., 2023).

The stamp, within the mixed Robusta coffee supply chain, is the traceability method used in Lampung, verifying both the origin and farming methods of the coffee produced. The stamp is provided by OFGs to buyers and it plays a key role in enhancing market access and ensuring traceability for large buyers and exporters.

The stamp is primarily a means to certify that their coffee originates from registered OFG farms. As part of the group, these farmers gain access to the stamp, which is evidence that their coffee meets the demands and standards of large buyers and companies. The stamp is crucial for proving to buyers that their expectations for quality and sustainability have been met. However, while the OFGs are supposed to provide stamps only for coffee produced by their members, the demand from large buyers often exceeds what these groups can supply. This leads to situations where OFGs source coffee from non-members to fulfil these quotas (see Findings: 9.3.2). As one OFG leader explained:

“So collect it from lots of different places.” (CK004)

This practice compromises the integrity of the stamp process, as coffee from unregistered farms can be sold under the OFG label, even though it doesn't necessarily meet the standards the stamp is supposed to represent. An OFG leader described this challenge:

“Of course, the coffee can come from everywhere.” ...“They actually say this is from farmer group but that’s not all, they usually buy from everywhere.” (CK004)

The Stamp serves as a valuable asset for both OFG members and independent farmers by providing access to markets and higher value chains. However, the inconsistent application of the stamp process, with OFGs stamping coffee from uncertified sources to meet quotas, undermines the traceability and integrity of the system. Both groups face challenges in maintaining the value associated with the stamp, especially in light of increasing demands for transparency and ethical sourcing from international buyers.

8.4.5 Infrastructure

Infrastructure, including roads and storage facilities play a crucial role in the overall efficiency and profitability of coffee farming. Some forms of equipment may also be grouped as infrastructure but are discussed in the farming equipment section e.g. processing and drying equipment.

Road quality is a crucial physical asset for farmers, as research has demonstrated that access to tarmac roads significantly enhances farmers' participation in training programs and their access to agricultural services. Improved road infrastructure also enables farmers to transport their crops to market more efficiently (Davis et al., 2012).

In Lampung, road quality emerged as a major concern for many farmers. Given that coffee farms are frequently located in remote areas, farmers faced challenges in both accessing their farms and transporting their coffee. In many cases, they must rely on motorbikes, as the poor road conditions make it impossible for cars or trucks to pass. These findings underscore the critical need for infrastructure improvements to facilitate market access and productivity in remote agricultural areas. As one OFG farmer explained:

“So the road access to the farming area is very bad in very bad condition. It's an obstacle for them to get to the farming area.” (P002)

Farmers and traders in Lampung noted that storage facilities are often used to hold coffee when prices are low, allowing it to be sold later when prices rise. While some traders in Lampung have access to these facilities, farmers generally do not. Although access to such storage could enhance farmers' bargaining power, their urgent need to sell quickly to settle debts and cover living expenses limits their ability to store coffee, even if the facility were available. One trader explained how he is able to store coffee when he does not require immediate payment.

“Because farmers all need money, if farmers doesn't need money they won't sell the product. And so do I, if I don't need money, I will keep the product in my storage.” (TR016)

Infrastructure, particularly road quality is perceived as an important asset for improving the efficiency and profitability of coffee farming in Lampung. Road access remains a major challenge for many farmers, limiting their ability to transport crops and access farms and services. Although, storage facilities could potentially enhance bargaining power the immediate financial needs of farmers often prevent them from benefiting fully from such assets.

8.5 Financial Capital

Financial capital refers to the financial resources available, including savings, credit, and income-generating opportunities that can maintain or improve their livelihoods (DFID, 1999). This section examines the various perceived sources of financial capital available to farmers, including both formal and informal channels, such as loans from banks, government programmes, OFGs and local traders. The accessibility and utilisation of these financial resources depend on multiple factors, such as supply chain connections and membership in formal organisations. Understanding the dynamics of access and the role of both formal and informal systems is essential for improving financial security and fostering sustainable agricultural practices.

8.5.1 Sources of Financial capital

Loans and sources of financial credit are accessible to farmers from various sources, including personal savings, OFGs, government and bank loans, as well as loans from traders or collectors. Research has identified several factors that influence a farmer's ability to access credit, including age, education, farming experience, number of coffee trees, and income (Iski et al., 2016; Karyani et al., 2024; Sartika & Karyani, 2018).

Despite the availability of formal financial credit options, research consistently shows that informal sources of credit are more frequently utilised than formal ones. Sartika & Karyani, (2018) reported that 51.67% of OFG farmers continue to rely on informal credit, while 41.94% secure loans from banks. Similarly, Karyani, et al (2024) found that 54.66% of farmers accessed financial capital through internal sources, often repaying loans with coffee, and 15.25% through informal lenders, whereas just 28.39% obtained credit from banks. Additionally, Paloma, et al (2020) observed that only 36% of farmers in West Sumatra had access to formal loans, while 63% did not, 93% of farmers in this research relied on personal funds, and just 3% obtained loans. Those who did access loans primarily used them for non-agricultural purposes, such as household needs, with minimal impact on farm income.

Research in Lampung revealed that various types of credit sources or loan agreements are available to farmers, but these are not equally accessible. Sources of financial capital include OFG, personal savings, government and bank loans and loans from traders/collectors. Given that previous research has shown farmers tend to rely more on informal loan systems, it is crucial to understand the reasons behind this and explore how access to a broader range of financial capital can be improved.

In Lampung one financial asset is the internal credit system offered by the OFGs for its members. When joining an OFG, members contribute financially to a shared fund, which can later be borrowed by farmers in times of need. This system provides members with a safety net, allowing them to manage cash flow and meet urgent financial demands between harvests. One farmer group leader explained the loan process,

"Yeah they do this shaping and trading and credit shaping and lend the money... some farmer they can save some money through the cooperative and then also lend some money from the cooperative." (CK002)

Access to financial assets also comes from government support. The Indonesian government provide loans through agreements with banks to OFGs. These loans can be used to purchase essential farming materials, such as pulpers or agrochemicals which helps improve production efficiency. A government official from The Plantation Department explained the process:

"There is a national credit system, actually for small business, we call it this is for small business entity. Running either by farmers or by the community, but the business would be running first, the business would be running first and then the government can help connects the there are several banks that have that agreement with the government to provide that scheme to the farmers." (GOV 004)

Another source of financial capital comes from loans provided by local traders or collectors. These informal loans are accessible to all farmers, regardless of their membership in OFGs. Farmers and traders in Lampung explained that these loans are typically given in cash, with repayment made in coffee after the harvest.

"the trader they usually borrow the money, and the guarantee is the result of the coffee." (P035)

While this arrangement provides immediate financial relief, it often limits the farmers' ability to negotiate prices for their crops. If a farmer is indebted to a trader, they are obligated to sell their harvest to that trader, even if better prices are available elsewhere. This can trap farmers in a cycle of debt, reducing their financial flexibility and long-term resilience, as one farmer (P035) stated:

"I think as long as I don't owe something to the seller, I have free choice. But the problem is, I owe money so, I will choose to sell some part to them." (P035)

This reliance on traders for financial support is compounded by the limited access independent and less formal OFG farmers have to government loans and other institutional credit systems (see Findings: 8.2.1). Because they are not part of an established group or registered business, they are excluded from the financial programs offered by the government. Thus, while traders provide a critical source of capital, the financial arrangement often comes at a cost to their autonomy.

Figure 18 illustrates farmers' perceptions of credit access for farm improvements. Interestingly, banks and self-support were identified as the most common perceived sources of financial support. However, during interviews, farmers frequently mentioned that loans and credit were typically provided by traders or collectors. This suggests that financial credit for farm improvements are believed to be primarily accessed through formal channels, rather than from traders. When considering both government and banks as sources, a total of 43.5% of farmers in this study perceived them as the primary route for funding farm improvements. By distinguishing the purpose of credit, the research in Lampung reveals that

formal credit sources are more prominent for farm-related tasks, while informal credit may play a more significant role in addressing daily needs.

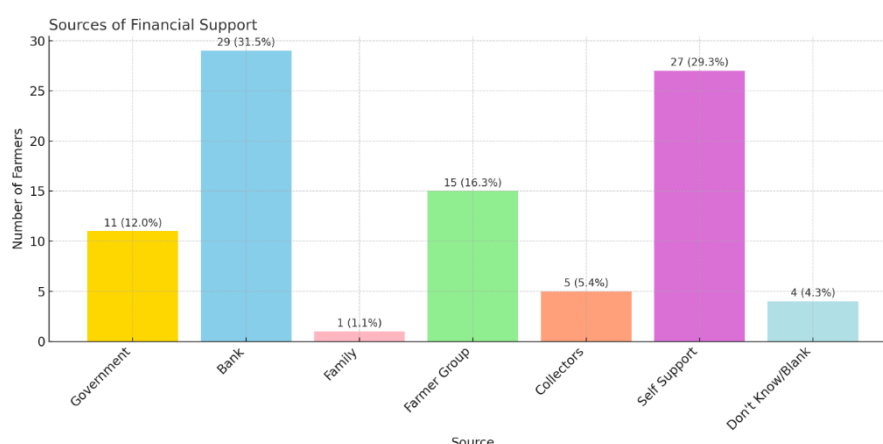


Figure 18 Sources of Financial support for farm improvements. Own data

8.6 Conclusion: Perceptions of livelihood assets

In conclusion, farmers' perceptions of the five key livelihood assets, human, social, natural, physical, and financial, reveal both strengths and persistent inequalities in access, quality, and relevance. Human capital is viewed as a foundational resource, particularly in the form of education, training, and technical knowledge, yet access remains uneven and often mediated by OFG membership.

Social capital, especially in the form of supply chain connections and collective action, is perceived as a key enabler of resource access and bargaining power, though the quality and depth of these networks vary considerably. Natural capital, particularly land, is widely accessed through inheritance, but quality concerns, informal claims, and uneven access to formal programmes like Social Forestry pose ongoing challenges. Physical capital such as tools, infrastructure, and environmentally friendly inputs is valued but inconsistently available, especially to independent or remote farmers. Financial capital is perceived as both essential and fragmented: while formal loans support long-term improvements, informal credit remains a lifeline for short-term needs, reinforcing dependency on traders.

Overall, these insights highlight how access to assets is experienced as contingent and unequally distributed, with OFG membership, location, and stakeholder relationships acting as critical gatekeepers. Understanding these patterns is crucial for designing more inclusive, context-sensitive interventions that strengthen asset access and, in turn, support the sustainability and resilience of coffee livelihoods in Lampung.

9 Findings: Perceptions of Livelihood strategies

This chapter examines the livelihood strategies employed by coffee farmers in Lampung, Indonesia, focusing on agricultural and income diversification, value addition and market engagement, collective action and bargaining power, and social networks and support systems. Each of these strategies plays a crucial role in enhancing the resilience and sustainability of farmers' livelihoods in the face of economic pressures, environmental challenges, and market volatility. By employing a combination of mixed cropping, grafting, off-farm employment, and direct trade initiatives, farmers in Lampung seek to diversify their income sources, reduce their reliance on coffee production alone, and mitigate risks associated with fluctuating prices and climate change.

The study explores how farmers utilise various forms of capital, financial, human, natural, and physical, as they navigate these livelihood strategies. Through the lens of the SLF and the ToA, this chapter highlights the complex mechanisms that facilitate access to these resources, whether through formal systems like government support and OFGs, or informal networks of social capital. It examines how these strategies enable farmers to build resilience, improve access to markets, and increase their bargaining power within the coffee supply chain.

Furthermore, the chapter explores the role of collective action, particularly through OFGs, in improving farmers' market access, securing better prices, and gaining support from government and private corporations. It also looks at how social networks and family-based support systems contribute to knowledge-sharing, resource exchange, and the long-term sustainability of farming operations.

While these strategies are essential in enabling farmers to respond to immediate challenges, the chapter also raises important questions about their long-term sustainability and the need for systemic change. By highlighting the strengths and limitations of these livelihood strategies, this research aims to provide a comprehensive understanding of the mechanisms that shape farmers' access to resources, the outcomes of their adaptive strategies, and the broader policy implications for supporting sustainable livelihoods in Lampung.

9.1 Agricultural and Income Diversification

Using primary interview and survey data complemented by secondary research this section examines the agricultural and income diversification strategies employed by coffee farmers in Lampung, Indonesia, and how these strategies help mitigate risks associated with market volatility, environmental stress, and economic pressures. It highlights how farmers adapt through practices such as mixed cropping, income diversification, grafting, and accessing off-farm employment.

9.1.1 Mixed Crops and Income Diversification

Reducing vulnerability to shocks depends not only on the ability to access assets but also on the ability to convert this access into income, food, and basic life necessities (Niehof, 2004). One of the key strategies for coping with shocks such as fluctuating prices, unpredictable yields, and climate variability is the diversification of crops (Anderzén et al., 2020).

Previous research has demonstrated that farmers in Sumatra employ a range of diverse strategies to achieve their livelihood objectives, with income diversification serving as one prominent approach. A study conducted in Simalungun, Sumatra, revealed that Arabica

coffee farmers derived 42.30% of their income from coffee production, while 61.5% of these farmers supplemented their earnings by cultivating additional crops such as potatoes, citrus, and chillies. Furthermore, many farmers engaged in off-farm employment to further diversify their income streams. The researchers noted that the initial motivation behind growing multiple crops was to meet household subsistence needs, but this practice has since evolved into a deliberate strategy to enhance income and access alternative markets beyond coffee (Hartatri & Neilson, 2021). This shift highlights the dynamic nature of livelihood strategies as farmers adapt to changing economic and environmental conditions.

Data from Bengkulu, Sumatra, shows farmers using crop diversification to stabilise and increase incomes. Some integrated orange cultivation with coffee, and in cases where orange trees matured, farmers abandoned coffee altogether. This transition suggests that the volatility of coffee supply chains is prompting some farmers to adopt crop conversion as a means of mitigating risk. However, the research found no evidence that diversification alone reduced poverty. Instead, it functioned as a short-term survival strategy to address immediate household challenges, rather than a long-term pathway to sustainable livelihoods (Irawan, 2023). This finding underscores the complexity of livelihood strategies and the need for context-specific approaches to addressing the multifaceted challenges of smallholder farmers.

Around the world income diversification as a strategy has been found to increase economic resilience in coffee farmers in Vietnam (Rigal et al., 2023) and in Kenya where diversification increased yields and increased farm generated incomes (Dorsey, 1999). As a result, many farmers around the world supplement their incomes from coffee with other on farm and off farm activities including diversification of crops and additional non-farm jobs (Anderzén et al., 2020; Dorsey, 1999; Rigal et al., 2023).

Previous research focusing on income diversification among coffee farmers in Sumatra and globally reveals that while diversification can enhance income stability and resilience, its long-term effectiveness in reducing poverty remains uncertain. The cases from Simalungun and Bengkulu underscore that diversification strategies are primarily adopted as adaptive responses to the volatility of coffee markets and the broader economic pressures facing smallholder farmers. However, these strategies often function as short-term survival mechanisms rather than long term solutions to issues such as market access, fluctuating prices, and poverty. As such, the success of income diversification is highly context-dependent and may require additional interventions aimed at addressing specific vulnerabilities of rural economies.

In Lampung this research found that just 13 of the 93 farmers (including farmer group leaders) surveyed gained an income exclusively from cultivating coffee, while 80 engaged in supplementary income-generating activities. Among these, 47 practiced mixed cropping, which serves as a secondary source of income and mitigates their exposure to and vulnerability to market fluctuations (see Findings: 6.1.1). An additional 16 farmers allocated space in their farms to other crops, however they did not gain an income from these crops, they were for household subsistence or shade. In addition to growing crops, 11 farmers diversified by raising animals such as goats, fish, and chickens. Furthermore, 21 farmers pursued off-farm jobs unrelated to coffee production, including teaching and carpentry (see figure 19).

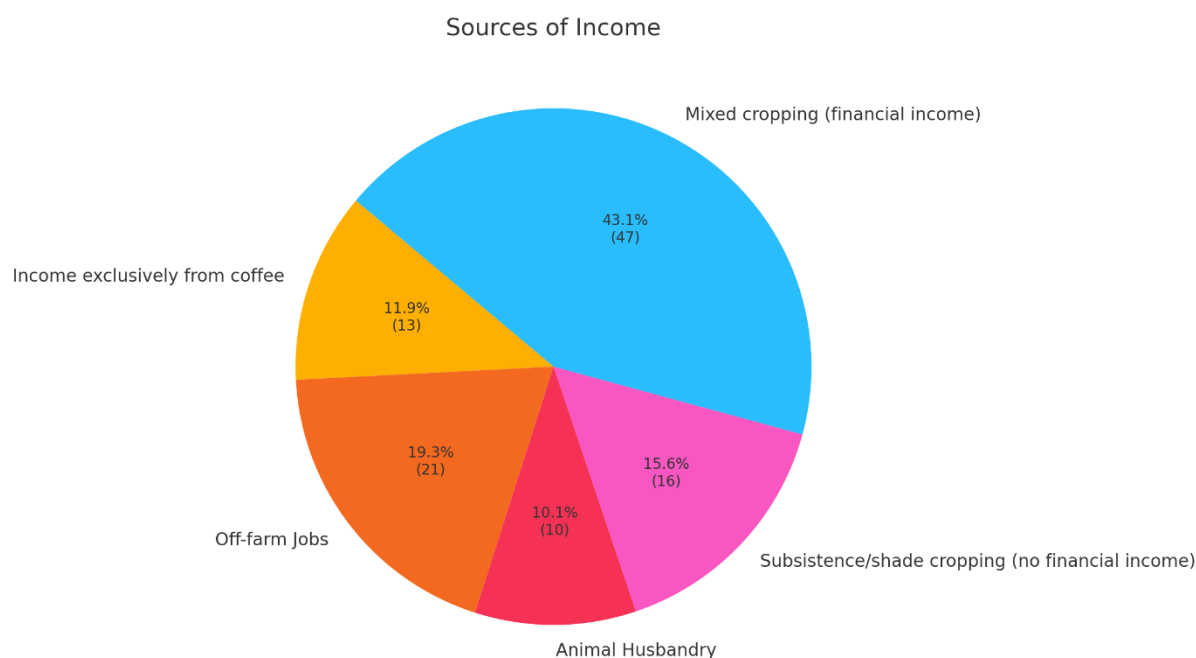


Figure 19 Diversification of income generating activities ⁷. Own data.

By engaging in mixed cropping and income diversification, 72.5% of the surveyed farmers in Lampung mitigate the risks associated with fluctuations in coffee market prices and environmental variability. This strategy allows farmers to leverage both their human and natural capital to generate additional, potentially more secure income streams. As one farmer explained:

“to get added value from like others like avocado, durian and stuff like that. So not only from the coffee.” (P029)

This adaptive strategy aligns with previous Indonesian research showing crop and income diversification as a way coffee farmers seek to improve livelihoods and reduce vulnerabilities (see Findings: Chapter 6). Findings here emphasise diverse livelihood strategies as responses to change. Viewed through the SLF, farmers’ engagement in mixed cropping, animal husbandry, and off-farm work highlights diversification as a means of improving access to financial and natural capital. Such adaptability may reduce reliance on coffee and strengthen resilience to market fluctuations, environmental stress, and social challenges. However, diversification may only provide short-term relief, with longer-term systemic changes required to achieve sustainable outcomes.

The ToA offers a useful lens for examining how farmers gain benefits from resources. It emphasises that access is not limited to ownership but involves mechanisms through which individuals derive benefits (Ribot & Peluso, 2003). From this perspective, farmers who diversify into mixed cropping, animal husbandry, and off-farm work broaden control over resources and expand opportunities beyond coffee. For example, the 47 farmers practising mixed cropping accessed additional markets, generating multiple income streams from staple and cash crops and buffering against volatile coffee prices. Those engaged in animal husbandry similarly tapped into local and regional markets, diversifying income sources. The

⁷ Some farmers had multiple additional sources of income, and one farmer’s source of income was not possible to translate so was not included.

ToA thus illustrates how diversification increases both access to resources and the ability to benefit from them.

Mixed cropping enhances food security by providing households with extra food resources. In this study, 16% of farmers reported no financial income from supplementary crops as they were used for subsistence. Those gaining financially are likely to benefit from subsistence use. This shows the multifunctional nature of mixed cropping, supporting both income and household food needs. Access to the human, physical, and natural assets needed for mixed cropping enables farmers to derive added benefits, strengthening human capital (health) and financial capital (reduced food costs).

Beyond agricultural diversification, off-farm income-generating activities strengthen farmers' access to financial and social capital, reducing vulnerability to external shocks. Among the 21 farmers with jobs such as teaching and carpentry, off-farm work also provided human capital and skills beyond agriculture. The SLF shows how diversifying income reduces dependence on volatile coffee markets, enhancing sustainability and resilience. The ToA highlights that access to diverse income relies on social relations, education, technology, and networks, enabling farmers to reduce vulnerability and improve security. However, this strategy is not equally available; variations in education, for example, can restrict opportunities for off-farm work (see Findings: 10.2).

Farmers and traders in the study also highlighted that mixed cropping could sometimes lead to a complete shift away from coffee cultivation altogether. This is largely driven by the unpredictability and volatility of the coffee markets, which significantly affect both prices and production. As one farmer group leader explained:

"it's not really actually for the coffee, because now many, many more farmers, they change from coffee, they replace some of their coffee plants to other forms because the price and also the production and low especially in the last two years." (CK004)

This shift in agricultural focus is not merely a response to short-term fluctuations but reflects broader market pressures that undermine the stability of coffee production. Through the lens of the SLF this strategy requires access to natural, human, physical and financial capital, and is not a strategy that all farmers are able to access due to the risk or lack of access to capitals. Interpreting this through the ToA illustrates how access to an asset such as land (natural capital) does not necessarily result in the ability to derive benefit from that asset. For those farmers with access to land but limited financial capital the ability to change crop production is limited, potentially reducing their ability to derive benefit.

A trader further emphasised the limitations of coffee as a sole source of income for small-scale farmers. According to one trader:

"Isn't enough for the smaller trader to depend on coffee, its just once a year. And then the farmer have to find another source of income. They can plant a staple crop or whatever they can do to get an income before the coffee can be harvested." (TR017)

These perceptions underscore how the uncertainty of the coffee market compels farmers to explore alternative crops and income sources. These views suggest that the current coffee

market structure is insufficient to sustain farmers' livelihoods on its own, highlighting the need for more stable and diversified sources of income within the agricultural sector.

Farmers in Lampung reported using mixed cropping not only as a strategy to generate additional income but also as a means of enhancing the environmental sustainability of their farming practices. By incorporating shade trees, farmers protect their coffee plants from excessive heat and maintain soil moisture, which is crucial for sustaining healthy crops and provides protection against environmental shocks and trends. Through this approach, farmers are indirectly leveraging natural capital to improve the resilience and sustainability of their agricultural systems. Social capital in the form of SCC with government and certifications enable access to sustainable farming training and resources to plant shade trees (see Findings: 8.2.1). One farmer explained the need for shade trees:

"So the farming system implemented is the multicultural with shade, so there are some plants, coffee also white pepper, with the shade. Those [shade] in order to protect the coffee plant, so it's not too dry, so this method is good to keep the soil moisture." (P002)

This illustrates how mixed cropping serves a dual purpose, enhancing both economic returns and environmental outcomes, while simultaneously improving the long-term viability of coffee farming in Lampung.

Cultivating staple crops such as rice or maize within OFGs is a strategy to access subsidised fertilisers. Although intended for staple crops, these subsidies are often used on coffee farms. In this study, 30 farmers reported growing staple crops, all as OFG members. Viewed through the SLF, this practice shows how farmers navigate institutional barriers and leverage assets: natural capital (staple crops) and human capital (OFG networks) to gain access to physical capital (fertiliser).

From the ToA perspective, this unofficial use of subsidies reflects indirect access, as farmers use mixed cropping within OFGs to obtain government resources not intended for coffee. This mechanism depends on social networks fostered through OFG membership (see Findings: Strategies: Social connections and support networks).

"Well, actually there is no subsidiary there's no coffee. It is only for other farming. From this year there's no subsidy for coffee for fertiliser. Maybe because they have also farm, like planting corn or something, that's how they get it." (GOV001)

9.1.2 Adapting Farming Methods.

Environmental challenges such as climate change, erratic rainfall, soil quality, and pests pose significant risks to coffee production in Indonesia (Sujatmiko & Ihsaniyati, 2018). In Lampung, production has decreased due to factors like unpredictable rainfall, resulting in levels much lower than its potential (Evizal et al., 2019). To increase yields farmers, deploy several strategies including efforts to access fertilisers and using grafting. Access to these assets is controlled by complex mechanisms that can create and limit access.

Use of Fertiliser.

Fertiliser is a physical asset that farmers in Lampung struggle to access (see Findings: 8.4.1). Several studies have found that the limited use of fertilisers among coffee farmers in

Indonesia stems from both the high cost and the complexity of accessing these inputs. Hartatri & Neilson, (2021) observed that Arabica coffee farmers in Sumatra primarily applied agrochemicals, including fertilisers, to their food crops rather than their coffee plants. This selective use of fertilisers has been identified as a key factor contributing to the region's suboptimal coffee yields, which are only 25% of their potential productivity (Hartatri & Neilson, 2021). Evizal & Prasmatiwi (2020) explain that in Lampung the lack of fertiliser is a problem for farmers and is affecting the success of grafting techniques and their yield, 25% of farmers stated they did not use fertiliser and Evizal & Prasmatiwi (2020) explain the cycle of perpetual debt plays a significant role in this decision.

In Lampung, the government's 2023 decision to end coffee fertiliser subsidies created access challenges. Although fertilisers remain available, full market prices are prohibitive, leading some farmers to turn to the black market. As one farmer group leader explained, fertiliser can be obtained through these unofficial channels:

"Black market, using the police, then the corporate police, military. It's very expensive almost twice...they scared the farmers, if you if you don't buy this fertiliser then all fertiliser will be poured the staple food and you will not get for your coffee, so because they scare and they all scared, they buy it from the police and the military. The threat is real." (CK004)

This increases the farmers vulnerability and decreases their ability to derive benefit from natural capital which can lead to lower yield and crop quality which can in turn lead to lower incomes and lower financial capital. One farmer explained:

"so they they're reducing chemical use of the fertiliser is not actually my directive but because I cannot afford". (P001)

This demonstrates the importance of the SLF and ToA in understanding the ability to gain access to assets, gain benefits from those assets and the complex mechanisms, processes and social relationships that can support or hinder this access. In this case, where formal access is blocked, farmers seek alternative and sometimes illicit routes to acquire the necessary inputs because they believe there is no other option. It highlights the hierarchies in these social structures and how new hierarchies have developed due to groups being denied access.

The SLF and ToA highlight how processes developed by powerful structures can create barriers to achieving sustainable livelihoods, particularly when those processes involve access to key assets. Also highlighting the significant role social relations as mechanisms of access or denial of access, and how these mechanisms can be used to exploit those with limited options.

This situation highlights broader structural issues in Indonesian agriculture, where policy complexity and logistical barriers hinder access to essential inputs like fertilisers. Limited affordable fertiliser access worsens productivity challenges in a sector already exposed to market fluctuations and environmental stressors. This threatens both the viability of smallholder coffee farming and the sustainability of national production. Addressing these barriers requires policy reforms to simplify subsidies and educational initiatives to raise awareness of available resources. Without such action, productivity gaps will persist, undermining agricultural output and rural livelihoods.

Grafting ('stek').

Technological developments are an important factor in improving production and incomes for farmers (Silamat et al., 2023). One important technological development in Lampung is the use of grafting techniques. Grafting coffee is a strategy used in Indonesia to adapt to changing environmental conditions and increase production (Irawan, 2023).

Irawan, (2023) identified several factors influencing farmers' decisions to adopt grafting practices, including access to information, and the availability of experts and technicians. The study highlighted that sources of information such as government agencies and extension services but did not discuss the role of peer-to-peer knowledge transfer. This emphasis on institutional sources underscores the importance of formal knowledge dissemination mechanisms in promoting agricultural innovation but does not address informal knowledge dissemination. Additionally, the research found that increased experience in coffee farming raised the likelihood of adopting grafting techniques and developing expertise in the practice (Irawan, 2023). This suggests that practical experience fosters not only greater receptivity to technological innovations but also the capacity to specialise in their application.

Interestingly, Irawan (2023) found that membership in OFGs did not significantly influence the adoption of grafting technology. This highlights the need to understand informal networks in the diffusion of agricultural technologies, which may be overlooked when focusing exclusively on formal group structures. While Irawan acknowledged the value of government extension services in facilitating the adoption of grafting, these services are predominantly available to OFG members, raising questions about the inclusivity of such programs. The apparent contradiction between the role of OFGs and the positive influence of extension services suggests that informal knowledge transfer and non-institutional relationships could play a more significant role than currently recognised.

Grafting (stek) plays a crucial role in farmers' strategies for enhancing resilience and increasing productivity (See Findings: 8.3.2). This technique is believed to help farmers maintain coffee yields despite adverse environmental conditions. In Lampung progress is being made to enable multiple harvests throughout the year through grafting techniques, this method could improve farmers' natural and financial capital, enabling them to better manage environmental risks and ensure sustainable yields throughout the year. As one government official explained

"They do experimental also the government they can help the farmers they want to improve income along the year, so they can plan specific clone for that harvest here, specific clones to harvest here, and specific clone to harvest here so they can harvest for longer time." (GOV 004)

Findings in Lampung support Irawan's work. In Lampung, knowledge-sharing and resource exchange among farmers regarding grafting were not determined by formal OFG membership, but rather by informal social capital and interpersonal relationships between farmers (see Findings: 8.1.2). Access to human capital, particularly knowledge and technical skills, is largely gained through informal networks, where farmers share grafting techniques and scions. Farmers stated they visit each other's farms to observe successful practices, exchanging valuable knowledge within their community. As one farmer explained:

"they're travelling a lot to see whether each [coffee trees] is good and then ask for the colleague farmer for the clone." (P035)

This peer-to-peer exchange fosters collaboration, enabling farmers to adapt grafting techniques to local environmental conditions while building their social capital through strengthened community bonds. Additionally, this method encourages experimentation, as farmers test different scions suited to diverse climates and ecological zones.

Farmers and government officials in Lampung stated that formal institutions, including government and certification bodies like the Rainforest Alliance, contribute to accessing human capital by offering structured training on grafting. For example, one farmer who received training through Rainforest Alliance noted, "*they had helped me to do a connection technique (grafting)*" (P035), underscoring how formal programs are seen as routes to enhance farmers' technical skills. However, there is an unequal distribution of access to these opportunities. Independent farmers, who are not part of OFGs, often miss out on these formal learning sessions, relying instead on informal knowledge-sharing networks and personal invitations to certification trainings through friendships.

This dual system of informal and formal knowledge transfer creates a broad dissemination of grafting techniques. Interview data suggests that farmers within OFGs are generally perceived to have better access to human, financial, and physical assets, while its believed independent farmers tend to benefit from community-based learning. However, the impact of these formal structures on the ability to benefit from grafting assets appears to be less significant than that of other assets, such as fertiliser. In this regard, social capital, especially through informal networks, is seen as more crucial.

Through these knowledge networks, farmers can enhance their use of natural capital and ability to derive benefit from natural capital by selecting grafts best suited to local environments, while also strengthening social capital through collaboration and shared resources. This integration of formal and informal strategies helps farmers increase their resilience to environmental and economic pressures, contributing to more sustainable livelihoods.

The ToA can be used to understand how farmers gain, maintain, and control access to the benefits of grafting. The framework emphasises the importance social relationships that enable individuals to obtain and use resources and derive benefit. In the case of grafting, access to knowledge is facilitated through social ties and connections with fellow farmers that grant individuals the ability to learn new techniques and acquire better crop varieties, farmers often work together and share information to enable other farmers to improve their production. Social capital is crucial, as farmers with wider networks can source better cuttings and obtain valuable insights on how to improve productivity in different environments (see Findings: 8.3.2).

Thus, the sharing of grafting knowledge and resources operates within a system where access to resources and ability to derive benefit are significantly affected by farmers' social networks. Those who participate in more extensive networks, either through OFGs or through informal friendships, are better equipped to access and utilise grafting knowledge. This underscores the importance of social capital in agricultural practices and how access to knowledge, which is facilitated by social relationships, plays a key role in shaping farmers' ability to secure and maintain productive livelihoods.

The success of the grafting strategy is closely linked to the ability to access both human capital, specifically knowledge and training, and natural assets, such as scions. This research

conducted in Lampung reveals that there are both formal and informal routes through which farmers can access these essential assets. Farmers' perspectives suggest that informal routes play a more significant role in enabling them to derive benefits from grafting, while formal routes, such as training programmes, also provide valuable opportunities for skill development. Farmers highlighted how knowledge is often shared informally, enabling independent farmers to access valuable formal knowledge through these informal exchanges. Strategies of accessing and gaining benefit from grafting demonstrates how formal and informal access routes can complement each other, creating a more inclusive system of knowledge dissemination that benefits both group members and independent farmers alike.

9.2 Value Addition and Market Engagement

Value addition and market engagement strategies are vital for improving farmers' livelihoods. This study explores perceptions of fine Robusta production, government training, certification, and social media as means of strengthening market positions. Analysed through the SLF and ToA, these strategies show how farmers navigate social and institutional structures, access resources, and build social capital. The frameworks highlight pathways to secure better prices and reduce reliance on intermediaries, which expose farmers to global market volatility and weak bargaining power. Findings emphasise the role of social networks, technology, and targeted government support in enabling sustainable and diversified market access in Lampung.

9.2.1 The fine Robusta domestic market.

The domestic market for mixed Robusta coffee (asalan) in Indonesia has been growing over the last 5 years, it has the second largest domestic market for exporting countries. In 2020 domestic coffee consumption reached 288,360 metric tons accounting for 37.8% of the coffee produced, showing that the industry is not reliant totally on the export market (Ashardiono & Trihartono, 2024).

In urban Indonesia, the café lifestyle features both specialty and non-specialty coffee drinks. Processing and brewing techniques vary by region to achieve distinct taste profiles. Numerous cafés now source single-origin coffees locally and sell specialty Arabica and Robusta blends. Although Robusta is often regarded as lower quality, research indicates strong demand for it in Indonesia (Ashardiono & Trihartono, 2024).

Several studies have investigated the Robusta supply chains (Ashardiono & Trihartono, 2024; Buana et al., 2024; Nugraha et al., 2019; Romdhon et al., 2021; Yulian et al., 2019) but none have investigated the fine Robusta routes. This research in Lampung indicates that fine Robusta production is seen as a significant development within the domestic market and an important livelihood strategy with the potential to increase incomes (see Findings: 5.2 & Chapter: 10). Roasters are using a range of processing and brewing techniques usually reserved for Arabica coffee however, there is very little research focusing on this.

From an SLF perspective, this strategy strengthens financial capital by creating a more stable and diverse market base, though the domestic market remains small and unable to match international demand. It also builds social capital through closer relationships with domestic buyers such as cafés and roasters. Group selling, often supported by government, enables smallholders to pool production, meet larger buyers' needs, and increase competitiveness.

This collective model also improves bargaining power, allowing farmers to secure better prices and terms. Yet the limited domestic market continues to pose challenges.

Using the ToA, domestic market development can be understood as a strategy that enables farmers to gain better access to assets such as equipment, markets, knowledge and training which improves the ability to derive benefit. The relationships formed between farmers and Domestic fine Robusta café owners identified in this research provide a direct route to market, bypassing many of the institutional and social barriers present in the international coffee trade. The ability to develop relationships with these local buyers allows farmers to more effectively navigate the domestic market landscape and secure better outcomes for their livelihoods.

9.2.2 Fine Robusta- Direct trade

Producing fine Robusta is a key value addition strategy for both independent and OFG farmers. Direct partnerships with buyers, such as domestic cafés and roasters, provide access to physical, social, and human capital, including equipment and technical support. These partnerships also improve financial capital by strengthening bargaining power, enabling farmers to produce higher-quality coffee and increase market value.

Direct trade agreements enhance social capital and reduce reliance on intermediaries such as traders and exporters. In Lampung, farmers and domestic fine Robusta café owners reported that direct negotiation secures better prices and long-term, quality-focused partnerships. These relationships reshape trade dynamics and provide stability for fine Robusta farmers, while also increasing access to financial capital through higher prices. One Domestic fine Robusta cafe owner discussed the process of negotiation:

“The first I negotiate about the price here with the farmer. I talked with the farmer, how much how much the trader here buy your coffee. He talked maybe 23,000 (IDR) a kilo. The maximum price 23,000 (IDR) and then I talked to him I want to buy your coffee, but with the good coffee quality, with the standards. Fine Robusta, full wash process, honey process, natural process and I will buy your coffee with good price, 45 000 (IDR).” (TR010)

Domestic fine Robusta Cafe owners not only act as buyers but also play a supportive role by providing farmers with essential equipment and training (see Findings: 5.1, Findings: 7.6 & Findings: 8.2.1). For instance, some agreements offer access to physical and human capital in the form of equipment and guidance on processing techniques. This knowledge transfer is crucial for improving the quality of Robusta coffee. One Domestic fine Robusta cafe owner highlighted the dynamics of this relationship and how the close working relationship ensures the quality of the coffee:

“Yes directly from farmers. And also we have cooperation [agreement] with the farmer because if I only buy from the farmer. It's OK maybe this year's the quality it's good. But next year, if we not cooperation maybe not good next years because the farmer needs knowledge. Needs we give some knowledge to the farmer for the make Robusta just like that and then Arabica also maybe like a full wash honey we give some information to the farmer and then every year I visit before the harvesting.” (TR010)

Direct trade arrangements give farmers access to physical and human capital. Domestic fine Robusta café owners provide machinery and training to build technical skills, adding value to coffee and enabling higher prices that may improve livelihoods. Use of this strategy also reduces vulnerability to global fluctuations by ensuring direct, consistent buyers. However, demand for fine Robusta remains limited, meaning that despite higher prices, farmers cannot rely on this market alone or abandon mixed Robusta production.

The ToA further deepens this analysis by examining the mechanisms through which farmers gain access to these markets. In this case, social relationships and connections with buyers becomes crucial. Farmers with established relationships or networks with café owners and the fine Robusta supply chain are better able to access these assets and derive benefit from them. These relationships enable farmers to obtain agreements and resources they otherwise wouldn't have through conventional channels.

9.2.3 Fine Robusta- Government support.

The government plays an important role in promoting the production of fine Robusta by providing access to human and physical capital in the forms of machinery and training. Utilising the governments support is a strategy only available to OFGs and it is not available equally across different OFGs, independent farmers cannot gain access at all (See Findings: 9.4.3). One of the key asset's accessible through this strategy is roasting and processing equipment, access to this physical capital helps farmers increase the value of their coffee which can increase their financial capital. As a government official from The Plantation department explained that selected OFG members are provided with roasting equipment:

"They [the government]] pick up the one like [extension farmer selected]. They still very clever, and they [government] come to talk to the farmers and also provide machinery for roasting". (GOV004)

Additionally, the government facilitates relationships between OFGs and private corporations such as exporters, increasing farmers social capital. This support often includes both machinery (physical capital), training (human capital), and supply chain connections (social capital), which can further improve coffee quality and market access.

The SLF highlights that the strategy of accessing government's interventions increase farmers' access to physical capital (roasting and processing machinery), human capital (training and knowledge) and social capital (supply chain connections). The government actively promote the development of OFGs to enable access to this support and to encourage farmers to sell coffee collectively with the aim of increasing farmer bargaining power. Access to these assets contribute to better livelihood outcomes by improving the quality of coffee and market access which has the potential to improve incomes.

The SLF highlights how government support can reduce farmers' vulnerability, enabling a shift from low-value commodity production to higher-value specialty coffee. Access to this strategy depends on OFG membership, as the government works only with selected groups. Farmers believed they needed to distinguish themselves to gain support, a view echoed by officials. Thus, the government plays a central role in deciding who accesses resources and how they are distributed.

"They must be famous in the eyes of the government so they get attention." (P078)

The ToA further illustrates how government support mechanisms control who can access the resources necessary for producing fine Robusta. Being a member of an OFG becomes a critical factor in gaining access to roasting machinery, training and connections, as the government only works with select OFGs rather than independent farmers. As such, OFG membership becomes a mechanism through which farmers can gain access to both material resources and knowledge, enhancing their position within the coffee value chain (See Findings: 9.4.3).

There is some incompatibility between direct trade agreements and government interventions. Government programmes encourage OFGs to roast and process their own coffee to retain more financial benefit. However, in some direct trade agreements, Domestic Fine Robusta Café owners roast and process beans themselves. This may create future tensions if both farmers and buyers compete for roasting and processing roles within the fine Robusta supply chain.

9.2.4 Training

Increasing training and farmer knowledge is often a recommended step to improving production and incomes in Indonesia (Hartatri & Neilson, 2021; Sarirahayu & Aprianingsih, 2018).

Yudha, (2021) found that farmers in Bogor Regency, West Java, lacked knowledge and access to information about market and distribution channels. They relied on middlemen for sales and information, limiting market access and keeping incomes low. Farmers were also tied to middlemen through perpetual debt, a finding shared in Lampung. Yudha (2021) explain that training could have a significant impact on farmers in Bogor. Training focusing on increasing knowledge in production methods to increasing quality and yield as well as and enabling access to markets will improve the welfare of farmers in Bogor.

Sarvina et al., (2021) express concerns about farmers capabilities in Indonesia and stress the need for training, particularly focusing on Climate Smart Agriculture (CSA)⁸. Due to the predicted risks regarding climate change and coffee production the authors of this study emphasise the importance of preparing for climate change and educating farmers in farming methods that can reduce the impacts of climate change on their production and welfare. They found several challenges in implementing this including access to extension services, policy and the organisation of institutions.

Farmers in Lampung can improve farming and processing techniques through training provided by the Indonesian government, private corporations and certifications. This technical support has helped increase yields significantly:

"Before, it was less than one tonne per hectare, but now it's improved to higher than one tonne per hectare" (GOV004).

Membership in OFGs is seen as a significant factor for farmers seeking to access formal training. The government and private corporations primarily offer training through these groups, making OFG membership a key factor in whether farmers can gain new skills and improve their practices (see Findings: 9.4.3). As a farmer group leader noted:

⁸ Climate Smart Agriculture- a programme proposed by the Food and Agriculture Organization of the United Nations to increase productivity, adapt to climate change and reduce greenhouse gasses (Food and agriculture Organization of the United Nations, 2013; Sarvina et al., 2021).

"The guidance from outside, from Olam or from the government, comes through the farmer groups, not individually". (CK004)

In Lampung, it is understood that without OFG membership, farmers cannot access training and support that enhance quality and production. However, farmers noted that independent farmers sometimes gain access to certification training through invitations from OFG members.

From the perspective of the SLF the strategy of adding value through training is restricted by social capital barriers. Those without the OFG membership (social capital) struggle to access this value adding strategy. OFGs serve as a bridge between farmers and external stakeholders. This connection provides farmers with the access to value adding training to improve their livelihoods by producing higher-quality coffee and participating more effectively in value chains.

The ToA also clarifies how farmers gain or are denied access to resources. In this case, OFG membership is believed to be a critical route through which farmers can secure the knowledge to add value to their production. Membership provides access not only to external stakeholders but also to internal group knowledge. As noted by one farmer:

"They expect it from the farmer groups because there are a lot of discussions, and the farmer group facilitates the education". (P026)

Here, access to knowledge is mediated through social relationships within the group, and membership facilitates participation in these knowledge-sharing events.

Accessing value adding training through OFGs in Lampung is perceived to be very important for farmers seeking to enhance production quality and access value-added markets. Unlike independent farmers, OFG members benefit from formal training opportunities provided by government and private corporations. However, these findings contrast with research from other regions, where OFG membership does not ensure access to market knowledge, and limited extension services act as barriers to training access (Sarvina et al., 2021; Yudha, 2021). Findings from this research in Lampung identify that value adding training is seen as important by farmers and that OFG status is believed to be a significant factor in accessing it, further research is needed to identify the scope and quality of the training that is accessible to OFGs and independent farmers in Lampung.

9.2.5 Certification

Coffee certification in Indonesia presents both opportunities and challenges for smallholder farmers. While certification can provide access to global markets and potentially higher prices (Arifin, 2022; Wahyudi et al., 2020), achieving the standards required is often challenging for farmers in Lampung and the increased price can be as little as 200- 300 IDR per kilogram (0.0099-0.015 GBP) (Ibnu, 2023). Arifin, (2022) found that in Lampung partnerships between OFGs and sustainability certifications increased yield and farm gate prices for coffee farmers which increased incomes, also the number of family members working on the coffee farm had a significant impact on income (Arifin, 2022). Studies show that economic benefits from certification are modest and unevenly distributed, with roasters capturing the majority of economic rent (Astuti et al., 2015).

Gaining certifications is a strategy that can open market access and training opportunities for mixed Robusta OFG members. Farmers in this research started that large buyers such as Nestle and companies such as LDC require certifications including Rainforest Alliance or 4C.

OFGs with these certifications have the option of selling their coffee to these buyers if they can achieve the quotas and quality standards. Certifications are also a strategy that creates access to training, enabling farmers to learn and apply sustainable practices that enhance both productivity and environmental stewardship. Non OFG members are also invited to these training sessions and are not excluded which is different to training provide through the Indonesian government (see Findings: 9.4.3). One farmer noted:

"Rainforest does facilitate training to produce organic fertilisers and provides certificates"(P036).

From the perspective of the SLF, certification enhances farmers' social capital by increasing market and stakeholder access, human capital by providing access to training and natural capital by promoting sustainable farming practices that preserve soil health and biodiversity. Whether certification can also increase financial capital by improving market access and farming practices is unclear at this stage.

The ToA helps explain how different farmers gain or are denied access to certification as a strategy. Access to certification is mediated by a combination of social relationships, institutional mechanisms, and material resources. Farmers who are part of well-established OFGs can leverage their collective agency and pool resources to meet certification standards, while independent farmers, who may lack these relationships and resources, struggle to gain access.

The majority (63.6%) of farmers in Lampung were aware of certifications but only 31.8% of farmers stated that they were certified (see figure 20 and 21). This raises questions about the perceived value of the assets gained from certifications for farmers in Lampung or the perceived barriers in place to achieve the standards. The average prices achieved for certified Robusta in this study is 39,216 (IDR) per kg and non-certified is 34,271(IDR) per kg, a difference of 4945 IDR (0.06 GBP) (see Findings: 10.1). Seven of the certified farmers did not sell their coffee as certified, they only sold mixed non-certified coffee.

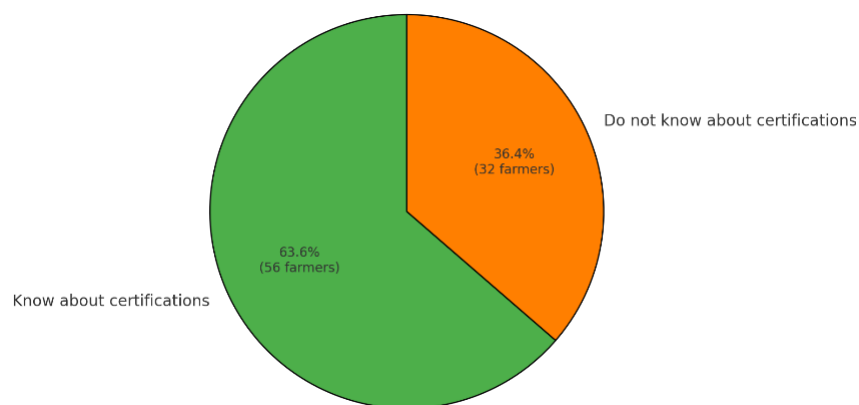


Figure 20 Farmer awareness of certifications in Lampung. Own data.

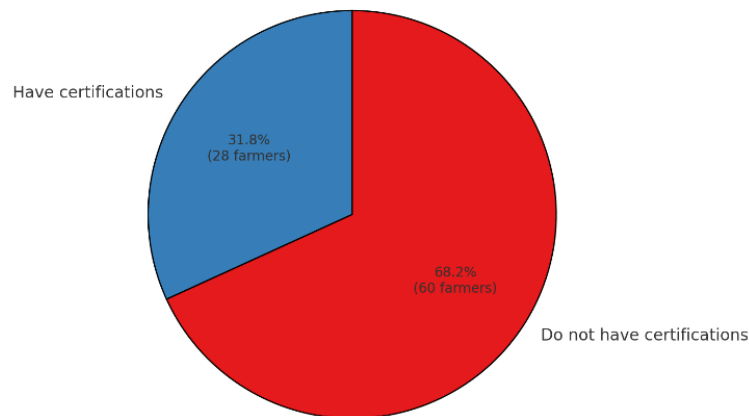


Figure 21 Farmers who have and do not have certifications. Own data.

The findings in Lampung suggests that although certification may open up access to markets and training it does not necessarily lead to significant increase in prices and incomes. This may explain the low number of certified farmers in Lampung and why some farmers chose not to sell their coffee as certified.

9.2.6 Social Media and Technology for Market Engagement

A study in East Java highlight the growing importance of social media and digital technologies for coffee farmers. Platforms such as Facebook, Instagram, and WhatsApp enhance selling prices, facilitate direct trade, and reduce reliance on intermediaries. Research shows farmers can triple prices while avoiding middlemen costs. Social media also improves efficiency by enabling faster transactions and removing the need to transport products to traditional markets. Overall, it is a valuable tool for promoting agricultural products, streamlining supply chains, and building direct buyer connections that strengthen farmers' bargaining power (Mohd. Arif & Pungky Syah Banar, 2019).

In Lampung the use of social media and technology has become an important strategy for farmers seeking to engage with markets more directly and efficiently. This has had influence on the fine Robusta market in particular. Platforms such as Instagram, WhatsApp, and other internet-based tools have allowed farmers to reach consumers without relying on traditional intermediaries, providing them with more control over pricing and market visibility. As one fine Robusta farmer explained how he has developed a market for his fine Robusta:

"So using social media posting. Yeah, you send sample to deliver to the café, to institution, every prospective consumers you send the samples and if they like it they buy it." (P078)

Additionally, knowledge has become more accessible through the coffee supply chains due to this strategy. Coffee prices for example can be accessed via a smart phone and as one trader stated, *"Due to the internet... farmers already know the price set by the big company, so it's a bit difficult for traders to set a lower price"* (TR001). This access to price information enables farmers to negotiate better deals and reduces the risk of being exploited by middlemen.

The SLF emphasises that this strategy builds social capital by connecting farmers with broader networks, including buyers, other farmers, and support services. It also has the potential to enhance financial capital by improving farmers' ability to market their products

at fair prices, while human capital is strengthened through the exchange of knowledge about market trends and pricing strategies. Using social media and technology as a strategy thus play a critical role in expanding farmers' livelihood options by diversifying their market engagement and improving the transparency of market operations.

The ToA further explains how technology serves as a means through which farmers can gain access to markets and negotiate prices. In this context, access is mediated by the availability of internet connectivity, digital literacy, and mobile technology. Farmers with access to these tools can more easily participate in the market, while those without such resources may remain dependent on intermediaries, limiting their market engagement and knowledge. Social media platforms and other online tools are resources that can shape how farmers access market opportunities and financial capital. The use of these tools enhances market access by providing a more level playing area for farmers with the right technological resources.

Findings in Lampung suggest that direct trade and enhanced farmer-consumer relationships facilitated through social media are believed to have the potential to significantly improve market access for farmers. Social media has thus emerged as a crucial strategy for fostering these connections.

9.3 Collective Action and Bargaining Power

For farmers collective action and the development of bargaining power are crucial strategies for enhancing livelihoods, especially within dynamic and complex agricultural supply chains (Ahmad et al., 2024; Bagus Putu Yudhia Kurniawantu et al., 2023; Noer, 2022). OFGs represent a structured approach through which farmers collaborate to pool their resources, access assets, and improve their bargaining power in the marketplace. Using the SLF, alongside the ToA, this section analyses how collective action through OFGs is perceived as a pathway for farmers to improve access to critical resources, training, and markets. This section explores how OFGs are seen as routes of access to government and private sector support and improve market access. Furthermore, it delves into the complexities and risks posed by informal practices, such as stamp forging, highlighting the tension between short-term gains and long-term sustainability.

9.3.1 Collective action

Collective action can be seen as an asset and a strategy (see Findings: 8.2.2). In this section collective action will be viewed as a strategy to increase bargaining power and connections to other stakeholders in the supply chain. In Lampung collective action takes the form of OFGs and there are several different OFGs in Lampung including informal farmer groups and formally registered cooperatives (See Findings: 5.1).

Collective action among OFGs in Indonesia plays a pivotal role in improving agricultural outcomes and rural livelihoods. Research consistently demonstrates that collective action through OFGs enhances smallholder farmers' capabilities, bargaining power, market access, and the prices they achieve (Ahmad et al., 2024; Bagus Putu Yudhia Kurniawantu et al., 2023; Noer, 2022). Additionally, OFGs facilitate connections to other stakeholders including the government and private corporations, such as exporters, who provide both knowledge and financial assistance. The ability of farmers to meet export market standards is also improved through collective action and stakeholder partnerships enabling increased access to global markets (Rokhani & Sumarti, 2016).

Ibnu et al (2018) has found that farmers in Indonesia who join OFGs report greater economic and social benefits compared to those who operate independently. Furthermore, farmers who hold dual memberships, such as belonging to both a farmer group and a KUBE, perceive even greater advantages than those with a single membership (Ibnu et al., 2018). A key factor contributing to the enhanced capabilities and engagement of farmers within OFGs is their connection to government support through extension workers, which strengthens the institutional capacity of these groups (Kurniawan et al., 2023).

However, Hartatri et al. (2019) found that specialty coffee farmers in Indonesia face challenges in accessing extension services through OFGs, limiting their ability to increase bargaining power and acquire knowledge. This difficulty is attributed to the restructuring of extension services, which consolidated support for fisheries, husbandry, food crops, and plantation crops under a single umbrella. As a result, extension staff are now expected to address the diverse needs of all these sectors, whereas in the past, specialised extension workers catered to specific industries (D. Hartatri et al., 2019).

This research in Lampung found that farmers view collective action as an effective strategy for gaining access to wider markets, achieving higher prices, gain access to subsidised fertiliser and gaining access to other stakeholders. However not all farmers were able to use strategy to gain benefit from these assets equally.

Farmers in Lampung reported pooling their harvests to access markets with higher demand; by pooling their harvest they can reach quotas and gain access to larger buyers. OFGs also provide traceability and certification stamps to attract large buyers. However, several participants discussed the common practice of stamp forgery, this finding has raised concerns about the reliability of these certification stamps, questioning their validity in meeting the required standards (see Findings: 9.3.2).

Farmers in Lampung perceived greater bargaining power through OFGs, not only can they sell to larger buyers they also sell to larger traders. If they are unhappy with the price offered OFG leaders explained that they will simply go to other villages or other areas to find alternative traders. Independent farmers are reliant on local traders and have limited ability to expand out of their area, although there is some negotiation the ability to influence price is limited, especially if the farmer is already indebted to the trader.

In Lampung, some farmers felt increased social capital through OFG membership, though this was unevenly distributed across groups and individuals. Limited extension services, noted in other studies, may explain perceptions of selective government support, causing dissatisfaction among farmers seeking greater assistance. The research also found that remote locations created barriers for some farmers in accessing other stakeholders.

From an SLF perspective, farmers believe that joining an OFG can increase their social capital but can also enhances their financial and physical capital through improved market and stakeholder access. Farmers within OFGs can consolidate their harvests to meet the high-volume demands of large buyers like Olam, LDC and Nestle. As one farmer group leader explained:

“25 farmers... combine the coffee into the farmer group for example 1 tonne, and Olam usually... needs about 10 tonnes.” (CK004)

This consolidation helps farmers meet market demands that would otherwise be unattainable if they were acting independently. By pooling their resources and harvests, farmers can secure higher prices and more stable market conditions, which directly influences their financial sustainability.

The ToA provides further insights into collective action. Through their collective structure, OFGs are believed to improve farmers' ability to derive benefit in the form of financial capital (increased prices) and social capital (supply chain connections). For independent farmers, however, access to markets is seen as more constrained. Without the social and economic ties provided by OFGs, these farmers must rely on intermediaries, which diminishes their bargaining power. As such, their access to market benefits is restricted.

Collective action through OFG membership is perceived as a strategy that can enhance the economic and social outcomes for smallholder farmers in Indonesia by providing greater access to resources, knowledge, and markets. Farmers in OFGs believe they benefit from improved bargaining power and financial stability than independent farmers. However, challenges persist, such as unequal distribution of social capital and limited access to extension services between different OFGs. Despite these challenges, OFGs play a crucial role in enabling farmers to meet market demands and improve their livelihoods through collective efforts.

9.3.2 Forging Stamps and Its Outcomes

Traceability within the coffee supply chain encounters significant social, economic, and environmental challenges, primarily due to the intricate nature of the supply chain. As coffee moves through numerous intermediaries before reaching the consumer, tracing its origin becomes increasingly complex. Key factors contributing to this issue include pervasive farmer poverty, insufficient technological investment, and limited information sharing among stakeholders (Duşmăneanu et al., 2024). These obstacles hinder the establishment of a transparent supply chain, which is critical for assuring the quality and provenance of products, particularly within the food sector.

In the Indonesian coffee industry, the absence of a robust traceability system exacerbates these challenges. Without a reliable mechanism to validate the origin and quality of coffee, Indonesian exports are often undervalued by importing countries (Nurhazizah et al., 2023). This lack of transparency diminishes the industry's competitive advantage in global markets, affecting both farmers and exporters.

Blockchain technology has been proposed as a potential solution to these traceability challenges. By offering a secure, decentralised method for recording and verifying transactions, blockchain could enhance transparency and accountability across the supply chain. Its implementation could not only improve the credibility of Indonesian coffee but also foster greater trust among international buyers, thus supporting the industry's long-term sustainability (Nurhazizah et al., 2023; Pradana et al., 2023). Nevertheless, integrating such advanced technologies would require overcoming existing barriers, such as limited infrastructure and the digital divide in rural farming communities.

Research in Lampung found that traceability evidence and certification verifications are provided through a 'stamp' and it is the responsibility of OFGs to provide this to buyers (see Findings: 8.4.4). This research found that stamp forgery is commonplace in Lampung and is used as a strategy to gain access to buyers.

Stamp forgery within OFGs reflects both a survival strategy and a threat to sustainable livelihoods. It allows groups to meet large buyer quotas but undermines the trustworthiness of both the group and the wider agricultural system. By including uncertified or non-member coffee under their stamp, OFGs temporarily boost financial capital through larger sales but sacrifice long-term sustainability and credibility, damaging social capital in supply chain relations. One trader explained this practice:

“from the 5000 tonne it's not all the certification coffee. I think it's come from the conventional [non-certified] coffee. And then they put in the certification coffee and sell with the Nestle with the good price.” (TR010)

It is claimed that companies (who act as intermediaries between OFGs and large buyers) are aware of this system and encourage it. While it may offer short-term financial gains, it risks deteriorating the group's relationships with large buyers and the large buyers relationships with consuming countries, which are critical for sustaining market access and ensuring livelihood security over time.

The ToA helps analyse the forgery of stamps as a strategic decision rooted in the need for access to markets. Through collective action, OFGs initially enables farmers to gain access to certifications and buyer networks, but the pressure to meet quotas leads farmers to informal strategies, such as stamp forging, to maintain this access. While this tactic provides short-term benefits by allowing farmers to sell to large buyers and companies, it threatens long-term access to markets, especially when the forgeries become public and too obvious for the more powerful groups to ignore. A trader explained how a KUBE was blacklisted by a larger buyer (Nestle) due to stamp forgery, effectively severing the group's access to important market channels.

“The big buyer [Nestle]... they block, like have a blacklist of the Kube”. (TR007).

In contrast, independent farmers, who are typically excluded from OFG benefits, may occasionally benefit from these informal systems if their coffee is included in the OFG's forged quota. However, this access is indirect and does not offer them long-term stability or security. The financial benefit of participating in a system built on forgery remains limited and unstable.

9.4 Social Networking and Support Systems

In the context of smallholder coffee farming in Indonesia, social networks and support systems play an important role in shaping the livelihoods and productivity of farmers (Ihsaniyati et al., 2024; Istiqomah et al., 2024). This section explores the dynamics of social networks and support systems for Robusta coffee producers in Lampung Indonesia. The informal exchange of knowledge, intergenerational transfer of agricultural practices, and formal support systems, such as OFGs, contribute to the development of human, physical, natural and financial capital among farmers. Through the SLF and ToA frameworks, this analysis examines how informal networks and structured support groups impact farmers' access to assets and the ability to derive benefit.

9.4.1 Social Networks and support systems: Farmer to farmer

Informal networks between farmers are an important method of knowledge sharing among coffee farmers in Indonesia. Informal networks have been identified as a critical strategy for

disseminating agricultural practices and improving production standards (Ihsaniyati et al., 2024; Istiqomah et al., 2024). The benefits of such exchanges extend beyond immediate agricultural improvements, contributing to personal and social development, enhanced farming techniques, and overall farm development (Istiqomah et al., 2024). Recent studies on farmers in Temanggung, Central Java, reveal that knowledge is shared through both face-to-face interactions and online platforms, with farmers participating in OFG meetings, training, coffee-related events, and using social media platforms such as WhatsApp, Instagram, and Facebook for communication and learning (Istiqomah et al., 2024).

The practice of knowledge sharing has not only improved agricultural techniques but has also encouraged the adoption of fine Robusta practices, such as red cherry picking. Both social media and face-to-face interactions were found to be crucial in facilitating knowledge exchanges, while also building farmers' confidence in adopting new methods. This exchange of knowledge fosters stronger social networks, deepens friendships, and empowers farmers to recognise the value of their expertise (Ihsaniyati et al., 2024; Istiqomah et al., 2024).

Findings in Lampung align with previous research showing that social capital is crucial for fostering farmer networks and knowledge exchange. Informal sharing of techniques, such as *stek* (grafting), extends beyond formal groups, underscoring the role of personal relationships. Farmers' testimonies highlight how reciprocal sharing builds collaborative learning, supporting access to human and physical capital that enhances productivity and sustainability (See Findings: 8.1.2 & Findings: 8.2).

"He has a lot of discussions with his colleague farmers... when he heard something new that was good, he tried it in the plantation".
(TR014)

Farmers expand their networks beyond OFGs, and the exchange of informal knowledge is not limited by group membership. Members also invite non-members to participate in selected formal training sessions, ensuring that even independent farmers, who may not have access to such resources, can benefit from the collective knowledge within the group. One farmer explained this process:

"If they don't become a member they cannot communicate directly to those actors, but the member of the corporation or farmer group will inform the person or farmer. Does not inform as a member about the information they will share they will still share between".
(P003)

Interpreting this through the SLF, farmers who can develop and access informal networks do so by leveraging social capital in the form of social networks. Access to this social capital facilitates the development of natural capital (such as scions), human capital (knowledge), and potentially financial capital due to improved quality and yield (See Findings: 8.1.2 & Findings: 8.3.2).

Viewing this through the ToA social capital plays a significant role in gaining, maintaining, and controlling access to both material and non-material resources. The ability to request grafting materials or knowledge from fellow farmers, as seen in the exchange of '*stek*' branches, underscores how social relationships provide access to resources and the ability to derive benefit from resources. These informal networks are crucial for farmers to secure the access needed to improve productivity and sustainability.

The remote location of coffee farms in Lampung, combined with poor road quality, may hinder some farmers and warrants further investigation. Examining how trust between farmers is built and how it shapes resource access would also provide valuable insights. In addition, technology may play a central role in overcoming geographical barriers, facilitating communication, and supporting knowledge and resource sharing, thereby influencing how social capital is accessed and the benefits gained.

9.4.2 Social Networks and support systems: Family

In Indonesia, family heritage plays significant role in coffee production, as agricultural knowledge is transmitted across generations, embedding sustainable land management and cultivation techniques within local practices (Faronny et al., 2024). Research conducted in Banyuwangi, Indonesia, reveals a dynamic interplay between inherited traditional knowledge and the adoption of modern agricultural methods, which together shape contemporary farming practices. The transmission of this generational knowledge has been found to enhance the resilience of farming systems, ensuring continuity and adaptability despite environmental and economic challenges (Faronny et al., 2024).

In Lampung this research found that family-based support systems play an important role in the sustainability of coffee farming. Many coffee farmers in Lampung stated they inherited their land and farming techniques from their parents, creating a system where farming knowledge is passed down alongside natural resources. As one farmer explained:

"It's a family heritage, how we do it, it's a tradition passed from generation to generation." (P029)

Beyond knowledge, family members often provide crucial labour during busy periods, reducing the need for external workers. In Lampung 33 out of 88 farmers stated family members help with picking coffee. This support can lower operational costs and increase productivity. As coffee farming can be a family endeavour, this collective approach to labour helps sustain the livelihood of the farm across generations. The findings in Lampung show that most farmers pay other workers to pick their coffee but over 30% still rely on family (see Figure 22).

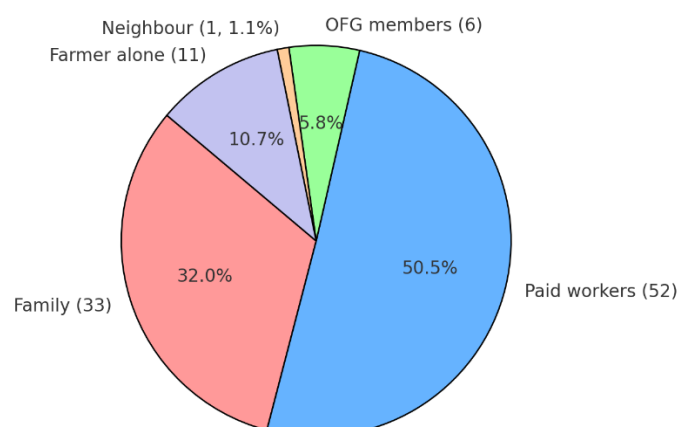


Figure 22 Chart showing who picks the coffee. Own data.

Through the lens of the SLF access to social capital in the form of family connections improves access to natural and human capital, in the form of land, knowledge and labour. Family members' participation in farming activities provides labour that would otherwise require external hiring, reducing costs. Moreover, intergenerational transmission of traditional knowledge ensures that farming methods are passed down from generation to generation. However, this reliance on traditional knowledge can also be a constraint if newer, more efficient techniques are not adopted.

The ToA views family connections as a key mechanism for accessing assets such as labour, land, and knowledge. In this context, a common strategy may involve households having more children or living with extended family members to increase the available labour force, in Lampung farmers on average had 2.2 children and an average of 3.6 people living in the household. To fully understand how this strategy is employed in Lampung and the farmers' perspectives, further research is needed.

9.4.3 Social Networks and support systems: Organised Farmer Groups (OFGs)

Ideally OFGs are created by farmers who share common views and goals and want to work together to achieve those common goals. However, most OFGs in Indonesia are not formed independently by the farmers, they are formed in response to membership being required to access subsidised fertiliser, agricultural extension support and other support from the government (Nuryanti & Swastika, 2011).

OFG membership has been found to have positive outcomes for farmers and improve agricultural productivity (Baga et al., 2023). However there are factors that influence a farmer's willingness to join OFGs and to participate in activities. Many farmers are hesitant to join OFGs and some of the factors influencing this decision are age, length of education, quantity of coffee, land size and labour availability, interestingly a recent study in East Java found that access to financial credit was less significant (Puryantoro et al., 2024).

The lived experience of farmers and the effectiveness of OFG membership as a strategy can be affected by the quality of extension services. Farmer participation and the success and sustainability of OFGs in Jember Indonesia were found to be significantly impacted by the roles of extension services. Research also shows that individual farmer traits and external support impact farmer participation which impacts the capacity of the OFGs (Kurniawan et al., 2023). This research is supported by findings in Uganda that found extension service quality was a significant factor influencing the engagement of farmers in learning and group activities (Ochago et al., 2017). The Indonesian government is experiencing struggles with the availability of extension services and recently concerns were expressed by The Chairman of Commission IV of the House of Representatives of the Republic of Indonesia (DPR, 2024).

In Lampung findings reveal that OFG membership is a strategy used to gain access to assets from the government and other stakeholders in the supply chain who control access those assets. OFGs play a pivotal role in enhancing the ability of farmers to access various forms of capital, including physical, natural, social, financial, and human capital. Creating and joining an OFG is a strategy that can enable farmers to interact more closely with stakeholders in the coffee chain such as other farmers, government agencies and private corporations. The support offered through an OFG varies due to factors such as the size of the group and the type of group it is (see Findings: 5.1). Interview and survey data from Lampung revealed some key assets that farmers are able to access through OFG membership.

OFG membership provides farmers with access to financial capital through internal savings and loan systems. When joining an OFG farmers are asked to contribute a sum of money into a collection that can be used for loans to members. If a farmer were to leave the group this money is returned to them. As one farmer group leader explained the support that groups can provide:

“credit shaping and lend the money, farmers they can they save some money through cooperative and then also lend some money from the cooperative.... I want to become very fair with the farmers. A farmer want to join the cooperative they have to donate some money, save some money and some is kept by cooperative and if the farmer want to quit the cooperative give back the money 100%. Yeah. So then the farmer won't lose the money.” (CK002)

In addition to financial capital, OFGs serve as platforms to access human and social capital development. They provide access to training, as well as advice and connections with external stakeholders. Membership in an OFG facilitates access to government and private sector support, including agricultural training, access to specialists, agrochemicals, and machinery.

Through OFG membership, farmers also gain access social capital in the form of new market opportunities and improved connections in the supply chain. For instance, government initiatives focusing on OFGs aim to make trade more direct, thereby increasing the share of profits retained by farmers. A plantation department official discussed the aims of their interventions including developing agreements between OFGs and exporters:

“They will help the farmer to promote what they have produced. Hopefully that the community will know about the farmers production and some part of the communities like exporter maybe they want to do like collaboration by having a memorandum of understanding with exporter and other any other actors like coffee shop and everything” (GOV001)

The development of OFG is encouraged through granting access to natural and physical assets such as subsidised fertiliser and land (see Findings:8.3 & Findings: 8.4). Access to these resources is only available through OFG and controlled by the Indonesian government. A government official explained the lack of support for independent farmers and how group membership can open access to resources:

“No, there's no individual helping for farmers and they have to be in a group.” (GOV001)

“So the farmers that are getting help from the government is like they include to farmer groups or any other groups at the village level. But it should be the groups should be like already established for at least two years in order to get the help subsidised from the government.” (GOV001)

Further emphasising the role of the government in the creation of OFG, a government official from the plantation department explained the benefits of transitioning from a farmer group to a cooperative, highlighting the increased governmental support available to cooperatives:

“if they become cooperative they have bargaining to get more of support from the government even higher because they are now in cooperative, they are legal entity, the government give more attention to them if they are in the cooperative rather than they are in the farmer group, so they push the farmer group to a higher rank, they become cooperative” (GOV004)

The issue of subsidised fertiliser frequently arose during interviews with both farmers and farmer group leaders, highlighting its significance and increasing scarcity. The official removal of coffee subsidies in 2023 has further complicated the situation, with farmers largely unaware of this policy change (See Findings:8.4). One farmer group leader recounted the role of government extension workers in the formation of his farmer group:

“Because farmers want to buy subsidised fertiliser, it should be through the farmer groups so we form the farmer group. And also if another programmes of help from the government, also through the farmer groups, they. Why we have to build the farmer groups.” (CK004)

Although this farmer group was established in 2016, before the subsidies were removed, the group leader continued to follow the same process for accessing subsidised fertiliser, despite the policy change. None of the interviewees, including farmers and farmer group leaders, were aware that coffee subsidies had been discontinued and subsidised fertiliser was stated as a common motivator for joining and OFG.

Access to natural capital, such as land, is also accessed through OFG membership. For instance, participation in the Social Forestry programme requires farmers to be members of an OFG (see Findings: 8.3).

The government’s role in promoting OFGs is evident, largely through extension workers. Farmers in this study reported mixed experiences with these services: some felt hidden agendas limited actual support, while others gained useful information and knowledge. Many, however, were dissatisfied and believed the government should do more. This suggests that although OFG membership is an active strategy, greater effort is needed to ensure equitable support and access to extension services. One farmer leader voiced distrust of extension workers, while another described their role:

“the representative of the farmer come out with the extension officers, they come to us to give guidance on the qualification but, of course in the end I think the extension official have collaboration with the military police just to play the farmers. So they don’t trust.” (CK004)

“There is this agricultural extension worker, they come to the farmer and give and give them education.” (P029)

The SLF interprets this strategy as a key to accessing the human, physical, financial, natural and social capital that is controlled by other stakeholders in the supply chain. Initially social capital is developed through joining OFGs and through the supply chain connections this opens up farmers can gain access to other capitals. The quality of this social capital can influence the level of access to other assets, for example, distrust in extension workers or a lack of access to them will form a barrier to gaining access to the assets they provide links to.

The ToA suggests that membership in an OFG is a strategy for gaining and maintaining access to resources that would otherwise be out of reach. Farmers gain access to financial resources through OFG membership. By pooling their financial resources collectively, farmers create a resource that is unavailable to non-members, and this resource is controlled and maintained by the farmers themselves, without external stakeholder intervention. However, mechanisms controlling access to most assets are ultimately held by external stakeholders, such as the government and private corporations, who can alter or revoke the access granted to OFGs. By fostering strong social and political relationships with government officials and private-sector actors, OFG members can secure crucial support that enhances their livelihoods.

According to the ToA, access to these resources is controlled by government and private corporation mechanisms, who use OFGs as a means to manage and distribute resources. By creating a need for farmers to join these groups to access essential assets, OFGs also function as an administrative tool for effectively monitoring and fairly distributing resources. In this context, farmers join OFGs as a strategy to benefit from the resources they enable access to.

9.4.4 Social networks and Support systems: Fine Robusta Supply chain

The domestic coffee market in Indonesia is expanding, with rising demand for both Arabica and Robusta coffee and a growing number of coffee shops in urban areas (Ashardiono & Trihartono, 2024). Most coffee farmers in Indonesia sell their coffee in the form of green beans to traders. Some of the main reasons for this include the distance, cost, using cash transactions and the ease of the transaction. Many farmers need the cash quickly to pay for their daily needs so often selling to a trader is preferred over selling through markets, cooperatives and companies (Rosiana & Feryanto, 2022). Opportunities for more direct trade are emerging in Lampung particularly for fine Robusta producers.

Previous studies reveal that direct trade agreements in export supply chains can significantly benefit farmers by increasing bargaining power, enhancing profit margins, and improving coffee quality. For instance, research on cooperative groups in Bandung, Indonesia, shows that by selling roasted coffee directly to buyers rather than green beans through exporters, farmers gain higher prices and retain a larger share of profits (Rifin & Naully, 2020).

Studies on Robusta supply chains also highlight that shorter, direct supply chains are more efficient, reducing non-value-added activities and yielding higher profit margins for farmers (Hadiguna et al., 2019). Direct trade agreements aim to foster a sustainable, mutually beneficial relationship between roasters and suppliers, focusing on long-term quality improvement and market stability. Research on connective businesses, which facilitate direct trade relationships between producers and roasters in African specialty coffee markets, has shown that these arrangements increase farmers' negotiation power, provide market access, and often include training and financial support, further stabilising farmers' incomes compared to traditional coffee supply chains (Borrella et al., 2015). However, the direct trade benefits seen in African specialty markets have yet to be thoroughly examined within Indonesia's fine Robusta sector, highlighting a need for further research to understand and leverage direct trade's potential in these emerging supply chains.

Research focusing on direct trade within coffee supply chains has primarily focused on mainstream markets and incomes, leaving fine Robusta supply chains, particularly direct trade relationships between buyers and farmers, largely underexplored. This gap is notable

given the unique market dynamics and potential benefits that direct trade could bring to fine Robusta farmers.

The production of fine Robusta is a strategy that can improve farmers social, physical and financial capital. In the fine Robusta coffee domestic route, social capital plays an important role in supporting farmers and increasing their financial and physical capital (see Findings: 9.2). Farmers build relationships with coffee shop owners and traders, often engaging in direct trade to receive better prices for their produce and increasing bargaining power for farmers.

These direct trade relationships provide not only financial benefits but also human capital in the form of advice and feedback on product quality as well as knowledge, one fine Robusta coffee shop owner explained:

“For the class for me, I will try to spread the knowledge with my coffee cooperative that I work with.” (TR009)

These relationships provide support networks that improve financial capital through human capital, as farmers can negotiate better deals without the involvement of middlemen due to the higher quality product and direct agreements with buyers.

In this context, the ToA shows how direct trade relationships can enable farmers to gain access to financial capital by reducing dependency on intermediaries like traders and collectors. These direct relationships also provide access to knowledge on farming methods and product quality, enabling farmers to improve their coffee output thereby deriving benefit. Coffee shop owners act as intermediaries who help bridge the gap between local farmers and the growing urban markets, allowing farmers to tap into more profitable trade routes.

Support networks in the fine Robusta supply chain are instrumental in helping farmers access critical social, financial, and human capital through direct trade relationships. These connections with Domestic fine Robusta café owners and roasters provide farmers not only with better prices but also with valuable knowledge and feedback on coffee quality. However, the potential benefits of these networks in fine Robusta remain largely unexplored, underscoring the need for further research to fully understand and expand the opportunities within this niche market.

9.5 Conclusion: Perceptions of livelihood strategies

In conclusion, the livelihood strategies explored in this study, agricultural and income diversification, value addition and market engagement, collective action and bargaining power, and social networks and support systems, play pivotal roles in enhancing the resilience and adaptability of coffee farmers in Lampung. These strategies not only help buffer farmers against market volatility and environmental stress but also enable them to diversify their income sources and strengthen their position within the coffee supply chain.

Farmers in Lampung utilise mixed cropping, grafting, and off-farm employment as adaptive strategies to secure their livelihoods and improve their access to resources such as financial capital, technical knowledge, and market opportunities. These strategies are perceived as a way of increasing resilience, as they provide multiple sources of income and mitigate risks associated with coffee production. Value addition strategies, particularly the development of

the fine Robusta market, offer new avenues for farmers to increase their incomes by securing better prices and reducing their dependency on volatile international markets. Technology and direct trade agreements also empowers farmers, enhancing their bargaining power and fostering more transparent market relationships.

Collective action through OFGs and the strengthening of social capital are strategies that allow farmers to gain access to government resources, training, and better market opportunities. While OFGs provide important benefits in terms of resource access, the benefits are not equally distributed across all farmers. Some farmers, particularly those outside OFGs, face challenges in accessing these benefits, highlighting the need for more inclusive strategies that reach all farmers, regardless of their group membership. Additionally, the practice of stamp forging within OFGs, though a short-term strategy to meet market demands, raises concerns about the sustainability and credibility of these groups in the long run.

Social networks and support systems, including informal knowledge-sharing among farmers and family-based support, are essential livelihood strategies. They not only facilitate the exchange of farming techniques but also provide crucial labour and resources that support farming operations. The interplay between formal and informal networks underscores the importance of community-based approaches in building resilience, as well as the need for policies that support these networks and ensure equitable access to resources and training.

While the strategies identified in this study help farmers mitigate immediate challenges and strengthen their livelihoods, they also reveal the need for broader systemic changes. Addressing issues such as limited market access, training, and policy support will be crucial in ensuring the long-term sustainability of these strategies. To achieve lasting improvements in the livelihoods of coffee farmers in Lampung, future interventions must focus on creating more inclusive and equitable systems that provide all farmers with the resources and opportunities necessary for sustainable development.

10 Findings: Perceptions of Livelihood Outcomes

This section presents a comparative overview of livelihood outcomes based on qualitative and quantitative survey data from Robusta coffee farmers in Lampung (see Appendix 2- All surveys). The data presented here is organised around the five livelihood capitals outlined in the SLF. As the data are based on self-reported perceptions and figures, they should be interpreted with caution. Potential sources of error include recall difficulties, such as inaccurate reporting of production volumes, and cultural factors that may influence how information on yields or prices is conveyed. These limitations underscore that the findings reflect farmers' perceptions rather than independently verified measures.

Radar charts are employed in this chapter as they enable a clear visualisation of the relative strength of livelihood outcomes and the associated asset indicators. By displaying multiple dimensions simultaneously, radar charts provide an accessible means of comparing the distribution and balance of outcomes across the five capitals. This form of visualisation is particularly well suited to the Sustainable Livelihoods Framework, as it captures the multidimensional nature of livelihoods and highlights interconnections and trade-offs between capitals. The DFID SLF guidance sheets present radar charts as an effective tool for presenting such data, given their ability to condense complex, multi-indicator information into a single, interpretable figure. In this way, radar charts not only facilitate the communication of findings but also align with established practice in SLF-based research (DFID, 1999).

Within each section of this chapter, key assets indicators corresponding to each SLF capital are examined, forming the basis for the percentage scores presented in the radar charts (see Appendix 13- List of outcome indicators). The radar chart (Figure 23) illustrates the relative strength of each capital through aggregated percentage scores, which are derived from multiple asset indicators within each category presented in this chapter. Each radar chart within this chapter is followed by a detailed explanation of the individual asset indicators (explained further in Appendix 13). Among the five capitals, human capital emerged as the strongest (85%), reflecting widespread access to healthcare, education, and training. Social capital also scored highly (73%), supported by strong participation in group meetings and decision-making processes. Financial capital (61%) showed moderate outcomes, with incomes generally exceeding poverty thresholds but remaining below upper-middle-income levels. Natural capital (51%) reflected a mixed picture of sustainable practices alongside environmental concerns. Physical capital scored lowest (42%), highlighting limited access to key infrastructure such as drying facilities and adequate road networks. Together, these results provide a holistic understanding of perceptions of livelihood outcomes among smallholder coffee farmers.

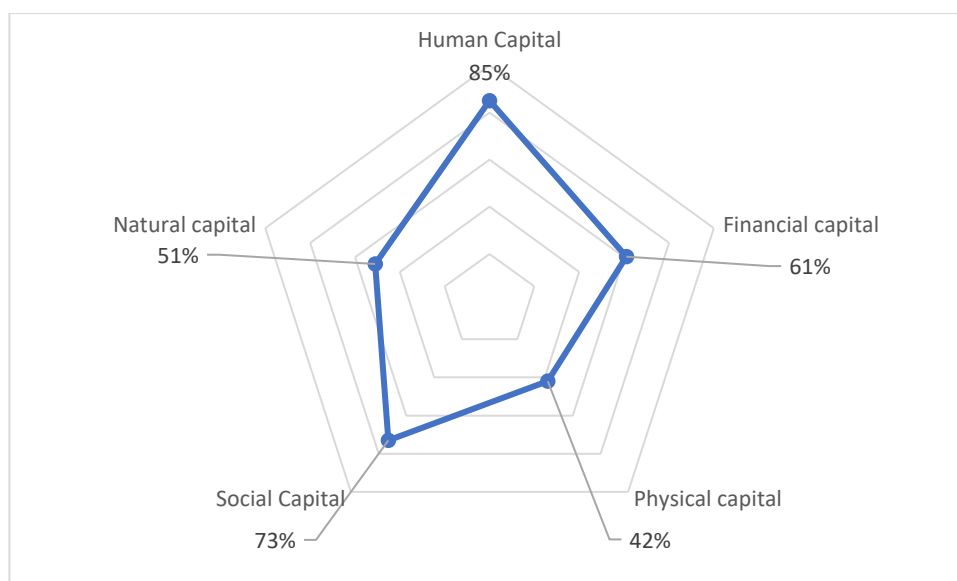


Figure 23 Aggregated livelihood outcomes. Own data

10.1 Financial Capital Outcomes

This section presents data on the financial capital outcomes of Robusta coffee farmers in Lampung. Figures 24 and 25 illustrate farmers' perceptions of financial capital across five indicators: (1) annual income compared to the World Bank's international poverty line (figure 24) annual income relative to the World Bank's upper-middle-income threshold (figure 25), (2) perceived changes in income over the past five years, (3) access to diversified sources of income, (4) access to formal financial credit, and (5) perceptions of fair prices for coffee (see Appendix 13- List of outcome indicators). Figure 26 presents the same data with annual income excluded to better highlight the remaining categories, as the high income levels reported in relation to the extreme poverty line in Figure 24 tend to obscure variation in the other indicators.

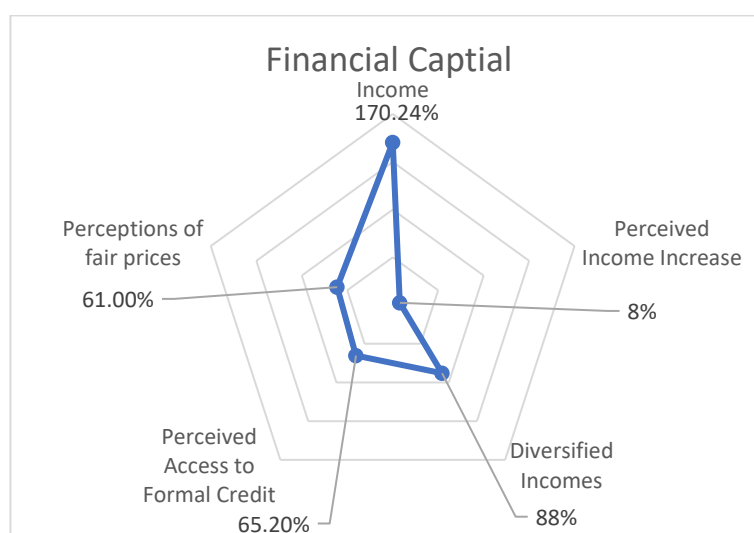


Figure 24 Financial Capital Outcomes using the World Bank extreme poverty line figure. Own data

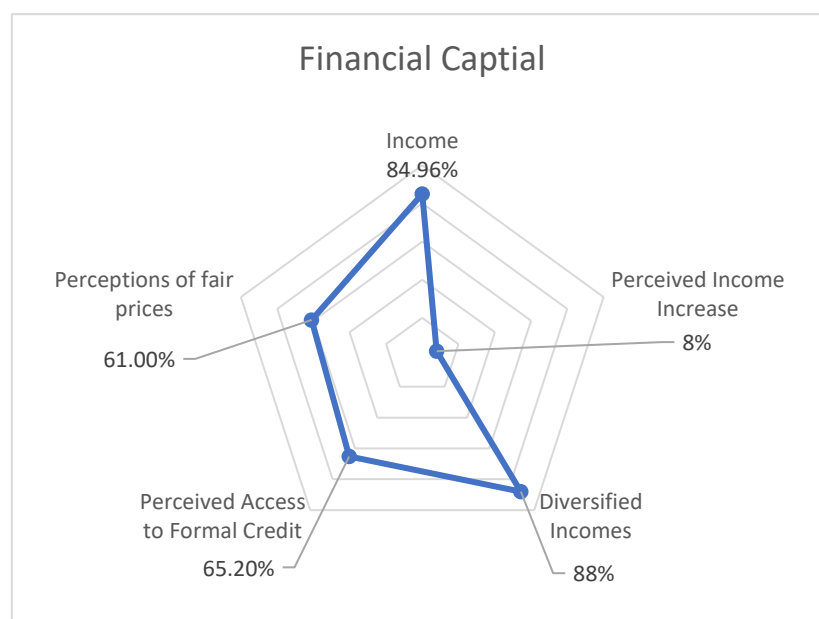


Figure 25 Financial Capital Outcomes using the World Bank poverty figure for upper middle-income countries. Own data

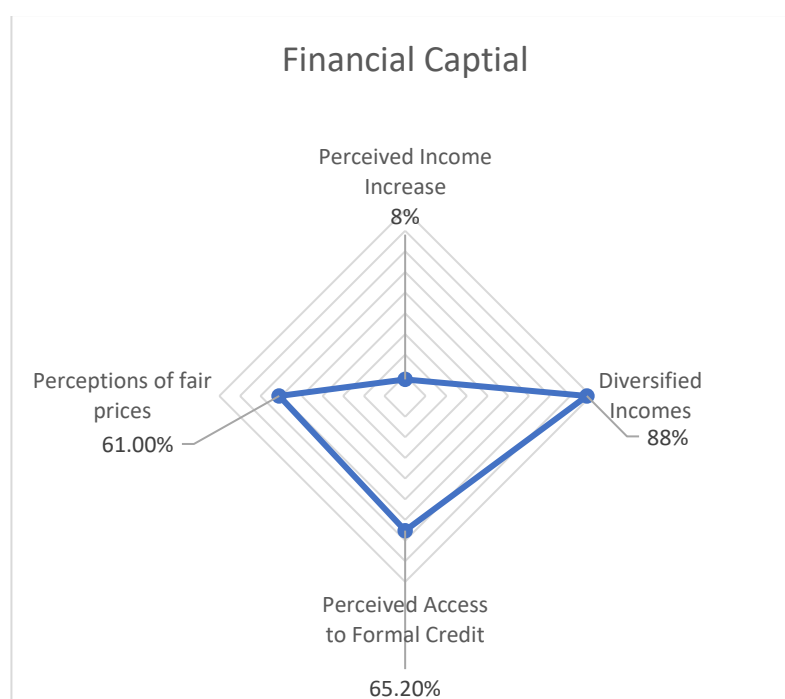


Figure 26 Financial capital access with annual income removed. Own data.

Annual income is calculated using survey data including the prices farmers achieved per KG of Robusta coffee, the number of KG of Robusta coffee sold per year. The average annual income for Robusta farmers is 34,950,892.86 IDR (approximately 1591.79GBP or 2,125.01USD). It is important to note that this relies on self-reported data from farmers of the previous year. When compared to other recent studies in Lampung this income is high, previous studies have found that average incomes from Robusta coffee range from 20,660,116 IDR to 24,532,081IDR (Ariyanti et al., 2019; Rahmita Zahra et al., 2023). Surveyed Robusta farmers in Lampung reported incomes 69% larger than the lowest figure in previous research.

The World Bank poverty thresholds were used in this study as they provide standardised measures that allow for comparison across countries and over time. Because national poverty lines vary widely depending on local economic and social circumstances, the World Bank's international lines offer a benchmark grounded in the cost of basic needs in the world's poorest countries (The World Bank, 2025). In addition, the World Bank also tracks higher thresholds, such as lower- and upper-middle-income countries, to reflect how poverty definitions shift with national development (The World Bank, 2025). Using these indicators allows the findings to be compared with global poverty data while also reflecting Indonesia's present economic situation.

In figure 24 the annual income from coffee was compared to the World Bank international extreme Poverty line of \$2.15 per day (The World Bank, 2024). Findings from Lampung revealed that Robusta coffee farmers reported an average daily income of \$5.82 per day, which is 170% of the World Bank poverty line (the percentage used as the outcome indicator). In 2023 Indonesia regained upper middle-income status, the World bank provides a different poverty index figure for these countries of \$6.85 per day which the farmers in Lampung fall below, achieving 84.96% of this amount (the percentage used as the outcome indicator), the difference this makes to financial capital is illustrated in figure 25 (The World Bank, 2024). This data represents self-reported incomes from coffee alone. For the purposes of this research this was calculated for Robusta coffee only, figure 27 illustrates the average income for all varieties of coffee. The average annual income for all coffee varieties in this study is 37,347,352.94 IDR (approximately 1,700GBP 2,270.72 USD) \$6.22 per day.

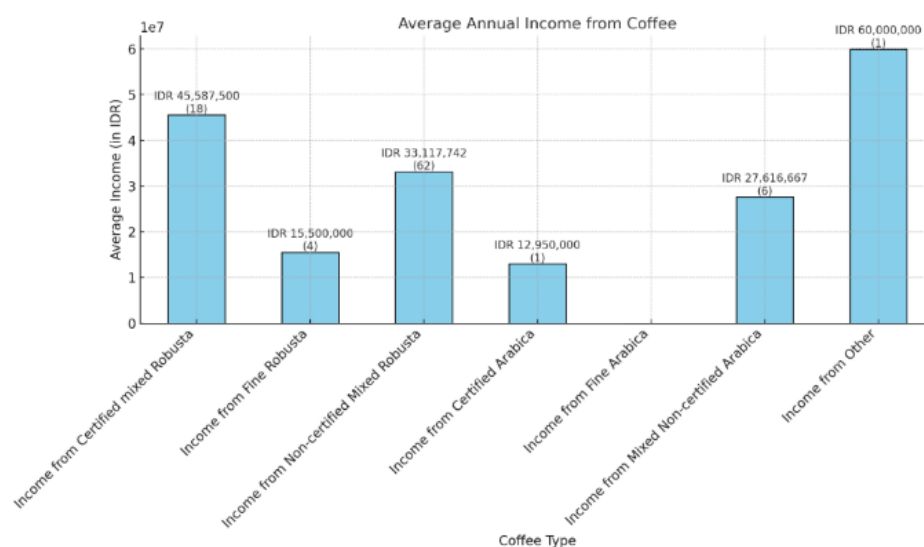


Figure 27 Self-reported annual income⁹. Own data

Perceived income increase refers to whether farmers believed their incomes from coffee had increased, decreased or stayed the same over the last 5 years (2018-early 2023). 85.2% believed their income had decreased, 5.7% believed it had stayed the same and 8% believed it had increased (the percentage used as the outcome indicator). This indicates that past income perceptions would be even higher than those collected in this research resulting in a

⁹ Income from 'other' refers to one farmer who sold Arabica and Robusta beans mixed together.

greater gap between this study group and previous research conducted by Ariyanti et al., (2019) and Rahmita Zahra et al., (2023).

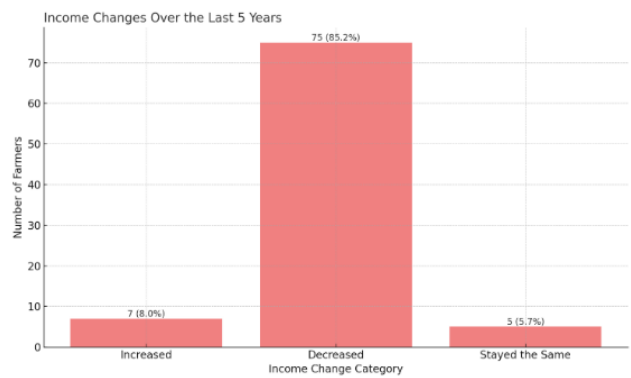


Figure 28 Perceptions of income between 2018 and 2023. Own data

Diversification of income refers to sources of household income. Farmers were asked if they had other sources of income or relied solely on coffee for their income. 88% stated they had other sources of income (the percentage used as the outcome indicator) and 11.9% stated they relied on coffee. A breakdown of the income diversification can be seen in figure 29. This data highlights that annual household incomes will be larger for 88% of the survey participants, however, incomes from other sources was not collected in this research. It's important to note that 84.8% of farmers stated that coffee was their main source of income (see Figure 30).

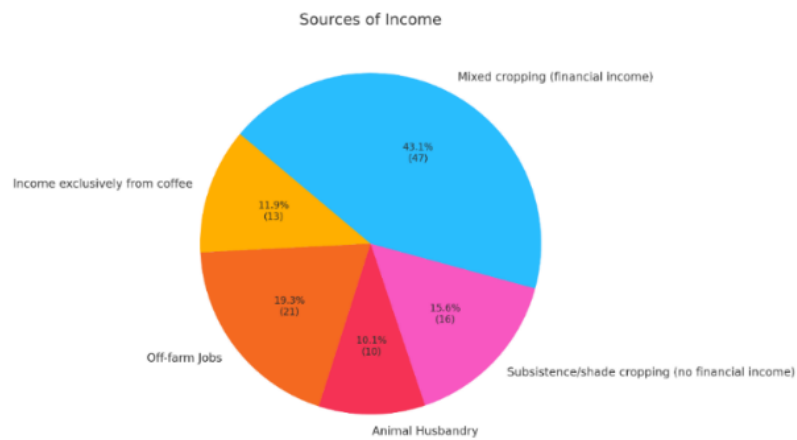


Figure 29 Sources of income for coffee farmers. Own data.

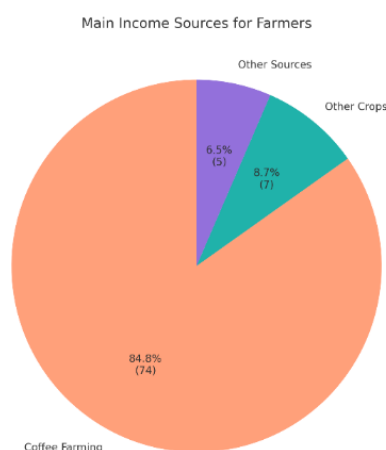


Figure 30 Farmers main source of income. Own data

Perceptions of access to financial credit data was gathered from survey data. Farmers were asked where they would access financial support for farm improvements. 65.2% stated external sources this includes, government, banks, OFGs and collectors (the percentage used as the outcome indicator). 31.4% stated they would self-fund or ask family and 4.3% did not know where they could access these resources. A breakdown of this data can be seen in figure 31. This data focuses on financial assistance for farm improvements only.

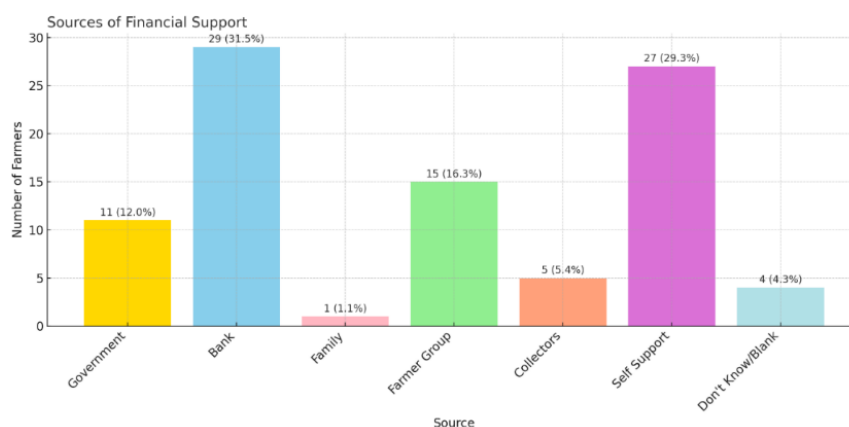


Figure 31 Perceptions of financial capital sources for farm improvements. Own data

Perceptions of fair prices refers to whether farmers felt they were able to get a fair price when selling their coffee. 61% believed they did get a fair price (the percentage used as the outcome indicator) and 39% believed they did not.

Prices achieved per kg. The reported prices per KG of coffee sold were used to calculate the average prices for each type of coffee sold. This data is self-reported data from surveyed farmers. This data was used to calculate annual incomes used in figure 24 and 25 and compared to World Bank poverty lines. However, it is important to note the details of prices achieved in further detail here (see figure 32).

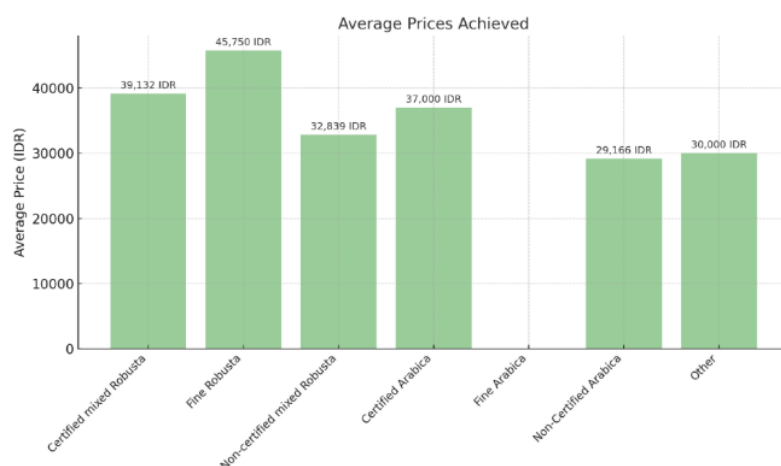


Figure 32 Average prices achieved per KG for each type of coffee ¹⁰ Own data

Coffee prices vary based on the type and quality of coffee produced. As shown in Figure 32, fine Robusta commands the highest average price at 45,750 IDR/kg, followed by certified mixed Robusta at 39,132 IDR/kg, and non-certified mixed Robusta at 32,839 IDR/kg. The largest price gap is between fine Robusta and non-certified mixed Robusta, averaging 12,911 IDR/kg. In comparison, the difference between fine Robusta and certified mixed Robusta is 6,618 IDR/kg, while the smallest gap, 6,293 IDR/kg, is between certified and non-certified mixed Robusta. However, it is important to note that fine Robusta is produced in much smaller quantities (less than half the average of other Robustas).

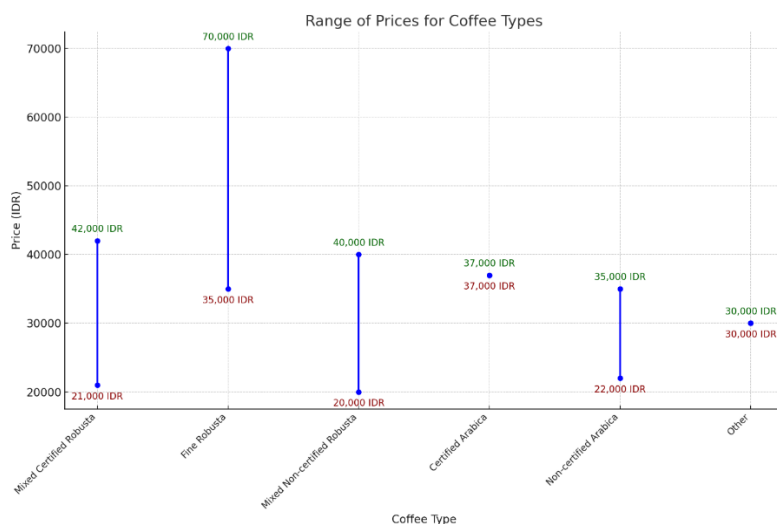


Figure 33 Range of prices achieved. Own data

In terms of the highest achievable prices, figure 33 shows that fine Robusta reaches the top price of 70,000 IDR/kg, compared to 42,000 IDR/kg for certified mixed Robusta and 40,000 IDR/kg for non-certified mixed Robusta.

The price range for coffee in Lampung varies significantly between the different types of Robusta coffee. The maximum price for all Robusta types was double the minimum price. This illustrates the price volatility experienced by coffee farmers in Lampung. The prices

¹⁰ One farmer stated a price in 'other' because he sold a mix of arabica and robusta but did not state the KG he sold.

farmers achieve are heavily influenced by the quality of the coffee, a factor typically determined by traders or collectors, though there may be room for negotiation (see Findings:9.3). In addition to quality, global price trends, particularly in the export market, also play a significant role in shaping the prices farmers receive (see Findings: 6.1.1, Findings: 7.3).

10.2 Human Capital Outcomes.

This section presents data on the human capital outcomes of Robusta coffee farmers in Lampung. Figure 34 illustrates farmers’ perceptions of human capital outcomes across seven indicators: (1) access to education, (2) levels of participation in agricultural training, (3) levels of adoption of new farming practices, (4) availability of healthcare services, (5) availability of sports facilities, (6) availability of community councils, (7) access to farm labour, and (8) experience in coffee farming (see Appendix 13- List of outcome indicators).

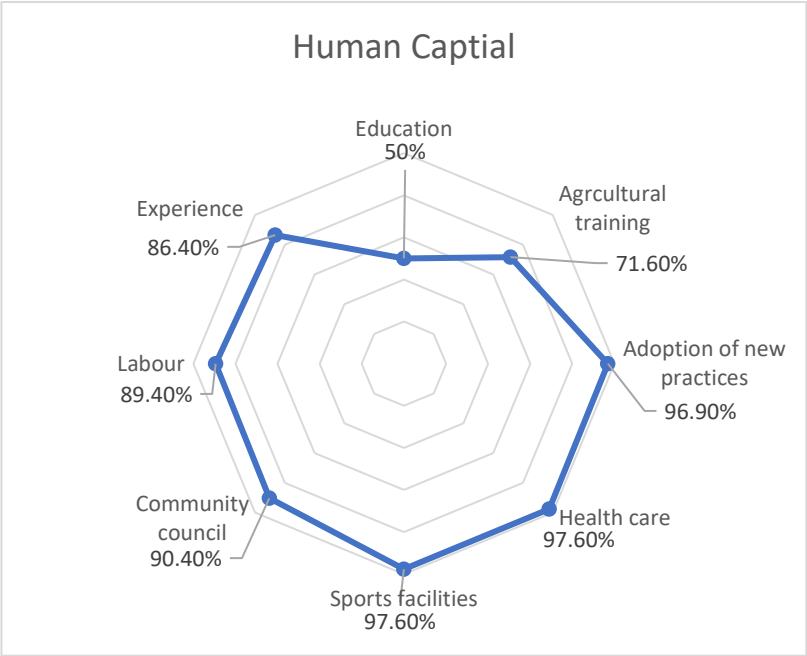


Figure 34 Perceptions of Human capital. Own data

Education levels were collected from survey data. Farmers were asked their level of formal education. All farmers in this research had accessed some form of formal education. 50% of farmers in this survey had completed high school (SMA) or above (the percentage used as the outcome indicator). This figure was selected because, in Indonesia, compulsory education covers Grades 1 to 12, which corresponds to elementary school (SD) through to high school (SMA) (Hapsari, 2024; Titony et al., 2024). It’s important to note that 47.3% of farmers did not complete the full 12 years of compulsory education, with 20.5% completing junior school (SMP) and 27.3% completing just elementary school (SD) only. A detailed breakdown is provided in figure 35.

In terms of access to educational infrastructure. Primary (elementary (SD) and junior (SMP)) education facilities were universally available to all participants, and 85% had access to secondary (high school (SMA)) education. Additional educational services included

specialised coffee schools, religious education facilities, and kindergartens, reflecting a broad spectrum of learning opportunities within the community (see Figure 37).

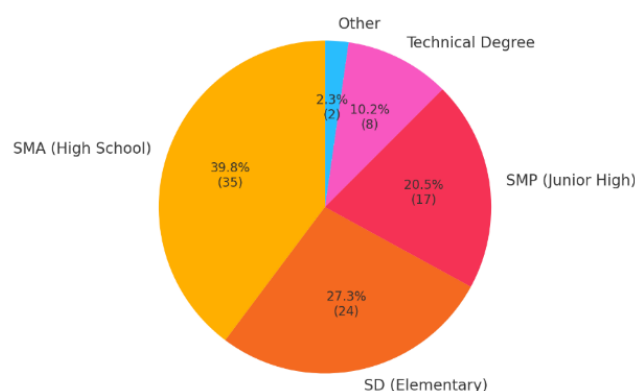


Figure 35 Levels of formal education. Own data.

Agricultural training includes formal training from the government, certifications and private corporations. The data reveals that 71.6% of farmers in this study had accessed formal training (the percentage used as the outcome indicator), while 28.4% had not. Among those who received training, the primary providers were the government (30.2%) and companies or large buyers (30.2%), followed by farmer groups (22.2%). Notably, training offered by the government and companies/large buyers was only accessible through OFGs. When these figures are combined, it becomes evident that 82.6% of the training accessed by farmers was delivered via OFGs. Certifications, in contrast, accounted for only 3.2% of the training attended by farmers. This low proportion could be attributed to a lack of available certification-based training opportunities. Alternatively, confusion over terminology may have contributed to this result; during the research, several farmers appeared to confuse certifications with companies or vice versa. Consequently, these figures may not fully reflect the reality of training access and participation in certification schemes.

The sources of the training are detailed in figure 36.



Figure 36 Farmer perceptions of who provides training ¹¹. Own data.

Adoptions of new practices: data found that 96.9% of farmers who attended training stated that they adopted new farming practices because of the training they had attended (the

¹¹ UNILA- University of Lampung

percentage used as the outcome indicator). Changes include the use of fertiliser, post-harvest processing and general coffee maintenance. Several farmers stated that the training helped them to understanding the quality of coffee and how to improve the quality.

Health care refers to the percentage of farmers who had access to health care facilities such as a medical centre. Access to healthcare was notably high, with 97.6% of farmers in the study having access to a medical centre (the percentage used as the outcome indicator).

Sports facility access was also high with 97.6% of farmers stating they had access to facilities such as sports fields within the community (the percentage used as the outcome indicator).

Community centres were available to 90.4% of farmers in this study (the percentage used as the outcome indicator). The facilities available to farmers including educational facilities is detailed further in figure 37.

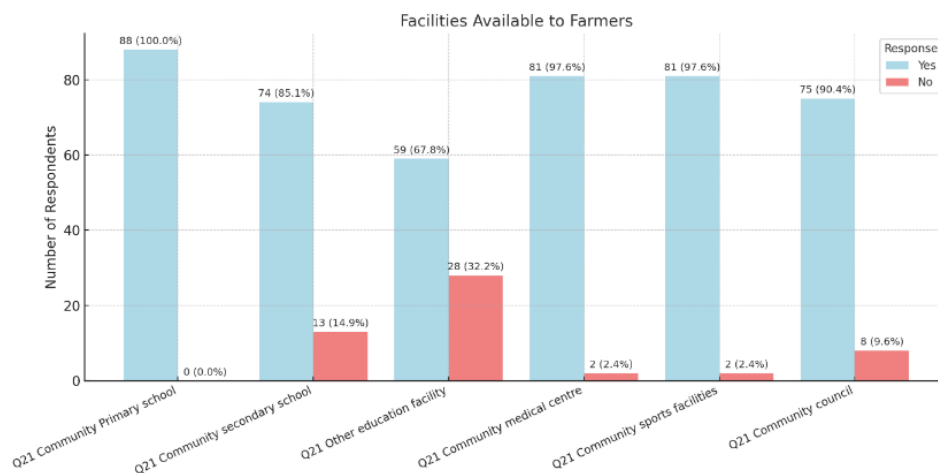


Figure 37 The facilities available to coffee farmers. Own data.

Labour refers to the percentage (89.4%) of farmers who had access to labour to help with their coffee farm (the percentage used as the outcome indicator). This includes family, paid labour, OFG members and neighbours. During harvest, 50.5% of farmers in this study rely on paid workers to assist with coffee picking, while 32% depend on family members for support. Only a small proportion of farmers (5.8%) reported receiving help from members of their OFGs, a finding corroborated by interview data. Notably, the role of OFG members in providing harvest assistance was not identified as a benefit of group membership or discussed as a shared responsibility within these groups (discussed further in Chapter 11). Furthermore, 10% of farmers reported harvesting their coffee alone (see Figure 38).

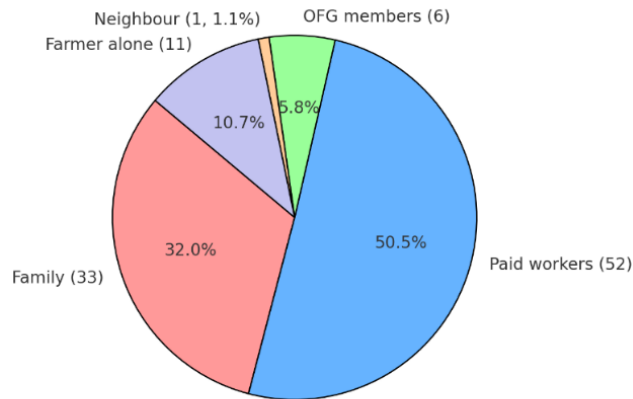


Figure 38 Who picks coffee. Own data.

Farming experience farmers in Lampung had an average of 24 years of coffee farming experience. Figure 34 illustrates the percentage of farmers with 10 or more years' experience in coffee farming 86.4% (the percentage used as the outcome indicator). A threshold of 10 years or more of coffee farming experience was adopted. This cutoff mirrors the approach used in climate adaptation research, where participants with under 10 years of experience are often excluded to improve the reliability of findings (Yeleliere et al., 2023). The following figure 39 shows a breakdown of the years of experience the farmers in this study had.

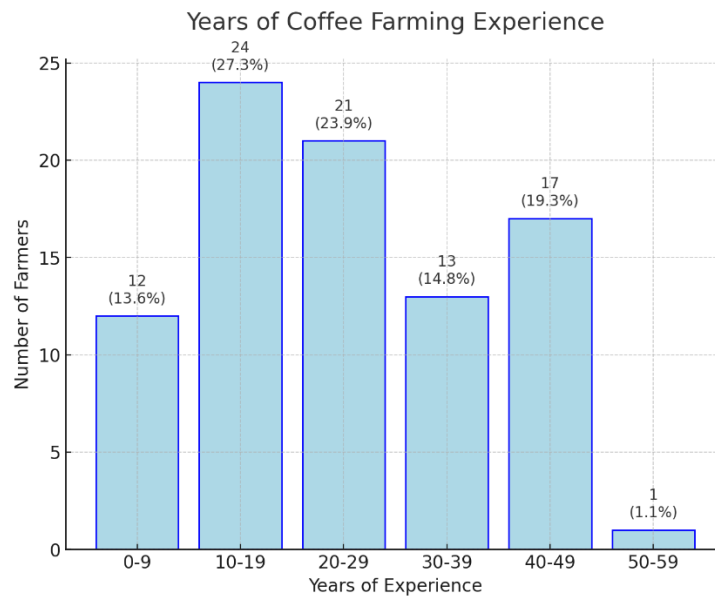


Figure 39 Years of experience in coffee farming. Own data

10.3 Social capital outcomes.

This section presents data on the social capital outcomes of Robusta coffee farmers in Lampung. Figure 40 illustrates farmers' perceptions of social capital across five indicators: (1) attendance at OFG meetings, (2) willingness and ability to share opinions, (3) supply chain connections, (4) sense of personal agency, and (5) capacity to negotiate within the supply chain (see Appendix 13- List of outcome indicators).

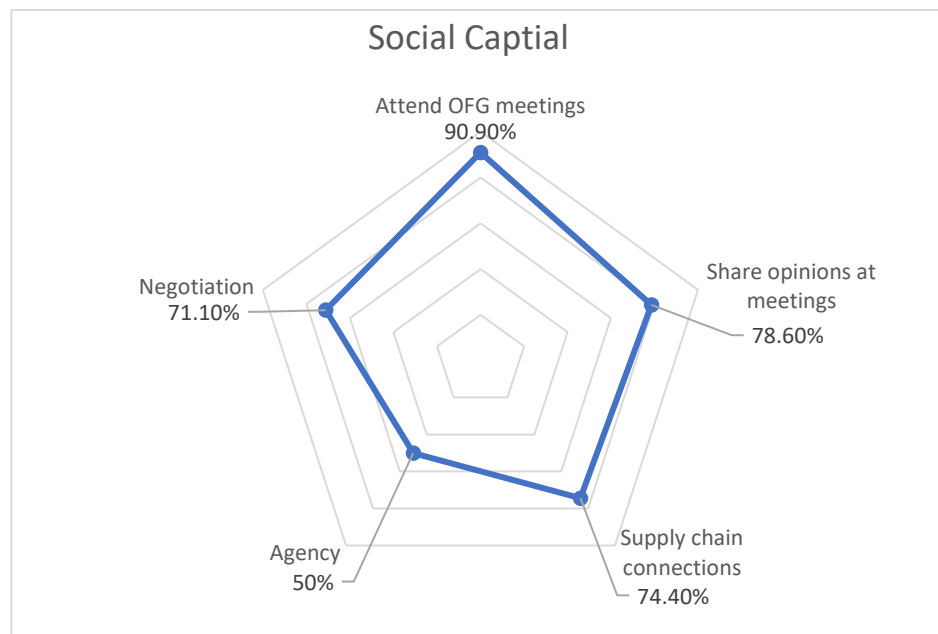


Figure 40 Perceptions of social capital outcomes. Own data

Meeting attendance refers to those farmers who stated they attended OFG meetings. In Lampung face-to-face meetings play a critical role in enabling farmers to share information, experiences, updates on market developments, and price information. Farmers in Lampung participate in a variety of meetings that contribute to developing social capital. In this study, 90.9% of farmers reported attending farmer group meetings (the percentage used as the outcome indicator). Although 27.3% of farmers stated they attended KUBE meetings this was not included to avoid the same meeting being included twice, KUBE members in this research all had dual memberships and a KUBE is considered an OFG (see Findings: 5.1). These meetings provide a platform for farmers to connect with stakeholders and build social capital.

Government meetings were attended by 63.3% of farmers, indicating the importance of these interactions. Interview data revealed that government entities control access to many essential assets for farmers, which likely explains the high attendance rates (see Findings:7.1). Village meetings were also well-attended, with 62.5% of farmers attending (see Figure 41).

Certification meetings were attended by 29 farmers, slightly more than the 28 participants who reported being certified. Interview data suggests that some non-certified farmers may have attended these sessions when invited by other farmers. However, attendance at

certification meetings was considerably lower than participation in OFG, government, and village meetings, with only 33% of surveyed farmers taking part (see Figure 41).

NGO meetings were rarely attended and seldom mentioned in interviews, suggesting that the role of NGOs in Lampung may be limited or that farmers refer to these organisations under different terminology. This gap indicates an area for potential growth, as NGOs often serve as facilitators of sustainable development. Enhancing NGO involvement or clarifying their presence could open new opportunities for farmers to access resources and support systems that align with sustainable livelihood goals.

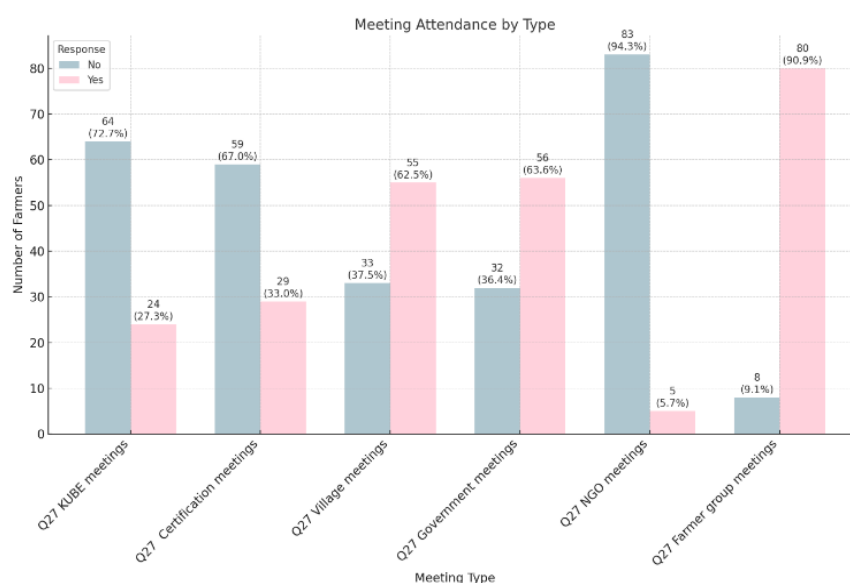


Figure 41 Meeting attendance for farmers. Own data.

Sharing opinions at meetings illustrates the percentage of farmers who stated they shared their opinions at the meetings they attended. 78.6% of farmers reported sharing their opinions at the meetings they attended (the percentage used as the outcome indicator), and 85.9% of these farmers felt their contributions were valued. Additionally, 73.8% felt involved in decision-making processes, although 26.2% indicated they did not feel included in these decisions (see Figure 42). These findings suggest that while the majority of farmers perceive their voices as being heard, valued, and influential in decision-making, a significant minority (approximately a quarter) feel excluded from these processes.

Notably, 94.2% of farmers expressed a desire to be more involved in decision-making. While the data indicates a relatively high level of involvement overall, this figure reveals a perceived gap in representation or influence, suggesting that farmers feel there are areas where their voices remain unheard (see Figure 42).

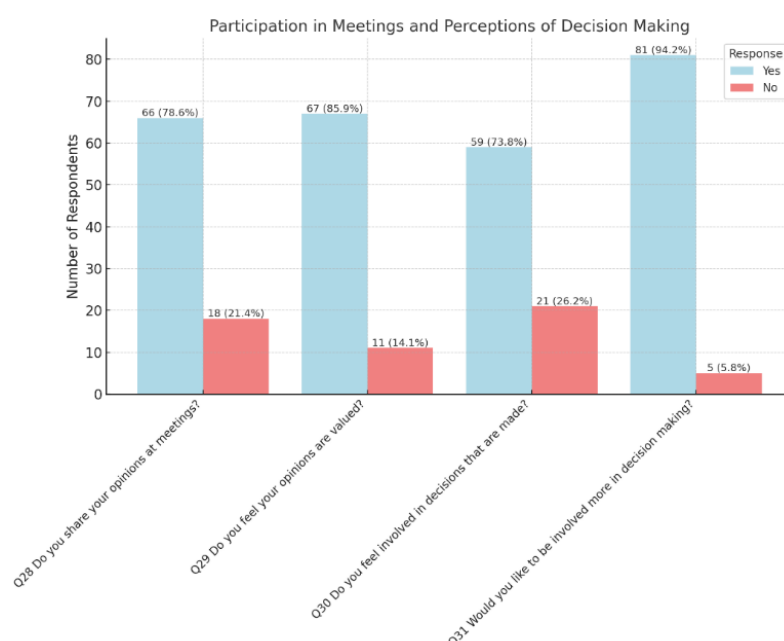


Figure 42 Perceptions of opinion sharing and decision-making. Own data.

Supply chain connections (SCC) illustrates the percentage of farmers who believed they had contact with everyone they needed to in the supply chain.

The majority of farmers (74.4%) in this study reported having contact with the stakeholders they deemed necessary (the percentage used as the outcome indicator). Among these, 28.8% identified traders or collectors as the stakeholder they had contact with, followed by 25.2% who highlighted farmer group leaders (see Figure 43). The predominant purposes for these interactions were knowledge exchange and obtaining coffee price information (see Figure 44). Notably, 96.6% of farmers sold their coffee directly to traders or collectors (see Figure 45), which aligns with the observation that traders and collectors constitute the most frequently engaged stakeholders.

Of the 25.6% of farmers who did not feel adequately connected, 69.2% expressed a desire for contact with large buyers, companies, or exporters. Additionally, 15.4% sought connections with successful farmers. A further 15.4% indicated a desire for greater engagement with farmer groups.

Only 14.4% of farmers reported being in contact with other farmers, a finding that interview data suggests should be considerably higher. Peer-to-peer interactions among farmers were identified as a critical channel for disseminating information and sharing farming techniques. Figure 43 distinguishes between direct farmer-to-farmer contact and contact facilitated through farmer groups. When these categories are combined, the total reaches 22.3%. However, this still remains relatively low, especially considering that 91% of farmers in this study were members of an OFG, and 90% reported attending farmer group meetings. This disparity may reflect limited direct communication among farmers during these meetings. Alternatively, it may indicate that the phrasing of the survey question led respondents to interpret “stakeholders” as individuals involved in the broader coffee sector, excluding fellow farmers.

Furthermore, only 6.5% of farmers reported contact with certification bodies, despite 32% of the sample being certified. This finding indicates that certification status does not inherently expand social networks or establish direct connections with certifying organisations.



Figure 43 Which stakeholders farmers state they are in contact with ¹². Own data.

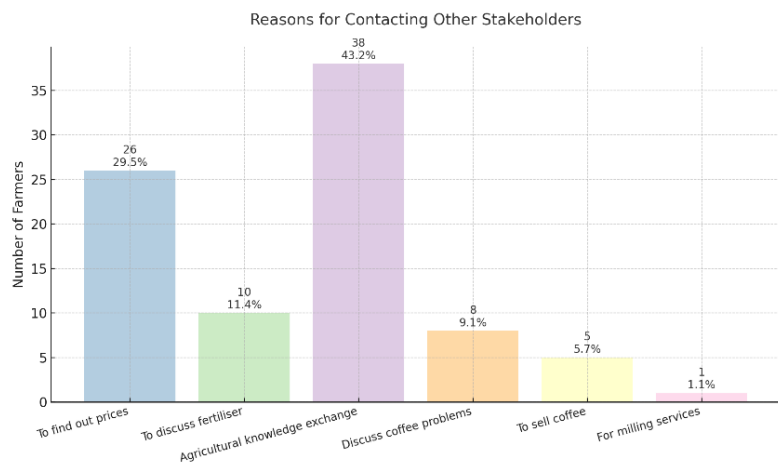


Figure 44 Reasons for contacting other stakeholders in coffee. Own data.

¹² Large buyers/companies and exporters were combined due to farmers using these names interchangeably.

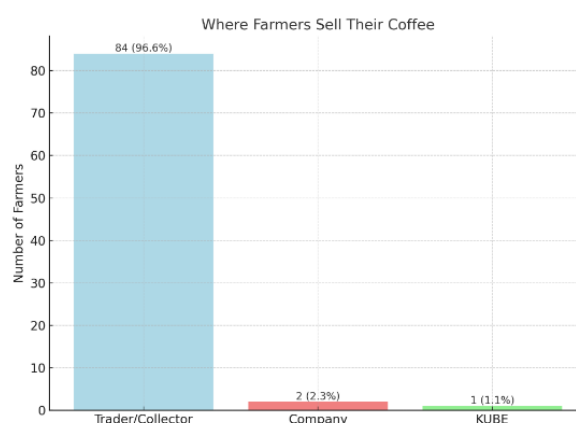


Figure 45 Who farmers sell their coffee to. Own data.

Agency in figure 40 refers to farmer perceptions of their capacity in decision making. Within this research group 21.3% of farmers identified group members as key decision-makers, and an additional 16% believed individual farmers made the decisions. When these categories are combined, 37.3% of respondents viewed farmers, either independently or as group members, as central to decision-making processes. Including group leaders, who are also coffee farmers, increases this total to 50.1% (the percentage used as the outcome indicator) (see Figure 46). Moreover, 27.5% of farmers expressed the belief that farmers should make the decisions, with 20.9% advocating for group members and 7.7% for group leaders. When these categories are combined, 56.1% of farmers believe that decision-making should rest primarily with those directly involved in farming (see Figure 47).

Over 25% of farmers identified traders/collectors as key decision makers. While this figure is lower than the combined perception of farmers' decision-making influence, it indicates that a notable proportion of farmers recognise the influence of traders and collectors. Similarly, 19.8% of farmers felt that traders and collectors should have decision-making authority, suggesting an acknowledgment of their role in supply chain dynamics.

Interestingly, the role of government in decision-making was perceived to be minimal, with only 4.3% of farmers believing the government makes decisions and 7.7% believing it should. These low figures suggest that farmers do not view government involvement as substantial or necessary in shaping decisions within the coffee sector. Likewise, companies and exporters were identified as decision-makers by only a small proportion of farmers, indicating limited perceived influence or desirability for these stakeholders to play a central role.

Furthermore, 75.3% of farmers expressed satisfaction with the current decision-making processes, indicating that they do not see a need for change. This high level of approval reflects a perception that decision-making is democratic and inclusive, with farmers feeling involved and valued in shaping outcomes.

This finding is based entirely on farmers' perceptions of the decision-making processes and the specific processes in which they are directly involved. While these insights provide valuable perspectives, they represent only one dimension of the broader decision-making landscape within the coffee sector (discussed further in chapter 11).

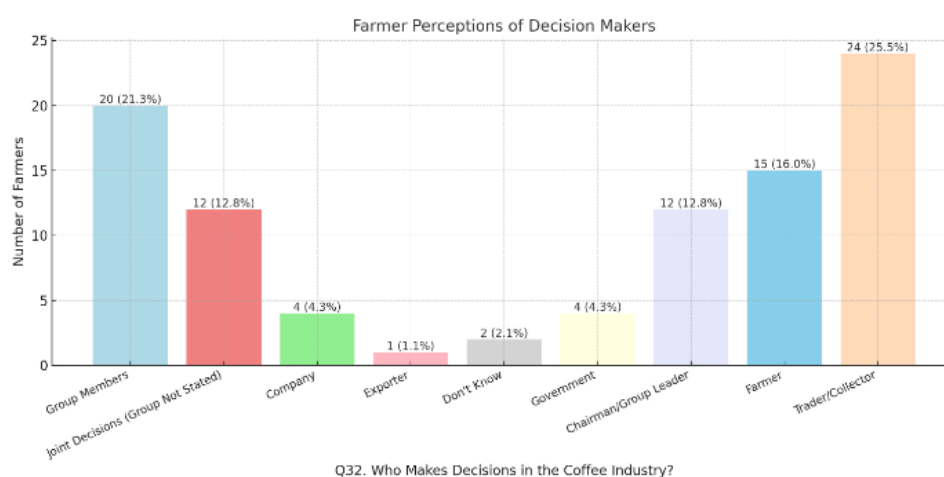


Figure 46 Who farmers perceive to be the decision-makers. Own data.

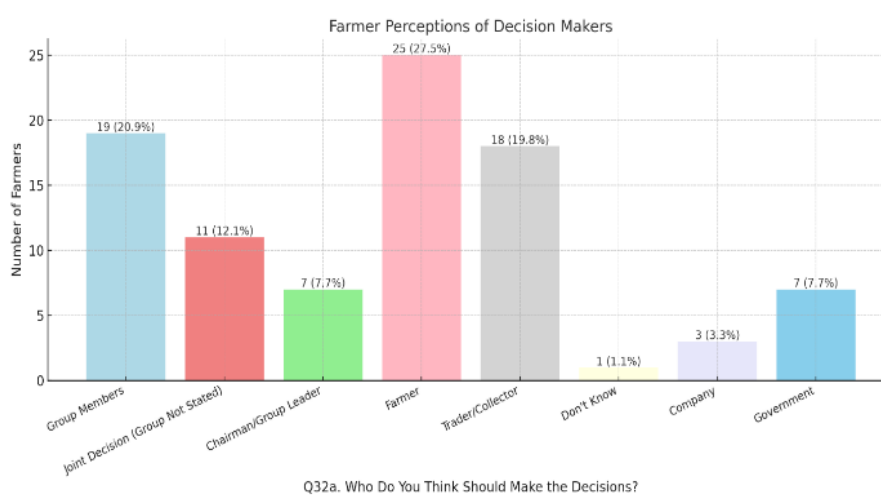


Figure 47 Who farmers perceive should be the decision makers. Own data.

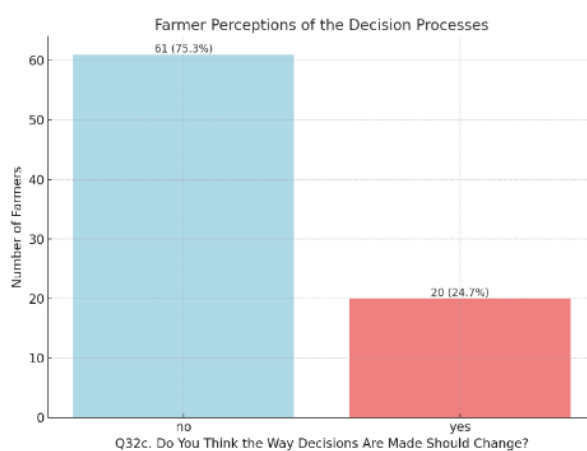


Figure 48 Perceptions of current decision making. Own data.

Negotiation refers to farmers' perceived ability to negotiate with buyers. The findings indicate that traders serve as the primary buyers for the majority of farmers in this study, with 96.6% reporting that they sold their coffee directly to traders or collectors. 71.1% reported some level of price negotiation (the percentage used as the outcome indicator), with the quality of their coffee serving as a key determinant in these discussions. Farmers provide samples to buyers, and prices are influenced by factors such as moisture levels and overall quality. However, 28.9% of farmers indicated that they are unable to negotiate prices, with buyers making unilateral decisions (see Figure 49). When asked about their perceptions of pricing, 61% of farmers reported that they received a fair price for their coffee, while 39% believed the prices were unfair.

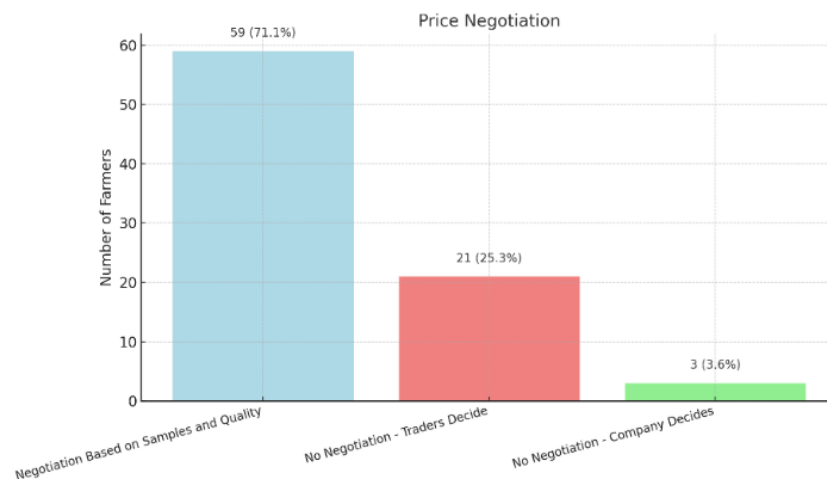


Figure 49 Farmer perception of ability to negotiate price. Own data.

10.4 Physical capital outcomes

This section presents data on the physical capital outcomes of Robusta coffee farmers in Lampung. Figure 50 illustrates self-reported data and farmers' perceptions across five indicators: (1) size of coffee farm, (2) access to processing mills, (3) access to drying facilities, (4) access to harvest equipment (5) access to machinery, and (6) quality of roads (see Appendix 13- List of outcome indicators).

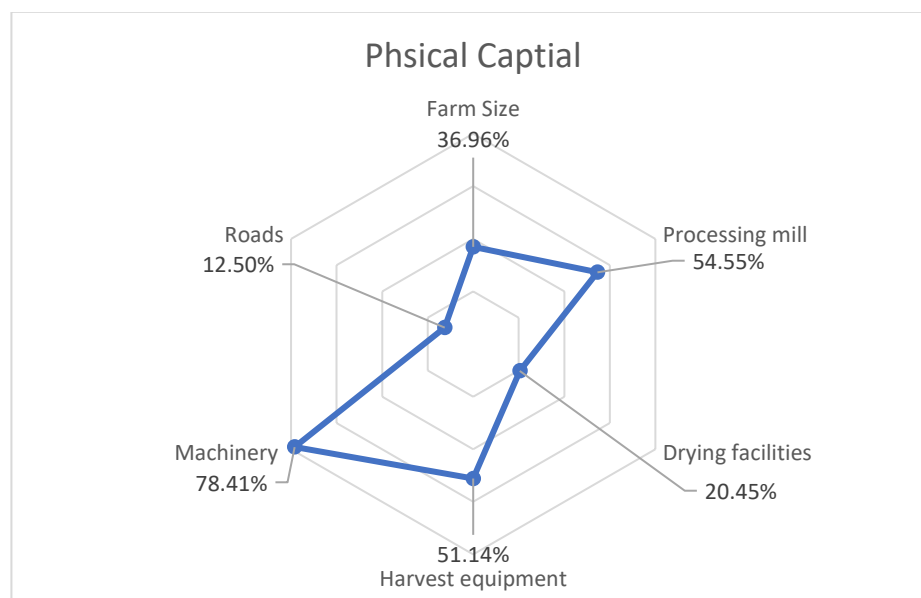


Figure 50 Perceptions of Physical capital outcomes. Own data

Farm size data were obtained through the survey. After excluding one outlier (see Methods: 3.3.5), the average farm size was calculated to be 1.5 hectares. To contextualise this figure in terms of physical capital outcomes, it was compared to the minimum farm size required to meet welfare standards and the minimum wage of the population. Recent research suggests that coffee farmers in Lampung Province require approximately 4.06 hectares to achieve these benchmarks (Aprildahani et al., 2023).

On average, farm sizes in Lampung represent only 36.96% (the percentage used as the outcome indicator) of the land area required to meet welfare standards and the provincial minimum wage, indicating a shortfall of 63.04%. This translates to an additional 2.56 hectares needed per farmer to reach the minimum threshold. This outcome and its ambiguity with annual income outcomes is discussed further in the discussion.

Processing mills refer to both wet and dry processing facilities, which are used to convert coffee cherries into green beans. In this study 54.55% (the percentage used as the outcome indicator) reported having access to such facilities, while 45.45% did not.

Drying facilities include equipment such as drying ovens, which are used to reduce the moisture content of coffee beans, a significant factor in price negotiations. In this study, 20.45% (the percentage used as the outcome indicator) reported having access to such facilities, while 79.55% did not.

Harvest equipment refers to tools such as sacks, spades, and other items used in the manual harvesting of coffee. In this study, 51.14% (the percentage used as the outcome indicator) reported having access to such equipment, while 48.86% did not.

Machinery refers to any mechanical equipment used in coffee production, including hullers, pulpers and grass cutters. In this study, 78.41% (the percentage used as the outcome indicator) reported having access to such machinery, while 21.59% indicated they did not.

Roads refer to the quality of access routes to and from coffee farms, which are essential for transporting coffee. This was identified as a significant concern among farmers, with 87.5% (the percentage used as the outcome indicator) reporting poor road quality as an issue, while only 12.5% did not state it was a problem.

Farmers were asked whether they owned or rented the land they cultivated; however, responses to this question indicated a degree of confusion or misunderstanding. As a result, this data has been excluded from the analysis and is discussed in more detail in the Methods section.

10.5 Natural capital outcomes

This section presents data on the natural capital outcomes of Robusta coffee farmers in Lampung. Figure 51 illustrates farmers' perceptions across six indicators: (1) coffee yield, (2) use of shade trees, (3) application of agrochemicals, (4) adoption of organic practices, (5) participation in social forestry schemes, and (6) involvement in certification programmes (see Appendix 13- List of outcome indicators).

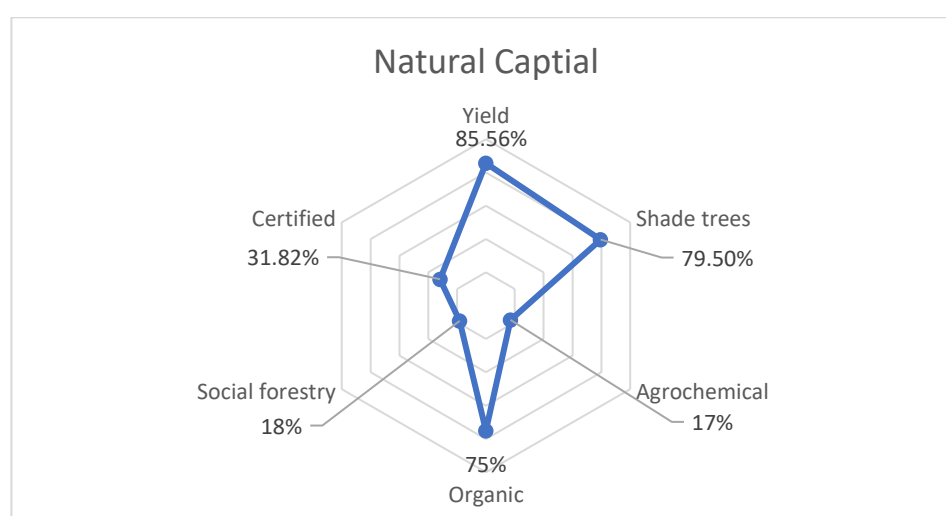


Figure 51 Perceptions of Natural capital outcomes. Own data

*Yield*¹³ was calculated using self-reported survey data, in which farmers provided estimates of the total volume of coffee sold during 2022 along with the size of their farms. From this information, an average yield of 699 kg/ha was derived. This figure was then compared to the 2022 provincial average yield for smallholder coffee farmers in Lampung, as reported by Indonesia's Central Statistics Agency (BPS), which was 817 kg/ha. Farmers in this study achieved 85.56% (the percentage used as the outcome indicator) of the provincial average,

¹³ The outlier farmer with 500 hectare farm was not included in this analysis.

indicating a yield that was 14.44% lower than the regional benchmark (BPS-Statistic Indonesia, 2024).

Shade trees: approximately 80% (the percentage used as the outcome indicator) of the farmers reported using shade trees in their coffee plantations. These trees included species such as avocado, jengkol, and durian, which also serve as mixed crops, contributing to diversified farming systems. Additionally, 54.1% of farmers indicated that they practiced mixed cropping, with banana and chilli being among the commonly cultivated crops. Interestingly, some of the crops categorised as mixed crops were also reported as shade trees, suggesting overlapping classifications by farmers (see Figure 52). Conversely, only 9.2% of respondents reported cultivating sun coffee, underscoring the prevalence of shade-tree use in the region.

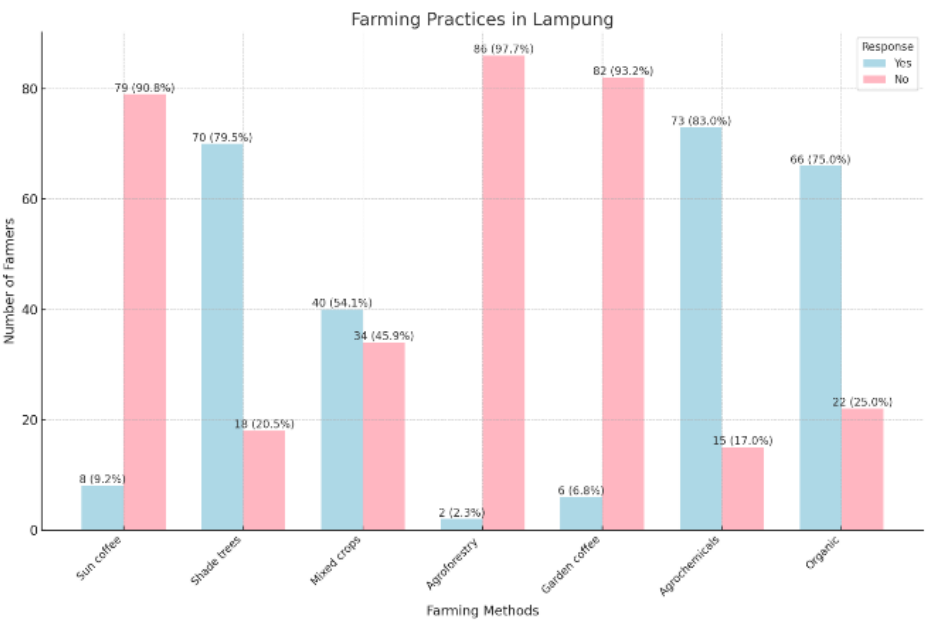


Figure 52 The farming practices reported. Own data

Agrochemicals: due to their potential detrimental environmental impacts the coffee farmers who did not use these chemicals were shown in figure 52. Agrochemical use was reported by 83% of farmers, 17% (the percentage used as the outcome indicator) of farmers stated they did not use agrochemicals.

Organic practices does not refer to being certified as organic, it refers to using some organic practices such as use of manure for fertiliser and the use of coffee husks for fertiliser. 75% (the percentage used as the outcome indicator) of farmers reported using organic practices, farmers who used these practices often used agrochemicals as well. 29.5% farmers expressed a desire to modify their farming methods, while 70.5% indicated no intention to make changes. Among those seeking changes, 14% farmers wished to transition toward more organic practices and reduce their reliance on agrochemicals.

Social forestry refers to farmers who reported growing coffee on land through Social Forestry and Community Forestry schemes, which aim to promote sustainable farming practices (see Findings: 7.1 & Appendix 11- Policy). Approximately 30% of farmers cultivate coffee within protected areas, however just 18.18% (the percentage used as the outcome indicator) stated

they farmed in protected areas under Social Forestry and Community Forestry programmes. 12.5% of farmers farmed in protected areas but did not state this was part of Social or community Forestry programmes. Notably, only 2.2% of all farmers reported engaging in agroforestry practices, implying that alternative production methods predominate in these protected landscapes. It's important to note that this discrepancy may reflect confusion over the definition of agroforestry, or it could suggest that agroforestry is not widely implemented.

Certifications that farmers in Lampung reported include Rainforest Alliance and 4C. Both certifications offer guidance and standards regarding environmentally sustainable farming practices, 31.82% (the percentage used as the outcome indicator) of farmer in this study reported being certified while 68.18% were not.

Perceptions of environmental threats. All farmers surveyed (100%) expressed that the environmental and environmental preservation was of importance to them. Through interviews and surveys, farmers articulated concerns about both current and future environmental conditions, with climate change and erratic weather patterns emerging as significant issues. Many farmers attributed low yields to irregular rainfall, which they reported had dislodged coffee flowers before the cherries could form, particularly over the past two years. In addition to the challenges posed by weather variability, farmers highlighted concerns regarding soil quality. They perceived that the excessive use of agrochemicals had led to substantial soil degradation, raising fears of erosion. These issues were further compounded by limited access to subsidised fertilisers, which exacerbated their ability to address declining soil fertility (see Figure 53).

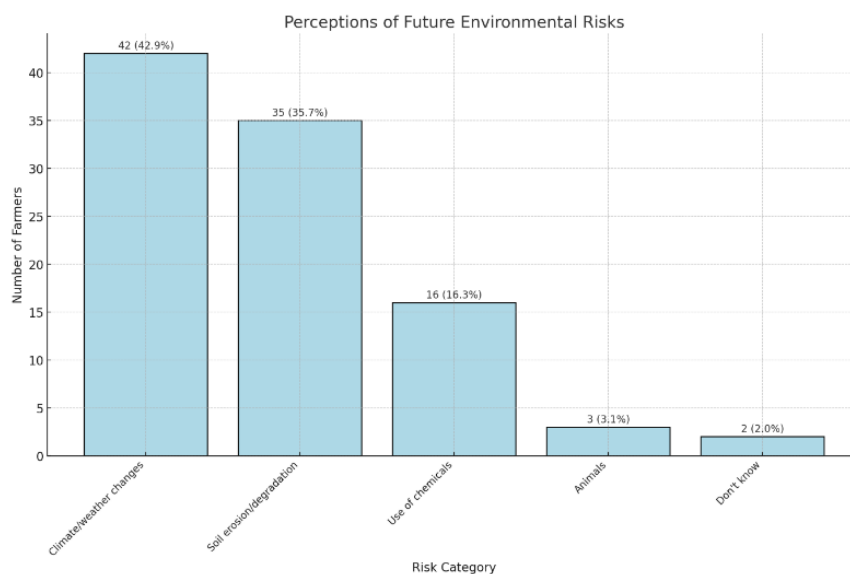


Figure 53 Perceptions of future environmental risks. Own data

10.6 Conclusion. Livelihood Outcomes.

This chapter has examined the perceived livelihood outcomes of Robusta coffee farmers in Lampung through the lens of the five capitals: human, financial, social, physical, and natural. By drawing together multiple indicators within each capital, the findings provide a multidimensional picture of farmers' perceived strengths and constraints, highlighting both resilience and vulnerability within the coffee sector.

Human and social capital outcomes emerged as the most robust. Farmers reported widespread access to healthcare, education, and community facilities, alongside strong participation in group meetings and decision-making processes. Training opportunities, primarily delivered through OFGs, were widely accessed, and most participants adopted new practices as a result. Social capital was reinforced through connections with traders, group leaders, and local institutions, with the majority feeling able to share their opinions and influence decisions, although a notable minority reported exclusion.

Financial capital outcomes were more mixed. Average self-reported annual incomes exceeded The World Bank international poverty thresholds and were higher than previous research in Lampung but remained below The World Bank upper-middle-income benchmark which is the category for Indonesia. Most farmers perceived their incomes to have declined over the past five years, despite the prevalence of income diversification across households. Access to financial credit for agricultural improvements was primarily perceived to come from external sources, and while price differences were evident between coffee types and certification statuses, price volatility remains a significant challenge for all Robusta coffee.

Physical capital outcomes revealed significant limitations. Average farm size fell well below the threshold required to meet welfare standards, and while access to processing mills, harvest equipment, and machinery was relatively common, drying facilities were scarce and road conditions were widely reported as poor. These gaps constrain production efficiency and the ability to achieve higher market value.

Natural capital outcomes presented a similarly uneven picture. Yields were below provincial averages, and although the majority of farmers used shade trees, mixed cropping, and some organic practices, agrochemical use remained widespread. Participation in certification and social forestry schemes was limited, and environmental risks such as climate change, erratic rainfall, and soil degradation were prominent concerns. Despite these challenges, environmental conservation was universally valued and environmental risks were identified by farmers, reflecting a strong awareness of ecological issues.

Taken together, the findings reveal a landscape of uneven asset distribution. Strong human and social capacities provide a foundation for resilience, yet weaknesses in physical and natural capital, coupled with volatile financial returns, threaten the sustainability of livelihoods. These insights provide a foundation for targeted interventions and further discussion on enhancing the long-term sustainability of smallholder coffee farming systems in Lampung.

11 Discussion and key insights

This chapter discusses the key insights of the research by presenting farmers' perceptions of their experiences, challenges, and opportunities within Lampung's coffee sector. Organised around the SLF and the ToA, the discussion is structured across six areas: supply chains, vulnerability context, structural factors and processes, access to assets, livelihood strategies, and outcomes.

The analysis goes beyond description by examining how farmers interpret their access to assets, the flow of benefits, and the actors who shape these processes. Particular attention is given to the role of OFGs as both enablers and gatekeepers, highlighting how membership influences inclusion, exclusion, and farmer agency. By focusing on farmer perspectives, the chapter identifies the mechanisms that reproduce inequalities, the informal strategies farmers adopt in response, and the implications these dynamics hold for resilience and livelihood sustainability.

11.1 Supply Chains

The coffee supply chain in Lampung involves a wide range of actors, including farmers, village and large traders, companies, processors, exporters, large buyers, OFGs, certification bodies, domestic café owners, the Indonesian Government and extension workers. These actors perform overlapping but distinct roles across production, processing, aggregation, certification, trade and access to assets (see Findings: 7 & Discussion: 11.3).

Three primary supply chain routes were identified: the export route, the domestic route (which includes niche fine Robusta direct trade), and the government-supported route. The export and domestic chains largely follow conventional paths from farmers through traders or OFGs to companies and buyers, though certification and traceability are more prominent in export-oriented sales. The government-encouraged model aims to simplify the chain by encouraging farmers to act as both traders and roasters, thereby increasing value capture. However, this model depends on substantial infrastructure, awareness, and institutional backing, and its implementation remains limited, and may sit uneasily alongside the domestic route, where cafés and roasters currently undertake roasting and quality assurance, introducing role overlap.

OFGs serve as intermediaries in all three chains by consolidating harvests, distributing traceability stamps, and facilitating access to certification, training, and credit. These groups vary in structure and function (see Findings: 5.1, table 8 and table 9). Despite the varied forms, all OFGs function primarily to aggregate coffee for sale and access formal markets.

While the Lampung coffee supply chain offers multiple market pathways and diverse stakeholder support, benefits are unequally distributed. Farmers outside of OFGs, particularly those lacking social connections or infrastructure, face significant barriers to accessing training, certification, and value-adding opportunities. Trust and mistrust also shapes farmers' views of supply chain actors, with mistrust especially directed at government promises and trader behaviour, adding to the fragility of these relationships. Addressing these structural inequalities, especially around access to support services, information, and market entry, will be essential to improving the inclusivity, transparency, and sustainability of the coffee supply chain in Lampung.

11.2 Vulnerability Context

Coffee farmers in Lampung face layered vulnerabilities arising from climate variability, market volatility, technological disparities, and the seasonal concentration of income. Coping strategies such as diversification, collective action, and value addition are present, yet access to the assets that enable them remains uneven. This discussion examines vulnerability as the product of interacting environmental, market, institutional, technological, and seasonal factors, and considers how differential access shapes farmers' capacity to adapt.

Climate Change and Environmental Degradation

Farmers in Lampung consistently identified climate variability, particularly erratic rainfall, as the main driver of yield decline, with self-reported production averaging 14% below provincial benchmarks. Although government programmes promote climate-resistant strains and adaptive practices, most farmers had not accessed this support. These interventions were channelled through OFG mechanisms, structurally excluding independent farmers and potentially increasing their vulnerability to climate change related risks. While state actors highlighted pests and diseases as major risks, farmers rarely mentioned them, revealing a disconnect between policy priorities and lived experience. Instead, farmers expressed strong demand for training on locally relevant adaptation strategies, particularly those focused on responding to weather changes and developing resilient strains. Informal grafting networks, involving scion exchanges, farm visits, and experimentation, provided important innovation pathways, yet remained unsupported by formal extension services. This represents a missed opportunity to integrate farmer-led initiatives into broader climate resilience efforts.

Many farmers practised shade tree cultivation and mixed cropping, approaches often associated with sustainable agriculture. These were primarily seen by farmers as practical methods for maintaining soil quality, crop health, and supplementary incomes, rather than deliberate climate adaptation strategies. Despite their prevalence, persistent vulnerabilities remain, shaped by both environmental stresses and structural constraints. Heavy reliance on agrochemicals was widely described by farmers as a necessity in the face of declining soil fertility and limited institutional backing. Some farmers supplemented with compost or manure, and a minority expressed interest in organic transitions, yet progress was constrained by gaps in technical guidance, costs, and unequal access to support. These patterns suggest that, although sustainable practices are valued, adoption is shaped less by farmer preferences than by the unequal flow of assets and opportunities in the sector.

Soil degradation was a widespread concern, often linked to long-term agrochemical use and restricted fertiliser access. Many farmers were unaware that coffee had been removed from the subsidised fertiliser scheme (Regulation No. 41/2021). Some exploited loopholes through staple crop registrations, while others turned to black markets. Independent farmers, lacking both OFG-based access and informal workarounds, were particularly disadvantaged. This policy change forced many to reduce application rates, further constraining yields. While government agronomic training could help, its delivery through OFGs again excluded independent farmers, demonstrating how vulnerability arises not only from environmental factors but also from institutional choices that reproduce inequalities in access to inputs and advice.

Although formal schemes such as Social and Community Forestry aim to promote sustainable land use, farmer participation remains limited. Most farmers cultivating in protected areas were not involved in these programmes, limited understanding of

agroforestry suggest that many farmers face barriers to accessing these initiatives or do not fully understand their aims. As a result, some relied on informal or illegal land clearing, which offered neither security nor long-term sustainability. This lack of engagement reflects both barriers to entry and weak institutional outreach, leaving farmers excluded from the potential benefits of these programmes. In practice, it reinforces structural inequalities and pushes some households towards environmentally risky coping strategies.

Market and Price Volatility

Price instability remains a central vulnerability for Lampung's coffee farmers, yet its causes were interpreted differently by farmers and supply chain actors. Traders emphasised international market fluctuations, seasonal oversupply, and global commodity cycles as primary drivers. By contrast, farmers commonly attributed low prices to local dynamics, such as quality assessments, moisture content, and trader behaviour, highlighting differences in how market risks are perceived. This divergence reflects disparities in access to information, which may limit farmers' responses and reinforce their sense of disempowerment in pricing negotiations.

This vulnerability is further amplified by the timing of sales. With income concentrated around a single annual harvest, most farmers reported being forced to sell immediately after harvest to meet urgent household needs or repay debts. This practice often locked them into accepting low prices during periods of market saturation. While the government noted the development of coffee strains designed to enable staggered harvests, none of the participating farmers reported access to these innovations, suggesting either limited rollout or poor diffusion of information, once again exposing a gap between policy and practice. Additionally, the widespread lack of storage and drying infrastructure constrained farmers' ability to preserve bean quality or delay sales to capitalise on higher off-season prices.

Despite these constraints, some digital tools offered limited protection against market manipulation. Smart phones, social media and WhatsApp enabled access to real-time pricing data, which farmers used to cross-check trader offers. While this improved price transparency for connected farmers, not all farmers have access to these assets. Fine Robusta producers were also more likely to leverage digital platforms for direct trade with cafés, bypassing intermediaries and accessing better prices. However, such market opportunities remained largely unavailable to mixed Robusta farmers, who faced more restricted market routes and limited leverage. Furthermore, certification schemes and volume thresholds imposed by large buyers excluded many smallholders, especially those without OFG affiliation, thereby further constraining access to premium markets.

Institutional Exclusion

Access to institutional support, including land, fertiliser, training, and machinery, was overwhelmingly shaped by OFG membership. Government resources were routinely distributed through OFGs by extension workers, leaving independent farmers excluded for lack of registration or affiliation. Extension workers were often valued as important knowledge sources, but their presence was inconsistent and sometimes viewed as politically influenced. As access to extension services was typically channelled through OFGs, this inconsistency reinforced the perception that independents had almost no reliable contact with institutional knowledge sources, while those in OFGs were at least recognised within state and market systems.

However, membership alone did not guarantee equal access. Perceptions of support varied by group type, production levels, geography, and internal dynamics, with higher-performing or more visible groups being seen to receive disproportionate benefits. Most farmers in this study described themselves simply as members of a ‘farmer group’, with only a small proportion specifying KUBE or Cooperative affiliation. This limited differentiation in responses suggests that farmers may not always clearly distinguish between types of OFG, or that the majority belong to the most basic groups where hierarchies and internal inequalities remain influential. These dynamics point to the importance of probing differences within OFGs themselves, as assumptions of uniform advantages risk oversimplifying farmer experiences and obscuring how access is uneven even among members.

Policy gaps further reinforced exclusion. Social Forestry and land-use schemes were largely channelled through OFGs, preventing many independent farmers and less formal OFGs from participating; some instead relied on informal or illegal land claims. Awareness of policy was limited, for example, most farmers did not know that coffee had been removed from the subsidised fertiliser scheme, forcing them to reduce inputs or turn to black markets. Such disconnects left farmers structurally disadvantaged, heightening vulnerability and risk while reinforcing dependence on informal systems.

Many farmers perceived government priorities to lie with staple crops such as rice and maize, which shaped subsidy and extension distribution and eroded trust in state interventions. Those outside high-performing OFGs often felt invisible within institutional frameworks. Survey data confirmed widespread dissatisfaction, with 94.2% of respondents wanting greater involvement in decision-making. However, while many viewed themselves, peers, or group leaders as local decision-makers, few identified the government in this role, and even fewer believed it should be. This suggests that farmers seek stronger agency but have low expectations of state engagement and limited trust in external governance structures.

Overall, farmers’ agency in institutional processes remains constrained. While OFG affiliation offers some voice and access, independent farmers are perceived to be largely excluded, and even within groups support and influence are uneven, with participation often failing to translate into meaningful benefits. These patterns highlight the persistence of structural inequality in access to resources, information, and decision-making, reinforcing vulnerabilities across the sector.

Credit Dependency and Financial Vulnerability

Access to credit is an important factor in shaping vulnerability among coffee farmers in Lampung. Farmers navigate between limited formal financial options and dependence on informal trader-based credit. While traders provide a vital safety net for daily needs and seasonal shortfalls, attached conditions such as pre-agreed prices and sale commitments constrain autonomy and entrench cycles of financial vulnerability.

Perceptions of traders varied. Some farmers described them as flexible and supportive, while others highlighted exploitative practices, including under-weighing and disputed quality assessments. These contrasting views illustrate the dual nature of trader-farmer relations: traders supply indispensable financial support but, as both creditors and buyers, also hold dominant control over market access and price-setting. This power concentration shapes benefit flows and frequently locks farmers into unfavourable selling terms.

Traders and collectors dominate coffee sales, but farmers' bargaining power is uneven. Negotiation was possible mainly for higher-quality coffee, while about a third of respondents had no scope to influence prices. As a result, experiences of fairness diverged, with nearly 40% reporting they did not receive fair prices. Farmers' ability to control pricing and trade conditions remains highly fragmented, leaving many exposed to disadvantageous outcomes.

The nature of credit dependency highlights a divide between short-term survival and long-term development. Informal trader loans dominate for household expenses, while formal credit via banks, government schemes, or OFGs is perceived as the route for farm investment. However, barriers such as the need for business registration or OFG membership exclude many from these formal options. OFG-based internal lending schemes exist but remain marginal; few farmers identified them as significant sources of credit, and most reported turning to traders for urgent needs.

Overall, the interaction of informal trader credit, restricted access to formal finance, and uneven perceptions of fairness shows how credit dependency operates both as a survival strategy and as a structural mechanism through which benefit flows are mediated and controlled.

Certification and Market Access Inequality

Certification was widely perceived not as a route to improved livelihoods but as a gatekeeping mechanism for accessing premium markets. Farmers framed it less as a resilience strategy than as a basic buyer requirement, typically navigated through OFG-issued verification stamps. Yet the administrative burden, technical standards, and lack of accessible training made certification difficult, especially for independent farmers. Financial resources, agronomic knowledge, and OFG membership were critical but unevenly distributed prerequisites, meaning certification often reinforced structural vulnerability rather than reducing it.

Survey data underscored these limitations: even among certified farmers, only 6.5% reported direct engagement with certification bodies. Training and education were recognised as benefits, but financial gains were minimal, with compliance costs and record-keeping burdens outweighing modest price premiums. This contributed to scepticism about certification's value in strengthening livelihoods.

Informal strategies emerged as responses to exclusion, most notably stamp forgery. Farmers and OFGs used this practice to fabricate certification or traceability when quotas or buyer requirements could not otherwise be met. While tacitly accepted by some stakeholders as a pragmatic workaround, it undermined traceability systems, introduced reputational risks, and revealed the depth of systemic exclusion driving risky informal practices.

Certification-linked benefits, such as training, equipment, and technical support, accrued mainly to well-connected OFGs with established private sector relationships. These groups were better placed to meet compliance standards, but the narrow distribution of support reproduced sectoral hierarchies. Independent farmers, lacking resources or affiliations, remained systematically excluded from certified value chains.

Overall, certification in Lampung functioned less as a mechanism for equitable development and more as a filter, structuring benefit flows around OFG membership, external support, and the capacity to bear compliance burdens.

Technological and Infrastructural Gaps

Technological resources and infrastructure formed another vulnerability factor. While some farmers, particularly those in OFGs or producing fine Robusta, accessed roasting equipment, drying ovens, or pulping machines and direct trade partnerships, often farmers lacked such resources. Survey data indicated that 59.1% of farmers expressed a desire for access to drying ovens, underscoring the importance of post-harvest technology for improving quality and price outcomes. With 90.9% farmers in this study being a member of an OFG this demonstrates that resources are not equally disseminated across groups and that other factors can determine access such as productivity and government recognition. Poor road infrastructure further compounded these issues, limiting access to markets and increasing transport costs, especially for those in remote areas.

Government programmes did provide processing equipment and training, but only to selected OFGs. Group leaders and government officials confirmed that access to roasting or drying equipment was based on perceived productivity, often measured by a group's visibility and production rates. This created structural barriers for less formal, less productive or independent farmers who remained excluded from such distributions. While this approach may improve efficiency from a programme delivery perspective, it risks reinforcing pre-existing inequalities, leaving more marginalised farmers without key productive assets.

Grafting techniques, by contrast, were widely adopted and diffused through informal networks. Farmers shared productive scions, tested new varieties on their land, and shared knowledge, often in the absence of any formal support. Although some training came via extension services or certifications, the bulk of grafting knowledge appeared to be self-taught or peer-transferred. This informal knowledge system was a powerful mechanism for building human and natural capital but remained under-recognised and unsupported by formal actors.

Digital tools also offered opportunities, with some farmers using WhatsApp or Instagram to engage buyers, learn new practices, or compare prices. Yet those without access to these assets remained disconnected from these benefit flows, reinforcing older patterns of inequality through new mediums.

Taken together, the evidence depicts vulnerability as cumulative and sustained. Climatic variability and price swings intersect with constraints on storage, inputs, and formal credit, while OFG-centred delivery and selective programme design shape who can adapt and on what terms. Coping strategies such as diversification, reliance on trader finance, peer-led grafting, and other informal workarounds provide short-term protection yet can deepen dependency or keep adaptation local and limited in scale. Misalignments between policy priorities and farmer-identified needs, alongside limited communication of state support beyond OFGs, weaken confidence in formal channels and steer households towards informal solutions with uncertain outcomes. Inequalities were also evident within OFGs themselves, with more visible or higher-performing groups perceived to receive greater support than others, highlighting that membership did not guarantee equal access to resources or benefits. Overall, risk is distributed along lines of network position and geography, with the least connected bearing the greatest exposure. Reducing vulnerability therefore hinges on widening equitable access to existing assets and aligning formal support with the strategies farmers already use and value.

11.3 Structural factors and Processes

Institutional, organisational, and market structural factors and processes significantly shape farmers' access to assets, information, and opportunities. This section examines how institutional frameworks, stakeholder relationships, market systems, and regulatory mechanisms interact to influence farmer experiences. By focusing on the roles of key actors, government bodies, private corporations, traders, certification schemes, and OFGs, it highlights how support and benefit flows are structured, and how processes of engagement, exclusion, and adaptation are embedded within these systems.

Structural factors

Government programmes provide essential training, equipment, and financial support, but these benefits are primarily delivered through OFGs. Independent farmers are commonly excluded due to eligibility requirements such as formal registration or business status. While some farmers expressed distrust in the government, citing a focus on staple crops and inconsistent or politically influenced support, others valued government extension officers where accessible, especially for their technical advice. However, extension services were inconsistently available, and even where present, access to state support such as roasting equipment or finance was often conditional on OFG affiliation. This conditionality produced not only material inequality but also feelings of mistrust and frustration among those excluded, reflecting the political nature of agricultural support. In response to these exclusions, some farmers resorted to informal or illegal strategies such as unauthorised land use or accessing subsidised fertiliser loopholes.

Private corporations, including companies, exporters, and large buyers, strongly influence access to markets, training, and resources, but their engagement is similarly channelled through OFGs. Companies such as LDC and Olam provide inputs, drying tarps, and training, but only to farmers who can meet demanding requirements related to certification, traceability, and delivery volumes. These criteria frequently exclude smallholders, prompting practices such as stamp forgery, where coffee from non-member farms is falsely presented to meet quotas. Some farmers described how promises of premiums or bonuses from these companies often failed to materialise, reinforcing perceptions of inequity and power asymmetry in these relationships. While these companies facilitate access to global markets, they are also perceived as powerful gatekeepers who shape the terms of participation. Government partnerships with private actors have expanded support for some OFG members, but they have also widened disparities between those inside and outside formal groups.

Traders and collectors play a complex but vital role as intermediaries. They offer farmers quick cash payments, informal credit, and ease of sale, particularly important for those excluded from formal supply chains. Farmers called for more government oversight to regulate trader behaviour and prevent exploitative debt cycles. Importantly, traders themselves also face financial risks, particularly when farmers default on loans during low-yield periods. These dynamics illustrate the traders' dual function as both enablers and constraints within the structure of the supply chain. It's important to note that there was a clear distinction between informal trader credit (used for daily household survival) and formal loans from banks or government schemes (sought for longer-term improvements) demonstrating how dependency on traders reinforces short-term coping rather than enabling transformation.

Certification systems present further structural challenges. While certification schemes such as Rainforest Alliance and 4C offer agronomic training and the potential for market access, participation is constrained by administrative, financial, and logistical burdens. Many farmers experienced certification passively, 32% were certified, yet only 6.5% reported direct engagement with certification bodies. Consequently, while some valued the training, others doubted the financial returns. The widespread use of stamp forgery highlights how structural exclusion and certification pressures drive informal workarounds that undermine credibility and traceability systems.

Importing countries influence market structures through regulatory power, but this influence is not widely recognised by farmers. Regulations such as the EU Deforestation Regulation (although not active at the time of study) will significantly affect how coffee is sourced and traded. However, no farmers in this study referenced these regulations, reflecting a localised understanding of supply chains. In contrast, traders acknowledged the influence of global markets, including the London Exchange, in setting daily prices, highlighting a divergence in structural awareness between actors at different supply chain levels.

The domestic fine Robusta market offers an alternative, quality-focused route, particularly through direct trade with coffee shops and roasters. These buyers provide higher prices, feedback, training, and equipment, but only to farmers who meet stringent quality standards. While this model increases bargaining power and enhances capacity, the market remains niche and is constrained by low market demand, resource limitations, logistical challenges, and inconsistent pricing between fine and mixed Robusta. Government support for this sector is growing, but there are risks of overlap or conflict with buyer arrangements, which require careful coordination to avoid disrupting trade relationships.

Across all structural domains, dependence on OFGs as the main conduit for support, markets, and certification creates systemic disparities. Farmers outside formal groups remain disadvantaged, facing multiple structural barriers that limit their access to key resources, decision-making processes, and opportunities for livelihood improvement. Geographical inequality compounds these exclusions, as remote farmers reported even weaker access to extension, infrastructure, and markets compared to those in better-connected locations.

Processes

Processes governing coffee production and trade in Lampung span national and international regulations, certification schemes, private corporation systems, and embedded cultural norms.

While government-led sustainability guidelines, such as the Technical Guidelines for Good Coffee Cultivation and Post-Harvest Handling, were not referenced by name, farmers displayed awareness of good agricultural practices, largely through extension workers or personal experience. However, pesticide testing, a requirement for export, was not mentioned at all by farmers, and the Indonesian National Standards (SNI) were not recognised at all, highlighting a disconnect between policy frameworks and farmer practice. Certification processes, particularly Rainforest Alliance and 4C, were more visible, but direct engagement remained low. Certification was also unavailable for fine Robusta producers, limiting its reach. Private corporation traceability processes, enforced via verification stamps, were frequently undermined by stamp forgery, reflecting systemic exclusion and a need for reform.

The Social Forestry Programme (Regulation No. 9/2021) provided formal land access but continued illegal land acquisition pointed to enforcement gaps and the enduring relevance of informal mechanisms. Similarly, the subsidised fertiliser policy (Regulation No. 41/2021) excludes coffee, yet some farmers accessed it through OFGs without awareness of the regulatory context, further revealing information asymmetries. Traders operated through informal credit-based relationships that were critical to many farmers' livelihoods, offering loans and quick payments, yet also limiting bargaining power and creating dependencies. These informal arrangements functioned largely outside regulatory oversight and were shaped by trust, proximity, and debt, rather than transparent processes.

Finally, cultural processes such as peer-to-peer learning, village meetings, and intergenerational knowledge transfer remained central to farmer knowledge systems. Yet, OFGs were underutilised for collaborative learning, representing a missed opportunity to institutionalise inclusive and farmer-driven knowledge exchange. Overall, both formal and informal processes shape farmers' access and benefits in the coffee sector, but limited engagement, knowledge asymmetries, and exclusionary mechanisms reinforce structural inequality and call for more transparent and inclusive governance.

Overall, the interplay between structural factors and operational processes reinforces existing inequalities in the coffee sector. While OFGs function as essential gateways to state and private sector support, their dominance also marginalises independent and less formalised farmers. Meanwhile, both national policies and international certification systems often operate at a distance from farmer realities, contributing to information gaps and informal workarounds. Understanding how these structures and processes shape farmer inclusion, exclusion, and adaptive agency is essential for designing more equitable and context-sensitive interventions in Lampung's coffee value chain.

11.4 Perceptions of Assets

Understanding how farmers perceive the assets available to them is essential for grasping their lived experience and the realities of their livelihoods. While the SLF distinguishes between human, social, natural, physical, and financial capital, these categories frequently overlap in practice. Farmers' interpretations of assets were shaped not only by availability and utility but also by broader issues of access, inclusion, fairness, and the ability to derive benefit. Across all capital types, asset distribution was perceived as uneven, often linked to group membership, stakeholder relationships, or geographical proximity to services. This section examines the key assets identified by farmers and explores how they understood the benefits these assets provided.

Human Capital

Most farmers had received formal education, yet only half had completed the full 12 years of compulsory schooling. Farmers in this study reported considerably higher levels of coffee farming experience compared to findings from other research in the region, suggesting that many may have left school early to enter farming. At the same time, education costs were widely reported as a significant household burden, indicating that families are prioritising investment in schooling despite these challenges. This pattern may reflect a shift in aspirations: parents may be placing greater emphasis on their children's education either because they perceive diminishing prospects in coffee production or because they recognise broader opportunities available through formal education. Access to healthcare was reported as relatively strong, with 98% of farmers citing availability and few identifying cost

as a barrier. However, this apparent accessibility may mask limited engagement, as farmers may seek medical services only when necessary, suggesting that the barrier may lie more in use than in access.

Farmers accessed training on grafting, pest control, and trade skills, primarily through government or private corporation programmes, though these were largely mediated through OFGs. Informal learning, including peer experimentation, social media, family and peer networks, and local field trials, was equally important, particularly for techniques like grafting. While government officials sometimes questioned the reliability of some of these informal channels, farmers regarded them as practical, responsive to local realities, and empowering, with their own trials and experimentation seen as legitimate ways of building and circulating knowledge. Farmers repeatedly expressed demand for more targeted training on climate adaptation, resilient coffee strains, and sustainable practices, underscoring a gap between state priorities and farmer needs. Although OFG meetings were recognised as sites of formal learning, especially when linked to government or certification programmes, farmer-led innovation often remained outside formal recognition, leaving a missed opportunity to bridge local knowledge with institutional support.

Labour during harvests was sourced primarily from paid workers (50.5%) and family members (32%), with smaller contributions from OFG peers (5.8%) or, in some cases, farmers harvesting alone. These patterns suggest potential vulnerabilities, particularly where reliance on limited household or hired labour overlaps with financial pressures. This highlights a missed opportunity for OFGs to play a stronger role in collective labour sharing and support during harvests.

Social Capital

Supply chain connections (SCCs) were perceived as central to accessing information, buyers, inputs, and training. OFG membership was widely seen as a gateway to government and private support, particularly through extension workers or certification bodies. These relationships enabled access to training, drying equipment, grafting techniques, and in some cases, market linkages with large buyers or exporters. However, farmers also expressed mistrust and dissatisfaction with government engagement. Some described government officials as corrupt or indifferent, while others reported being ignored or overlooked due to their group's low visibility or remote location.

Connections with domestic fine Robusta café owners were also perceived as beneficial, particularly in relation to price negotiation and fairness. These SCCs were seen to offer access to valuable resources, including training and processing equipment. The government similarly supported fine Robusta farmers through the provision of roasting equipment and training. However, this support was channelled through OFGs, reinforcing the perception that independent farmers remained structurally excluded from such opportunities. Relationships with traders were described as both supportive and exploitative. Farmers appreciated traders' willingness to provide cash or credit during times of need but also noted power imbalances, especially when prices were set unilaterally or when debt constrained their ability to negotiate.

Certification-related SCCs were less positively viewed. While certifications offered access to training and were often required by large buyers, many farmers saw them as administrative hurdles rather than beneficial assets. Several farmers associated certification with specific buyers like Nestlé, sometimes conflating corporate actors with certification bodies, indicating

limited awareness of certification structures. Some noted that certifications helped improve coffee quality or gave access to drying tarps, but the overall perceived benefit was modest. Farmers appeared to view certification as an obligation to access buyers rather than a strategic asset.

Collective action through OFGs enables farmers to pool resources and access markets that would otherwise be closed to individuals, illustrating the significant role of social capital in expanding livelihood opportunities. This mechanism is perceived by many as an effective way to increase bargaining power and meet the requirements of large buyers. However, its benefits are unevenly distributed; only those free from outstanding debts to traders can fully participate. For indebted farmers, the potential gains from collective action are undermined by pre-existing obligations, highlighting how financial constraints can limit the advantages of group-based strategies. In this way, the advantages of collective action are most accessible to those already in a better financial position, while the most financially vulnerable, often those with existing debts, remain excluded. This dynamic can reinforce, rather than reduce, underlying inequalities among farmers.

Informal farmer-to-farmer exchanges were vital for knowledge and resource sharing, especially in grafting and experimentation. These networks played an under-recognised but crucial role in strengthening resilience outside formal channels. However, they received little institutional recognition or support, representing a missed opportunity to integrate farmer-led knowledge into broader governance systems.

Natural Capital

Natural capital access centred on land, soil quality, and plant material. Around half the farmers inherited land, while others gained access through the Social Forestry Programme or informal claims. Soil degradation, linked to long-term agrochemical use and limited fertiliser access, was a recurrent concern. Grafting (“stek”) was widely adopted and viewed as an effective yield-enhancing technique, with farmers actively sharing scions and experimentation results through peer networks. Farmers reported that shade trees and mixed cropping were commonplace and valued for maintaining soil moisture and crop health and for providing supplementary income, yet these practices were rarely articulated as deliberate climate-adaptation strategies.

Yields averaged 699 kg/ha, 14.44% below the provincial benchmark, and farmers widely attributed underperformance to ageing trees, degraded soils, and input constraints. Farmers consistently identified erratic rainfall as the primary environmental risk, whereas pests and diseases, which were seen as significant to government officials, were seldom prioritised, revealing a gap between formal priorities and farmer perceptions. Although government programmes promote climate-resilient varieties and adaptive practices, most farmers reported little or no access to such support. Farmer-led trials and grafting innovations were active but largely unrecognised by formal extension, representing a missed opportunity to scale locally adapted solutions.

Fertiliser constraints were central. Coffee’s removal from the subsidised fertiliser scheme (Regulation No. 41/2021) limited access to inputs; some farmers pursued loopholes via staple-crop registrations or turned to black markets, while independent farmers lacked both OFG-mediated distribution and informal workarounds, forcing reduced application rates and further depressing yields. Where agronomic training existed, it was not perceived as equally

available to all OFGs and excluded independent farmers, reinforcing structural barriers to soil management and adaptation.

Access to land in protected areas illustrated similar dynamics. Although Social and Community Forestry schemes are intended to provide legal tenure and promote sustainable practices, participation was low and understanding of agroforestry limited. Consequently, some farmers resorted to informal or illegal land clearing, which provides neither security nor environmental safeguards. Overall, barriers to natural capital stemmed as much from institutional and distributional barriers, unequal access to inputs, information, and recognition of farmer innovation, as from environmental pressures themselves.

Physical Capital

Subsidised fertiliser was widely regarded as a valuable asset, with the removal of coffee from the scheme generating confusion and frustration. Farmers viewed it as central to productivity and soil health. Some but not all OFG members accessed limited workarounds, but supply constraints and complex procedures limited effectiveness. Independent farmers and some OFG members resorted to black market sources, paid higher prices, or reduced usage. These experiences reinforced a sense that access to valuable assets remains uneven, largely determined by group affiliation and connections, and contributed to persistent perceptions of unfairness and vulnerability in the distribution of livelihood benefits. Ultimately, these dynamics highlight how institutional arrangements continue to shape who is able to secure key assets, and, by extension, who can realise the full potential of coffee farming in Lampung.

Farmers' perceptions of equipment, such as drying ovens and pulpers, reveal how physical assets are understood not just as tools for processing, but as gateways to higher-value markets and improved quality standards. However, access to such assets was shaped by both market and state actors. Government programmes were recognised for providing equipment such as roasting machines, pulping devices, and drying ovens, but access was selective and conditional. Officials and group leaders confirmed that resources were allocated to OFGs based on perceived productivity, visibility, and compliance with government standards. As a result, well-established groups received disproportionate benefits, while less formal and lower producing groups, along with independent farmers, were systematically excluded. Although this approach appeared efficient for programme delivery, it reinforced structural inequalities and widened the gap between those with and without institutional recognition. Private corporations also distributed tools and training, but these were usually tied to certification or quotas, again favouring stronger OFGs and excluding independent farmers.

Technological resources revealed additional disparities. Survey data showed that 59.1% of farmers desired access to drying ovens, highlighting their importance for achieving better quality and higher prices. Yet despite 90.9% of surveyed farmers belonging to an OFG, resources were not evenly disseminated, suggesting that internal hierarchies, geography, and production levels also influenced access. These patterns demonstrate that OFG membership alone was not a guarantee of inclusion.

Infrastructure limitations further constrained opportunities. Poor roads restricted market access and increased transport costs, particularly in remote areas. A lack of storage compounded with urgent financial needs forced many farmers to sell immediately after harvest, limiting their ability to benefit from price fluctuations. These conditions were perceived as reinforcing geographic and market-based inequalities.

Traceability stamps were viewed as valuable assets that enabled access to premium markets. However, informal practices such as stamp-sharing with non-members undermined trust. Some companies reportedly provided assets in exchange for stamp use, while others, like Nestlé, withdrew from trading with groups due to forgery. These practices exposed farmers to reputational risk and highlighted the fragility of access to formal markets.

By contrast, grafting techniques were widely adopted and diffused primarily through informal systems. Farmers shared productive scions, tested new varieties on their land, and exchanged knowledge with peers, often without institutional recognition or support. Although some training came via extension services or certification programmes, farmer-led experimentation and peer-to-peer learning formed the backbone of innovation. Farmers highlighted these practices as empowering, contrasting them with formal systems that were often seen as exclusionary, or inaccessible.

Digital technologies created both opportunities and risks. Some farmers used social media and internet sources to connect with buyers, compare prices, and share practices, particularly in the fine Robusta sector. However, digital divides meant that farmers without internet access or smart devices were left disconnected, reinforcing older inequalities through new mediums.

Overall, physical capital access in Lampung was shaped by overlapping institutional, market, and technological barriers. While OFG membership improved access to some resources, internal inequalities and selective distribution systems meant that many farmers remained excluded. Informal innovation in grafting and digital networking offered alternatives, but these were insufficient to compensate for the lack of infrastructure, processing equipment, and transport facilities that constrained farmer autonomy and market engagement.

Financial Capital

Although income levels reported by Robusta farmers in this study exceed previous research and lie above the international extreme poverty line, their position below the upper-middle-income poverty threshold highlights persistent vulnerability within coffee-based livelihoods. The widespread belief among farmers that incomes have declined over the past five years, despite relatively high current earnings, points to deeper concerns about volatility, rising costs, and diminishing returns. These perceptions may reflect more than just price or yield changes; they indicate a lack of confidence in the long-term viability of coffee as a stable income source.

Although most farmers sold directly to traders or collectors, negotiation power remained highly uneven. Quality was the primary basis for bargaining, but about a third of respondents felt unable to negotiate at all. Almost 40% reported feeling they did not receive fair prices, reflecting both information asymmetries and the entrenched dominance of traders in setting terms. This sense of unfairness was often linked to credit dependency, with indebted farmers particularly constrained in their ability to seek alternative buyers.

Access to credit was widely recognised by farmers as a key asset underpinning their livelihoods. However, there was a clear perception that formal credit sources, such as government or bank loans, were largely inaccessible to most farmers. This inaccessibility was attributed to eligibility criteria that prioritise registered business entities, which excluded both independent farmers and OFGs lacking formal business status. As a result, informal credit, most commonly obtained from traders, emerged as the primary and, for many, the

only feasible source of financial support. While this form of credit was valued for its accessibility and immediacy in meeting household needs, it was also perceived as a double-edged sword. Some farmers described these arrangements as constraining, particularly when indebtedness became linked to unfavourable pre-agreed pricing or ongoing obligations to traders. This reliance on informal credit thus not only highlights the limitations of existing financial infrastructure for rural farmers but also raises concerns about power imbalances and potential vulnerabilities that arise when access to critical assets is contingent on informal relationships and agreements.

The limited availability of OFGs as a source of credit for farm improvements is a notable finding. Only a small proportion of farmers identified their OFG as providing credit, reflecting both the restricted reach and variability of such schemes across OFGs. Where internal OFG savings funds did exist, these were established through member contributions upon joining, with the option to reclaim their deposit on leaving the group. Members who had access to these schemes viewed them positively, emphasising their flexibility and their role in providing emergency support. Importantly, these systems were described as more supportive and less risky than informal loans from traders, as they were based on mutual trust and collective management. However, the fact that not all OFGs operated savings schemes, combined with the total exclusion of independent farmers from such support, contributed to a two-tiered system of financial access. This differentiation reinforced disparities in farmers' autonomy and resilience, underlining how access to collective resources through OFGs can be both enabling and, by its absence, a source of continued vulnerability for those outside formal group structures and those within OFGs without these assets.

Farmers' accounts of debt reveal its dual role as both a critical support mechanism and a source of ongoing vulnerability. The widespread reliance on informal loans, particularly from traders, was often seen as necessary to meet urgent or routine expenses in the absence of accessible formal credit. However, this form of indebtedness came with significant trade-offs. While farmers valued the immediate access to cash that traders provided, they also recognised the ways in which such arrangements diminished their bargaining power, particularly when future sales were tied to loan repayment under pre-determined or unfavourable terms. Some farmers described these dynamics as exploitative, highlighting instances where debts were used by traders to justify unilateral pricing decisions or to penalise them for alleged quality issues. Nonetheless, others accepted these relationships as an unavoidable feature of the local financial landscape, underscoring the lack of viable alternatives. These experiences point to the complex ways in which debt can simultaneously enable farmers to manage short-term needs and perpetuate structural vulnerabilities, reinforcing the importance of context-specific financial assets in shaping livelihood strategies and outcomes.

In summary, farmers' accounts point to real strengths across the capitals, but uneven conversion of assets into durable benefits. OFG membership is often necessary yet not sufficient, as selective distribution, weak infrastructure, volatile markets, and limited formal credit continue to filter who gains. Hierarchies within OFGs, where more visible, better connected, or higher-performing groups were perceived to secure disproportionate support, also shaped access and determined who could derive benefit from asset access. Informal strategies, peer learning, trader finance, and niche café linkages create pockets of inclusion but can increase dependency. Overall, the flow of benefits is perceived to be structured by

external rules and priorities, with OFGs serving as channels through which these rules are enacted at the local level. Their dual role as both facilitators and necessary intermediaries, rather than powerful actors in their own right, shapes farmers' sense of inclusion, agency, and vulnerability, while leaving those outside formal groups facing persistent barriers. More inclusive, context-responsive support that recognises farmer innovation and improves transparency in market and credit relations is needed to translate access to assets into sustained livelihood gains.

11.5 Perceptions of Actors Controlling Access to Asset Benefits

Understanding the flow of benefits from livelihood assets requires examining not only which actors farmers believe control access, but how these perceptions influence farmers' sense of inclusion, trust, and agency. Across multiple asset types, benefit flows were viewed as shaped by institutional gatekeeping, especially through OFG structures, as well as informal and relational mechanisms such as peer networks and trader relationships. This section is structured by asset-linked benefits, examining farmers' perceptions of access and the actors they saw as central in mediating benefit flows.

Farmers' perceptions of benefit flows in Lampung's coffee sector reveal a system in which access to key livelihood assets is largely determined by the requirements and conditions set by powerful external actors, primarily government agencies, large private corporations, and traders. Within this system, OFGs were frequently seen as necessary for accessing resources such as training, credit, fertiliser, equipment, land tenure, and premium market opportunities. However, OFGs themselves were not seen to control distribution or set the rules; rather, they operated within frameworks designed and enforced by external institutions. Formal affiliation with an OFG was therefore widely perceived as a prerequisite for eligibility in government programmes or participation in buyer-led schemes. While this membership opened doors to collective bargaining and institutional support, it also acted as a boundary that excluded independent farmers who could not, or chose not to, join.

Across asset categories, benefit flows were consistently shaped by a small number of influential actors who acted as gatekeepers to both material support and institutional recognition. The Government were perceived as controlling access through programme eligibility rules and selective resource allocation, often privileging OFGs considered productive or compliant while excluding independent or less productive and less visible OFGs. While government officials promoted the existence of training and support programmes, farmers were either unaware of or reported being excluded from them, highlighting poor communication and an institutional disconnect.

Private corporations reinforced these hierarchies by limiting training, equipment, and purchasing opportunities to certified OFG members or those meeting volume thresholds. Traders exerted influence through financial dependency, providing informal credit for urgent needs but binding farmers into pre-agreed trade terms that reduced bargaining power. Many farmers distinguished between using trader loans for everyday survival and formal loans for farm improvements, underlining the dual role of traders as both creditors and buyers. Even between different OFGs, group hierarchies, geography, and selective quota systems meant that not all groups benefitted equally.

Informal knowledge-sharing and peer-to-peer learning offered more inclusive and trusted alternatives, and domestic café owners provided limited new routes into higher-value markets, yet these systems lacked the structural scale to rival formalised channels. Some

farmers described stamp forgery and black-market fertiliser trade, sometimes linked to police or military actors, as adaptations to exclusionary systems, illustrating both ingenuity and heightened vulnerability. Although OFG membership was widely seen as amplifying farmers' collective voice, scepticism remained over whether participation in forums or meetings translated into meaningful institutional change. Together, these dynamics highlight that access to asset benefits was not always determined by need or merit, but more by proximity to power, networks, and institutional visibility. As a result, the concentration of control among a few actors perpetuates inequalities, constrains farmer agency, and reinforces dependency across the coffee supply chain. These dynamics illustrate how farmers in Lampung perceive control over benefit flows, emphasising the central role of institutional gatekeeping, the conditionality of OFG membership, and the limited scope of alternative pathways.

11.6 Perceptions of strategies.

Farmers in Lampung adopt a diverse array of livelihood strategies to access key assets and influence benefit flows within the coffee sector. These strategies are shaped by their resource constraints, social networks, institutional structures, and exposure to market and environmental risks. While some strategies reflect creative adaptation and collective agency, most serve primarily as coping mechanisms rather than routes to transformational change. The following section draws directly on farmers' accounts to examine how their experiences with these strategies affect both their ability to access key assets and their control over benefit flows within the coffee sector.

Diversification

Diversification, including crop mixing, livestock keeping, and off-farm work, emerged as the most widely used strategy among farmers in Lampung. Farmers described how engaging in a variety of income-generating activities helped them buffer against the unpredictability of coffee farming. For example, one farmer noted the importance of *"get added value from like others like avocado, durian and stuff like that. So not only from the coffee"* (P029), while a trader explained that *"the farmer have to find another source of income. They can plant a staple crop or whatever they can do to get an income before the coffee can be harvested"* (TR017). This approach was not limited to crop diversification but also included raising livestock and seeking off-farm employment, with the aim of supplementing household income and providing a safety net in years when coffee prices or yields were low.

Despite its prevalence, both farmer accounts and existing research indicate that diversification is primarily a coping mechanism rather than a transformative strategy. While farmers viewed diversification as essential for managing risk and ensuring some income security, it was not discussed as a path to long-term prosperity or change. This widespread reliance on diversification reflects the ongoing vulnerabilities and constraints of rural livelihoods in Lampung. As one farmer group leader observed, shifts to alternative crops were often driven by falling coffee prices or poor yields, rather than by a deliberate strategy for growth: *"many, many more farmers, they change from coffee, they replace some of their coffee plants to other forms because the price and also the production and low especially in the last two years"* (CK004). Thus, diversification serves as a necessary adaptation to a challenging environment, but one that ultimately underscores, rather than resolves, the persistent risks faced by smallholder farmers.

Grafting and Informal Knowledge-Sharing

Grafting was widely recognised by farmers as an effective strategy for improving coffee productivity and increasing resilience to climate change. Many farmers reported experimenting with different varieties of scions to develop coffee plants better suited to local conditions. This process of innovation was largely driven by informal knowledge-sharing among peers. Farmers described exchanging scions, discussing grafting techniques, and observing each other's successes and failures in the field. These informal networks were seen as a way to spread new ideas, as well as to support ongoing adaptation to environmental and market challenges.

The importance of peer-to-peer learning reflects both the resourcefulness of Lampung's coffee farmers and the unevenness of institutional support in the sector. Many farmers described their reliance on fellow producers for advice and information, which may reflect the absence of accessible extension services or formal training. In some cases, local farmer-led research into grafting was seen as more influential than official guidance. This form of collective problem-solving enabled farmers to address production challenges in real time, building on shared experience and experimentation. However, while this informal system fostered innovation and adaptation, it also highlighted gaps in formal support structures and underscored the importance of social capital in rural livelihoods. Farmers' willingness to share knowledge and materials speaks to a culture of collaboration, but it also points to a system in which individual and community initiative is relied upon to compensate for broader institutional shortcomings.

Engagement with the Fine Robusta Market

Farmers' experiences with engaging in the domestic fine Robusta market illustrate both the opportunities and constraints. For those who have been able to establish partnerships with café owners and roasters, participation in this market has resulted in access to higher prices, training, and occasionally new equipment. These benefits are closely tied to ongoing relationships and collaboration, with support provided to help farmers meet the quality standards required by fine Robusta buyers. Farmers report that, for those able to participate, this strategy can improve both financial outcomes and knowledge of advanced processing techniques, representing a distinct approach to accessing and enhancing livelihood assets.

However, farmers also described the fine Robusta market as highly limited in reach and scale. The volume traded remains small relative to the larger mixed Robusta market, and access is mediated by existing social networks and relationships with buyers. As a result, only a select group of producers have been able to consistently participate and benefit from this niche market. These experiences underscore both the potential and the current exclusivity of fine Robusta engagement as a pathway to improved asset access and control over benefit flows in Lampung's coffee sector.

Use of Social Media and Digital Tools

The use of digital tools and social media platforms has begun to influence how farmers in Lampung access assets and manage benefit flows within the coffee sector. Farmers who are engaged in the fine Robusta market have started to leverage platforms such as Instagram and Facebook to establish direct contact with buyers, negotiate prices, and arrange sales, allowing them to bypass traditional traders. This approach has enabled a subset of farmers to exercise greater control over the sale of their coffee, build relationships with new buyers, and access information that can support better decision-making around marketing and pricing. In these cases, digital connectivity has functioned as a tool for empowerment,

facilitating new forms of engagement and enabling more transparent interactions in the marketplace.

For most farmers, however, the primary use of technology remains limited to the access and sharing of price information rather than establishing new market linkages. Many reported relying on digital platforms mainly to verify the prices offered by traders or share updates with peers within their networks. While this increased transparency helps farmers make more informed choices and may strengthen their negotiating position, it does not substantially alter the underlying structure of market access for most producers. As a result, the ability of digital tools to create real change is mostly limited to farmers who are already involved in higher-value markets or who have the right social connections to make use of these new opportunities.

Collective Action through OFGs

Collective action through OFGs remains a central strategy for many coffee farmers in Lampung, providing a range of practical and strategic benefits. Group membership is often essential for gaining certification and stamps, which are required to access higher-value markets and meet the volume quotas set by large buyers. By pooling their harvests, OFG members can negotiate collectively, giving them greater bargaining power than they would have as individuals. This enables them to compare prices from different buyers and select the best available deals, helping to maximise their income from coffee sales. Many farmers valued these opportunities, highlighting how collective action made it possible to overcome individual limitations, meet market requirements, and engage with actors in the supply chain.

However, the experience of collective action is also marked by limitations and frustrations. While OFG membership provides a platform for farmers to express their concerns and participate in meetings with buyers, government representatives, and other stakeholders, many farmers remained sceptical about the actual impact of these forums. Some described a sense of disappointment or powerlessness when their input did not lead to visible change, suggesting that participation alone does not guarantee meaningful influence over decisions. This gap between being heard and being able to shape outcomes emphasises the structural constraints that persist within the sector. Although collective approaches can increase negotiating power and open doors to important resources, they do not automatically shift deeper patterns of control or alter the balance of power in the supply chain.

Stamp Forgery

Farmers' experiences with stamp forgery reveal how informal adaptation can become a necessary strategy for gaining access to assets and controlling the flow of benefits in restrictive institutional environments. Both OFG members and group leaders reported resorting to stamp forgery, often to meet quota or standards requirements. This strategy was seen as a practical response to rules and systems that, in practice, were difficult or impossible for all farmers to comply with. For many, engaging in stamp forgery was less about deliberately breaking rules and more about finding ways to secure needed resources and market access when formal pathways were blocked.

Importantly, some farmers recounted instances where companies or external actors encouraged or required them to forge stamps in exchange for access to assets such as equipment or resources. This practice shows that the incentive for forgery does not always originate with the farmers themselves but can be part of broader pressures within the supply chain.

These experiences point to the complex and sometimes contradictory situations faced by coffee farmers in Lampung. While formal systems are designed to regulate benefit flows and ensure traceability, the need for forgery demonstrates that these frameworks can leave significant gaps in access. Farmers' willingness to adopt such measures underscores both their determination and their capacity for creative problem-solving under pressure. At the same time, the use of stamp forgery signals ongoing tensions between the intended operation of official systems and the practical needs of farming communities. Ultimately, this form of informal adaptation highlights how some farmers must navigate a trade-off between risk and inclusion, seeking ways to overcome barriers to assets and benefits even when it means operating outside formal structures.

Reliance on Informal Systems

Trader relationships play a crucial role in how farmers in Lampung access assets and manage benefit flows. Many farmers described their reliance on traders, as well as family and peers, for obtaining credit, selling their coffee, and accessing other forms of support. These informal arrangements are often valued for their speed and flexibility, especially when formal credit or support systems are seen as inaccessible or overly bureaucratic. Farmers reported that traders are frequently willing to provide loans or purchase coffee immediately, helping them address urgent financial needs or household expenses. The responsiveness of traders and the ability to access resources quickly make these relationships an essential part of daily life for many farmers.

However, farmers also recognised the risks and limitations embedded in these arrangements. While trader relationships can help farmers cope with short-term shocks or cash flow problems, they often reinforce patterns of dependency and unequal power. For example, farmers who receive loans or advances from traders are typically required to sell their coffee at predetermined prices, reducing their bargaining power and sometimes resulting in less favourable terms. Some farmers acknowledged that such dependency limits their ability to negotiate or seek out better opportunities, especially in the absence of more inclusive or reliable formal alternatives. Overall, the trade-off between immediate resilience and longer-term vulnerability was a recurring theme, with farmers aware that the flexibility of informal systems often comes at the cost of lasting independence and opportunities to improve their livelihoods.

In summary, farmers in Lampung employed diverse and often overlapping strategies to manage risk and maintain livelihoods, yet these approaches were more coping mechanisms than transformative solutions. Diversification, grafting, informal systems, and digital tools reflect ingenuity and adaptability, but their benefits were constrained by structural exclusions and uneven institutional support. Collective action through OFGs expands opportunities but does not guarantee equitable inclusion, while practices such as stamp forgery and reliance on traders highlight the persistence of barriers in formal systems. Overall, farmers' strategies reveal both resilience and vulnerability: resourcefulness in the face of constraint, but limited scope to alter their position within the wider coffee sector. These findings underscore the need for more inclusive, flexible, and context-responsive interventions that build on farmer agency while addressing the structural inequalities that restrict their potential for transformation.

11.7 Perceptions of outcomes.

Drawing on self-reported survey data and interview findings from Robusta coffee farmers, this section examines how farmers themselves interpret the impacts of their livelihood strategies and the distribution of benefits. The analysis is organised by the five capitals of the SLF, human, social, financial, physical, and natural, allowing for a comparative exploration of both strengths and ongoing vulnerabilities, reflecting through the lenses of the SLF and ToA frameworks. Special attention is given to the ways in which OFG membership and adaptation strategies shape farmer perceptions of outcomes, and to the barriers that influence who is able to access benefits from assets. The discussion goes beyond descriptive reporting, offering critical reflection on how the flow of benefits and institutional arrangements contribute to patterns of adaptation, inequality, and resilience within Lampung's coffee sector.

Human Capital Outcomes

Farmer perceptions of human capital outcomes were the highest across all capital outcomes, perceptions reveal both strengths and hidden vulnerabilities shaped by the current strategies and flows of benefits within the coffee sector. While there is widespread reporting of access to healthcare, education, and training among farmers, the fact that half have not completed compulsory schooling and high levels of coffee farming experience indicates that many began farming early to support family needs. This suggests that some problems remain hidden behind the overall picture of good access. This high level of farming experience sets these farmers apart from those in other Indonesian based studies (Fajri et al., 2024; Irawan, 2023), but it also shows that many families have faced long-term insecurity in rural areas, potentially resulting in children leaving school early to begin working on the coffee farms.

Education is perceived as a financial burden for many households, yet its prioritisation, suggests a shift in aspirations, possibly reflecting both an intention to diversify away from coffee farming and a recognition of the need for broader livelihood options in an uncertain environment.

In terms of capacity-building, over 70% of farmers had accessed official training and the majority of those who received training adopted new practices as result including improved coffee maintenance and post-harvest processing. Together, these outcomes reinforce perceptions of comparatively high human capital among farmers in this study. However, most training opportunities, whether from government, private actors, or certification schemes, are mediated through OFGs, reinforcing group membership as a critical gatekeeper to knowledge, innovation, and adaptation. This system creates marked inequalities, with independent farmers facing ongoing exclusion from essential training and information, particularly about market standards and adaptive practices. Although some independent farmers can access certification training via invitations from peers, the dominant pattern is one in which formal training benefits flow favourably to those within OFGs.

Peer-to-peer learning is perceived as a vital, though often an under-recognised source of knowledge transfer by other stakeholders. The role of peer networks is especially important in areas such as grafting, where formal extension support is weak or absent, and farmers themselves drive innovation and adaptation. However, a discrepancy between survey and interview data on farmer interaction suggests that direct peer contact may be more limited than interview data suggests, or possibly under-reported due to misunderstandings in how farmers conceptualise their own roles within the local stakeholder network. This finding is

itself revealing, indicating that farmer-to-farmer knowledge exchange, while crucial, may not be consciously acknowledged by participants.

A further point of concern is the prevalence of paid labour for coffee harvesting, with few farmers reporting mutual support among OFG members or fellow farmers for this key activity. This reliance on hired workers, rather than group-based support, may indicate a lack of practical cooperation within OFGs and a weakness in human capital labour. If OFG members do not support each other with harvest labour, this challenges assumptions that groups strengthen solidarity and mutual aid. It also raises questions about whether OFGs are functioning more as administrative gateways to external resources, such as certification or subsidies, than as platforms for everyday cooperation. The additional costs associated with hiring labour can also squeeze household margins, especially when coffee prices are low, potentially reducing the benefits farmers can derive from coffee production.

Timing further amplifies these vulnerabilities. Coffee harvests are highly time-sensitive, and without reciprocal labour systems poorer households may struggle to mobilise workers quickly, with implications for quality and income. In some cases, this reliance on hired labour may increase dependence on trader advances or debt, reinforcing cycles of obligation and limiting farmer autonomy. These findings suggest that OFGs are not serving as vehicles for collective responses to labour needs and highlight a mismatch between institutional expectations of group cohesion and farmer practice. Programmes that assume cooperation arises naturally within OFGs may overlook this gap, underscoring the need for interventions that foster cooperative labour-sharing.

Farmers who engage directly with domestic fine Robusta café markets reported greater access to tailored training, ongoing feedback, and support from buyers or café owners, a benefit that is typically dependant on strong social capital and participation in specific market niches. These findings were corroborated by fine Robusta Domestic café owners, highlighting the opportunities and also the uneven distribution of training and support across different markets.

Overall, the outcomes for human capital are shaped not only by formal access to services and training but by the ways in which group membership, peer networks, and market positioning mediate these opportunities, reinforcing both adaptation and persistent inequalities.

Social Capital Outcomes

Overall, farmers report high social capital, reflected in frequent meeting attendance, active participation, and strong supply chain connections among OFG members. However, perceived agency to influence decisions remains comparatively low.

Within this study sample farmer participation in OFGs is high, with most reporting that they attend meetings and can share their opinions. While many farmers feel their contributions are valued, a sizeable minority still experience exclusion from decision-making, and almost all would like to have a greater say in how things are run. The local system is generally viewed as democratic, but this perception may mask underlying frustrations about how responsive leaders actually are to members' concerns.

It is important to note that the high proportion of OFG members in the sample may reflect difficulties in identifying and communicating with independent farmers. Recruitment pathways likely privileged OFG networks, meaning non-affiliated farmers, who are less

connected institutionally, may have been under-represented. This potential sampling bias should be taken into consideration when interpreting findings on social capital and participation.

Government is perceived to play a minimal role in local decision-making, with only 4.3% of farmers believing the government makes decisions, and just 7.7% believing it should. Similarly, companies and exporters are only rarely identified as decision-makers. This suggests that farmers see decision-making as primarily local and internal to the group, and do not consider government or outside actors central or even desirable in these processes. Notably, a large proportion of farmers also reported feeling that the decision-making process did not need to change, indicating either satisfaction or resignation with the current arrangements.

Supply chain connections are a central part of farmers' social capital. Nearly all farmers have regular contact with traders and collectors, who play a key role in buying coffee and setting prices. However, relationships with larger actors such as companies, large buyers, exporters, and certification bodies are far less common, leaving most farmers dependent on less powerful, more local contacts. When asked, no farmers reported being in contact with the government, highlighting a strong disconnect between farmers and state actors.

Access to markets is critical for income gains, but these markets are often controlled by gatekeepers such as government bodies, companies, and large buyers, who typically require OFG membership for participation. Some farmers found ways around these controls, such as stamp forgery, but this is not a sustainable or equitable solution. Many certified farmers still sell into non-certified channels, often because these routes offer easier, faster sales, or help them settle debts with traders, even when this means missing out on higher prices, indicating the price increase is not seen as significant.

Traders and companies are perceived as central to the control of pricing and market access in the local coffee sector. Many farmers feel frustrated by the power these actors hold, which can restrict both the price received and the ability to access markets. Some farmers access alternative routes for selling their coffee, such as direct sales of fine robusta to domestic café owners, which may offer access to assets such as higher prices and negotiation. However, these channels are often small scale, limited in reach, and highly dependent on the production of high-quality fine Robusta and individual relationships.

Overall, social capital outcomes are perceived as shaped by both the presence and quality of relationships, within groups, along the supply chain, and with gatekeeping actors, reinforcing both opportunities and persistent vulnerabilities. All these findings reflect only farmers' perceptions of the decision-making processes they directly experience.

Financial Capital Outcomes

Farmers' perceptions of financial capital outcomes point to persistent instability and vulnerability. Coffee farming remains the primary income source for most farmers in this study, and their incomes, while above the World Bank extreme poverty threshold, do not reach World Bank upper-middle-income levels. A clear majority of farmers perceive their incomes from coffee as having declined in recent years, which has created uncertainty about the long-term viability of coffee as a livelihood. This perception aligns with both interview and survey data, which highlight ongoing financial insecurity among farming households. It also supports the finding that farmers may be investing more in education for their children

and diversifying their incomes due to a growing perception that coffee production alone cannot deliver sustainable livelihoods.

At the same time, self-reported income data from this study suggest higher earnings than those found in previous research. Average annual incomes from coffee were reported at almost 35 million IDR, 69% higher than the lowest figure in earlier Lampung studies. On the surface, this appears to challenge the narrative of persistent financial vulnerability. However, several factors call this interpretation into question. Income figures were self-reported and may reflect short-term price fluctuations, recall bias, or the OFG-heavy sample, which could include farmers with better market connections than the wider population. Cultural factors may also have shaped the way farmers reported their incomes and yields, as respondents may have been inclined to present themselves as more successful or productive than they were. Moreover, the figures represent gross revenues, not net income after fertiliser, labour, debt repayments, and other costs. When these expenses are considered, financial security is likely to be much weaker than this income data suggests.

This tension becomes clearer when income is considered alongside structural constraints in farm size and physical capital. The average farm size in the study was 1.5 hectares, only 37% of the 4.06 hectares estimated to be necessary for farmers in Lampung to achieve minimum welfare standards (Aprildahani et al., 2023). Similarly, access to processing and drying facilities was limited, preventing many farmers from producing the quality required to enter higher-value markets. These constraints mean that, even if incomes appear comparatively high in one season, they may not be sustainable over the long term. In effect, the combination of small landholdings, limited physical assets, and reliance on volatile markets creates a fragile financial base: farmers may achieve reasonable earnings in the short run but remain highly exposed to shocks, price swings, and input costs. The apparent contradiction between reported incomes and broader asset constraints therefore underscores how vulnerability persists, even in households that seem relatively secure, and highlights the importance of structural barriers in shaping financial capital outcomes.

Price volatility continues to pose a significant risk. For each type of Robusta coffee, the highest prices are routinely double the lowest, indicating marked instability in the market. This volatility affects all market segments, including fine Robusta and certified coffee. Certification, which is intended to provide income premiums and market stability, often fails to deliver on these promises. Farmers widely described the financial incentive as small and inconsistent, with compliance procedures burdensome and time-consuming. Many certified farmers therefore bypassed certification channels, prioritising quicker and more flexible sales options that allowed them to access immediate cash or repay debts to traders. Farmers' choices reflect practical decision-making, where immediate cash and straightforward transactions are prioritised over small or uncertain certification premiums, highlighting a disconnect between the stated goals of certification and the realities of farmer experiences.

These practices carry wider implications. Certification in practice was often perceived less as a resilience tool than as a gatekeeping mechanism, accessible mainly to well-connected groups with the resources to comply and offering little benefit to others. The persistence of stamp forgery, which enables certified and non-certified coffee to be pooled to meet buyer quotas, further erodes system integrity and illustrates how exclusionary frameworks push farmers towards informal workarounds. Together, these dynamics suggest that certification may reinforce inequalities rather than reduce them, benefitting a minority while leaving most farmers unconvinced of its value. They also point to a need for interventions that

simplify requirements, strengthen incentives, and consider alternative quality-assurance mechanisms better aligned with farmer needs and priorities.

Access to credit remains fragmented and conditional. Formal credit for farm improvements was generally available only to OFG members, and even then often required formal documentation such as proof of registration, or business status. These requirements reinforced inequalities between members of recognised groups and independent farmers who lacked the necessary paperwork or institutional backing. Within OFGs, not all groups were equally able to meet these conditions, not all OFGs are registered or have business status. As a result, many farmers turned instead to informal loans from traders or family to meet daily needs. Such credit relationships were widely accessible but often came with the obligation to sell coffee to the lender, deepening dependency and reducing farmers' bargaining power, particularly when terms were unfavourable.

Overall, the outcomes for financial capital reflect a persistent sense of vulnerability and dependency, with many farmers feeling exposed to market fluctuations, limited access to reliable credit, and the ongoing challenge of securing a fair price for their coffee. The strategies adopted, such as seeking informal credit, stamp forgery, or relying on direct sales may provide short-term financial relief but rarely address the underlying structural constraints.

Physical Capital Outcomes

Physical capital is widely recognised by farmers as the weakest component of their asset base. Most lack adequate drying facilities and suffer from poor road access, with average farm sizes less than 40% of the minimum needed for basic household welfare. These limitations have a direct impact on productivity and quality, constraining the potential for farmers to benefit from price improvements or adopt higher-value market strategies. Regardless of other improvements, these physical constraints reduce the overall effectiveness of any strategy aimed at improving livelihoods. They also reinforce exclusion from premium markets, as farmers without adequate infrastructure are less able to meet quality standards. Farmers in remote areas face disadvantage, with poor road access raising transport costs and widening inequalities with better-connected producers. More broadly, the weakness of physical capital undermines the benefits of other assets: training or financial credit cannot translate into sustained improvements if farmers lack the infrastructure to apply new practices or process coffee to higher-value standards. These findings highlight the structural nature of physical constraints and the need for collective or cooperative investments in infrastructure, since individual farmers are unlikely to overcome these barriers alone.

The distribution of equipment and physical facilities is highly unequal. Government or private corporation investment in machinery and infrastructure is generally targeted toward high-performing or formally recognised OFGs, while independent farmers and less formal groups are largely excluded. This selective distribution not only reinforces existing cycles of exclusion but also means that investments in physical capital often fail to benefit the wider sector. Farmers outside of recognised OFGs are therefore less able to improve their productivity or access quality-sensitive markets, perpetuating inequalities.

Access to subsidised fertiliser is a major and persistent concern for most farmers in this study. Many believe that government priorities favour staple crops over coffee, and most were unaware that coffee had been formally removed from subsidy schemes. Even among

OFG members, access to subsidised fertiliser is often unreliable or insufficient, and recent regulatory changes have further worsened the situation for all farmers. This not only undermines farmers' capacity to maintain productivity but also erodes trust in both government policy and support mechanisms.

Technology has begun to offer new avenues for addressing some physical capital constraints. Farmers, particularly those engaged in fine Robusta production, are increasingly using social media platforms (such as WhatsApp, Instagram, and Facebook) to develop direct marketing channels. Fine and mixed Robusta farmers are increasingly using smart phones to access up to date pricing information. These digital tools have become essential for branding, sales, and reducing vulnerability to trader exploitation, especially where traditional infrastructure and support are lacking. While technology cannot substitute for core infrastructure, it has become an important supplement for farmers able to access and utilise these platforms.

In summary, outcomes related to physical capital are marked by entrenched disparities and ongoing barriers to improvement. The limited reach and unequal distribution of infrastructure investments, combined with persistent problems around fertiliser access, continue to restrict the effectiveness of other strategies and maintain cycles of vulnerability within the sector.

Natural Capital Outcomes

Farmer perceptions of natural capital outcomes reveal both recognition of environmental challenges and mixed views on the effectiveness of current strategies and benefit flows. Most farmers consider shade trees and mixed cropping as valuable and routinely practise them, seeing these strategies as beneficial for conserving soil and supporting crop health. There is a strong awareness of agroecological principles in the community, and these practices are understood as important for both current and future productivity.

However, farmers widely acknowledge that reliance on agrochemicals remains high, often viewing this as a necessity to sustain yields in the face of declining soil fertility and persistent pest pressure. There is a universal concern about soil degradation, with many farmers perceiving it as an unavoidable outcome of their current production systems. Some see mixed cropping and shade trees as ways to slow down land degradation, but most do not view them as complete solutions, especially given ongoing input constraints.

Reported yields are generally lagging behind the provincial average. Farmers attribute this not only to environmental factors such as poor soil and erratic weather, but also to practical barriers: lack of access to high-quality fertiliser and the inability to invest in more sustainable methods. These shortcomings are often viewed as external to the farm household, reflecting broader failings in input supply and sector support, rather than solely individual choices.

Climate risks are acutely felt, with erratic rainfall and input shortages compounding a sense of vulnerability. Farmers express that, even when they are concerned about conservation, they are often unable to invest in longer-term strategies (such as organic methods) because the immediate risks to income are too great. There is a perception that support for more sustainable approaches, whether from government, OFGs, or market actors, is insufficient to enable meaningful change at farm level.

Overall, farmers perceive the outcomes of their strategies for natural capital as partial and often inadequate, shaped and limited by the current flow of benefits, the constraints of input access, and a lack of broader sectoral support. While there is widespread concern for

environmental conservation, most feel unable to fully act on these concerns due to persistent economic and practical pressures.

In summary, farmers' perceptions of the outcomes of current strategies and benefit flows reflect both areas of progress and persistent challenges across all five capitals. While there is evidence of adaptation, innovation, and some gains in access, especially for those embedded in OFGs or niche markets, structural barriers, exclusion, and uneven asset distribution remain defining features of the landscape. Informal mechanisms and workaround strategies often fill gaps left by formal systems, yet they rarely address underlying vulnerabilities and can introduce new risks or dependencies. Trust in both formal and informal institutions is often tenuous, shaped by experiences of limited voice, policy shortcomings, and the need to continually negotiate access to resources and opportunities. Overall, the perceived outcomes described by farmers highlight the need for more inclusive, equitable, and responsive support systems if sustainable and resilient livelihoods are to be realised for all members of Lampung's coffee sector.

11.8 Conclusion: Discussion and key findings

This chapter has examined how farmers in Lampung perceive supply chains, vulnerabilities, access to assets, benefit flows, outcomes and the actors who mediate these processes. Across all themes, the findings show that access is rarely determined by need, but instead by institutional gatekeeping, market hierarchies, and social positioning. OFGs emerge as central to these dynamics: they enable access to training, equipment, certification, and markets, yet also serve as boundaries that exclude independent farmers. Formal systems of support and certification, while designed to strengthen livelihoods, are widely experienced as selective, conditional, and often poorly communicated. In parallel, informal systems such as trader credit, grafting networks, stamp forgery, and black-market fertiliser trade fill critical gaps but often reproduce dependency, vulnerability, and uneven outcomes.

Taken together, these perceptions highlight the persistence of structural inequalities across the coffee sector. Farmers report resilience through diversification, collective action, and peer learning, yet these strategies largely function as coping mechanisms rather than transformative solutions. Human and social capital are relatively strong, but financial and physical capital remain fragile, and natural capital is constrained by degraded soils, erratic climate, and limited institutional support. The gap between farmer-identified needs and institutional priorities, whether in climate adaptation, credit, or certification, reinforces distrust in external actors and underlines the limited voice farmers feel they have in shaping decisions. Access to benefits is therefore less about individual effort and more about proximity to power, networks, and recognition within institutional frameworks.

Several cross-cutting themes emerge within this research. Farmers' livelihoods are shaped by persistent vulnerabilities, such as climate risk, market volatility, and infrastructural gaps, that are compounded by uneven access to support systems and resources. These vulnerabilities rarely operate in isolation but intersect to amplify risk: climate variability reduces yields, which in turn heightens reliance on traders for credit at unfavourable terms, while weak infrastructure limits farmers' ability to time sales or access more lucrative markets. Asset identification and perceived benefits are highly context-dependent, with OFG membership, stakeholder relationships, and proximity to services consistently enabling or constraining access. OFG membership often functioned as a gateway to training, certification, and government resources, but membership alone did not guarantee inclusion, OFG hierarchies,

productivity levels, and group visibility shaped who benefitted most. Independent farmers remained structurally disadvantaged, yet even within groups experiences diverged, revealing that access is filtered through both formal affiliation and positionality within networks.

The flow of benefits from key assets is largely determined by institutional gatekeepers, especially the government and private sector actors, whose rules and priorities mediate farmers' ability to participate in high-value markets and resource distribution. Farmers frequently described these arrangements as selective, conditional, and poorly communicated, highlighting how external priorities often override farmer-identified needs. Certification, fertiliser distribution, and equipment programmes illustrate this dynamic: while designed to support productivity, they were perceived as mechanisms that reinforced dependency, encouraged informal workarounds such as stamp forgery or black-market fertiliser, and deepened mistrust in formal institutions. Taken together, these cross-cutting themes show that vulnerabilities, access, and gatekeeping are intertwined, creating a system in which adaptation depends less on farmer initiative than on navigating unequal power relations and institutional conditionality.

These findings underscore the need for more inclusive, transparent, and context-responsive approaches to supporting coffee farmers. Valuing and integrating farmer-led innovation, widening equitable access beyond OFG membership, and addressing the asymmetries of trader credit and certification are essential if support systems are to foster resilience rather than reproduce dependency. By focusing on farmer perceptions, this chapter has demonstrated how inequalities are embedded in both formal and informal arrangements, shaping who can adapt, who is excluded, and how benefits and risks are distributed.

This research has directly addressed all five research questions, linking each to farmers' lived experiences and the mechanisms shaping access, vulnerability, and outcomes. It has also gone beyond these questions by revealing how institutional and informal systems, such as trust networks, stamp forgery, and trader credit, shape who benefits and who does not; how structural inequalities persist across the sector; and how relationships between farmers and institutions influence adaptation and resilience within Lampung's coffee livelihoods.

12 Final Considerations and reflections.

In this final chapter, I reflect on the overall contribution of the research, the strengths and limitations of the study, and the lessons learned through the process of conducting fieldwork in Lampung. It also considers what I would do differently if the study were to be repeated, identifies areas for future research, and reflects on the broader implications of the findings.

It is first useful to revisit the research questions that guided the study and summarise how each was addressed through the findings. Together, these questions formed the foundation of the inquiry and helped to structure the analysis presented in the previous chapters.

How do smallholder coffee farmers in Lampung perceive and experience access to livelihood assets, benefit flows, and vulnerability, and what do these perspectives reveal about the roles and relationships of key stakeholders in shaping equitable outcomes?

This overarching question was addressed by showing how farmers perceive their access to livelihood assets and understand the ways in which access to benefits is shaped by institutional gatekeeping, market hierarchies, and social positioning, with OFGs acting as channels within these systems and informal mechanisms filling the gaps left by formal structures.

The following outlines how each sub-question was addressed through the findings:

What vulnerabilities and benefit-flow mechanisms shape the livelihoods of coffee farmers in Lampung, and how do farmers understand and interpret these conditions?

Findings identified intersecting vulnerabilities, including climate variability, market volatility, and weak infrastructure, combined with conditional access to credit and inputs, shaping how farmers experience and interpret risk.

How do farmers in Lampung identify and describe the key livelihood assets available to them, and what benefits do they perceive these assets provide?

Farmers viewed human and social capital as their strongest foundations, while financial, physical, and natural capitals remained fragile due to dependence on external resources and environmental decline.

How do farmers in Lampung understand the flow of benefits from key livelihood assets and which actors do they perceive as controlling access to these benefits?

Benefit flows were found to be shaped by institutional gatekeepers, particularly government agencies, traders, and private corporations, with OFGs facilitating rather than controlling access.

What are farmers' experiences of the livelihood strategies they use to gain access to assets and control over the flow of benefit?

Farmers employed a range of livelihood strategies, including diversification, trader finance, grafting networks, and informal workarounds, to navigate exclusionary formal systems; these provided short-term stability but often reinforced dependency.

What are the perceived outcomes of the strategies and current flow of benefit systems in Lampung?

Outcomes were uneven: while farmers strengthened their knowledge, relationships, and cooperation, material and environmental conditions remained constrained, sustaining inequalities within the sector.

As the data was collected and analysed, it became clear that adhering too rigidly to these questions would have constrained the richness of the material. The interviews, surveys, and observations generated insights that extended beyond the original framing and revealed new patterns and dynamics that could not be neatly contained within the predefined questions. For this reason, while the research questions guided and anchored the study, the presentation of the findings also adopted a broader interpretive approach. This not only ensured that farmers' voices and perspectives were not reduced to overly narrow categories but also emphasised the contribution of the research: it both answered the initial questions and extended beyond them to highlight wider processes and dynamics within the coffee sector.

Framework contributions and boundaries.

By bringing the SLF together with the ToA the study developed a new merged framework that enabled a richer and more dynamic analysis than either approach could achieve alone. This combination made it possible to view assets such as supply chain connections, training, and knowledge not simply as static "assets", but simultaneously as strategies for securing access and as mechanisms of exclusion or inclusion. The ToA allowed a deeper analysis of relationships as mechanisms and strategies, providing insight into the impacts of formal and informal ties. Such layering demonstrates how assets are experienced unevenly, and how power relations, rules, and connections determine who can derive benefit. This integrated framework represents a key contribution of the thesis and offers a tool that could be further applied in other smallholder and commodity chain contexts.

The merger of the two frameworks moves the analysis beyond a focus on access to assets towards a sharper understanding of whether and how farmers can derive benefits from those assets. For example, fertiliser subsidies may exist as a resource, but benefit is mediated by eligibility rules, group membership, and local enforcement. The framework also draws attention to who and what controls the flow of benefits, whether through institutions, regulations, or interpersonal relationships. Another contribution lies in its ability to integrate perceptions with structural conditions: rather than treating survey responses as isolated indicators, the merged framework situates them within broader mechanisms of power and access. This provides a way of making sense of diverse and sometimes contradictory perspectives, showing how they are grounded in uneven opportunities and constraints.

This framework could be usefully applied in other commodity chain studies, especially those concerned with how farmers navigate certification schemes, government interventions, or sustainability programmes. It also offers potential for adaptation to non-agricultural contexts where livelihoods depend on layered relationships with markets, state actors, and intermediaries, for example, fisheries or forestry. In comparative work, it could help identify common mechanisms that cut across commodities while still recognising local variation in assets and outcomes.

Despite its strengths, the merged framework also has boundaries. It is less well equipped to capture the temporal dynamics of change, such as how benefit flows evolve across harvest seasons or how mechanisms shift in response to new policies and market fluctuations. For example, relationships with traders may provide favourable terms during periods of high demand but weaken when international prices fall.

The framework is also not designed to predict future outcomes. It can explain why some farmers access and benefit from assets while others are excluded, but it cannot forecast how these patterns would change under new conditions. For instance, it shows how OFG

membership currently shapes access to subsidised fertiliser, but it cannot model how this access would alter if subsidy policies were withdrawn or expanded. Finally, while the framework highlights mechanisms of exclusion, it does not provide an evaluation of fairness. It can identify who is excluded and how, but whether this is fair or unfair requires interpretive judgement. For example, it explains how certification enables some farmers to reach higher-paying buyers while others are restricted to local traders, but it cannot conclude whether this outcome should be considered fair.

Strengths

A major strength of this study lies in its ability to centre farmer perspectives on access and outcomes. Much of the research on coffee supply chains has focused on structural dynamics, institutional arrangements, and the perspectives of buyers and lead firms, with limited engagement with how farmers themselves perceive or experience these systems (as discussed in the literature review). By contrast, this research focuses the views of farmers themselves, providing insight into how they perceive opportunity, and constraint within their livelihoods. This shift in focus gives visibility to dimensions of experience that are often overlooked in more top-down approaches.

Another strength is the use of a mixed-methods design. Semi-structured interviews provided depth, allowing farmers to explain their experiences and meanings in their own words, while the survey generated comparable trends across a broader sample. The combination of methods captured individual experiences while also highlighting broader trends, making it possible to connect farmers' voices to wider patterns without losing the detail of lived experience.

The use of radar charts also added value to the analysis. By aggregating survey indicators into five capital categories, the charts allowed complex, multi-dimensional findings to be visualised in a way that was clear and accessible. They provided a comparative view across the five capitals, helping to identify imbalances and overlaps that might otherwise remain hidden in text or tables.

The study further benefitted from careful ethical preparation and attention to process. This included obtaining informed consent, protecting confidentiality, and ensuring data storage complied with ethical requirements. Particular care was given to translation and interpretation, with training for enumerators and an emphasis on maintaining participants' original phrasing. Triangulation with secondary sources, such as policy documents and existing research, strengthened the validity of the findings and situated farmers' perspectives within a wider context.

Limitations

Like any study, this research has boundaries shaping how findings should be read. A central limitation is reliance on self-reported data, particularly incomes, yields, and prices. These figures are vital for understanding livelihoods but prone to recall error and social desirability bias. The survey focused on coffee-related earnings and diversification within that sector, without systematically recording other household income sources such as remittances, wage labour, or non-farm enterprises. Consequently, the analysis may not capture the full livelihood picture. Self-reporting was unavoidable, so results should be viewed as perceptions rather than precise accounts.

Translation also presented challenges. Despite training enumerators and emphasising accurate phrasing, moving between languages carries risks of meaning being lost or altered.

Nuances in local terminology, especially around concepts such as fairness or negotiation, may not have been fully conveyed. Although these risks were mitigated by team discussions some interpretation inevitably entered the data.

The sample composition also presents limitations. Fieldwork through OFGs over-represented their members, while independent farmers were less visible. Although many participants had farmed independently before joining groups, current independents remained under-represented. Farmers in the fine Robusta sector were similarly less visible, reflecting its smaller scale compared to mixed Robusta. Their perspectives highlighted emerging trends but cannot be generalised to the wider farmer population. Only two domestic fine Robusta café owners were interviewed, and while they offered valuable insights into quality in niche markets, they represent too narrow a segment to reflect the wider supply chain.

Finally, while radar charts provided a clear and accessible way of comparing capitals, they inevitably compressed variation. Aggregating multiple indicators into a single percentage score made broad patterns visible but masked differences within each category. For example, social capital appeared strong overall, yet this obscured the contrast between very high rates of group meeting attendance and lower levels of perceived ability to negotiate with buyers. The charts should therefore be read as visual summaries rather than detailed representations of farmers' circumstances.

Reflexivity

If repeated, the research should prioritise strengthening income and yield data by triangulating self-reports with external checks. Receipts, weigh-scales, or buyer records could supplement self-reports, offering firmer measures for interpreting data and enhancing credibility. Collecting such records was impractical: farmers and traders often did not keep them, or they existed only as scattered notes, with digital systems rare and records rarely linked to individual names. In addition, stamp forgery raised doubts about the reliability of available paper records.

Future sampling could also be expanded to deliberately include more independent farmers and those living in more remote areas. While many participants had past experience as independents and were able to reflect on the differences, the research was shaped by access through OFG networks. This was a practical entry point but created an unavoidable bias towards group members. A more balanced sample would have captured a wider spectrum of farmer perspectives, especially those who remain outside organised structures.

Securing more interviews with institutional actors would also have strengthened the research. Farmer perspectives revealed much about access and constraints, but the voices of buyers, certifiers, and government officials were less fully captured. Including these groups more systematically would have allowed stronger triangulation between farmer accounts and the perspectives of those shaping standards, policies, and purchasing practices.

Research in this setting relied on other researchers and local leaders to contact participants, translators to bridge language, and enumerators for surveys. These intermediaries shaped what was possible, who participated, and how responses were expressed. Their support enabled fieldwork but also inevitably influenced participation and discussion.

The presence of a foreign researcher influenced participants. Some appeared cautious about expressing criticism, while others seemed to expect I could improve their situation or provide

resources. This may have amplified narratives emphasising hardship or requests for support. Acknowledging this influence is essential when interpreting the data.

Taken together, these dynamics mean the findings should be read as situated accounts, shaped not only by farmers' lived realities but also by the research process itself. Acknowledging this does not undermine the value of the study but rather strengthens it by making transparent the ways in which knowledge was co-produced between farmers, intermediaries, and the researcher.

Future research directions

The study opens several pathways for further inquiry. One important direction would be longitudinal work that follows the same households across multiple seasons. This would allow researchers to track how incomes, diversification strategies, and perceptions of risk shift over time, and would provide a stronger sense of how benefit flows and vulnerabilities change in response to price fluctuations, policy adjustments, or environmental pressures.

This research shows that farmers' relationships with traders, group leaders, buyers, and extension workers shape access and exclusion. Future studies could apply social network analysis to make these patterns more explicit. Mapping ties between farmers and other actors would provide a systematic picture of asset and market access. Such analysis would complement perception-based data by identifying key hubs, points of connection, and areas of marginality. It would also highlight informal networks outside formal memberships that remain central to daily livelihood practices.

Comparative studies would also enrich understanding. Examining Robusta farmers in other parts of Indonesia, or comparing across different household groups within Lampung, could highlight how inequalities of wealth, gender, or geography shape access. Such comparisons would help distinguish which patterns are specific to this case and which may reflect broader dynamics in coffee production and smallholder livelihoods.

Finally, the merged SLF and ToA framework developed in this study has potential beyond this research. Applying and refining it in other smallholder contexts, whether in coffee, cocoa, fisheries, or forestry, would test its adaptability and usefulness as a broader analytical tool. This would also help assess how well it captures access and benefit flows across different commodity chains and policy environments.

Practical implications

While the focus of this research has been academic, several practical and policy-relevant insights emerge. These findings highlight where interventions could be better designed to support smallholder farmers in Lampung and beyond.

First, interventions that are channelled through OFGs can risk reinforcing inequalities. While OFGs provide valuable training, resources, and connections, they do not reach all farmers equally. Independent farmers, or those unable to meet requirements, are often excluded from these benefits. This suggests that any future policy or programme delivered through OFGs should include explicit mechanisms to widen access, ensuring that support does not bypass farmers outside organised structures or within less formal structures.

Second, farmers consistently pointed to infrastructure as a central bottleneck for improving production and market access. Poor road conditions and the limited availability of drying facilities were repeatedly highlighted as constraints. Investment in these areas would have a

direct impact on farmers' ability to produce and sell coffee more efficiently, reduce post-harvest losses, and reach markets. Addressing infrastructure gaps is therefore likely to yield tangible improvements in livelihoods.

Finally, certification schemes and new market opportunities are valued by many farmers, but their benefits are uneven. For these initiatives to have broader impact, they must be accompanied by investment in building trust and ensuring equitable access. Without this, certification risks benefitting only a subset of farmers, often those already well connected, while leaving others behind. Creating more transparent procedures, strengthening communication, and reducing reliance on group-based gatekeeping would increase the inclusivity of such schemes.

Closing reflection

This research has shown that understanding smallholder livelihoods requires looking not only at the assets that farmers hold but also at the mechanisms and relationships that determine how those assets are used. Assets on their own do not guarantee benefits. It is the rules, institutions, and relationships that shape whether farmers can convert access into real advantages. By combining these insights, the study highlights the importance of examining livelihoods as dynamic systems, where access and exclusion are constantly negotiated.

The integration of the SLF with the ToA has been central to this achievement. On its own, the SLF risks presenting livelihoods as inventories of capitals, while the ToA reveals mechanisms but can be less systematic in categorising assets and outcomes. Together, these frameworks provided a more comprehensive lens, allowing the study to capture both the resources farmers depend on and the power relations that govern their use. In placing farmer perceptions at the centre, the framework also ensured that lived experiences were not overshadowed by structural analysis.

A key contribution of this research is therefore the foregrounding of farmer voices. Rather than treating farmers as passive recipients of policy or market forces, the study shows how they actively interpret livelihood conditions, identify constraints, and make sense of the actors and processes shaping access. This reveals not only what structures exist, but how they are perceived and experienced on the ground, including informal mechanisms such as trust, negotiation, and everyday relationships that often remain invisible in formal accounts.

While the research is bounded by the limitations already noted, it makes important contributions. It has demonstrated that access to assets and ability to derive benefit are unevenly structured, and that these inequalities are embedded in both formal institutions and informal practices. Crucially, it also shows that these structures are not experienced uniformly; farmers interpret, negotiate, and respond to them in different ways depending on their position, relationships, and lived realities. By drawing attention to these patterns, the study provides insights that can inform both research and policy.

This thesis contributes to the field in several broader ways. It adds to research on coffee livelihoods by bringing farmers' own perceptions to the centre of analysis in Lampung's Robusta sector, an area where these perspectives have been underrepresented. It also contributes conceptually by showing the value of combining the Sustainable Livelihoods Framework with the Theory of Access single integrated analytical approach that links assets, strategies, outcomes, and the mechanisms of access and relationships that shape them.

Empirically, the study shows that livelihoods are shaped not only through official programmes, certifications, and market structures, but also through trust, informal exchanges, and everyday negotiations that are often less visible in more formal accounts.

More broadly, the research offers an approach that can be adapted to other smallholder contexts where questions of equity, access, and benefit distribution are central. By grounding the analysis in farmers' own perspectives, the study demonstrates the importance of interpretive and flexible approaches for understanding how livelihood systems operate in practice.

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14 Appendix

14.1 Appendix 1 – All interview guides

Producer semi structured interview guide.

Date _____ Identifying number P/ _____

Organisation and relationships in the supply chain.

P1 Decision making/ P3 Empowerment/ P4 Connections

O2 Environmental Outcomes/ O2 Economic Outcomes/ O3 Social Outcomes.

(Forms, spaces and levels of power. Organisation of the supply chain. Relationships between stakeholders. Access and mechanisms.)

1. How long have you worked in coffee? Do you enjoy working in coffee? How did you begin your career in coffee?
2. What do you know about history of coffee in Indonesia?
3. Is Indonesia's coffee heritage is important to you? And other Indonesians? (family history)
4. What does coffee mean to you? What impact does it have on your life?

5. Robusta SUPPLY CHAIN

Can you tell me about the roles of the people in this supply chain and if anyone is missing?

- The relationships between the different stakeholders
- Who makes the decision about coffee production? (who has the most influence over decisions)
- Views on price differences at the different stages of the supply chain

6. What recent major changes have been made in the supply chain that have affected farmers? (quality standards, prices, certification requirements)

Follow up questions:

- a. What do you know about how these changes were developed/decided?
- b. Who was involved in the development?
- c. Where were the decisions made?
- d. Do you feel you had enough involvement in these decisions?

Vulnerability context

The current situation and the factors that make the community vulnerable to poor livelihood standards.

7. What do you think about the condition of the coffee industry at the moment?

Follow up questions:

- a. What challenges do you think people in coffee production face? (trade, environmental factors, poverty/prices,)
- b. What do you think about the regulations in coffee production? (Domestic and international)
- c. What do you think about the role of certifications in coffee?
- d. Do you think young people will want to work in coffee production? (why or why not)

8. What do you think needs to happen to improve the issues highlighted?

Human Capital.

P2 Resources/ P3 Empowerment/ P4 Connections

O3 Social Outcomes.

(A focus on the resources available to people within the coffee industry and how useful the resources are. Knowledge transfer and relationships. May also link to empowerment)

9. Can you tell me about any training or support you have had from the VSS/ Government or any other source?

Prompts:

- a. What was it?
- b. Who attends? Who doesn't attend?
- c. Was it useful? How or why not?
- d. Did it have any impact if so how? if so how? if not why not? (barriers)
- e. How do you think training and support can be improved?

what training and support would you like?
How would you ask/request new training?

Physical Capital.

P1 Decision making/ P2 Resources /P3 Connections

O2 Economic Outcomes/ O3 Social Outcomes

(A focus on infrastructure in the community, what is the current condition and what needs improving. Indications of who and how are decisions made regarding investments)

10. What resources do farmers need to make coffee farming more sustainable? (equipment, fertiliser, good beans etc)

- How do farmers get access to these things?
- Who decides whether they get access?

Social Capital.

P1 Decision making/ P3 Empowerment/ P4 Connections

O3 Social Outcomes

(Participation in decision making, arenas of decision making. Empowerment and relationships)

11. The coffee supply chain who listens to you?

- Where do you feel listened to? *(what spaces exist, are there any independent groups)*
- Where do you feel you're not listened to?
- How would you like this to change?

Natural Capital

P1 Decision making/ P2 Resources/ P3 Empowerment/P3 Connections

O1 Environmental outcomes/ Economic Outcomes/

(A focus on environmental impact, knowledge and values. How decisions are made and access to mechanisms)

12. What made you decide on the farming methods you use?

Prompts:

- Training
- Costs
- Regulations/ standards/ inspections
- Access to resources (equipment/agrochemicals)
- Being certified

13. What impact do your chosen methods have on the environment/Natural resources?

14. Are there any changes you would like to see in the future to protect the environment/natural resources?

Financial Capital

P1 Decision making/ P3 Empowerment/ P4 Connections

O2 Economic Outcomes/ O3 Social Outcomes.

(A focus on decision making, relationships, factors influencing decisions)

15. How do you feel about the prices you achieve for your coffee?

Additional questions:

- a. If you weren't happy with a price what would you do?
- b. What factors determine the price? (quality/level of processing/certification etc)
- c. Do prices vary depending on who and where you trade?

16. What do you think needs to change to improve the coffee industry?

17. What needs to change to help farmers?

Trader/buyer/roaster/ OFG leader interview guide

Date _____ Identifying number TB/ _____

Organisation and relationships in the supply chain.

P1 Decision making/ P3 Empowerment/ P4 Connections

O1 Environmental Outcomes/ O2 Economic Outcomes/ O3 Social Outcomes.

(Forms, spaces and levels of power. Organisation of the supply chain. Relationships between stakeholders. Access and mechanisms.)

1. How long have you worked in coffee? Do you enjoy working in coffee? How did you begin your career in coffee?
2. What do you know about history of coffee in Indonesia?
3. Is Indonesia's coffee heritage is important to you? And other Indonesians?
4. What does coffee it mean to you? What impact does it have on your life?

5. Robusta SUPPLY CHAIN

Can you tell me about the roles of the people in this supply chain and if anyone is missing?

- The relationships between the different stakeholders
- Who makes the decision about coffee production? (who has the most influence over decisions)
- Views on price differences at the different stages of the supply chain

6. What recent major changes have been made in the supply chain that have affected farmers?

Follow up questions:

- e. What do you know about how these changes were developed/decided?
- f. Who was involved in the development?
- g. Where were the decisions made?
- h. Do you feel you had enough involvement in these decisions?

Vulnerability context

The current situation and the factors that make the community vulnerable to poor livelihood standards.

7. What do you think about the condition of the coffee industry now?

Follow up questions:

- e. What challenges do you think people in coffee production face? (trade, environmental factors, poverty/prices,)
- f. What do you think about the regulations in coffee production? (Domestic and international)
- g. What do you think about the role of certifications in coffee?
- h. Do you think young people will want to work in coffee production? (why or why not)

8. What do you think needs to happen to improve the issues highlighted?

Human Capital.

P2 Resources/ P3 Empowerment/ P4 Connections

O3 Social Outcomes.

(A focus on the resources available to people within the coffee industry and how useful the resources are. Knowledge transfer and relationships. May also link to empowerment)

9. Can you tell me about any training or support that is available? for you/farmers/other stakeholders

Follow up questions:

- a. What was it?
- b. Who provides it? (certification, government, other)
- c. Who attends? Who doesn't attend?
- d. Did it have any impact if so how? if so how? if not why not? (barriers)
- e. How do you think training and support can be improved?

what training and support would you like?

How would you ask/request new training?

Physical Capital.

P1 Decision making/ P2 Resources /P3 Connections

O2 Economic Outcomes/ O3 Social Outcomes

(A focus on infrastructure in the community, what is the current condition and what needs improving. Indications of who and how are decisions made regarding investments)

10. What resources to you think are the most important for a coffee farmer? (equipment, fertiliser, good beans etc)

- How do farmers get access to these things?
- Who decides whether they get access?

Social Capital.

P1 Decision making/ P3 Empowerment/ P4 Connections

O3 Social Outcomes

(Participation in decision making, arenas of decision making. Empowerment and relationships)

11. The coffee supply chain who listens to you?

- Where do you feel listened to? *(what spaces exist, are there any independent groups)*
- Where do you feel you're not listened to?
- How would you like this to change?

Natural Capital

P1 Decision making/ P2 Resources/ P3 Empowerment/P3 Connections

O1 Environmental outcomes/ Economic Outcomes/

(A focus on environmental impact, knowledge and values. How decisions are made and access to mechanisms)

12. What impact do you think farming methods have on the environment/Natural resources?

13. What do you think influences farmers choices to use the farming practices?

Prompts:

- a. Training
- b. Costs
- c. Regulations/ standards/ inspections
- d. Access to resources (equipment/agrochemicals)
- e. Being certified

14. Are there any changes you would like to see in the future to protect the natural resources?

Financial Capital

P1 Decision making/ P3 Empowerment/ P4 Connections

O2 Economic Outcomes/ O3 Social Outcomes.

(A focus on decision making, relationships, factors influencing decisions)

15. Do you think anything needs to change to improve incomes for people working in coffee?

Why do you think this hasn't happened?

16. Since you started working in coffee:

- a. How has the industry developed in this time?
- b. Has the domestic market for coffee changed in this period?
- c. What do you feel /think about coffee?

Organisation

P1 Decision making/ P2 Resources/ P4 Connections

O1 Environmental Outcomes/ O2 Economic Outcomes/ O3 Social Outcomes

(A focus on the impacts on the group structure/functioning and also outcomes)

17. (If certified) What affect has the certification had on you/ your group?

(If NOT certified) What affect do you think certification would have on you/ your group?

Prompts:

- a. Connections with stakeholders (farmers, other cooperatives, NGOs, government etc)
- b. Negotiation of prices/terms
- c. How the cooperative is organised
- d. Members- involvement/ number of members
- e. Sales
- f. Regulations
- g. Access to equipment/markets

Government Interview guide

1. Would you mind explaining the role of your department/organisation and your role within that?
 - a. How long have you worked in coffee?

Organisation and relationships in the supply chain.

2. **SUPPLY CHAIN** Can you tell me about the roles of the people in this supply chain and if anyone is missing?
 - The relationships between the different stakeholders
 - How would you describe your departments relationships with other members of the coffee industry?
 - Who makes the decision about coffee production? (who has the most influence over decisions)
3. Do you think anything should change in this supply chain?
4. What are the most significant changes in coffee growing that have affected farmers? (quality standards, prices, certification requirements)
Follow up questions:
 - i. What do you know about how these changes were developed/decided?
 - j. Who was involved in the development?
 - k. Where were the decisions made?
 - l. Do you feel you had enough involvement in these decisions?

Vulnerability context

5. What do you think about the condition of the coffee industry **at the moment**?
Follow up questions:
 - i. What challenges do you think people in coffee production face? (*trade, environmental factors, poverty/prices,*)
 - j. What do you think about the regulations in coffee production? (*Domestic and international*)
 - k. What do you think about the role of certifications in coffee?
 - l. Do you think young people will want to work in coffee production? (*why or why not*)
6. What do you think needs to happen to improve the issues highlighted?
7. What do you think are the threats to the coffee industry in the future?

Human Capital. (Policy development)

A focus on the resources available to people within the coffee industry and how useful the resources are. Empowerment? Knowledge transfer, relationships.

8. Can you tell me about any support available for people working in coffee? (from your department/organisation)
Follow up questions:

- m. What was it?
- n. Who attends? Who doesn't attend?
- o. Did it have any impact if so how? if so how? if not why not? (barriers)
- p. How do you think training and support can be improved?

9. Can you tell me about any development projects have been implemented Lampung?

Prompts

- Environmental
- Social
- Recreation
- Other

10. What type of development projects do you think this community needs?

Physical Capital.

A focus on infrastructure in the community, what is the current condition and what needs improving.

11. What resources and infrastructure do farmers need to make coffee farming more sustainable? (equipment, fertiliser, good beans, roads, water supply etc)

- How do farmers get access to these things?
- Who decides whether they get access?

Social Capital.

Participation in decision making, arenas of decision making. Empowerment.

12. How are decisions made in your department/organisation regarding the coffee industry? (for example funding allocations, resources and training etc)

Who is involved? Where it takes place? Who is NOT involved?

Natural Capital

Focus on environmental impact, knowledge and values.

13. What impact do you feel coffee farming has on the environment/Natural resources?

- a. What do you think influences farmers choices to use more sustainable farming practices?

14. Are there any changes you would like to see in the future to protect the environment/natural resources?

Financial Capital

A focus on incomes and living conditions.

**15. What do you think about the incomes achieved from coffee?
What changes do you think are needed for the future?**

14.2 Appendix 2- All surveys

Farmer survey

Produsen/Petani

Identitas respondent nomor P/ _____

Data Umum

1. Lokasi/Provinsi/desa: *Location, province/village* _____

2. Umur: *Age* Tahun

3. Jenis Kelamin *Gender*: L/P

4. Status *Marriage status*: a. Menikah *Marrred* b. Tanpa status pernikahan
without marrital status c. Belum menikah *Never married*

5. Jumlah tanggungan keluarga (anak):

No of children

6. Jumlah anggota keluarga yang tinggal di rumah:

No of people living at home

7. Apakah Bapak/Ibu adalah anggota Koperasi, KUBE, kelompok
tani/hutan/kelompok lainnya?

Are you a member of a group?

Jika IYA, sebutkan nama kelompoknya

The name of the group

Jenis grup apa itu? (kelompok tani/KUBE. koperasi
dll).....

The type of group (KUBE cooperative, farmer group etc)

8. Bapak/ibu tahu tentang sertifikasi?

Do you know about certifications?

9. Apakah usaha kopi Bapak/Ibu sudah tersertifikasi (missal Fairtrade, Rainforest
alliance. 4C)

Do you have any certifications?

10. Tingkat Pendidikan

Education

a. Tidak bersekolah *None*

b. SD *(age 5-11)*

c. SMP *(age 13-15)*

d. SMA *(age 15-18)*

e. Technical degree/ diploma

Jenis gelarnya

.....

When did you start growing coffee

Why did you start growing coffee?

How long have you/your family been farming this land?

Do you drink coffee?

What do you feel/think about coffee?

What type if coffee do you grow?

_____ %

_____ Kg

Rp/kg

18. Apakah Bpk/Ibu memiliki penghasilan lain di luar dari usaha tanaman kopi?

Do you have any other sources of income?

Jika IYA, dari usaha apa saja

If yes what is it?

19. Berapa Jarak dari lokasi ini ke pedagang/KUBE/koperasi

Km

Distance from KUBE /cooperative/ trader

Social

20. Apakah Bpk/Ibu menghadiri jika ada acara yang diadakan oleh masyarakat sekitar? (misalnya rapat desa, rapat sekolah, acara keagamaan)

In your community do you attend any events or gatherings? (e.g. village meetings, school meetings, religious events)

Pertemuan mana yang telah Anda hadiri?

Which ones have you attended?

21. Apakah masyarakat disini memiliki:

Does your community have

a. Sekolah Dasar Primary school	b. SMP/SMA Secondary school	c. Fasilitas pendidikan lainnya Other education facility _____
d. Pusat Kesehatan Medical centre	e. Lapangan/Fasilitas olahraga Sports field/ facilities	f. Lembaga Desa A community council

22. Infrastruktur apa yang dibutuhkan oleh petani kopi? (misal persediaan air, akses jalan yang baik, dll)

What infrastructure do you think the people in coffee production need ? (e.g. better water supply, better roads etc)

22.a Siapa yang memutuskan apakah infrastruktur ini diperbaiki?

Who decides whether this infrastructure is improved?

22.b Menurut Anda mengapa infrastruktur ini belum diperbaiki?

Why do you think this infrastructure hasn't been improved?

23. Apakah Bpk/Ibu memiliki kontak dengan industri kopi? (misalnya petani lain / pemimpin kelompok / sertifikasi / pedagang / pembeli / perusahaan / eksportir)

Who do you have contact with in the coffee industry? (e.g. Other farmers/ group leaders/ certification/ traders/ buyers/ companies/ exporters)

24. Bagaimana cara Bpk/Ibu berhubungan dengan pihak dari industri kopi?

How do you contact other people in the coffee industry?

- 25. Apa alasan utama yang membuat Bpk/Ibu mengontak atau menghubungi pihak dari industry kopi?**

What are the main reasons for contacting other people in the coffee industry?

- 26. Apakah Bpk/Ibu berfikir telah memiliki hubungan baik dengan semua pihak dari industry kopi yang diutuhkan? (dilingkari)**

Do you feel you have contact with all the people you need to in the coffee industry? (please circle)

a. Ya	b. Tidak

Jika tidak, siapa yang ingin atau belum dihubungi/dikontak?

If no, who would you like to be in contact with?

- 27. Pertemuan atau rapat apa yang pernah dihadiri dengan pihak dari industri kopi?**

What types of meetings have you attended with people in the coffee industry?

a. Rapat dengan koperasi KUBE	b. Rapat tentang sertifikasi Certification meetings Dari pihak mana? Which one?	c. Rapat Desa Village meetings
d. Rapat dengan Instansi Pemerintah Government meetings	e. Rapat dengan NGO meetings	f. Kelompok tani Farmer groups
g. Other		

- 28. Pada rapat atau pertemuan denga pihak industry kopi, apakah Bpk/Ibu memberikan/mengemukakan pendapat?**

At meetings with other people in the coffee industry do you share your opinions?

- 29. Apakah Bpk/Ibu berpikir bahwa pendapat Bpk/Ibu penting bagi orang lain di industry kopi?**

Do you think your opinions are valued by people in the coffee industry?

- 30. Apakah Bpk/Ibu merasa dilibatkan dalam pengambilan keputusan yang dibuat oleh pihak industry kopi?** *Do you feel involved in decisions that are made in the coffee industry?*

- 31. Apakah Bpk/Ibu mau untuk dilibatkan dalam proses pengambilan keputusan di indutsri kopi?**

Would you like to be involved more in decision making in the coffee industry?

- 32. Siapa yang membuat keputusan dalam industri kopi?**

Who makes the decisions in the coffee industry?

32a Menurut Anda siapa yang harus mengambil keputusan dalam industri kopi?

Who do you think should make the decisions in the coffee industry?

32.b Bagaimana keputusan dibuat? (suara, pertemuan pribadi, pertemuan komunitas dll)

How are decisions made? (votes, private meetings, community meetings etc)

32c Apakah menurut Anda cara keputusan dibuat harus berubah?
Do you think the way decisions are made should change?

Jika ya, bagaimana seharusnya itu berubah?
If yes, how should it change?

Economi Economic

33. Apa mata pencaharian utama di keluarga anda?
What is the main sources of income in your household?

34. Menurut pendapat anda, penghasilan dari kopi lebih dari 5 tahun ini:
Over the last 5 years would you say your income from coffee has

c. Meningkat <i>Increased</i>	d. Menurun <i>Decreased</i>	e. Sama saja <i>Stayed the same</i>

35. Apa pengeluaran terbesar dalam keluarga?
What are your largest household costs?

36. Bagaimana cara anda menjual kopi?
How do you sell your coffee?

37. Bagaimana cara anda menegosiasikan harga?
Do you negotiate the price?

38. Apakah anda berpikir harga yang anda dapat sudah cukup tinggi?
Do you think you get a fair price?

39. Berapa luas kebun yang anda miliki? _____ Hectares
Size of your farm

40. Dari luas kebun yang dimiliki, berapa hektar yang ditanami kopi? _____
Hectares/%
How much is used for coffee?

41. Berapa luas kebun yang ditanami tanaman lain? _____ Hectares/%
How much is used for other crops?

42. Berapa luas kebun yang dipergunakan untuk kandang ternak? _____
Hectares/%
How much is used for livestock?

43. Apakah lahan pertanian milik sendiri atau sewa?
Do you own or rent your farm?

44. Apakah anda ingin memiliki lahan sendiri?
Would You like to own your land?

f. Ya	g. Tidak

45. a. Jenis kopi apa yang anda jual?
What kind of coffee do you sell?

a. asalan (campuran) <i>Mixed</i>	b. petik merah (halus, ceri merah) <i>Fine, red cherry</i>	c. lainnya _____ <i>Other</i>

b Jenis pemrosesan apa yang Anda lakukan?

What kind of processing do you do?

a. Diproses kering <i>Dry processed</i>	b. Semi-dicuci <i>Semi washed</i>	c. Dicuci sepenuhnya <i>Fully washed</i>
d. Madu diproses <i>Honey processed</i>	e. Fermentasi <i>fermented</i>	f. Lainnya <i>Other</i>

46. Siapa yang memanen kopi?

Who picks the coffee?

47. Apakah anda punya akses untuk menggunakan: *What resources do you have access to:*

a. Pabrik Pengolahan <i>(Processing mill)</i>	b. Fasilitas pengeringan <i>(Drying facilities)</i>	c. Peralatan Panen <i>(Harvest equipment)</i> Alat pane napa yang digunakan? <i>What equipment do you use? _</i>
d. Mesin pertanian <i>(Farm machinery)</i> Mesin apa yang digunakan <i>(What machinery to you use?)</i>		e. Lainnya: <i>Other</i>

48. Sumber daya apalagi yang ingin anda bisa akses?

What additional resources would you like access to?

49. Bagaimana cara anda mengukur kualitas kopi?

How do you measure the quality of your coffee?

50. Jika anda ingin mengembangkan perkebunan anda, darimana anda akan mendapatkan bantuan dana ?

If you wanted to make improvements to your farm where can you get financial help?

51. Menurut pendapat anda, apa ancaman utama dari usaha perkebunan kopi?

What do you think are the main threats to the coffee industry?

Lingkungan Environment

52. Jenis usaha kebun kopi yang dijalankan saat ini: *Which farming practices do you use for coffee?*

a. Kopi matahari/ tanpa naungan <i>(Sun coffee)</i>	b. Tanaman naungan <i>(Shade trees)</i> Jenis Pohon naungan <i>Which type of shade tree?</i>	c. Tanaman campuran <i>Mixed crops</i> Tanaman apa lagi? <i>Which other crops?</i>	d. Agroforestri	e. Kebun kopi <i>(Garden coffee)</i>
f. Menggunakan pupuk kimia <i>Agrochemicals</i> Apa saja <i>Which ones</i>		g. Organik metode Apa saja <i>Which ones?</i>		h. Lainnya <i>Other</i>

53. Mengapa memilih sistem/metode tersebut?

Why did you choose these farming methods?

54. Apakah ada keinginan untuk mengubah sistem/metode tersebut?

Would you like to change the farming methods you use?

h. Ya	i. Tidak

Jelaskan, mengapa?

Why?

55. Sejak Anda mulai, bagaimana hal-hal berubah dalam cara Anda menanam kopi?

Since you started how have things changed in way you grow coffee?

56. Apakah anda menanam kopi di Kawasan yang dilindungi/dalam Kawasan?

Is your coffee grown in a protected area/nature reserve?

57. Apakah menurut anda pelestarian lingkungan itu penting?

Do you think environmental conservation is important?

58. Apa isu lingkungan yang paling mempengaruhi usaha kopi saat ini?

What are the main environmental issues you think affects coffee now?

59. Apa masalah lingkungan utama yang menurut Anda akan memengaruhi kopi di masa yang akan datang?

What are the main environmental issues to you think will affect coffee in the future?

60. Apakah anda pernah mengikuti pelatihan tentang produksikopi?

Have you attended any training focusing on coffee production?

Jika Iya, kapan pelatihan tersebut diadakan?

If yes, when was the training?

Apa judul pelatihannya?

What was the training title?

61. Siapa yang melaksanakan pelatihan tersebut?

Who provided the training?

62. Apakah ada perubahan yang dilakukan pada usaha kopi setelah mengikuti pelatihan?

Did you change any practices after the training?

j. Ya Perubahan apa saja <i>What did you change?</i>	k. Tidak Mengapa tidak?..... <i>Why not?</i>

Coffee in Indonesia

63. Menurut Anda, apa pendapat orang Indonesia tentang kopi/apa arti kopi bagi orang Indonesia?

What do you think Indonesians think of coffee /what does coffee mean to Indonesians?

64. Siapa yang minum kopi di Indonesia?

Who drinks coffee in Indonesia?

65. Bagaimana minum kopi di Indonesia berubah?

How has coffee drinking in Indonesia changed?

66. Apakah orang Indonesia minum kopi Anda?

Do Indonesians drink your coffee?

Trader and Roaster survey

Survei pedagang/pembeli/roaster

Identitas respondent nomor TR/ _____ Tanggal:
Data dasar.

1. Lokasi/Provinsi/Desa: *Location province/village* _____

2. Umur: *Age* _____ Tahun

3. Jenis Kelamin: *Gender* L/P

4. Marital Status: a. Menikah *Married* b. Tanpa status pernikahan *No marital status*
c. Belum menikah *Not married*

5. Jumlah tanggungan keluarga (anak):

No of children

6. Jumlah anggota keluarga yang tinggal di rumah:

No of people living at home

7. Tingkat Pendidikan

Education

a. Tidak bersekolah *None*

b. SD (*age 5-11*)

c. SMP (*age 13-15*)

d. SMA (*age 15-18*)

e. Technical degree/ diploma

Jenis gelarnya

.....

8. Sudah berapa lama Anda bekerja di industri kopi?

How long have you worked in the coffee industry?

9. Beli kopinya dimana? (langsung dari peternakan/pasar/lainnya)

Where do you buy your coffee? (directly from farms/ markets/ other)

10. Apakah Anda membeli kopi Anda dari daerah / provinsi lain?
mana lagi?

Do you buy Your coffee from other regions/provinces?

Jika ya, provinsi

If yes, which other provinces?

11. Berapa banyak petani yang berdagang dengan Anda?

How many farmers do you trade with?

12. Kira-kira berapa banyak kopi yang Anda beli/perdagangkan per tahun?

Approximately how much coffee do you buy/trade per year?

Robusta

Sertifikat Certified Kg Speciality/fine _____ Kg asalan/ Tidak bersertifikat

Mixed non- certified.....kg

Arabica

Sertifikat _____ Kg speciality/fine _____ Kg asalan/ Tidak bersertifikat kg

Jenis lainnya

_____ Kg

13. Di mana Anda menjual kopi?

Where do you sell the coffee ?

14. Kepada siapa Anda menjual kopi?

Who do you sell the coffee to?

15. Berapa harga rata-rata yang Anda bayar per Kg kopi?

What are the average prices you pay per Kg of coffee?

Robusta

Sertifikat _____ Rp/Kg Speciality/fine _____ Rp/Kg asalan/ Tidak bersertifikat
.....Rp/Kg

Arabica

Sertifikat _____ Rp/Kg speciality/fine _____ Rp/Kg asalan/Tidak bersertifikat
..... Rp/Kg

Jenis lainnya

_____ Rp/Kg

16. Sebelum menjual kopi apakah anda mengolah kopi tersebut dengan cara apapun? (termasuk pemanggangan)

Before selling the coffee do you process the coffee in any way? (including roasting)

17. Berapa harga rata-rata yang Anda capai dengan menjual satu Kg kopi?

What are the average prices you achieve selling a Kg of coffee ?

Robusta

Sertifikat _____ Rp/Kg Speciality/fine _____ Rp/Kg asalan/ Tidak bersertifikat
.....Rp/Kg

Arabica

Sertifikat _____ Rp/Kg speciality/fine _____ Rp/Kg asalan/ Tidak bersertifikat
Rp/Kg

Jenis lainnya

_____ Rp/Kg

18. Apakah Anda memiliki sumber pendapatan/pekerjaan lain? Jika demikian, apakah mereka?

Do you have any other sources of income/employment? If so, what are they?

Sosial Social

19. Infrastruktur apa yang dibutuhkan oleh petani kopi? (misal persediaan air, akses jalan yang baik, dll)

What infrastructure do you think the people in coffee production need ? (e.g. better water supply, better roads etc)

19.a Siapa yang memutuskan apakah infrastruktur ini diperbaiki?

Who decides whether this infrastructure is improved?

19.b Menurut Anda mengapa infrastruktur ini belum diperbaiki?

Why do you think this infrastructure hasn't been improved?

20. Apakah Bpk/Ibu memiliki kontak dengan industri kopi? (misalnya petani lain / pemimpin kelompok / sertifikasi / pedagang / pembeli / perusahaan / eksportir)

Who do you have contact with in the coffee industry? (e.g. Other farmers/ group leaders/ certification/ traders/ buyers/ companies/ exporters)

21. Bagaimana cara Bpk/Ibu berhubungan dengan pihak dari industri kopi?

How do you contact other people in the coffee industry?

22. Apa alasan utama yang membuat Bpk/Ibu mengontak atau menghubungi pihak dari industri kopi?

What are the main reasons for contacting other people in the coffee industry?

23. Apakah Bpk/Ibu berfikir telah memiliki hubungan baik dengan semua pihak dari industri kopi yang diutuhkan? (dilingkari)

Do you feel you have contact with all the people you need to in the coffee industry? (please circle)

f. Ya	g. Tidak

Jika tidak, siapa yang ingin atau belum dihubungi/dikontak?

If no, who would you like to be in contact with?

24. Pertemuan atau rapat apa yang pernah dihadiri dengan pihak dari industri kopi?

What types of meetings have you attended with people in the coffee industry?

h. Rapat dengan koperasi KUBE	i. Rapat tentang sertifikasi Certification meetings Dari pihak mana? Which one?	j. Rapat Desa Village meetings
k. Rapat dengan Instansi Pemerintah Government meetings	l. Rapat dengan NGO meetings	m. Kelompok tani Farmer groups
n. Other		

25. Pada rapat atau pertemuan dengan pihak industri kopi, apakah Bpk/Ibu memberikan/mengemukakan pendapat?

At meetings with other people in the coffee industry do you share your opinions?

26. Apakah Bpk/Ibu berpikir bahwa pendapat Bpk/Ibu penting bagi orang lain di industri kopi?

Do you think your opinions are valued by people in the coffee industry?

27. Apakah Bpk/Ibu merasa dilibatkan dalam pengambilan keputusan yang dibuat oleh pihak industri kopi? *Do you feel involved in decisions that are made in the coffee industry?*

28. Apakah Bpk/Ibu mau untuk dilibatkan dalam proses pengambilan keputusan di industri kopi?
Would you like to be involved more in decision making in the coffee industry?

29. Siapa yang membuat keputusan dalam industri kopi?
Who makes the decisions in the coffee industry?

29a Menurut Anda siapa yang harus mengambil keputusan dalam industri kopi?
Who do you think should make the decisions in the coffee industry?

29.b Bagaimana keputusan dibuat? (suara, pertemuan pribadi, pertemuan komunitas dll)
How are decisions made? (votes, private meetings, community meetings etc)

29c Apakah menurut Anda cara keputusan dibuat harus berubah?
Do you think the way decisions are made should change?

Jika ya, bagaimana seharusnya itu berubah?
If yes, how should it change?

Ekonomis Economic

30. Apa yang penting ketika memilih petani untuk berdagang?
What is important when choosing a farmer to trade with?

31. Bagaimana Anda menegosiasikan harga yang Anda beli kopi?
How do you negotiate the price you buy coffee?

32. Apakah menurut Anda harganya adil?
Do you think the price is fair?

33. Bagaimana Anda mengukur kualitas kopi yang Anda beli?
How do you measure the quality of the coffee you buy?

34. Sumber daya apa yang dapat diakses petani Anda:
What resources do your farmers have access to?

f. Pabrik Pengolahan (Processing mill)	g. Fasilitas pengeringan (Drying facilities)	h. Peralatan Panen (Harvest equipment) Alat panen apa yang digunakan? <i>What equipment do you use? _</i>
i. Mesin pertanian (Farm machinery) Mesin apa yang digunakan (What machinery to you use?)		j. Lainnya: <i>Other</i>

35. A Jenis kopi apa yang Anda beli?

What type of coffee do you buy?

d. asalan (campuran) <i>Mixed</i>	e. petik merah (halus, ceri merah) <i>Fine, red cherry</i>	f. lainnya _____ <i>Other</i>

b Bagaimana kopi diproses?

How is the coffee processed?

g. Diproses kering <i>Dry processed</i>	h. Semi-dicuci <i>Semi washed</i>	i. Dicuci sepenuhnya <i>Fully washed</i>
j. Madu diproses <i>Honey processed</i>	k. Fermentasi <i>fermented</i>	l. Lainnya <i>Other</i>

36. Menurut Anda apa ancaman utama bagi industri kopi?

What do you think are the main threats to the coffee industry?

Lingkungan Environment

37. Praktik pertanian apa yang dilakukan petani yang Anda beli dari penggunaan?

Which farming practices to the farmers you buy from use?

i. Kopi matahari/ tanpa naungan <i>(Sun coffee)</i>	j. Tanaman naungan <i>(Shade trees)</i> Jenis Pohon naungan <i>Which type of shade tree?</i>	k. Tanaman campuran <i>Mixed crops</i> Tanaman apa lagi? <i>Which other crops?</i>	l. Agroforestri	m. Kebun kopi <i>(Garden coffee)</i>
n. Menggunakan pupuk kimia <i>Agrochemicals</i> Apa saja <i>Which ones</i>		o. Organik metode Apa saja <i>Which ones?</i>		p. Lainnya <i>Other</i>

38. Siapa yang memutuskan metode pertanian apa yang digunakan petani? (agroforestri , agrokimia, organik dll)

Who decides what farming methods the farmers use? (agroforestry, agrochemicals, organic etc)

39. Apakah metode pertanian yang digunakan penting bagi Anda?

Are the farming methods used important to you?

Mengapa? Mengapa tidak?

why? Why not?

40. Apakah menurut anda pelestarian lingkungan itu penting?

Do you think environmental conservation is important?

41. Apa isu lingkungan yang paling mempengaruhi usaha kopi saat ini?

What are the main environmental issues you think affects coffee now?

42. Apa masalah lingkungan utama yang menurut Anda akan memengaruhi kopi di masa yang akan datang?

What are the main environmental issues to you think will affect coffee in the future?

43. Apakah anda pernah mengikuti pelatihan tentang produksikopi?

Have you attended any training focusing on coffee production?

Jika Iya, kapan pelatihan tersebut diadakan?

If yes, when was the training?

Apa judul pelatihannya?

What was the training title?

44. Siapa yang melaksanakan pelatihan tersebut?

Who provided the training?

Coffee in Indonesia

45. Menurut Anda, apa pendapat orang Indonesia tentang kopi/apa arti kopi bagi orang Indonesia?

What do you think Indonesians think of coffee /what does coffee mean to Indonesians?

46. Siapa yang minum kopi di Indonesia?

Who drinks coffee in Indonesia?

47. Bagaimana minum kopi di Indonesia berubah?

How has coffee drinking in Indonesia changed?

48. Apakah orang Indonesia minum kopi Anda?

Do Indonesians drink your coffee?

Cooperate/KUBE Farmer group leader Survey

Survei pimpinan Koperasi/KUBE.

Identitas respondent nomor CK/ _____

Data dasar

1. Lokasi/Provinsi/Desa: *Location Province/village* _____
2. Umur: *Age* Tahun
3. Jenis Kelamin: *Gender* L/P
4. Marital Status: a. Menikah *Married* b. Tanpa status pernikahan
 No marital status c. Belum menikah *Not married*
5. Jumlah tanggungan keluarga (anak):
No of children
6. Jumlah anggota keluarga yang tinggal di rumah:
No of people living at home
7. Tingkat Pendidikan
Education
 - h. Tidak bersekolah *None*
 - i. SD (*age 5-11*)
 - j. SMP (*age 13-15*)
 - k. SMA (*age 15-18*)
 - l. Technical degree/ diploma Jenis gelarnya
.....

8. Sudah berapa lama Anda bekerja di industri kopi?

How long have you worked in the coffee industry?

9. Apakah Anda memiliki sumber pendapatan/pekerjaan lain? Jika demikian, apakah mereka?

Do you have any other sources of income/employment? If so, what are they?

Data grup

10. Berapa jumlah anggota KUBE?

Number of members

11. Berapa jumlah anggota perempuan

Number of women members

12. Bapak/ibu tahu tentang sertifikasi?

Do you know about certifications?

13. Apakah usaha kopi Bapak/Ibu sudah tersertifikasi (misal Fairtrade, Rainforest alliance. 4C)

Do you have any certifications?

Dari pihak mana?

If yes which ones?

Sudah berapa lama Anda berafiliasi dengan skema sertifikasi?

How long have you been affiliated with the certification scheme?

14. Kapan kelompok Anda dibentuk?

When was your group formed?

15. Mengapa kelompok Anda didirikan?

Why was your group founded?

16. Bagaimana kelompok Anda dibentuk?

How was your group formed?

17. Bagaimana grup berubah sejak dibuat? (*organisasi, struktur, dll*)

How has the group changed since it was developed? (organisation, structure etc)

18. Apakah anggota berubah? (nomor / lokasi / jenis kelamin dll)

Have members changed? (numbers, locations, gender etc)

19. Apa arti kopi bagi Anda/anggota Anda?

What does coffee mean to you/your members?

20. Apakah Anda/anggota Anda minum kopi ?

Do you/your members drink coffee

apakah mereka sudah mencoba kopi mereka sendiri?

have they tried their own coffee?

21. Jenis kopi apa yang dihasilkan anggota Anda?

What type of coffee do your members produce?

Robusta

Sertifikat _____% Speciality/fine _____% asalan/ Tidak bersertifikat
.....%

Arabica

Sertifikat _____% Speciality/fine _____% asalan /Tidak bersertifikat%

Jenis lainnya

_____ %

22. Di mana Anda menjual kopi?

Where do you sell the coffee ?

23. Kepada siapa Anda menjual kopi?

Who do you sell the coffee to?

24. Berapa banyak kopi yang dijual grup Anda dalam setahun? (Kg)

How much coffee do your group sell in a year?

Robusta

Sertifikat *Certified* ____ kg Speciality/fine _____ kg asalan/ Tidak bersertifikat
Mixed Non-certified.....kg

Arabica

Sertifikat ____ kg Speciality/fine _____ kg asalan/ Tidak bersertifikat kg

Jenis lainnya

_____ kg

25. Beli kopi berapa?

How much do you buy coffee for?

Robusta

Sertifikat ____ Rp/kg Speciality/fine _____ Rp/Kg asalan/ Tidak bersertifikat
.....Rp/kg

Arabica

Sertifikat ____ Rp/kg Speciality/fine _____ Rp/kg asalan/ Tidak bersertifikat

.....Rp/kg

Jenis lainnya.

_____ Rp/kg

26. Sebelum menjual kopi apakah anda mengolah kopi tersebut dengan cara apapun?

Before selling the coffee do you process the coffee in any way?

27. Berapa harga kopi yang Anda jual?

How much do you sell coffee for?

Robusta

Sertifikat ____ Rp/kg Speciality/fine _____ Rp/Kg asalan/ Tidak bersertifikat
.....Rp/kg

Arabica

Sertifikat ____ Rp/kg Speciality/fine _____ Rp/kg asalan/ Tidak bersertifikat

.....Rp/kg

Jenis lainnya

_____ Rp/kg

Sosial Sosial

28. Apakah Bpk/Ibu menghadiri jika ada acara yang diadakan oleh masyarakat sekitar? (misalnya rapat desa, rapat sekolah, acara keagamaan)

In your community do you attend any events or gatherings? (e.g. village meetings, school meetings, religious events)

Pertemuan mana yang telah Anda hadiri?

Which ones have you attended?

29. Apakah masyarakat disini memiliki:

Does your community have

g. Sekolah Dasar Primary school	h. SMP/SMA Secondary school	i. Fasilitas pendidikan lainnya Other education facility

j. Pusat Kesehatan Medical centre	k. Lapangan/Fasilitas olahraga Sports field/ facilities	l. Lembaga Desa A community council

30. Infrastruktur apa yang dibutuhkan oleh petani kopi? (misal persediaan air, akses jalan yang baik, dll)

What infrastructure do you think the people in coffee production need ? (e.g. better water supply, better roads etc)

30.a Siapa yang memutuskan apakah infrastruktur ini diperbaiki?

Who decides whether this infrastructure is improved?

30.b Menurut Anda mengapa infrastruktur ini belum diperbaiki?

Why do you think this infrastructure hasn't been improved?

31. Apakah Bpk/Ibu memiliki kontak dengan industri kopi? (misalnya petani lain / pemimpin kelompok / sertifikasi / pedagang / pembeli / perusahaan / eksportir)

Who do you have contact with in the coffee industry? (e.g. Other farmers/ group leaders/ certification/ traders/ buyers/ companies/ exporters)

32. Bagaimana cara Bpk/Ibu berhubungan dengan pihak dari industri kopi?

How do you contact other people in the coffee industry?

33. Apa alasan utama yang membuat Bpk/Ibu mengontak atau menghubungi pihak dari industry kopi?

What are the main reasons for contacting other people in the coffee industry?

34. Apakah Bpk/Ibu berfikir telah memiliki hubungan baik dengan semua pihak dari industry kopi yang diutuhkan? (dilingkari)

Do you feel you have contact with all the people you need to in the coffee industry? (please circle)

a. Ya	b. Tidak

Jika tidak, siapa yang ingin atau belum dihubungi/dikontak?

If no, who would you like to be in contact with?

35. Pertemuan atau rapat apa yang pernah dihadiri dengan pihak dari industri kopi?

What types of meetings have you attended with people in the coffee industry?

o. Rapat dengan koperasi KUBE	p. Rapat tentang sertifikasi <i>Certification meetings</i> Dari pihak mana? Which one?	q. Rapat Desa <i>Village meetings</i>
r. Rapat dengan Instansi Pemerintah <i>Government meetings</i>	s. Rapat dengan NGO meetings	t. Kelompok tani <i>Farmer groups</i>
u. Other		

36. Pada rapat atau pertemuan dengan pihak industri kopi, apakah Bpk/Ibu memberikan/mengemukakan pendapat?

At meetings with other people in the coffee industry do you share your opinions?

37. Apakah Bpk/Ibu berpikir bahwa pendapat Bpk/Ibu penting bagi orang lain di industri kopi?

Do you think your opinions are valued by people in the coffee industry?

38. Apakah Bpk/Ibu merasa dilibatkan dalam pengambilan keputusan yang dibuat oleh pihak industri kopi? *Do you feel involved in decisions that are made in the coffee industry?*

39. Apakah Bpk/Ibu mau untuk dilibatkan dalam proses pengambilan keputusan di industri kopi?

Would you like to be involved more in decision making in the coffee industry?

40. Siapa yang membuat keputusan dalam industri kopi?

Who makes the decisions in the coffee industry?

40a Menurut Anda siapa yang harus mengambil keputusan dalam industri kopi?

Who do you think should make the decisions in the coffee industry?

40.b Bagaimana keputusan dibuat? (suara, pertemuan pribadi, pertemuan komunitas dll)

How are decisions made? (votes, private meetings, community meetings etc)

40c Apakah menurut Anda cara keputusan dibuat harus berubah?

Do you think the way decisions are made should change?

Jika ya, bagaimana seharusnya itu berubah?

If yes, how should it change?

Ekonomis Economic

41. Bagaimana Anda menegosiasikan harga yang Anda beli kopi?

How do you negotiate the price you buy coffee?

42. Apakah menurut Anda harganya adil?

Do you think the price is fair?

43. Sumber daya apa yang dapat diakses petani Anda:

What resources do your farmers have access to?

k. Pabrik Pengolahan <i>(Processing mill)</i>	l. Fasilitas pengeringan <i>(Drying facilities)</i>	m. Peralatan Panen <i>(Harvest equipment)</i> Alat pane napa yang digunakan? <i>What equipment do you use? _</i>
n. Mesin pertanian <i>(Farm machinery)</i> Mesin apa yang digunakan <i>(What machinery to you use?)</i>		o. Lainnya: <i>Other</i>

44. **a** Jenis kopi apa yang dihasilkan anggota Anda?

What kind of coffee do your members produce?

g. asalan (campuran)	h. petik merah (halus, ceri merah)	i. lainnya _____

b Jenis pemrosesan apa yang mereka lakukan?

What kind of processing do they do?

m. Diproses kering <i>Dry processed</i>	n. Semi-dicuci <i>Semi washed</i>	o. Dicuci sepenuhnya <i>Fully washed</i>
p. Madu diproses <i>Honey processed</i>	q. Fermentasi <i>fermented</i>	r. Lainnya <i>Other</i>

45. Siapa yang memilih kopi?

Who picks the coffee

46. Bagaimana cara mengukur kualitas kopi?

How do you measure the quality of the coffee?

47. Menurut Anda apa ancaman utama bagi industri kopi?

What do you think are the main threats to the coffee industry?

Lingkungan Environment

48. Praktik pertanian apa yang digunakan petani dalam kelompok Anda?

Which farming practices do your farmers in your group use?

q. Kopi matahari/ tanpa naungan <i>(Sun coffee)</i>	r. Tanaman naungan <i>(Shade trees)</i> Jenis Pohon naungan <i>Which type of shade tree?</i>	s. Tanaman campuran <i>Mixed crops</i> Tanaman apa lagi? <i>Which other crops?</i>	t. Agroforestri	u. Kebun kopi <i>(Garden coffee)</i>
v. Menggunakan pupuk kimia <i>Agrochemicals</i> Apa saja <i>Which ones</i>		w. Organik metode Apa saja <i>Which ones?</i>		x. Lainnya <i>Other</i>

49. Siapa yang memutuskan metode pertanian apa yang digunakan oleh anggota Anda?
Who decides what farming methods are used by your members?

50. Apakah metode pertanian yang digunakan penting bagi Anda?
Are the farming methods important to you?
Mengapa? Mengapa tidak?
Why? Why not?

51. Apakah menurut Anda pelestarian lingkungan itu penting?
Do you think environmental conservation is important?

52. Apa masalah lingkungan utama yang menurut Anda memengaruhi kopi sekarang?
What are the main environmental issues you think affects coffee now?

53. Apa masalah lingkungan utama yang menurut Anda akan memengaruhi kopi di masa depan?
What are the main environmental issues to you think will affect coffee in the future?

54. Apakah Anda pernah mengikuti pelatihan yang berfokus pada produksi kopi?
Have you attended any training focusing on coffee production?

Jika Iya, kapan pelatihan tersebut diadakan?
If yes, when was the training?

Apa judul pelatihannya?
What was the training title?

Siapa yang melaksanakan pelatihan tersebut?
Who provided the training?

Coffee in Indonesia

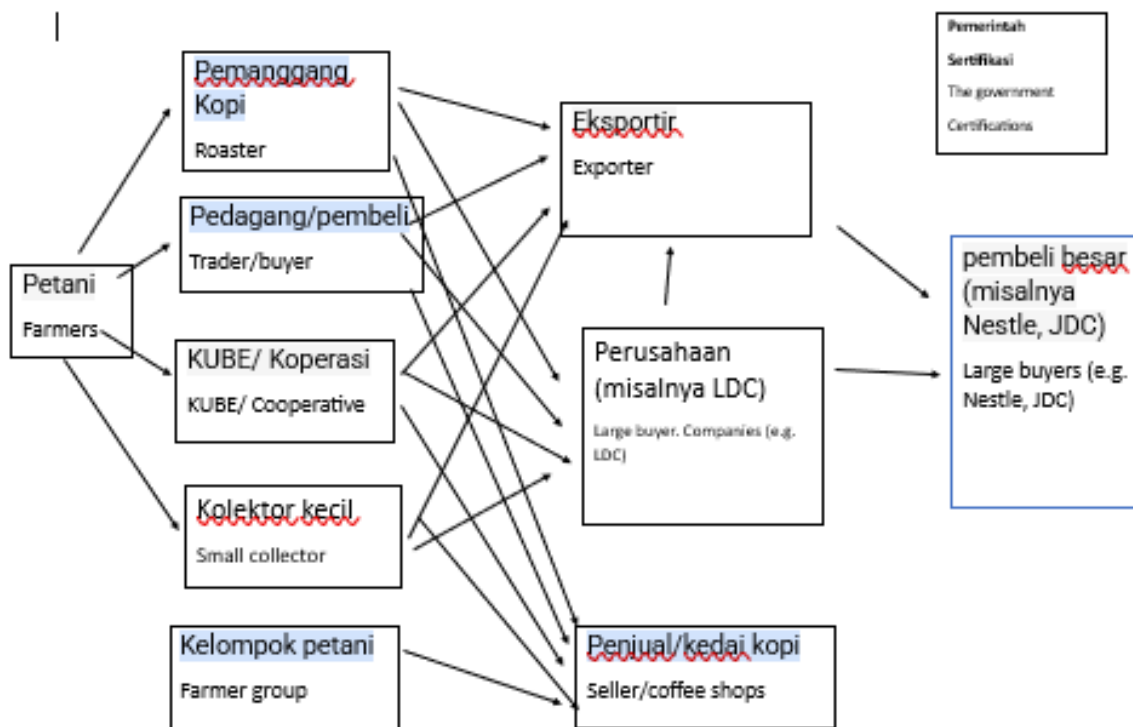
55. Menurut Anda, apa pendapat orang Indonesia tentang kopi/apa arti kopi bagi orang Indonesia?
What do you think Indonesians think of coffee /what does coffee mean to Indonesians?

56. Siapa yang minum kopi di Indonesia?
Who drinks coffee in Indonesia?

57. Bagaimana minum kopi di Indonesia berubah?
How has coffee drinking in Indonesia changed?

58. Apakah orang Indonesia minum kopi Anda?
Do Indonesians drink your coffee?

14.3 Appendix 3 Coffee supply chain prompt



14.4 Appendix 4 Key changes following pilot study

- Village location details were included in the survey to provide clearer geographic context.
- The supply chain discussion prompt was adapted to include companies such as LDC, large buyers like Nestlé and Douwe Egberts, and small collectors, reflecting stakeholders identified during observations and early interviews.
- Some compound questions were split into two (e.g. separating “name of OFG” and “type of group”), and questions ending with “why?” were divided to ensure both the factual response and the reasoning were captured.
- “Non-certified” category was merged with *Asalan* (mixed coffee) due to their similarity, to avoid redundancy and improve consistency.
- Simple infrastructure questions were moved to the survey (for open responses) while interviews concentrated on more detailed exploration of resource access, mechanisms, and barriers.
- Additional survey questions were added to clarify and gain additional detail on perceptions of decision-making processes.
- Survey questions on farming methods were reorganised to clearly distinguish types of organic practices and to include mixed-crop farming.
- Questions that previously elicited yes/no answers were adapted to encourage more detailed responses.
- Interview questions were reoriented to focus more explicitly on resource access, mechanisms of inclusion/exclusion, and where farmer voices are heard or not heard.
- The interview schedules were significantly shortened and refined to allow the semi-structured nature of the interviews to flow more naturally, reduce repetition with the survey, and create space for adaptive discussion tailored to respondents.

14.5 Appendix 5 Consent form 1

Bahasa Indonesia Version

Lampiran 2

Contoh *Informed Consent*



Ini adalah pemberitahuan resmi oleh Caroline Dunn dari University of Hertfordshire sehubungan dengan penelitian yang melibatkan peserta manusia.

Judul studi: Membangun ketahanan di seluruh rantai pasokan kopi.

Nomor Protokol: cLMS/PGR/UH/05165

Komite Persetujuan:

Komite Etika Kesehatan, Sains, Teknik, dan Teknologi Universitas Hertfordshire dengan Otoritas yang Didelegasikan

Jika Anda memiliki pertanyaan tentang dokumen ini, silakan hubungi saya Caroline Dunn c.dunn2@herts.ac.uk atau supervisor saya Jonathan Morris j.2.morris@herts.ac.uk

Membangun ketahanan di seluruh rantai pasokan kopi.

Saya Caroline Dunn dari The University of Hertfordshire yang sedang melakukan penelitian yang bertujuan untuk menyelidiki hubungan dalam rantai pasokan kopi bersertifikat dan tidak bersertifikat. Dalam penelitian ini kami akan meminta 100 responden untuk menyelesaikan survei dan mewawancarai 40 responden yang dipilih melalui rekomendasi oleh anggota rantai pasokan atau karena peran mereka dalam industri kopi. Anda dipilih sebagai responden dalam penelitian ini.

Saya menjamin bahwa setiap informasi yang Anda kirimkan akan dijaga kerahasiaannya. Nama Anda atau informasi apa pun yang mungkin mengidentifikasi Anda dalam laporan studi tidak akan digunakan.

Wawancara akan memakan waktu sekitar 40 menit.

Survei akan memakan waktu sekitar 15-20 menit.

Partisipasi Anda sepenuhnya bersifat sukarela. Anda berhak untuk menarik partisipasi Anda kapan saja, atau menolak untuk menjawab beberapa pertanyaan. Jika Anda memiliki pertanyaan mengenai penelitian ini, jangan ragu untuk bertanya kepada peneliti yang melakukan wawancara.

Jika Anda memiliki pertanyaan tentang penelitian ini di kemudian hari, Anda dapat menghubungi koordinator penelitian:

Nama koordinator penelitian : Caroline Dunn

Alamat kantor: Universitas Herfordshire College Lane Hatfield Herts AL10 9AB

Nomor telepon/Fax : +447708943879

Email : c.dunn2@herts.ac.uk

Tambahan pertanyaan atau keluhan/keberatan terhadap hak Anda sebagai responden dalam penelitian ini dapat diajukan kepada Komite Etik Penelitian IPS dan Humaniora, Badan Litbang Nasional:

Ketua Komite Etik Ilmu Sosial dan Humaniora

Gedung BJ Habibie

Jl. M.H. Thamrin No.8, Jakarta Pusat

Website: <http://klirensetik.brin.go.id>

Email : klirensetik@brin.go.id

* Bila wawancara memerlukan rekaman, dan atau pengambilan gambar/foto harus mendapatkan izin dari responden

** Pilih sesuai dengan metode pengumpulan data yang digunakan

The informed consent must be submitted in Bahasa Indonesia version. The English version only serves as guidance.



This is an official notification by Caroline Dunn of the University of Hertfordshire in respect of a study involving human participants.

Title of study: Building resilience throughout the coffee supply chain.

Protocol Number: cLMS/PGR/UH/05165

Approving Committee:

The University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

If you have any queries concerning this document, please contact me Caroline Dunn c.dunn2@herts.ac.uk or my supervisor Jonathan Morris j.2.morris@herts.ac.uk

Building resilience throughout the coffee supply chain.

I am Caroline Dunn from The University of Hertfordshire who is conducting a study that aims to investigate relationships in certified and non-certified coffee supply chains. In this study we will ask 100 respondents to complete a survey and interview 40 respondents that are selected through recommendations by members of the supply chain or due to their role in the coffee industry. You are selected as a respondent in this study.

The interview will take about 40 minutes.

The survey will take about 15-20 minutes.

I guarantee that any information you submit will be kept confidential. Your name or any information that might identify you in the study report will not be used.

Your participation is completely voluntary. You have the right to withdraw your participation at any time, or to refuse to answer some of the questions. If you have any questions regarding this study, please do not hesitate to ask the researcher who conduct the interview.

If you have any questions regarding this study at a later date, you may contact the research coordinator:

Name of research coordinator: Caroline Dunn

Office Address :University of Herfordshire
College Lane
Hatfield
Herts
AL10 9AB

Phone number/Fax : +447708943879

E-mail : c.dunn2@herts.ac.uk

Additional questions or complaints/objections against your rights as a respondent in this study can be submitted to the Research Ethics Committee on Social Studies and Humanities, National Research and Innovation Agency:

Chief of Ethics Committee on Social Studies and Humanities

B.J. Habibie Building

Jl. M.H. Thamrin No.8, Jakarta Pusat

Website: <http://klirensetik.brin.go.id>

E-mail : klirensetik@brin.go.id

* Permission from the respondent is necessary if the interview requires recording and/or taking pictures/photos

** Choose according to the data collection method used

14.6 Appendix 6 Consent form 2 UH

UNIVERSITAS HERTFORDSHIRE
KOMITE ETIKA UNTUK STUDI YANG MELIBATKAN PENGGUNAAN PESERTA MANUSIA
(‘KOMITE ETIKA’)
BENTUK EC3
FORMULIR PERSETUJUAN UNTUK STUDI YANG MELIBATKAN PESERTA MANUSIA

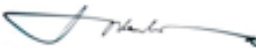
Saya, yang bertanda tangan di bawah ini [sebutkan nama Anda di sini], dengan **HURUF BLOK**

SOETANTO ABDOELLAH.....
dari [berikan detail kontak di sini, cukup untuk memungkinkan penyelidik menghubungi Anda, seperti alamat pos atau email]

Jl. Pajajaran IX/E-38 Jember 68122, Indonesia, email soetanto938@gmail.com.....
dengan ini setuju untuk mengambil bagian dalam penelitian yang berjudul **Membangun ketahanan di seluruh rantai pasok kopi**.

Nomor Protokol UH eLMS/PCR/UH/05165
Silahkan centang

- ☐ Saya menegaskan bahwa saya telah diberi Lembar Informasi Peserta (salinan yang dilampirkan pada formulir ini) yang memberikan keterangan tentang penelitian ini, termasuk tujuan, metode dan rancangannya, nama dan rincian kontak orang-orang kunci dan, sebagai sesuai, risiko dan manfaat potensial, bagaimana informasi yang dikumpulkan akan disimpan dan untuk berapa lama, dan rencana untuk studi tindak lanjut yang mungkin melibatkan pendekatan lebih lanjut kepada peserta. Saya juga telah diberitahu tentang bagaimana informasi pribadi saya pada formulir ini akan disimpan dan untuk berapa lama. Saya telah diberikan rincian keterlibatan saya dalam penelitian ini. Saya telah diberitahu bahwa jika ada perubahan signifikan terhadap tujuan atau desain penelitian, saya akan diberitahu, dan diminta untuk memperbarui persetujuan saya untuk berpartisipasi di dalamnya.
- ☒ Saya telah diyakinkan bahwa saya dapat menarik diri dari penelitian kapan saja tanpa kerugian atau harus memberikan alasan.
- ☐ Dalam memberikan persetujuan saya untuk berpartisipasi dalam penelitian ini, saya memahami bahwa perekaman suara, video atau foto akan dilakukan dan saya telah diberitahu tentang bagaimana/apakah rekaman ini akan dikirim/ditampilkan.
- ☒ Saya telah diberi tahu bagaimana informasi yang berkaitan dengan saya (data yang diperoleh selama studi, dan data yang saya berikan tentang diri saya) akan ditangani: bagaimana hal itu akan dijaga keamanannya, siapa yang akan memiliki akses ke sana, dan bagaimana hal itu akan atau dapat digunakan.
- ☐ Saya memahami bahwa jika ada pengungkapan aktivitas yang melanggar hukum atau indikasi keadaan non-medis yang akan atau telah membahayakan orang lain, Universitas dapat merujuk masalah tersebut ke pihak berwenang yang sesuai.
- ☐ Saya telah diberi tahu bahwa suatu saat nanti saya dapat dihubungi lagi sehubungan dengan studi ini atau lainnya.

Tanda tangan peserta  Tanggal 26 Mei 2023

Tanda tangan penyelidik (utama)..... Tanggal.....

Nama penyelidik (utama), [dalam BLOCK CAPITALS please]

CAROLINE DUNN

Formulir EC3 – 26 Mei 2021

**UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
(‘ETHICS COMMITTEE’)**

**FORM EC3
CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS**

I, the undersigned [please give your name here, in BLOCK CAPITALS]

of [please give contact details here, sufficient to enable the investigator to get in touch with you, such as a postal or email address]

hereby freely agree to take part in the study entitled *Building resilience throughout the coffee supply chain*.

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 In giving my consent to participate in this study, I understand that voice, video or photo-recording will take place and I have been informed of how/whether this recording will be transmitted/displayed.

4 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used.

5 I understand that if there is any revelation of unlawful activity or any indication of non-medical circumstances that would or has put others at risk, the University may refer the matter to the appropriate authorities.

6 I have been told that I may at some time in the future be contacted again in connection with this or another study.

Signature of participant.....Date.....

Signature of (principal) investigator.....Date.....

Name of (principal) investigator [in BLOCK CAPITALS please]

14.7 Appendix 7 UH Participant information sheet

UNIVERSITY OF HERTFORDSHIRE

**ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS
(‘ETHICS COMMITTEE’)**

FORM EC6: PARTICIPANT INFORMATION SHEET

1 Title of study

Working title- Building resilience throughout the coffee supply chain.

2 Introduction

You are ~~being invited~~ to take part in a study. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide ~~whether or not~~ you wish to take part. The University’s regulation, UPR RE01, ‘Studies Involving the Use of Human Participants’ can be accessed via this link:

<https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs>
(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

3 What is the purpose of this study?

This research will investigate relationships through certified and non-certified supply chains and the effects on environmental, social, and economic outcomes in the coffee supply chain in Lampung, Sumatra.

The project will focus on Rainforest Alliance, Indonesian Standard (IS) coffee VSS and non-certified supply chains.

Semi structured interviews of stakeholders including farmers, exporters, traders and employees within the VSS will be used.

The aims are to identify relationships within certified and non-certified supply chains and what impact these have on environmental, social and economic outcomes such as income and use of sustainable farming methods.

4 Do I have to take part?

It is completely up to you ~~whether or not~~ you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you ~~have to~~ complete it. You are free to withdraw at any stage without giving a reason. A decision to withdraw at any time, or a decision not to take part at all, will not affect any treatment/care that you may receive (should this be relevant).

5 Are there any age or other restrictions that may prevent me from participating?

Over 18 years old only.

6 How long will my part in the study take?

If you decide to take part in this study, you will be involved in it for a 40 minute interview (approximately), and a short-written questionnaire. The data you share will be anonymous and will be stored securely until the end of 2026.

7 What will happen to me if I take part?

The first thing to happen will be to read the Participant form and consent form, discuss any questions and sign the forms if you are happy to take part. An audio recording of the interview will be taken using a Dictaphone. The interviewer and interpreter will ask you questions about your experiences and life in the coffee industry. The interviewer may take notes during the interview and they will be anonymous with your unique participant number.

8 What are the possible benefits of taking part?

By taking part in this study you will be contributing to knowledge that may support sustainability of the coffee supply chain.

9 How will my taking part in this study be kept confidential?

All information you provide will be anonymous and stored on a secure One drive account accessible only to researcher (Caroline Dunn). Any written documents will be anonymous and destroyed as soon as the content is uploaded to the one drive account. Audio recordings and transcripts will be anonymous and stored on the secure One drive account. At the end of the 2026 all transcripts, notes and recordings will be destroyed.

10 Audio-visual material

With permission audio recordings of interviews will be taken using a Dictaphone. Recordings will be transcribed and uploaded to a secure One drive account. They will be accessible only to Caroline Dunn and will be destroyed at the end of 2026. Anonymous quotes may be used, names and personal information will be kept confidential.

11 What will happen to the data collected within this study?

Audio recordings of interviews will be taken using a Dictaphone. Recordings will be stored on a secure One Drive account accessible only to the researcher and deleted from the Dictaphone as soon as this is done. Transcripts of recordings will be stored on the secure One drive account and anonymous. Any written data will be uploaded to the secure One drive account and hard copies destroyed. All information will be anonymous.

- The data collected will be stored electronically, in a password-protected environment, until the end of 2026, after which time it will be destroyed under secure conditions;
- The data will be anonymous prior to storage.

12 Will the data be required for use in further studies?

- The data will not be used in any further studies.

13 Who has reviewed this study?

This study has been reviewed by:

- The University of Hertfordshire Social Sciences, Arts and Humanities Ethics Committee with Delegated Authority

The UH protocol number is

14 Factors that might put others at risk

Please note that if, during the study, any medical conditions or non-medical circumstances such as unlawful activity become apparent that might or had put others at risk, the University may refer the matter to the appropriate authorities and, under such circumstances, you will be withdrawn from the study.

15 Who can I contact if I have any questions?

If you would like further information or would like to discuss any details personally, please get in touch with me, in writing, by phone or by email:

Caroline Dunn
c.dunn2@herts.ac.uk

University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB
+4477-8943879

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

14.8 Appendix 8 Codebook (interviews and surveys).

Interview codes

Name	Description	Files	References
Abandoned farm	Information about abandoned farms or reclaimed abandoned farms	1	1
Additional incomes	Information about incomes from sources other than coffee	14	23
Agreements	Comments about agreements (formal and informal). Contracts included	23	99
credit	Agreements involving giving and receiving credit from another stakeholder	1	1
Alternative uses of coffee		2	3
ASIC	Association of Scientific Information for coffee	1	1
Aspirations	Dreams and aspirations for the future, could be personal goals or hopes for the coffee industry as a whole	21	40
Barriers Challenges Needs	Factors that make buying selling and farming difficult. Factors in the supply chain that cause issues. Factors that cause issues in production. the things that stakeholders feel they need or needs to change	26	415
Admin procedures	Focusing on administration procedures, forms, documents, processors that stakeholders need to follow that are seen as a problem or barrier to completing the task.	6	21
Budget	Budget information as a barrier	1	1
Competition	Comments about competition between stakeholders	11	18
Environmental issues	Comments about soil fertility and barren soil causing problems, other environmental issues in general (climate change/weather is a separate code)	9	26
Expenses	Comments relating to not being able to improve, develop due to the cost of doing so.	13	17
Inspections	Comments about inspections being a barrier	2	2

Name	Description	Files	References
Lack of support	Comments relating to not getting support from other stakeholders e.g government or certifications.	18	67
Market demand	Comments focusing on lack of demand or problems reaching quotas from buyers	15	31
Old coffee trees	Information about coffee trees being old	3	3
Overcoming barriers	Comments focusing on how the barriers are overcome, what changes are being made or what is needed to overcome the barriers	13	46
Pests and disease	Comments about pests and diseases that affect coffee plants	7	18
Price fluctuations	Comments about price changes causing problems for stakeholders	7	20
Quality	Achieving a quality standard as a barrier	6	8
Safety	Information about safety being a barrier to progress	1	1
Supervising farmers	Information about supervising farmers as a barrier, perhaps due to the distance between farms or amount of farms	1	5
Time	Comments about outcomes taking too long, for example seeing benefits of organic farming may take a long time to show	2	3
Transport	Issues with transporting coffee, could be linked to the cost of transport or availability of transport	2	2
Changes in coffee	Anything indicating a change over time in coffee production or trade. Also changes that are wanted for the future	28	221
Changes	Comments about significant changes in coffee	28	154
Future changes	What changes are wanted or needed in the future	16	41
No changes	Comments stating the coffee production and trading has stayed the same	8	15
Coffee school	Any information about the coffee school	3	5

Name	Description	Files	References
Connections	Signs of connections being built between poorer groups	28	1196
Relationships between stakeholders	Comments focusing on relationships between stakeholders. Conflicts, tensions and good relationship indicators	28	155
Roles and communication	How information is communicated through the supply chain. The roles of different stakeholders	28	1031
Big company	Information about the companies than owned and own large plantations in Indonesia.	1	3
Broker	Information about roles and relationships linked to brokers. Brokers as a middle person between trader and exporter	2	3
Certifications	Communication with certifications VSS and their roles	25	48
Coffee shop	Information about the roles and relationships linked to coffee shops in the supply chain	11	23
Companies	Communication involving companies like LDC and their roles	15	53
Consumer	Information relating to the end consumers in the supply chain	7	8
Cooperatives	Comments focusing on cooperatives	16	30
Ecom	comments about the company ECOM (company)	1	2
Exporter	Communication involving the exporter and their roles	22	50
Extension workers	Extension workers from the government or companies	16	25
Family	Communication within families about coffee and their roles	14	23
Farmer group	Comments about communication with farmer groups and their roles	25	122
Joined farmer groups	Comments focusing on farmer groups joining to make larger farmer groups	5	8

Name	Description	Files	References
Farmers	Communication to and from farmers and their roles	28	153
Extension farmers	Farmers who are trained by the government to encourage other farmers to change methods or train them in new methods such as fine robusta	2	5
Independent farmers	Comments about farmers not within OFGs	11	22
Government	Communication to and from the government and their role	28	151
ICCRI	Indonesian coffee and coco Institute	1	7
Importing countries	Comments about countries than Indonesia exports coffee to	9	18
KUBE	Communication involving a KUBE and their role	19	36
Large buyers	Comments about large buyers such as Nestle and JDC	20	77
Leaders	Village or cooperative leader communication and the roles	3	5
NGO		2	4
Processor	Roles and communication with the processor	3	3
Researchers	Comments about working with researchers	3	5
Roasters	information about the roles and relationships linked to roasters	8	22
Small collector	Merge with traders and collectors	12	30
Specialty coffee Association Indonesia		1	1
Traders	Communication to and from traders and their roles (to merge with small collectors)	25	90
Transportation	Information about transportation services as a member of the supply chain	1	1
Villages	Roles and relationships within villages and with other village communities	5	7

Name	Description	Files	References
Decision making	Comments about decision making arenas, who makes decisions and how decisions are made. The choices that stakeholders have or don't have.	28	676
Budget allocations	Information about how funding is allocated through the supply chain, this may originate from government and how it is allocated to farming	4	6
Influencing decisions	Comments focusing on anything that might influence a decision, this could be environmental factors or policies that restrict/manipulate decisions. Also how decisions are made.	26	216
Joining trader group	Decisions to join a trader group and factors influencing this decision	1	1
Price negotiations	Information focusing on negotiation methods, procedures of deciding on the prices coffee is sold and bought for	21	36
to be certified	factors influencing the decision to be certified	6	6
To go to training	factors influencing the decision to do training	3	3
To join farmer group	Factors that may affect the decision to join a farmer group or not	17	47
To join KUBE		3	4
To make cooperative	factors influencing why a cooperative is made	2	8
To sell or hold	The decision to sell the coffee or wait and store the coffee	2	3
To stop farming coffee		4	6
To work in coffee	What made stakeholders decide to work in coffee	19	37
Treats		1	1
where to buy	Information about how decisions are made regarding buying coffee (this will apply more to traders than farmers) what factors they take into account when choosing a producer to buy from	6	19
Where to sell	Factors that influence where a producer can sell to or where a trader can sell on to.	23	99

Name	Description	Files	References
Definitions	Comments indicating differences of definitions of key vocabulary.	7	15
Economic value	Information about the economic value of coffee to Indonesia, this is not about the prices or incomes or farmers, this code is about the value to the Indonesian economy as a whole.	5	6
Enjoying coffee	Comments focusing on the enjoyment of coffee	6	12
Prevented from enjoying	Comments about factors preventing stakeholders enjoying coffee.	1	1
Farming methods	Comments focusing on farming methods chosen, why they are chosen and impacts	28	395
Agrochemicals	Any comments relating to herbicides, pesticides and other agrochemical use	24	67
Agroforestry		6	16
Asalan	Mixed robusta coffee, not fine	9	25
Deforestation	Comments focusing on deforestation, the clearing of forest areas	5	13
Fine Robusta		15	51
GAP	Good Agricultural practices	4	4
Growing tall	New method of allowing the coffee tree to grow very tall in order to get more coffee cherry	1	1
Intensive farming	Information about intensive forms of farming such as sun coffee or planting coffee very close to each other	1	1
Micro lot	Information focusing on small scale farming, may be referred to as coffee gardens or micro lots	1	1
Mixed crops	Variety of crops interspaced, for income not shade	9	13
Organic	Comments relating to organic farming, methods, problems, aspirations to become organic etc	17	29
Pest, weed, disease control		11	21

Name	Description	Files	References
Plantations	Information about large scale plantations , usually managed by big companies	1	1
Protected areas	Comments about farming in Nature reserves or protected areas.	2	3
Regeneration	Comments regarding the regeneration of coffee plants, replacing or regenerating old plants	5	5
Shade trees	Comments focusing on shade trees	10	11
Small holder	Information about small holder farming, usually less than one hectare	1	1
Soil regeneration		5	6
Stek Grafting	Comments relating to the Stek method of grafting a healthy branch to an old tree. Can also be referred to as cloning	12	18
Sun coffee		2	3
Forest production	Comments relating to crops or products derived from the forests of Indonesia	4	13
Harvest season changes	Information about cloning different species of coffee to allow several harvests a year instead of one.	1	2
Health	Comments relating to the health affects of coffee	9	14
History	Information linked to the history of coffee in Indonesia	25	89
heritage	comments about the family history of coffee. heritage and inheritance	23	44
Recent history	Information about coffee in recent history, not the origin of coffee, this code is focused more on memories and recounts of coffee within lifetimes	6	12
The origins of coffee in Indonesia and Lampung	Comments about how coffee growing began or how it moved to Lampung	18	22
Independent Robusta community	Comments about Independently formed groups focusing on robusta coffee	1	1
Infrastructure	Infrastructure available and what is needed	9	15

Name	Description	Files	References
Roads	Comments about road quality	8	8
Water	Comments about water supply	2	2
Knowledge	Sharing of knowledge. Showing knowledge or lack of knowledge. Restrictions in knowledge sharing. Barriers	28	216
Gaps in knowledge	Comments that indicate a gap in knowledge, something that the person is not interested in or something that the person would like to learn but hasn't yet	24	59
New knowledge	New knowledge that has been developed, through training, sharing information or experience etc. How knowledge of coffee and farming has changed through time and generations. How new knowledge is acquired	13	31
Sharing knowledge	Examples of knowledge sharing between stakeholders. Indication of created spaces?	24	70
Traditional knowledge	Knowledge passed down through generations or more traditional methods of coffee growing	13	23
Liberica	Information about Liberica coffee	1	1
Management	Information about the management of coffee farms/plantations	1	5
Markets	Comments about where coffee is sold, who it is sold to and the types of coffee sold	21	71
Branding and marketing	Comments focusing on advertising, getting branding of coffee and expanding the markets through this	2	3
Migration	Comments about migrating to Sumatra to grow coffee.	5	6
mythical and religious links	Comments relating to myths and religious links to coffee, this may be its origins, or links to how coffee is used today	3	3
Outcomes	comments focusing on the current state of the coffee industry. The outcomes for stakeholders and the environment	28	531

Name	Description	Files	References
Economic outcomes Prices	Comments focusing on prices. Economic outcomes	27	140
adding value	Information about stakeholders or processors that add value to the coffee along the supply chain	3	3
Environmental	Comments focusing on the impacts of farming methods	28	82
Health of coffee	Information about factors impacting coffee tree health	12	25
Quality of coffee	Comments about producing quality coffee	24	72
Social outcomes	• Connections • Farming groups • Community • Sharing knowledge, information, and resources • Social identity	28	119
Yield	Comments focusing on yield	24	70
Power	decisions, spaces, forms and levels of power. Decision making arenas and signs of empowerment. And connections between poorer actors	28	619
Acceptance status quo	comments about acceptance of the current situation and no intention or motivation to change or improve	8	9
Empowerment	Signs of empowerment and social action and collective agency	21	68
Forms of power	visible, hidden and invisible power	28	262
Independence	Information linked to independent changes or movements without the influence of outside sources such as the government. Also the desire to work alone and not be influenced by outside sources	17	45
Levels of power	household, local, national and global	27	157
Spaces of power	closed invited and claimed.	24	76
Processing	Comments relating to processing methods or roles involving processing	17	79
Brewing	Comments about brewing coffee	1	1

Name	Description	Files	References
Drying	Comments relating to drying coffee	11	12
Post harvest	Information about post harvest but not specific	4	4
Powder	Producing coffee powder	1	1
Roasting	Information about farmers moving into roasting. the challenges or methods of moving into roasting. Also any other comments about the activity of roasting	9	24
Sorting	The sorting of the coffee beans into fine and asalan	3	4
Programmes initiatives	Information about programmes for change. This could include government initiatives, certification focused programmes, farmer led initiatives that focus on changing and attempting to improve the coffee industry. Support provided to stakeholders from different sources.	26	185
Changing the supply chain	Information about programmes that change the supply chain e.g. giving a stakeholder the opportunity to take on another role of a different stakeholder, (farmers becoming roasters)	3	4
Community development	Initiatives and programmes focusing on communities and improving life for people in farming communities	1	5
Encouraging cooperatives	Information about programmes to encourage farmers to create cooperatives and the motivations for creating a cooperative	1	1
Fine robusta	Information about the government plan to increase the fine robusta market and to encourage farmers to roast their fine robusta	8	17
Government partners	Information about government programmes involving other stakeholders and partnerships such as LCD or big buyers agreeing to train farmers as part of the government programme	1	3
Improve production	programmes focusing on improving production/yield	1	3
Registering clones	Information about registering clones/ graft	1	1
Social forestry scheme		1	7

Name	Description	Files	References
Supervision	Information about the government or other organisations supervising the farms and farmers as part of an improvement programme	1	3
Rebel area	comments about the area that rebels against government programmes	1	1
Regions	Comments focusing on specific factors about the region e.g West lampung. This can involve specific farming methods, traditions and identity	12	23
Regulations Standards Requirements	Comments about any regulations, requirements and standards throughout the coffee supply chain	24	188
Aims	comments focusing on the aims and objectives of the regulations, standards	4	9
Awards	Information about coffee awards, winning awards, aiming to win, achievements	1	1
breaking rules	Comments relating to breaking regulatory rules, agreements and loop holes	9	18
Certification standards and rules		8	8
Conservation practices	Information about practices relating to conservation, these may be rules or regulations	1	2
EU deforestation regulation		6	8
Planning and monitoring		4	10
Quality control	Comments about how coffee is checked that it reaches standards and regulations	11	18
Quota	Information about being able to reach demands as a requirement	2	2
Restrictions, rules	Comments focusing on rules and what can not be done due to rules, regulations or laws	7	19
SNI standards	Information about Indonesian National standard certification, its standards and regulations	1	1

Name	Description	Files	References
Standards and qualifications	standards such as water content, shape, cleanliness NOT certification standards	7	16
Research	Comments focusing on research in coffee	1	3
Resources	The valuable resources needed by farmers in coffee	28	885
Access to resources	the ability to derive benefit from things	27	110
Key resources	Resources mentioned that are needed for improved outcomes	28	458
Crops	Comments about other crops as a resource that is needed	3	3
Equipment	Farming equipment and processing equipment	16	30
Fertiliser		23	63
Financial	Any support financially from other sources	17	33
Knowledge		21	66
Land	comments relating to needing land also land quality, soil quality	9	17
Organic resources		8	10
Pesticide and herbicide	Chemicals	7	11
Quota, demands	Being able to reach quotas and demands of buyers. or there being enough demand for coffee (fine particularly)	10	20
Seeds		1	3
Shade plants		3	3
Stamp	Access to getting coffee 'stamped', this may be to say it came from a particular farm (that it didn't) or that its from a certified farm but isn't.	2	4
Stek branches	Access to quality branches in order to do the stek method (grafting)	10	24
Storage	access to storage and ability to store coffee until prices increase	3	3

Name	Description	Files	References
Technology	Use of phones and other technology that has affected the coffee supply chain	3	3
Training		21	52
Mechanisms	the ways relationships and processes allow access to benefits and resources	28	314
SC connections	Supply chain contact and access to members of the supply chain. Supply chain links, trading links, communication and information transfer.	26	131
Support	Include support from government, certifications or any other stakeholder	24	101
Sentiment	Negative or positive statements	28	348
Negative	Negative comments	28	217
Positive	Positive comments	27	131
Social media	How social media is used in coffee, for trade, price information, advertising and communication in general between stakeholders	5	6
Supply chain routes	routes of trade in the supply chain. who trades with who	28	228
Domestic routes		13	38
International routes		18	39
Traceability	Comments relating to where the coffee came from, traceability	10	19
Traditions	Any traditions relating to coffee or stating coffee is part of a tradition in Indonesia	4	7
Training	Training available in coffee	22	79
Trust	Information about trust or distrust between stakeholders	16	41
Unofficial opening of the forest	Information about the claiming of land unofficially, clearing the forest for farming	2	3
Value of coffee	the role of coffee in everyday life, what people think about how coffee has impacted them, what it has brought to their lives or the lives of the people	21	64

Name	Description	Files	References
	in Indonesia. Can also include what coffee has brought to Indonesia as a whole		
Values Mindset	Cares and priorities in life and coffee. Ethical beliefs and morals. include comments about the values of other members of the supply chain. Cultural values. Positive and negative views	28	216
Motivations	comments about being motivated to work in coffee or to develop	3	4
Pride	Comments about being proud of growing and producing coffee. Pride in the quality of coffee. Individual or national pride	5	5
Voices	Information about voices being heard or not heard, who listens and does not listen	28	202
Weather climate change	Comments focusing on the weather and the impacts of weather and climate change	18	36
Women	Anything focusing on female farmers, their roles, successes etc	3	3

Farmer survey codes

Name	Description	Files	References
Additional incomes		1	77
Changes		1	171
Changes in coffee drinking	Changes in how coffee is consumed	1	87
Changes in coffee farming	What changes that farmers have seen happen since working in coffee	1	84
Confusing answer	Answers that do not fit the question or are generally confusing	1	7
Confusion between stakeholders	Where participants have given the wrong stakeholder in answer to a question, e.g. given the name Nestle as the name of the certification when it was in fact 4c	1	4
Contacts connections		1	375

Name	Description	Files	References
Who farmers have contact with		1	64
How do you contact others in coffee	methods for contacting others in the supply chain	1	78
Meetings attended		1	118
Additional meetings	Any other meetings that farmers state they have attended	1	10
Certification meetings attended	The certification meetings farmers state they have attended	1	23
Government meetings	The government meetings the farmers state they have attended	1	9
Kube meetings	The KUBE meetings farmers state they have attended	0	0
NGO meetings	The NGO meetings that farmers state they have attended	1	1
Reasons for contacting others		1	97
Build friendships		1	2
Cooperating	Working together to sell or trade coffee	1	6
Fertilisers		1	10
General coffee discussions	not specific just general coffee info	1	3
Meetings	to collect information about meetings	1	2
Price info		1	24
Problems	General problems	1	9
Services	Additional services such as processing	1	1
To sell coffee		1	6

Name	Description	Files	References
Training or knowledge sharing		1	34
Quality information.		1	1
Would farmers would like contact with		1	18
Decisions		1	763
Decision makers-improve infrastructure		1	70
Decision makers in coffee		1	73
Decision to grow coffee		1	100
Easy crop	Because coffee is easy to grow	1	3
Enjoys being a farmer		1	3
Follow spouse	Follow wife into coffee growing	1	2
For an income		1	11
Good opportunities and or income		1	10
Government influence		1	1
Heritage	Following family into coffee and or inheriting land	1	34
Limited options		1	4
Main commodity	Deciding to grow coffee because its the main commodity in the area/country or region	1	8
Majority of people grow coffee	Deciding to grow coffee because that's what the majority of the people in the area do	1	11
Suitable land or environment	Deciding to grow coffee because of the suitability of the land	1	13

Name	Description	Files	References
How decision making should change		1	27
How decisions are made in coffee generally	Perceptions on how decisions are made	1	73
Involvement in decision making	Additional comments about being involved or not involved	1	24
Price negotiations	How prices are negotiated	1	97
Cleanliness	As a price determiner	1	1
Compare collectors	Comments about contacting a number of different collectors/traders for prices	1	6
Discussion or debate	Comments about negotiation	1	14
No negotiation		1	24
Samples and quality	Comments about providing samples and the quality of the coffee samples	1	50
Water content	As a price determiner	1	2
Reasons for choosing farming method		1	153
Reasons for wanting or not wanting to change farming method		1	65
Reasons for not improving infrastructure		1	72
Budget		1	41
Covid 19		1	2
Lack of support	Comments about support being limited or lacking	1	8
Location and physical access	Remoteness or difficulties getting to the areas in need of improvement	1	9

Name	Description	Files	References
Other	Random answers about support	1	8
Regulations	Rules due to protected areas affecting improvements	1	2
Unity issues	Problems with community not being united	1	2
Who farmers think should make decisions		1	74
Economic outcomes		1	262
Credit	Sources of credit available to farmers	1	87
Largest household costs		1	88
Main sources of income		1	87
Education level	Comments about education levels	1	10
Environmental Outcomes		1	524
Current threats	What farmers think are the current environmental threats relating to coffee	1	86
Farming methods		1	324
Agrochemicals used		1	72
Mixed crop		1	39
Organic practices		1	62
Shade tree		1	63
Type of coffee grown	Fine or mixed robusta	1	88
Future threats	What farmers think are the future environmental threats relating to coffee	1	85
Protected areas additional comments	Comments about farming in protected areas	1	29
Farmer thoughts and feelings about coffee	Comments about thoughts and feelings about coffee	1	92

Name	Description	Files	References
Dependence	Comments about coffee as the source of their livelihood and supporting family etc.	1	14
Drink	Comments about coffee simply being a drink	1	3
Enjoyment		1	10
Expensive		1	1
Family business	Coffee being part of the family or heritage	1	2
Health	Views on coffee relating to health	1	10
Income		1	40
Plants	Coffee thoughts referring to coffee as simply a plant	1	2
Regional		1	2
Spiritual or philosophical comments	Comments about coffee that sound spiritual in nature	1	6
Superior product	Comments stating coffee is a superior product	1	1
Tradition	Comments regarding traditions and thoughts about coffee traditions	1	1
Greed	Comments about greed relating to a stakeholder	1	1
Group names	Cooperatives, farmer groups or KUBE names and definition comments	1	80
Indonesians thoughts	What Indonesian people think of coffee	1	88
Infrastructure needed	What infrastructure farmers believe is needed	1	84
Main threats to coffee Industry		1	87
Measuring quality of coffee	Comments about measuring quality	1	88
Production changes	Additional comments about changes in coffee production	1	8
Resources/ Assets		1	166

Name	Description	Files	References
Resources farmers have		1	82
Resources wanted	The resources farmers would like to have access to	1	84
Sentiment		1	2
Negative		1	2
Positive		0	0
Stakeholders	Specific mention of stakeholders	1	2
Supply chain routes		1	88
Who coffee is sold to	Who farmers sell their coffee to	1	88
Training		1	188
Changes after training		1	70
Titles of training		1	55
Training provider		1	63
Type of certification	Name of the certification given	1	25
Type of group	Description of what type of group it is, farmer group, cooperative or KUBE	1	72
Type of processing	Processing done by the farmers	1	88
Who drinks coffee		1	84
Who picks coffee		1	88

Group leader survey codes

Name	Description	Files	References
Additional incomes	Sources of additional incomes	1	5
Certifications	The certifications that the group has	1	3
Changes in coffee drinking		1	5
Coffee meaning	What coffee means to group members	1	5

Name	Description	Files	References
Connections and communication		1	23
How to contact others in coffee		1	5
Meetings attended		1	9
Sharing opinions in meetings		1	1
Who do you have contact with		1	3
Why do you contact others in coffee		1	5
Decisions		1	36
Farming methods	Who decides on the farming methods used	1	5
How are decisions made		1	5
Infrastructure decisions	Who decides whether infrastructure is improved	1	5
Infrastructure-why it hasn't been improved		1	5
Involvement in decision making		1	1
Price negotiations		1	5
Who makes decisions in coffee		1	5
Who should make decisions		1	5
Environmental		1	10
Threats now		1	5
Treats future		1	5
Farming methods		1	20

Name	Description	Files	References
Importance	Importance of farming methods	1	5
Type of agrochemicals		1	4
Type of mixed crop		1	4
Type of organic		1	4
Type of shade tree		1	3
Group information		1	20
Changes and developments	How the group has changed or developed since creation	1	5
Changes in members		1	5
How the group was formed		1	5
Why the group was formed		1	5
Indonesian thoughts	What do Indonesian people think about coffee	1	5
Infrastructure		1	5
Infrastructure needed		1	5
Processing		1	4
How coffee is processed		1	4
Quality	How quality is measured	1	5
Resources	resources that farmers have access to	1	5
Supply chain routes		1	11
Where- selling	Where coffee is sold	1	5
Who -selling	Who they sell their coffee to	1	6
Training		1	8
Provider		1	4

Name	Description	Files	References
Title		1	4
Treats to coffee industry		1	5
Who drinks coffee		1	5
Who picks the coffee		1	5
Women members of groups		1	1

Trader Survey codes

Name	Description	Files	References
Additional incomes	trader additional incomes	1	12
Certification meeting extra comments		1	7
certifications		1	1
Changes in coffee drinking		1	16
Contacts communication		1	55
Have contact with	who traders have contact with	1	16
How contact is made	how trader stays in contact with other stakeholders	1	15
Reasons for contact		1	16
Sharing opinion comments		1	4
would like contact with		1	4
Decisions		1	127
Change	How should decision making change	1	2
Choosing farmer	What's important when choosing a farmer to trade with	1	20
Certification		1	1
Consistency		1	1

Name	Description	Files	References
Don't choose		1	1
Honesty		1	3
Loyalty		1	2
Quality		1	8
Willingness to improve		1	2
Young		1	1
Decision making extra comments		1	4
Farming methods	Who decides the farming methods	1	17
How	How are decisions made	1	14
Infrastructure improvements-Who decides		1	14
Infrastructure- why it hasn't been improved		1	12
Budget		1	6
coffee is declining		1	1
Competition with other crops for funds		1	2
Government issues		1	2
Location- difficult to access		1	1
Negotiations	How are prices negotiated	1	16
Who	Who makes decisions in coffee	1	14
Who should	Who should make decisions in coffee	1	14
Education	level of education	1	17

Name	Description	Files	References
Environmental		1	32
Future threats		1	16
Treats now		1	16
Farming methods		1	52
Additional comments		1	4
Type of agrochemicals		1	12
Type of mixed crop		1	7
Type of organic		1	7
Type of shade trees		1	7
Why farming methods are important		1	15
Indonesian thoughts	What do Indonesian people think about coffee?	1	17
Infrastructure needed		1	17
Measuring quality of coffee	How quality is measured	1	17
Meetings		1	11
Farmer group meeting extra comments		1	6
Government meeting extra comments		1	4
Kube meetings extra comments		1	1
Processing	Additional comments about the processing the trader does after buying	1	14
Resources	The types of farming resources farmers have access to	1	14
Supply chain routes		1	58
Buying- where and who from	where coffee is bought and who from	1	16

Name	Description	Files	References
Buying-regions	the different regions coffee is bought from	1	8
Selling where	where coffee is sold	1	17
selling- who	who coffee is sold to	1	17
Training		1	20
Title of training		1	10
Training providers		1	10
Treats to the coffee industry		1	17
Who drinks coffee		1	24
Additional comments	Additional comments about whether Indonesian people drink the traders coffee	1	7

14.9 Appendix 9 Examples of memos

Fertiliser access

- Fertiliser initially coded as a resource (natural/physical capital).
- Access strongly linked to OFG membership (social capital).
- Further linked to subsidised fertiliser schemes (policy, institutional mechanisms, structural factors and processes).
- Discussed by all farmer participants
- Farmers describe difficulties: affordability, black-market reliance → trust, corruption
- Codes: resources, access, OFGs, Government, trust, barriers, relationships/connections, power,
- Forms of power and decision-making spaces → mechanisms and relationships (ToA), structural factors and processes
- Linked to broader themes, mechanisms of access, promotion of OFG, exclusion of independent farmers, perception of prioritisation of staple crops and distrust in institutions.

Stamp forgery

- Codes: stamps, quotas, stamp forgery, resources
- Stamps initially coded as traceability requirement (structural/institutional process).
- Linked to OFG responsibilities (who holds/controls stamps).
- Forgery connected to farmers bypassing restrictions (informal mechanisms of access).
- Linked into broader theme of short-term coping vs long-term trust risks.

Traders and credit

- Codes: relationships, trader roles, financial resources,
- Traders and collector terms used interchangeably
- Dependency and cycles of debt (selling at lower price for speed/credit).
- Being able to store coffee- not available to farmers but available to some traders.
- Time of harvest- already indebted and coffee already sold at a pre agreed price regardless of price changes.
- Part of broader theme of financial vulnerability but also a form of social capital and financial capital.

Diversification strategies

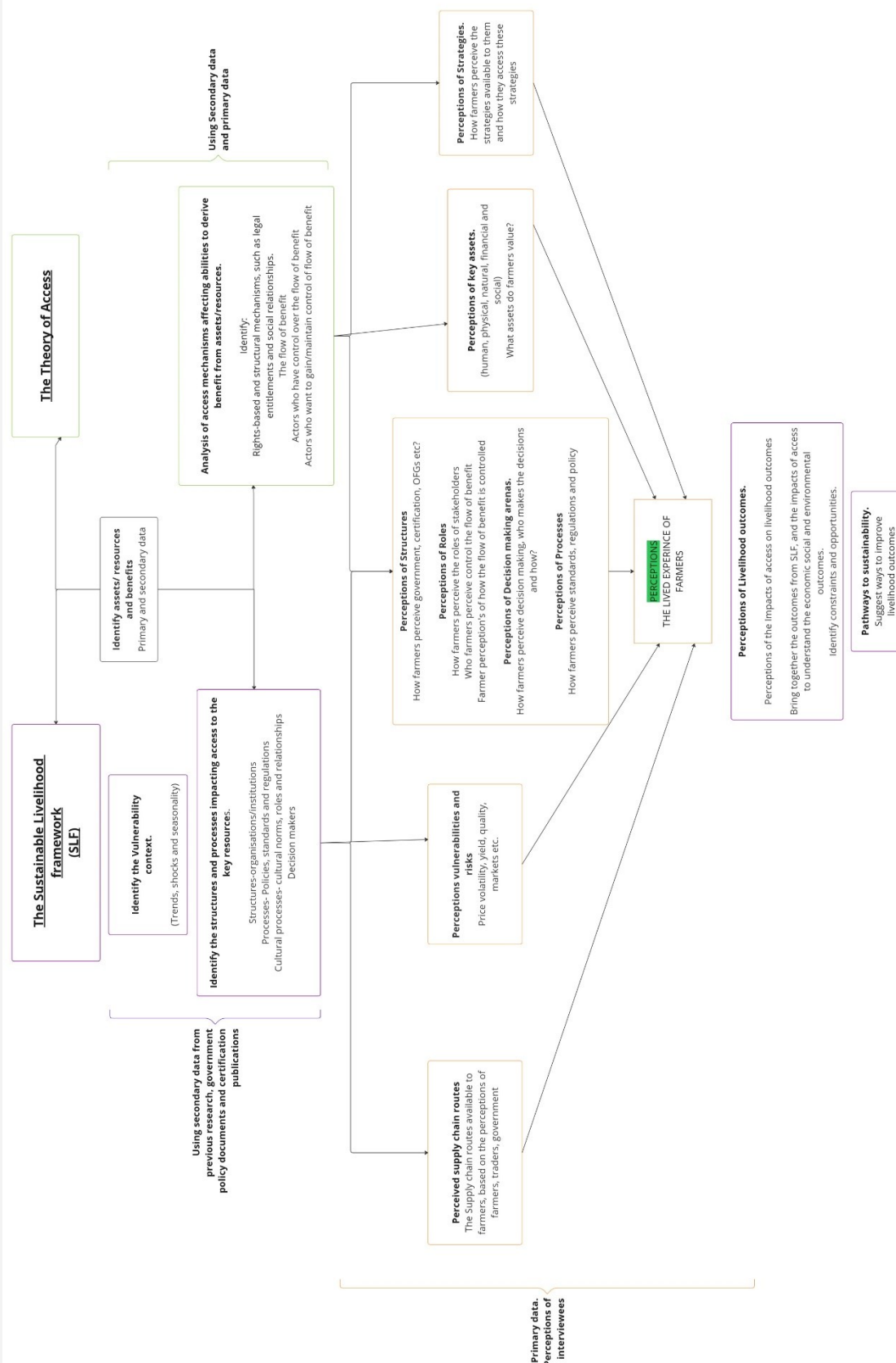
- Codes: farming methods, mixed cropping, grafting, income
- Grafting- linked to government programmes, multiple harvests
- Sharing knowledge, farmer to farmer and scions- social capital and physical (grafting)

- Alternative forms of income, different markets, reducing reliance on volatile coffee markets
- Contribute to broader theme of buffering against vulnerabilities, alternative markets and moving away from coffee production.

Fine Robusta and cafés

- Codes: fine robusta, direct trade, coffee shop, farming methods, quality, prices achieved
- Linked to training support from buyers (human/physical capital). Domestic buyer training, government training and certification.
- Emerging new market, direct trade and potential buffer against vulnerabilities.

14.10 Appendix 10 Framework flow



14.11 Appendix 11 Policy impacting coffee production

Regulation Number 49 of 2014. Technical Guidelines for Good Coffee Cultivation (Good Agricultural Practices/ GAP on Coffee) (Minister of Agriculture of the Republic of Indonesia, 2014)

Objective:

The regulation promotes sustainable coffee cultivation, balancing economic, environmental, and social dimensions. The aim is to increase productivity and quality while maintaining the ecological integrity of coffee plantations.

Sustainability Principles:

Environmentally sustainable practices to protect land, water, and biodiversity.

Economically viable approaches ensuring fair benefits across the coffee value chain, including farmers and exporters.

Socially acceptable methods, including equitable access to resources and adopting regionally appropriate technologies.

Recommended Good Agricultural Practices (GAP):

Land Selection and Preparation

- **Land Suitability:** Emphasis on selecting land with the appropriate altitude, slope, and soil characteristics:
 - Robusta Coffee: Best suited for altitudes of 0–900 m above sea level.
 - Arabica Coffee: Grows well at altitudes above 1,000 m.
- **Soil Requirements:** Soil should have good organic matter, adequate depth, and appropriate pH levels (5.5–6.5 for Robusta, 4.5–6.5 for Liberica).
- **Terracing and Contour Planting:** recommended for sloped land to prevent erosion.
- **No Burning Policy:** Land clearing must be done without burning, using mechanical or chemical means.

Planting Materials

- Use of certified seeds or clones with known resistance to pests and adaptability to local conditions.
- Arabica Varieties: Recommendations include clones such as Gayo 1 and Sigarar Utang.
- Robusta Clones: BP 308 and other nematode-resistant clones are suggested.

Soil and Fertility Management

- Incorporate green manure and organic matter to maintain soil fertility.
- Employ legume cover crops (e.g., *Centrosema pubescens*, *Pueraria javanica*) to enrich the soil and suppress weeds.

Erosion and Water Management

- Terracing: Required on land with slopes greater than 8%.

- Rorak Trenches: These are shallow pits filled with organic material to conserve water and improve soil fertility.
- Construction of drainage channels to manage water flow.

Shade Management

- Temporary shade crops are recommended during the early growth stages.
- Permanent shade trees like Gliricidia and Leucaena protect plants and prevent soil degradation.

Pest and Disease Control

Integrated Pest Management (IPM) strategies are advised, including:

- Manual weed removal or herbicide use.
- Use of pest-resistant varieties.
- Biological controls where possible.

Harvest and Post-Harvest Handling

- Coffee cherries should be harvested at full ripeness for optimal quality.
- Post-harvest processes such as drying must ensure compliance with food safety standards to prevent contamination.

Certification and Standards:

Encourages adherence to certifications like Fairtrade, Organic, and Rainforest Alliance for better market opportunities and premium pricing.

Focuses on product traceability and meeting global quality standards.

(Minister of Agriculture of the Republic of Indonesia, 2014)

Regulation of the Minister of Agriculture of the Republic of Indonesia Number 52 of 2012 concerning Guidelines for Post-Harvest Coffee Handling.(Minister of Agriculture of the Republic of Indonesia, 2012).

Objective:

The policy aims to enhance the quality and marketability of Indonesian coffee through improved post-harvest handling practices. It seeks to:

Increase farmers' incomes.

Boost foreign exchange through coffee exports.

Generate employment and support environmental conservation.

Scope:

The regulation covers technical guidelines for post-harvest coffee handling, ensuring safety, environmental preservation, and compliance with Indonesian National Standards (SNI).

Guidelines for Post-Harvest Handling:

- Harvesting: Coffee cherries must be harvested at optimal ripeness to ensure quality.

- **Sorting and Grading:** Coffee beans should be sorted and graded to meet quality standards.
- **Processing:** Recommended methods include wet and dry processing to remove pulp and mucilage while maintaining bean integrity.
- **Drying:** Coffee beans must be dried to a moisture content of 12% or lower to prevent mould and ensure safe storage.
- **Storage:** Beans should be stored in clean, dry, and ventilated conditions to maintain quality and prevent contamination.

Sustainability and Food Safety:

- Encourages the use of environmentally friendly post-harvest technologies.
- Emphasises food safety to produce beans free from contaminants such as pesticide residues and mycotoxins.

Compliance with Standards:

- Aligns with Indonesian National Standards (SNI 01-2907-2008) for coffee beans.
- Supports adherence to international market requirements for export.

Implementation:

- The guidelines serve as a reference for farmers, cooperatives, and other stakeholders involved in the coffee supply chain.
- Local governments and extension services are tasked with providing technical assistance and infrastructure support.

(Minister of Agriculture of the Republic of Indonesia, 2012)

Regulation Number 9 of 2021 on Social Forestry Management. (Ministry of Environment and Forestry Republic of Indonesia, 2021a)

The Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 9 Tahun 2021 tentang Pengelolaan Perhutanan Sosial (Regulation No. 9 of 2021) was issued by the Indonesian Ministry of Environment and Forestry to establish a framework for the sustainable management of forests through social forestry programmes. These regulations aim to promote sustainable forest management by involving local communities and Indigenous Peoples as primary actors to enhance their welfare, maintain environmental balance, and preserve cultural and social dynamics.

Objective

The regulation seeks to:

- Provide legal access for community-based forest management.
- Encourage sustainable forest utilisation to improve local welfare.
- Maintain ecological balance and ensure the preservation of social and cultural values.

Types of Social Forestry

The regulation outlines five distinct types of social forestry programmes:

1. Hutan Desa (Village Forests): forest areas managed by village institutions¹⁴ to improve community welfare through sustainable resource use and ecological conservation.
2. Hutan Kemasyarakatan (Community Forests): forest areas managed by local communities to sustainably utilise resources for improved livelihoods and environmental conservation.
3. Hutan Tanaman Rakyat (People's Plantation Forests): forest plantations established in production forest¹⁵ areas, managed by formally registered groups such as Forest Farmer Groups, Associations of Forest Farmer Groups, or Forest Farmer Cooperatives, to enhance productivity using sustainable silviculture techniques.
4. Hutan Adat (Customary Forests): are forest areas legally recognised as belonging to Indigenous Peoples and managed according to their traditional laws and practices.
5. Kemitraan Kehutanan (Forestry Partnerships): are collaborative agreements between formally registered groups or Indigenous Peoples and entities such as forestry business permit holders or conservation managers. These partnerships allow communities to access and utilise forest resources sustainably while benefiting from the expertise, resources, or facilities of the partner entities, promoting shared responsibility and mutual benefits

Each type of social forestry programme differs based on its management objectives, the communities or institutions involved, and the forest functions (e.g., production, conservation).

Access and Criteria for Participation

Legal access to social forestry programmes is provided through Social Forestry Management Approvals, which include permits or recognitions issued by the Ministry of Environment and Forestry. The eligibility criteria and processes vary across the types of forestry but generally include the following:

Eligibility Criteria:

- Participants must belong to formally registered groups, such as farmer groups, cooperatives, village institutions, or Indigenous Peoples' organisations recognised under the law.
- They must demonstrate residency near or within forest areas.
- The organisations or groups (e.g., village institutions or cooperatives) must meet governance and competency requirements.

Individual and Group Applications:

- Individuals can make initial applications for certain programmes, such as Hutan Kemasyarakatan (HKm) and Hutan Tanaman Rakyat (HTR). However, before permissions are granted individuals must either join an existing formally registered group or form a new group (e.g., farmer group or cooperative).

¹⁴ Village institutions (Lembaga Desa) are formal organisations established through village regulations and led by the village head to manage Hutan Desa sustainably, ensuring community welfare, environmental preservation, and inclusive participation.

¹⁵ Production Forest refers to a forest area designated for the primary function of producing forest products, including timber and non-timber products

- Groups or Institutions are required for programmes like Hutan Desa (Village Forests) and Hutan Adat (Customary Forests), where applications must be submitted by formalised village institutions or Indigenous Peoples' organisations recognised under the law.

Application Process:

1. Applicants must submit a formal request, which includes supporting documentation such as identity verification, maps of the proposed area, and plans for sustainable forest use.
2. Administrative and technical verifications are conducted, including assessments of the suitability of the forest area and the eligibility of the applicant.
3. Permits are issued for a specified term (typically 35 years, renewable).

Farming practices and restrictions

Hutan Desa (Village Forests):

- Permitted Practices: Agroforestry¹⁶ combining trees with food crops, fruits, and medicinal plants to support community welfare, provided they align with sustainable forest management plans¹⁷.
- Restrictions: No burning, excessive land clearing, or practices that harm ecological balance.

Hutan Kemasyarakatan (Community Forests):

- Permitted Practices: Agroforestry and non-timber forest products (e.g., bamboo, honey) for sustainable livelihoods.
- Restrictions: Palm oil plantations are prohibited, and all activities must follow the approved group management plan¹⁸.

Hutan Tanaman Rakyat (People's Plantation Forests):

- Permitted Practices: Intensive agroforestry with bioenergy plants, fodder, and commercial crops using sustainable silviculture techniques.
- Restrictions: Maintain a minimum of 100 trees per hectare, and practices must not harm forest productivity.

Hutan Adat (Customary Forests):

- Permitted Practices: Farming guided by customary laws, focusing on culturally significant non-timber products like fruits and medicinal plants.
- Restrictions: Activities must not conflict with customary laws or harm the environment.

Kemitraan Kehutanan (Forestry Partnerships):

¹⁶ The policy does not define the term 'Agroforestry' but refers to agroforestry practices, particularly in the context of integrating tree planting with agricultural activities.

¹⁷ Sustainable forest management plans in social forestry outline 10-year goals for conservation, sustainable resource use, and institutional strengthening, including mapping, zoning, and adherence to legal and environmental guidelines.

¹⁸ Approved group management plans outline how forests will be conserved, used sustainably, managed by groups, and monitored, with clear maps and compliance with legal and environmental rules.

- Permitted Practices: Farming agreed upon with conservation or business permit holders to balance community and conservation objectives.
- Restrictions: Activities must comply with partnership agreements and not undermine conservation goals.

Monitoring and Evaluation

The regulation mandates regular monitoring and evaluation to ensure compliance and effectiveness:

- Verification Teams: Multi-disciplinary teams, including representatives from local governments, civil society, and technical units of the Ministry, conduct administrative and field verifications.
- Evaluation Criteria: Focus areas include legal compliance, ecological health, sustainable management practices, and socio-economic benefits to communities.
- Monitoring Tools: Utilise GIS mapping, satellite imagery, and on-site inspections (e.g., GPS and drones) to track forest conditions, boundaries, and land use.
- Processes: Administrative checks ensure documentation compliance, while field visits verify physical conditions and community activities against approved plans.
- Frequency and Reporting: Regular evaluations (at least once every 5 years) are conducted, with findings reported to the Ministry, enabling corrective actions or sanctions for non-compliance.

Sanctions for Violations

Administrative sanctions are imposed on parties who violate the regulations, including:

- Warnings or suspensions of permits.
- Revocation of permits for severe or repeated violations.
- Requirements to restore affected forest areas to their original condition.

These sanctions aim to uphold sustainable practices and prevent the misuse or degradation of forest resources.

(Ministry of Environment and Forestry Republic of Indonesia, 2021b)

Lampung Provincial Regulation No. 43 of 2015 on Coffee Governance and Trade (Governor of Lampung, 2015)

Objective:

This regulation establishes a governance framework for the cultivation, processing, and trade of coffee in Lampung Province, aiming to enhance quality, sustainability, and market competitiveness. It defines formal structures and processes that shape farmer practices, market interactions, and compliance standards within the coffee sector.

- **Certified Planting Materials:** Farmers must use certified robusta seeds from approved sources to ensure high yields and product quality, with certification overseen by recognised bodies.
- **Sustainable Cultivation Practices:** Farmers are required to follow Good Agricultural Practices (GAP), including proper planting, shade management, and integration with complementary crops or livestock to improve incomes sustainably.
- **Harvest and Post-Harvest Standards:** Coffee must be harvested at full maturity and processed following national (SNI)¹⁹ and international quality standards, ensuring high product quality and market value.
- **Geographical Indication Certification:** Coffee marketed as "Lampung Robusta" must meet geographical indication standards to protect regional identity and reputation.
- **Certification and Verification:**
 - Certification processes, including seed certification, sustainability certification, and geographical indication compliance, are conducted by provincial and district plantation services, authorised certification bodies, research institutions, and local field officials.
 - Verification teams ensure compliance through field inspections, laboratory assessments, and documentation reviews.

By formalising these rules and processes, the regulation transforms the governance of coffee production and trade in Lampung, ensuring sustainability, quality assurance, and improved livelihoods for farmers. It also strengthens institutional structures by integrating certification systems, supervision mechanisms, and collaborative verification processes.

(Governor of Lampung, 2015)

Regulation No 41 of 2021 Subsidised Fertiliser. (Ministry of Agriculture Republic of Indonesia, 2021)

Objective:

The Regulation on Subsidised Fertiliser (Ministerial Regulation No. 41 of 2021) establishes the governance framework for the allocation, distribution, and supervision of subsidised fertiliser in Indonesia to support national food security and enhance agricultural productivity. It provides a formal structure influencing farmer practices and access to resources.

Eligible Crops:

- The policy is intended for farmers engaged in the cultivation of food crops (e.g., rice, maize, soybeans), horticulture, plantations, and animal husbandry.
- It prioritises the use of subsidised fertiliser for staple crops to ensure food security.

¹⁹ SNI (Standar Nasional Indonesia)- the standard set and supervised by authorised national standardisation institutions. It applies to products, including coffee, to ensure compliance with national quality and safety requirements

Farmer Eligibility and Application:

- Farmers must:
 - Be members of registered farmer groups.
 - Be included in the Definitive Plan for Farmer Group Needs (RDKK), a digital system used to record and allocate fertiliser needs.
 - Actively cultivate eligible crops listed under the regulation.
- Farmers who do not meet these criteria are ineligible to receive subsidised fertiliser.

Types of Fertiliser:

- Includes inorganic fertilisers such as urea, NPK, and SP-36, as well as organic fertilisers derived from biological materials.

Pricing and Distribution:

- Subsidised fertiliser is sold at a Highest Retail Price (HET) set by the government to ensure affordability.
- Distribution is managed through authorised retailers, overseen by provincial and district agricultural authorities.

Verification and Oversight:

- Multi-level verification teams, including central, provincial, and district officials, ensure compliance with the RDKK and allocation systems.
- The Fertiliser and Pesticide Monitoring Commission supervises distribution and submits biannual reports to the Ministry of Agriculture.

Specific Provisions for Coffee Farmers:

- No specific provisions for coffee farmers are included in this policy, as it focuses broadly on staple crops and other eligible agricultural sectors.

(Ministry of Agriculture Republic of Indonesia, 2021)

Regulation of the Ministry of Trade of the Republic of Indonesia Number 24 the Year of 2018 concerning provisions on the certificate of origin of Indonesian products. (Ministry of Trade of the Republic of Indonesia, 2019)

Objective:

To enhance the efficiency of the Certificate of Origin issuance process, ensuring that Indonesian goods meet international origin criteria.

Key Provisions for Certificates of Origin:**Application and Documentation:**

- Exporters must apply electronically for Certificates of Origin, providing comprehensive details about the goods, including production processes and raw material sources.
- Documentation must support the origin claims, including detailed descriptions and any relevant production data.

Specific Requirements for Coffee:

- Coffee exports require detailed certificates that include the type of coffee (e.g., Arabica, Robusta), specific processing methods employed (e.g., dry or wet processing), and any relevant certifications (e.g., organic, geographical indications).

Certificate Format and Details:

- The Certificate of Origin must include:
 - Detailed descriptions of the goods.
 - Exporter and importer information.
 - Shipping details, such as routes and methods, to ensure compliance with the direct consignment rule.

Verification and Compliance:

- Authorities perform verifications to ensure the accuracy of the provided information and compliance with the rules of origin specified under applicable trade agreements.
- Certificates are issued electronically with a digital signature, incorporating security features such as QR codes to verify authenticity.

This regulation, particularly with its specific focus on coffee, ensures that all exported goods, especially coffee, are properly certified as originating from Indonesia, meeting both domestic legal standards and international trade requirements. This helps in maintaining the credibility of Indonesian exports in the global market.

(Ministry of Trade of the Republic of Indonesia, 2019)

The Indonesian National Standard (SNI) 01-2907-2008(National Standardization Agency of Indonesia, 2008)

The Indonesian National Standard (SNI) 01-2907-2008, established by the National Standardization Agency (BSN) on January 1, 2008, sets quality criteria for coffee beans in Indonesia.

Objective

The standard defines classification, quality requirements, testing methods, marking, and packaging for both Robusta and Arabica coffee beans.

Coffee beans are classified based on:

- Type: Robusta and Arabica.
- Processing Method: Dry and wet processing.

- Defect Level: Six quality levels (e.g., Mutu 1, Mutu 2, etc.), with specific maximum defect values.

Quality Requirements

General Requirements:

- No live insects.
- No foul or mouldy odour.
- Maximum moisture content: 12.5%.
- Maximum impurity content: 0.5%.

Specific Requirements for Robusta and Arabica:

- Bean Size: Beans are classified into "large," "medium," and "small" based on specific sieve measurements.
- Defect Levels: Beans are evaluated on the number of defects, with different thresholds for each quality level.

Sample Collection

The standard follows the procedures set out in SNI 19-0428-1998 for collecting solid samples.

Testing Methods

Testing includes:

- Insect Presence: Visual inspection for live insects.
- Odor Tests: Organoleptic tests to detect foul or mouldy odours.
- Moisture Content: Determined by drying samples at 105°C for 16 hours.
- Sieve Tests: Beans are passed through sieves to determine size and check for defects.
- Defect Classification: Defects such as broken beans, black beans, or insect damage are quantified and given a score.

Testing Results

The coffee is considered to pass the test if it meets the general and specific quality criteria, including the maximum allowable defects for each quality grade.

Labelling

Each coffee shipment must be marked with:

- Product name.
- Quality type.
- "Made in Indonesia" label.
- Net weight.
- Bag number.

- Destination port.

Packaging

Coffee is packaged in new, clean, dry burlap sacks, each with a net weight of 60 kg or as agreed upon between buyer and seller.

(National Standardization Agency of Indonesia, 2008)

14.12 Appendix 12 Importing country regulations

United states

Importing coffee into the United States involves compliance with several federal regulations to ensure safety, quality, and proper labelling. The primary agencies overseeing these regulations are the Food and Drug Administration (FDA), U.S. Customs and Border Protection (CBP), and the U.S. Department of Agriculture (USDA) (Kienzle, 2018).

Importers must ensure that their coffee products meet all applicable FDA, CBP, and USDA regulations. This includes obtaining necessary permits, submitting required documentation such as a certificate of origin (country) as required by the ICO (International Coffee Organisation), phytosanitary certificates and ensuring that coffee products are safe and properly labelled (Kienzle, 2018).

Egypt

Importing coffee into Egypt requires compliance with specific regulations to ensure product safety and quality. The primary authorities overseeing these regulations are the General Organization for Export and Import Control (GOEIC) and the Egyptian Food Safety Authority (EFSA) (International Trade Administration, 2022).

Import Control (GOEIC) oversees the certification process, requiring documents like a Certificate of Origin, Health Certificate, and Analysis Certificate. Coffee must also comply with shelf life requirements, though green coffee can be imported as long as it is harvested within the same year. Importers must adhere to labelling regulations, with all product information, including the product name, ingredients, and expiration dates, presented in Arabic. Specific rules apply for coffee that contains halal certification, requiring a statement of compliance (U.S. Department of Agriculture, 2009)

Additionally, coffee imports are subject to testing for pesticides and chemical contaminants by the Central Laboratory of Residue Analysis to ensure compliance with Food and Agriculture Organisation and World Health Organisations standards. If coffee fails to meet these standards or labelling requirements, it may be rejected, though importers have the right to appeal or request a re-test. Overall, the regulations are designed to ensure that coffee products imported into Egypt are safe for consumption and meet the country's import standards (U.S. Department of Agriculture, 2009).

Malaysia

Importing coffee into Malaysia involves compliance with several regulations to ensure product safety and quality. The primary authorities overseeing these regulations are the Ministry of Agriculture and Food Industries (MOA) and the Malaysian Quarantine and Inspection Services (MAQIS). (U.S. Department of Agriculture, 2022)

Coffee imports into Malaysia are governed by the Food Act of 1983 and the Food Regulations of 1985, which ensure the safety, quality, and compliance of food products entering the market. The Food Safety and Quality Division (FSQD) of the Ministry of Health (MOH) oversees the implementation of these laws. Imported coffee products are subject to inspection and random sampling by the Malaysian Quarantine and Inspection Services (MAQIS) at various entry points to ensure compliance with national standards. Additionally, coffee must meet labelling requirements, including providing the product name, ingredients, expiration date, country of origin, and details about the importer, all in Bahasa Malaysia or English (U.S. Department of Agriculture, 2022).

For pesticides and contaminants, coffee imports must adhere to the maximum residue limits (MRLs) set by the Food Regulations 1985 and in accordance with Codex Alimentarius standards. Any coffee products found to have residues exceeding the permitted levels may be rejected. Furthermore, the Department of Islamic Development Malaysia (JAKIM) oversees the certification of halal products, and any coffee products that are intended for the Muslim population must include halal certification, especially if they are served in restaurants or cafes. This ensures the coffee meets both food safety and religious requirements for consumption (U.S. Department of Agriculture, 2022).

In terms of packaging, the regulations dictate that coffee must not be stored or transported in containers that may contaminate the product. Also, date marking is mandatory, ensuring that consumers are aware of the product's expiration date or best before date. These regulations help maintain the quality and safety of coffee products entering Malaysia, ensuring they meet both local standards and international expectations. (U.S. Department of Agriculture, 2022)

India

Importing coffee into India involves compliance with several regulations to ensure product safety and quality. The primary authorities overseeing these regulations are the Food Safety and Standards Authority of India (FSSAI) and the Directorate General of Foreign Trade (DGFT). Key regulations include providing import permit, a phytosanitary certificate, compliance with food and safety regulations and labelling including details of the product's name, country of origin and ingredients (U.S. Department of Agriculture, 2020).

Coffee imports must comply with the Food Safety and Standards Act (2006), which consolidates several laws related to food safety. The regulations mandate that coffee products, especially pre-packaged ones, adhere to labelling requirements that include the product name, list of ingredients, nutritional information, date of manufacture, and country of origin. Additionally, coffee products are subject to maximum residue limits (MRLs) for pesticides and contaminants as specified by the FSSAI (U.S. Department of Agriculture, 2020).

The Legal Metrology Act also applies, which requires that all pre-packaged food, including coffee, bear the retail sale price (MRP) and net quantity information. For imported coffee, the country of origin must be clearly labelled, and the FSSAI's logo and registration number are mandatory. Moreover, coffee may be subject to random sampling and inspection to ensure compliance with safety standards (U.S. Department of Agriculture, 2020).

In terms of procedures, the coffee importation process includes submitting necessary documents such as the importer's license, phytosanitary certificates, and ensuring compliance with the FSSAI import regulations. Additionally, sampling fees and inspection processes must be followed, as detailed in the FSSAI Food Import Clearance Manual. (U.S. Department of Agriculture, 2020).

Europe

Importing coffee into the European Union (EU) requires compliance with a series of established food safety, quality, and labelling regulations. The EU enforces strict requirements to ensure that coffee products meet public health and environmental standards, and these requirements are outlined by various EU regulations and directives (European Commission., n.d.-b).

Coffee must meet EU food safety standards under Regulation (EC) No. 178/2002, which covers food safety procedures to ensure that food is not harmful to human health. Imported coffee must be free from contaminants, including pesticides and harmful substances (European Commission., n.d.-b)

Under the EU Deforestation Regulation (EUDR), all coffee imports must prove that they are not linked to deforestation. Importers will be required to provide detailed evidence regarding the traceability of their coffee supply chains, proving that their coffee was not produced on deforested land. This regulation aims to combat global deforestation, with a focus on commodities like coffee, cocoa, and palm oil (European Commission., n.d.-c).

Coffee imports must comply with EU Regulation No. 1169/2011 on food labelling. This includes requirements such as product name, list of ingredients, allergens, the net quantity of the product, and the country of origin (European Commission., n.d.-a).

14.13 Appendix 13 List of Outcome Indicators

Capital	Indicator	Description
Financial	(1) Annual income compared to the World Bank's international poverty line and annual income relative to the World Bank's upper-middle-income threshold.	Average annual household income was calculated from self-reported survey data and benchmarked against World Bank poverty thresholds. The resulting figures are presented as percentages of the World Bank benchmarks, providing a standardised way to assess how far the average farmer household in Lampung sits above or below recognised poverty lines.
	(2) Perceived changes in income over the past five years.	Farmers were asked if they thought their household income had increased, decreased, or stayed the same over the past five years. Their answers were recorded as percentages, with the share reporting an increase showing how farmers themselves perceive changes in their livelihoods. This indicator adds a subjective view that complements the benchmarked income data.
	(3) Access to diversified sources of income.	Farmers were asked whether their households relied only on coffee or also had other income sources. The results were recorded as percentages, showing the share of farmers with diversified livelihoods (for example, through mixed cropping, animal raising, or off-farm jobs) compared with those depending solely on coffee. This indicator highlights how far farmers are able to spread risk and reduce their reliance on coffee as their only source of income.
	(4) Access to formal financial credit.	Farmers were asked where they would source credit for farm improvements. Responses were grouped into those relying on external sources such as banks, cooperatives, or government schemes, and those relying on internal or informal sources such as household savings, family, or traders. The percentage reporting external sources was used as the indicator, reflecting farmers' access to and willingness to use formal credit.
	(5) Perceptions of fair prices for coffee	Farmers were asked whether they believed the price they received for their coffee was fair. Responses were recorded as percentages, with the share reporting 'yes' representing the indicator. This measure reflects farmers' own perceptions of fairness in market transactions, complementing the income and price data by highlighting how farmers evaluate the terms of trade they face.
Human	(1) Access to education	Farmers were asked to state their highest level of formal education. Responses were grouped by attainment level, and the percentage of farmers who had completed high

		school (SMA) or above was used as the outcome indicator. This threshold was selected because it aligns with Indonesia's 12 years of compulsory education (Grades 1–12). The measure provides an indication of educational attainment as part of human capital.
	(2) Levels of participation in agricultural training	Farmers were asked whether they had participated in formal agricultural training, including sessions provided by government agencies, companies, or farmer groups. Responses were recorded as percentages, with the share reporting participation used as the indicator. This measure reflects access to knowledge and skills that can improve farming practices and adaptation
	(3) Levels of adoption of new farming practices	Farmers who had attended training were asked whether they had adopted new farming practices as a result. Responses were recorded as percentages, with the proportion reporting adoption used as the indicator. This measure captures the extent to which training translates into changes in farming behaviour and innovation uptake.
	(4) Availability of healthcare services	Farmers were asked whether they had access to healthcare facilities in their communities, such as medical centres. Responses were recorded as percentages, with the share reporting access used as the indicator.
	(5) Availability of sports facilities	Farmers reported whether sports facilities were available in their community, such as sports fields. Responses were recorded as percentages, with the share reporting access used as the indicator.
	(6) Availability of community councils	Farmers were asked whether community councils or centres were present in their area. Responses were recorded as percentages, with the share reporting access used as the indicator.
	(7) Access to farm labour	Farmers were asked whether they had access to labour to support coffee production, either from family members, hired workers, or neighbours. Responses were recorded as percentages, with the share reporting access used as the indicator.
	(8) experience in coffee farming	Farmers reported how many years they had been engaged in coffee farming. Responses were averaged, and the percentage of farmers with ten or more years' experience was used as the indicator. The ten-year threshold was adopted following research practice in climate adaptation studies, where farmers with under ten years of experience are often excluded to improve reliability (Yeleliere et al., 2023). This reflects accumulated knowledge and long-term experience as part of human capital
Natural	(1) Coffee yield	Farmers provided self-reported data on the size of their farms and the volume of coffee sold in 2022. From these figures, an average yield per hectare was calculated and compared against the 2022 Lampung provincial average

		reported by BPS. The indicator is expressed as the percentage of the provincial benchmark achieved by the sample, providing a standardised measure of productivity.
	(2) Use of shade trees	Farmers were asked whether they used shade trees on their coffee farms. The indicator is the percentage who reported doing so. This reflects adoption of practices that support soil conservation, crop health, and diversified production.
	(3) Application of agrochemicals	Farmers reported whether they applied agrochemicals such as fertilisers, pesticides, or herbicides. The indicator is the percentage of farmers who reported not using agrochemicals. This reflects practices that reduce chemical dependency and potential environmental harm, potentially contributing positively to natural capital.
	(4) Adoption of organic practices	Farmers were asked whether they used organic practices such as manure, compost, or coffee husks as fertiliser. The indicator is the percentage who reported adopting these practices. This reflects the extent to which farmers supplement or replace agrochemical use with organic inputs.
	(5) participation in social forestry schemes	Farmers were asked whether they cultivated land under Social Forestry or Community Forestry programmes. The indicator is the percentage who reported participation. This reflects access to legally recognised forest land and engagement with government sustainability initiatives.
	(6) Involvement in certification programmes	Farmers reported whether they were certified under schemes such as Rainforest Alliance or 4C. The indicator is the percentage of farmers who reported certification. This reflects participation in sustainability programmes that can influence access to markets, training, and environmental standards.
Physical	(1) Size of coffee farm	Farmers reported the size of their coffee farms. The average farm size was calculated from self-reported data, and this was compared against the 4.06 hectares identified in other research as the minimum required for households in Lampung to meet welfare standards and the provincial minimum wage. The indicator is expressed as the percentage of this benchmark represented by the average farm size, providing a measure of land access as a component of physical capital.
	(2) Access to processing mills	Farmers were asked whether they had access to processing mills, including wet and dry facilities. The indicator is based on the percentage of farmers who reported having access. This reflects the extent to which farmers can carry out post-harvest processing, which is crucial for improving quality and market value
	(3) Access to drying facilities	Farmers reported whether they had access to drying facilities, such as drying ovens, used to reduce the moisture content of coffee beans. The indicator is the percentage of

		farmers who reported access. This reflects farmers' ability to meet quality standards required by buyers, as moisture levels are often a determining factor in price negotiations.
	(4) Access to harvest	Farmers were asked whether they had access to basic harvest equipment such as sacks and spades. The indicator is based on the percentage of farmers reporting access. This reflects the availability of essential tools needed to carry out harvest activities effectively.
	(5) Access to machinery	Farmers reported whether they had access to machinery such as hullers, pulpers, or grass cutters. The indicator is the percentage of farmers who reported access. This reflects farmers' ability to use machinery to support production and processing, which can reduce labour demands and improve efficiency.
	(6) Quality of roads	The indicator is the percentage of farmers who identified road quality as a problem. This reflects perceptions of infrastructure, which directly affects transport costs, efficiency, and market access.
Social	(1) Attendance at OFG meetings	Farmers were asked whether they attended OFG meetings. The indicator is based on the percentage of farmers who reported attending, with KUBE meetings excluded to avoid double counting, as all KUBE members also held OFG membership. This measure reflects participation in group activities, which provide opportunities for information exchange and building social capital.
	(2) Willingness and ability to share opinions at meetings	Farmers who attended meetings were asked whether they shared their opinions during discussions. The indicator is the percentage of farmers who reported speaking up, providing insight into their ability and willingness to contribute within group settings.
	(3) Supply chain connections	Farmers were asked whether they felt they had contact with everyone they needed to in the coffee supply chain. The indicator is the percentage of farmers who reported having these necessary connections. This measure reflects the perceptions of farmers' networks across key stakeholders, from traders and group leaders to larger buyers and certification bodies
	(4) Sense of personal agency	Farmers were asked about their role in decision-making processes, including whether they felt their voices were valued and whether they had influence in local decisions. The indicator is based on the percentage who reported being involved and able to influence outcomes. This reflects farmers' perceived agency within their communities and organisations.
	(5) Capacity to negotiate within the supply chain.	Farmers were asked whether they were able to negotiate the price of their coffee with buyers. The indicator is the percentage of farmers who reported some level of negotiation, compared with those who said prices were set unilaterally. This reflects farmers' perceived bargaining power within the supply chain.

14.14 Appendix 14 Certification standards

Certification	Features	Key standards
Fairtrade	- Buyers to pay a minimum price: \$1.40 per pound of Arabica, \$1.05 per pound for Robusta (an additional 30 cents for organic) an extra 20 cents per pound - Additional Fairtrade premium. 25% to be allocated to improving production and quality the rest can be used for training, credit and financial services and cash payments for producers struggling to meet basic needs and food shortages. - Additional training provided to producers focusing on climate change and how to adapt to changing weather conditions. (Fairtrade Foundation [About coffee], n.d.)	- Democratic decision making within organisation/ cooperative. - Labour and workforce requirements. - Buyers to pay a minimum price. - Farmers/workers decide how Fairtrade premium is used. - No child labour. - Buyer to offer payment advance. - Minimised and safe use of agrochemicals. Safe waste disposal. Soil fertility practices and water management. No use of genetically modified organisms. (Fairtrade International [About standards], n.d.)
Organic	Four principles - Health - Ecology - Fairness - Care (The Four Principles of Organic Agriculture IFOAM-Organics International, n.d.) Farmers follow farming practices that ensure crops are grown to organic standards(Ferreira & Ferreira, 2018). There is a transition period of 2 to 3 years for farmers to change to organic practices. Producers cannot access a price premium during the transition period (Blackman and Naranjo, 2012).	- No chemical fertilisers. - No synthetic pesticides or herbicides. - To follow soil conservation standards (includes mulching and use of shade trees) - Fossil fuels during production should be minimal. - Pollution in post-harvest stage should be minimal (Blackman & Naranjo, 2012)
Bird friendly	Developed in 1990 to preserve wild bird habitats. All certified farms are Organic certified and follow stringent growing standards. With a focus on increasing tree diversity and foliage to provide habitats for birds and other wildlife. Certified producers have access to a premium for certified coffee. (About Bird Friendly Coffee Smithsonian's National Zoo, n.d.)	Organic standards (certified by a USDA accredited agency) plus specific requirements focusing on: - Height of canopy - foliage cover - diversity of tree and shrub species - floristic diversity - structural diversity - leaf litter - living fences - buffer zones along waterways Importers and roasters sign a legal agreement with (SMBC) to state they guarantee 100% purity and traceability. (Bird Friendly Farm Criteria Smithsonian's National Zoo, n.d.)
Rainforest Alliance	Rainforest Alliance merged with UTZ certification in 2018. Aims to focus on addressing environmental, economic and social elements of sustainability. Rainforest Alliance is working to tackle forest and biodiversity	Rainforest Alliance standards include farm based and supply chain requirements. There are mandatory standards and self-selected standards. Smart monitors are used to assess several of the standards.

	issues such as deforestation, enable producers to prepare for climate change, improving livelihoods and improving human rights issues in agriculture. (Our Approach Rainforest Alliance, n.d.)	The key areas are: • farm management • traceability • income monitoring • sustainable farming methods • working conditions • environmental standards (Rainforest Alliance, 2022)
4C Common code for the coffee community.	Aims to improve social, economic and environmental standards of coffee production and processing (J. Bray & Neilson, 2018) Provides access to markets and aims to improve producer income, working conditions and protect biodiversity. Introduces baseline standards for the production of coffee. (Home › 4C Services, n.d.)	12 baseline principles <u>4 economic</u> • Business management • Capacity and skill development • Access to services and market information. • Traceability <u>2 social</u> • Human and labour rights • Working conditions <u>6 environmental</u> • Protection of biodiversity and high carbon stock areas • Use of pesticides and other hazardous materials • Soil conservation and fertility • Water conservation • Waste management • Energy consumption (4C Services GmbH, 2020)
Organik Indonesia.	National organic certification issued by the Indonesian Government. Covers all stages of agricultural production. (ORGANIC AGRICULTURE SYSTEM – SDS Indonesia Sustainable Development Services, n.d.)	Standards covering all stages of production: • Production/farm site • handling • storage • transportation • labelling • marketing • production facilities • Additives to the final product (ORGANIC AGRICULTURE SYSTEM – SDS Indonesia Sustainable Development Services, n.d.)
Indonesia Standard Coffee (ISCoffee)	National certification scheme initiated by the Indonesian government through the Ministry of Agriculture. Pilot programmes have begun in some coffee producing areas including Lampung and Nusa Tenggara Barat. Thought to be the first national scheme to address the sustainability of coffee in Indonesia. (Ibnu et al., 2019)	23 principles and criteria and 87 indicators. Key areas include: • The legality of land and suitable location. • Farmers to join groups and become part of a cooperative. • Harvest and post-harvest processing techniques. • Health and safety conditions. • Local culture and wisdom considerations. • Environmental standards including water and soil improvement practices. Buffer zones and conservation of biodiversity. (Ibnu et al., 2019)

