Unpacking the Trade Systems of Non-Wood Forest Products (NWFPs) and its Implications for Rural Livelihoods

Organization, Coordination, Mobility and Interactions in NWFPs trade systems in Manica Province, Mozambique

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Unpacking the Trade Systems of Non-Wood Forest Products (NWFPs) and its Implications for Rural Livelihoods. Organization, Coordination, Mobility and Interactions in NWFPs trade systems in Manica Province, Mozambique.

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Abstract

This study has been carried out in collaboration with the Food and Agriculture Organization (FAO) of the United Nations. The empirical context is an ongoing project by FAO in southern Africa, where it is important to strengthen non-wood forest products (NWFPs) through enhancing the production of NWFPs at the community level and integrate smallholders into commercial value chains. The aim for FAO is to enhance sustainable forest management of the Miombo woodlands in Mozambique/Zimbabwe. Recent years NWFPs has received growing interest from research, organizations and development bodies to deal with environmental degradation whilst simultaneously supporting rural livelihoods. However, limited attention has been given to the practical organisation and coordination of such NWFPs trade systems and what implications such trade systems have for rural livelihoods, which then is captured in the purpose of this thesis. The study has focus on three selected NWFPs; caterpillars (*harati*), honey and baobab. The data has been collected in 4 different districts across the Manica Province: Mossurize, Machaze, Guro and Chimoio based on a qualitative approach using semi-structured interviews and observations. Drawing on the concepts of nodes, bricolage and access.

Findings show that NWFPs trade systems in Manica cannot be understood as linear chains but as complex trade systems. The complexity exhibit patterns of coordination with key nodes connecting disperse collection sites and different markets linking Mozambique with Zimbabwe, Malawi, South Africa and urban markets within Mozambique. Mobility opportunities are central to the organization of the trade systems with buses and transport routes connecting products with a demand cross-border. Flexibility, timing, personal relationships and the opportunities that emerge through these mobility patterns are crucial for coordination and organization. Bus drivers and intermediaries often act as key coordinators linking collectors in remote rural areas with buyers in neighboring countries. Findings challenge a simplistic understanding of NWFPs as isolated to remote areas, showing an embeddedness into regional and international markets. While some NWFPs are integrated into formal export-oriented value chains, a substantial share of the trade continues to operate through informal and adaptive arrangements, filling gaps left by formal structures. Important livelihood implications appeared as NWFPs contribute significantly to food security and income generation, particularly during periods of agricultural insecurity. At the same time, increasing commercialization and cross-border demand may reshape local access to resources and create tensions between subsistence use and market-oriented trade.

Keywords: NWFPs, Mozambique, rural livelihoods, informal trade systems, cross-border trade, bricolage, nodes, mobility, Miombo woodlands, commercialisation

Table of contents

List of tables

List of figures

Abbreviations

FAO	Food and Agriculture Organization of the United Nations
ILO	International Labour Organization
IOM	International Organization for Migration
MITADER	Ministério da Terra, Ambiente e Desenvolvimento Rural (Ministry of Land, Environment and Rural Development)
NWFPs	Non wood forest products
SLU	Swedish University of Agricultural Sciences
SDAE	Serviço Distrital de Actividades Económicas (District Service for Economic Activities)

1. Introduction

The empirical context for this thesis is the ongoing project *Integrated Transboundary Sustainable Management of the Miombo Forests* by the Food and Agriculture Organization of the United Nations (FAO) (FAO, 2024). The project seeks to promote sustainable forest management while also enhancing rural livelihoods in both Mozambique and Zimbabwe. Through the enhancement of production of non-wood forest products (NWFPs) at the community level and integration of smallholders into commercial value chains (FAO, 2024). With the promotion of NWFPs the project wants to create economic incentives for sustainable forest management while simultaneously supporting local livelihood opportunities. The collaboration that enables this thesis to participate in the project, is undertaken within the framework of a recent Memorandum of Understanding (MoU) between SLU and FAO, established to strengthen academic and institutional cooperation.

Across Southern Africa, the Miombo woodlands constitute a crucial ecological and socio-economic landscape, serving as a source of biodiversity whilst sustaining the lives of millions of people change (FAO, 2024). In addition to supporting rural livelihoods through food, fuel, medicine and income-generating activities, forests also play a crucial role in climate regulation, carbon sequestration and the provision of ecosystem services. Yet, the Miombo woodlands are under pressure from deforestation, illegal logging and the effects of climate change (FAO, 2024). As a response, in 2022 the Miombo initiative and the Maputo declaration was signed by 11 Southern African countries, as a leading framework to promote sustainable forest management and conservation (Miombo restoration alliance, n.d.). The aim was to capitalise 500 million USD for large scale native species restoration projects across the countries where the woodlands are stretching (ibid).

In this context, promoting NWFPs such as wild fruits and berries, honey, medicinal plants and edible insects have received increased attention as an approach towards a sustainable future, in which biodiversity conservation is maintained, whilst supporting livelihoods, local and national economies (FAO, 2024). However, the promotion of NWFPs is not a new phenomenon and the interest from FAO dates back before the restoration initiative was announced. FAO have acknowledged and appreciated the importance of NWFPs for decades, encouraging governments to collect and assess data on these products (Sills et al., 2011).

Historically, researchers and development stakeholders argued that the economic contribution of NWFPs had been underestimated and emphasized their potential for rural livelihoods with integration into formal markets, value addition and exports. In this context, international trade opportunities were emphasized, while local markets for unprocessed products were often mentioned as economically limited as they easily get flooded with products, thus are constrained from price instability. Hence arguments were strengthened for promoting commercialization and export-oriented interventions (Sills et al., 2011).

At the same time, critics arose addressing the optimistic outcomes of such interventions. Debates increasingly questioned the tendency to portray NWFPs as universal "win-win" solutions for conservation and rural development. Instead of NWFPs as a pathway out of poverty, forests and forest-dependent livelihoods were associated with areas of chronic poverty and boom-bust market cycles. Researchers were pointing towards NWFPs as impossible to manage and subordinate, by concluding that "*NTFPs are not a silver bullet*" (Sills et al., 2011).

Later a middle ground between the more optimistic and pessimistic ways forwards appeared, highlighting the embeddedness of NWFPs in cultural traditions, local markets, food systems and everyday livelihood strategies. Challenging the somehow previous simplified narratives of NWFPs as either the "*silver-bullet"* or subordinate. Instead, they were recognized for their heterogeneity and as integrated into by socio-economic patterns (Shackleton et al., 2011). This complexity became increasingly apparent with research on NWFPs in Africa.

Initially, much of the early research on NWFPs was focused on South America and Asia. The absence of research on NWFPs in Africa was explained by the amounts of crisis ongoing at that time such as HIV/ AIDs, famine etc. making environmental concerns less important. When researchers assessed NWFPs in Africa, the complexity was revealed as distinct with NWFPs entangled in complex livelihood systems rather than the "*pristine forest extractor- narrative*" that was reflected in Amazonas (Sills et al., 2011).

Although much of the emphasis are on the subsistence use of these products within a rural context, these products are also traded. This trade spans from local markets into urban areas, with some even exported to international markets. Often correlating with migration patterns and urbanization with consumption preferences for unprocessed NWFPs either because of tradition, price or quality. Existing research on NWFPs trade to urban and international markets (Shackleton

et al. 2011). However, less attention has been given to how this trade is organised in practice and how these products move.

Assessing, NWFPs are complex for multiple reasons: the diversity of products and harvesting practices, the informal nature of extraction, insufficient ecological data on sustainability and ongoing debates regarding the definition of NWFPs (Belcher et al., 2005., Schackleton. et al., 2011). Meaning that initiatives aimed to promote development of NWFP value chains are not a straightforward solution (ibid). Instead, they are dynamic and fluid, shaped by interactions between actors, markets and institutions. Rather than operating through clearly defined formal value chains, NWFPs are often organized around local or informal markets, informal traders, transport routes and border crossings, through which products, information and capital circulate (Belcher et al., 2005). Informal economies play a significant role across Sub-Saharan Africa and are deeply embedded within everyday livelihood strategies (Smit & Musango, 2015). In terms of the informal economy, according to ILO:s definition (2003) it relates to "*economic activities by workers and economic units that are - in law or in practice - not covered or insufficiently covered by formal arrangements*". Rather than existing separately from formal systems, informal and formal market arrangements are often interconnected and mutually dependent (Meagher, 2013).

This study takes place in Manica Province located in central Mozambique, a border region neighbouring Zimbabwe and situated within wider regional mobility networks connected to South Africa, Malawi and other land-locked countries. Border regions are characterized by unique livelihood dynamics shaped by mobility and exchange of ideas, goods and services (Tati, 2012). In such areas cross-border mobility is facilitating a movement of goods, people and knowledge, which in turn create interconnected markets that extend beyond the national boundaries and shapes local livelihoods in different settings (ibid). The forests thus provide for a broad variety of needs both locally, regionally and globally - in terms of food, energy, construction material, cultural values and traditional knowledge, especially considering all the NWFPs (Shackleton, 2011). A significant share of these NWFPs are traded across borders and the volumes are increasing (MITADER, 2018).

NWFPs trade systems are approached in this study as shaped by complex, adaptive and overlapping market systems rather than linear value-chains. Conventional value-chain analysis often assumes relatively stable flows of products between producers, intermediaries and consumers (Stobiersky, 2020). NWFPs trade in the study sites appears to emerge through shifting interactions between actors, transport routes, interactions and cross-border demands

connecting Mozambique with neighbouring countries such as Zimbabwe, Malawi and South Africa.

Previous research has highlighted how relationships between people, livelihoods, and NWFPs are highly dynamic, context-dependent and difficult to generalize, as households continuously adapt their livelihood strategies in response to changing social, economic and environmental conditions. This complexity has made it difficult to develop comprehensive assess the contribution of NWFPs to livelihoods across different contexts (Shackleton et al., 2011).

1.1 Purpose

Despite the growing attention to NWFPs trade systems relatively little attention have been brought to:

- Interactions between formal and informal trade systems organization on NWFPs
- How these systems relate to cross-border trade and mobility
- The implications this has for rural livelihoods

The purpose of this thesis is therefore to contribute to unfolding these complexities within the Mozambiquan context in the Manica Province by examining how NWFPs trade systems are organised and coordinated through formal and informal structures in relation to cross-border demands, and what implications such trade systems have for rural livelihoods. The study focus on three important NWFPs; caterpillars (*harati*), honey and baobab.

1.2 Main-research questions

This study has two main-research questions:

1. How are NWFPs trade systems organised and coordinated?
2. What implications do the organisation of these trade systems have for rural livelihoods?

1.3 Sub-research questions

This study also has five sub-research questions, where 1-4 mainly is connected to main-research question 1 and 5 mainly is connected to main-research question 2:

1. Who are the actors involved in NWFPs trade systems and how are they interacting?
2. How are NWFPs trade systems coordinated in practice?

3. What demands shape NWFPs trade systems, particularly in the cross-border context, and how are products traded and transported to meet demands?
4. How do formal and informal trade systems of NWFPs interact?
5. How do NWFP trade systems shape rural livelihoods and what implications does this have for future value chain initiatives?

1.4 Relevance

This study is relevant to the ongoing work at FAO, specifically the ongoing project *Integrated Transboundary Sustainable Management of the Miombo Forests* aiming to promote sustainable forest management in Mozambique and Zimbabwe. Hence, this study seeks to generate insights that may inform future development initiatives and stakeholder engagement in NWFPs value chains and trade systems.

2. Background and previous research

2.1 Historical understanding of NWFPs

Rural households have long depended on NWFPs for subsistence, while the trade of these products has played varying roles in the society and for the economy over time (Sills et al. 2011). During the colonial period, many NWFPs constituted important trade commodities, and later came to be considered as secondary resources before regaining renewed attention in recent decades (ibid).

Historically NWFPs were key global commodities, being exported from Asia, Africa and the Amazon to Europe. E.g, gum Arabica is recognised as feeding the industrial revolution. Following World War 2, their importance declined due to the emergence of exports in timber and synthetic substitutes for forest derived products. This was then followed by a decline in the acknowledgment of NWFPs in forest policy agendas and statistics, as for example FAO stopped collecting data on these products in 1971. During the same period, forest policies, as for some Forest Tropical Plans often treated NWFPs separately as social and economic implications of logging and conservation interventions (Sills et al., 2011).

Interest in NWFPs re-emerged between 1987 with the release of Brundtland report and 1992, with the UN conference. In 1989, De Beer and McDermott published a book in which "*non-timber forest products"*, was for the first time established as a category arguing for a distinction between timber (Sills et al., 2011). This renewed attention contributed to, according to Sills et al. (2011) three major developments; First, organizations and development agencies were interested in how NWFPs could be commercialized and contribute to rural development. Second, it generated scepticism concerning both the sustainability and the broader development potential of NWFPs. Third, discussions and research arose on how "productive conservation" could be achieved through the promotion of NWFPs.

2.2 NWFPs and livelihood

NWFPs constitute important components of rural livelihoods as it contributes to food security, income generation and coping strategies serving as safety nets during periods of economic or environmental stress. The most common products derived from the forest are wild spinach, mushroom, edible fruits, edible insects, medicinal plants and many other animal and plant items (Shackleton et al., 2011).

Research suggests that approximately 60 million people depend directly on NWFPs for their survival, while approximately 350 million rely on them as safety nets during periods of crisis, such as crop failure or illness restricting people to work. In addition, between 500 million and one billion people manage forest areas for subsistence use or the sale of NWFPs and 45 million are involved in processing and transforming these products into commercial goods. Commonly, the collection and use of NWFPs are seen in rural areas and the dependence on these products are often linked to limited market access with limited cash income. Forests generate important source of food, medicine and construction materials for free, often available for anyone (Shackleton et al., 2011).

Further, scholars are giving increased attention to meanings of NWFPs beyond income, encompassing cultural dimensions and its connections with biodiversity and contributions to a meaningful life (Cocks et al., 2011). Many communities have a longstanding experience in collecting, preparing and using these products and this cultural embedment is currently driving a demand into growing urban areas and their markets (ibid). As a result, NWFP systems are not only located in rural livelihoods directly dependent on forest resources but also incorporated into broader socio-economic networks.

These forests from which NWFPs are collected, are inhabited areas and millions of people rely on resources from these forests for their livelihood. The forests provide for a broad variety of needs both locally, regionally and globally - in terms of food, energy, construction material, cultural values, and traditional knowledge (Min et al., 2024). Initiatives aimed to promote a sustainable forest management must take into considerations the importance of NWFPs for livelihoods and balance trade-offs between conservation, productive land-use, provision of ecosystem services and the social and cultural meaning of the land and forest for people (Fastré, Possingham & Strubbe., 2020).

2.3 Trade of NWFPs

Beyond subsistence use, NWFPs are commercialised and traded through local, regional and international markets generating important incomes for rural households (Shackleton et al., 2011). Engagement in trade of NWFPs is explained by four main reasons, as identified by Shackleton et al. (2011): first as a response to distress, second to diversify livelihoods, third to increase incomes and exit poverty, and fourth as a lack of other livelihood options. The trade is further being driven by organisations facilitating commercialisation of NWFPs to create incentives for conservation (ibid).

Researchers have frequently highlighted how the economic contribution of NWFPs previously has been underestimated and suggested an enormous potential on bringing these products into formal markets, through value addition and export-oriented commercialization (Sills et al., 2011). At the same time, local markets for unprocessed products were conceived as limited due to price instability and saturation of markets, further strengthening arguments for commercialization and value addition (Sills et al., 2011).

Trade dynamics are not limited to rural areas. Stoian (2005) highlight in a study from Brazil the importance of forest derived products for the urban poor. Emphasising its important contribution for both poverty reduction and income generation in peri-urban areas. Trade of NWFPs is expanding, both locally and into regional markets. This is driven both by demand and supply, related to migration patterns, urbanisation and changing consumption patterns that contribute to a growing demand for affordable forest-derived products (Shackleton et al., 2007). Increased mobility patterns have also been identified as one contributing factor to the increased movement between rural and urban settings (Shackleton et al., 2011). Interestingly, instead of urbanization causing a decreased demand of NWFPs it may increase the demand with traditions and consumption patterns following urbanization (ibid).

Previous studies have highlighted how communication technologies, such as mobile phones and informal trader networks, have transformed NWFP-trade by reducing transaction costs. This has opened up for markets further away from local markets and facilitated for potential increased trust-building. Such developments have increased the capacity of actors operating in remote areas to access new markets, exchange information and organize transportation networks (Shackleton et al., 2011).

Some of existing literature on NWFPs focus on global and export markets, while overlooking the importance of local and informal trade systems. This lack of attention to the local aspects can lead to an underestimation of their role in supporting rural livelihoods and may contribute to a marginalization of low-income groups or actors involved in these markets (Shackleton et al., 2007).

2.4 NWFPs and governance

Local and informal markets are often poorly supported by research, and in policy frameworks. Although the number of studies on NWFPs has increased, few have resulted in substantial policy changes or practical interventions. Previous studies have shown that policymaking around NWFPs often is reactive, especially when products shift from subsistence use and local trade toward large-scale markets. A

more opportunistic approach has also been observed, when governments intervene where products gain economic value or when influential actors aim for a greater control over production and trade (Laird, Wynberg, & McLain, 2011).

Previous research highlights how governance of NWFPs often is characterized by fragmented and inconsistent policy frameworks, and that is when regulations are frequently introduced as ad hoc responses rather than thorough comprehensive understanding of local trade systems and livelihoods (Ros-Tonen & Kusters, 2011). Scholars further emphasize that policymakers often have limited understanding of the diversity, complexity and context-specific nature of NWFPs and their value chains (ibid). Reasons for this is that many NWFPs are traded informally or harvested for subsistence purposes, and thereby fall outside formal regulatory priorities. In many contexts the collectors are marginalised both in political and economic terms, with low interest from governments to address their needs (Laird, Wynberg, & McLain, 2011).

When policies are implemented or resources are allocated to the sector, the enforcement is often weak with low awareness of existing regulations among traders and producers. This might be explained by the complexity surrounding these products as policies must take several aspects into consideration; biodiversity conservation, sustainable harvesting practices, livelihood support, market regulation, quality control, and state revenue generation (Laird, Wynberg, & McLain, 2011).

Shackleton et al. (2007) argue that strengthening NWFPs requires increased recognition, improved institutional support and interventions that address socio-economic, infrastructural and governance constraints. At the same time, emphasizes the importance of mapping and incorporating information regarding these value chains for statistical documentation, as well as communicating such findings to create awareness of the scale and importance of this trade (ibid).

2.5 Natural resource and NWFPs context in Mozambique

2.5.1 Natural resources

The forest in which NWFPs are collected from are also sites for extraction of minerals, conversion into agricultural land, and connected to the broader economy and subject to political interests. As such, NWFPs in Mozambique exists in this borderland of natural resources. Therefore, this section will contribute to the contextual understanding of natural resources in Mozambique and a brief political context.

Mozambique is a country with extensive natural resources: gold, forest, arable land, graphite, natural gas and coal. The country contains large areas of miombo woodlands, which provide important ecosystem services and constitute a critical source of food, medicine, fuelwood, construction materials, and income for rural populations (Ribeiro et al., 2013). Approximately 70% of the population relies on natural resources for their livelihoods (World Bank, 2026). At the same time, forests in Mozambique are under increasing pressure from deforestation, charcoal production, logging, agricultural expansion, and mining activities. (Ribeiro et al., 2013).

Despite its abundancy of natural resources Mozambique continues to experience widespread poverty and inequality, and poverty levels has also increased in recent years (The World Bank, 2026). A recent report published by The World Bank (2026) underscores the need for urgent policy actions as the population continues to grow, at the same time as there is constrained fiscal space and rising public debt, seriously limiting the government's capacity to invest in key sectors or respond to crises. The report stresses that delays in reforms will increase costs and further constrain the government's ability to manage natural resources and deliver essential services to the population.

Agriculture remains the primary livelihood source for the majority of Mozambique's population, and it contributes significantly to livelihoods particularly in rural areas (Jamú, n.d.). The sector is dominated by smallholder farmers practicing rain-fed agriculture, with limited access to inputs, markets, credit, and infrastructure (ibid). Since end of the civil war in 1992, agricultural development strategies have increasingly emphasized commercialization, market integration, and foreign investment.

2.5.2 NWFPs in Mozambique

Mozambique has a high diversity of NWFPs with most main producing provinces are Manica, Sofala, Inhambane and Zambézia. In 2018 the national strategy for NWFPs was released, *PFNM Visão 2035*, describing the importance of NWFPs for substance as well as commercialisation opportunities in Mozambique (MITADER, 2018).

The report identifies the increasing promotion of products such as honey and other NWFPs through projects, companies, NGOs,and international development initiatives. The report identifies numerous products with commercial potential, including baobab, honey, wild fruits, medicinal plants and natural oils, targeting both national and international markets. Despite the growing attention towards

NWFPs in Mozambique there is a lack of reliable national data about production quantities and trade volumes (MITADER, 2018).

Governance frameworks and legal interventions surrounding NWFPs in Mozambique, as seen as well in other countries are often developed in response to a crisis or a problem, such as overexploitation, rather than being developed based on systematic assessments of the broader opportunities and threats associated with the products, species, ecosystems and livelihoods involved (MITADER, 2018).

2.6 Study sites

2.6.1 Miombo woodlands

The Miombo woodlands is part of the extensive savannah spanning across Central and South Africa. The landscape is characterised by a dry and deciduous tree canopy, with summer rains with an annual rainfall ranging between 500 to 1500 mm, followed by a dry period which usually lasts for 5-8 months (Magalhães, 2017).

Mozambique has extensive natural forest cover, covering approximately 43 percent of the territory and hosts a rich biodiversity and unique ecosystems (World Bank, 2018) Its geographical location and extensive territory has a great diversity in terms on climate and soil condition, upholding a great variety of ecosystems (FAO, 1999) mainly dominated by tropical dry forests and woodlands comprising mainly Miombo, Mopane and Mecrusse woodlands (Magalhães, 2017).

Ongoing charcoal production, agricultural expansion and weak forest governance have contributed to continuous deforestation and forest degradation, and consequently a decline in the provincial biodiversity (Lisboa et al., 2024). Deforestation here refers to a change where natural forests are converted into non-forested land (ibid). In terms of pressure on the forests, charcoal and firewood together supply around three-quarters of the country's total energy needs (Kamnitzer, 2024). Charcoal production and firewood collection are major livelihood strategies in the Miombo Woodlands as well as a major driver of forest loss (Lisboa et al., 2024). For many households, charcoal acts as an important safety net during crisis periods, when agricultural yields fail or when other income sources are insufficient. The dependency on charcoal is linked to limited access to alternative energy sources, poverty and the lack of economic opportunities in rural areas (Lisboa et al., 2024).

2.6.2 Manica province

The Manica province is in the central-western part of Mozambique sharing border with Zimbabwe to the west, the Tete Province to the north, and the Sofala Province to the east with Chimoio as the provincial capital. The Manica province experiences a tropical climate with distinct wet and dry seasons, with rainfall patterns varying across the province due to differences in altitude. Field observations and discussions with FAO staff indicated that the vegetation is dominated by miombo woodlands, which provide for important household resources such as fuelwood, construction materials, and non-wood forest products (personal communication, March 2026).

The Manica province is crucial for agriculture as well as a logistical hub in the 'Beira Corridor'. It has transport routes between Zimbabwe, Zambia and other landlocked countries with the Port of Beira in Mozambique. It serves as a major control point for customs with very important and high-volume transit traffic connecting to Zimbabwe (IOM, 2020).

2.6.3 The 4 districts (Mossurize, Chimoio, Machaze, Guro)

This study took place in four different districts in Manica province: Mossurize, Machaze, Guro and Chimoio district (*see Figure 1).*

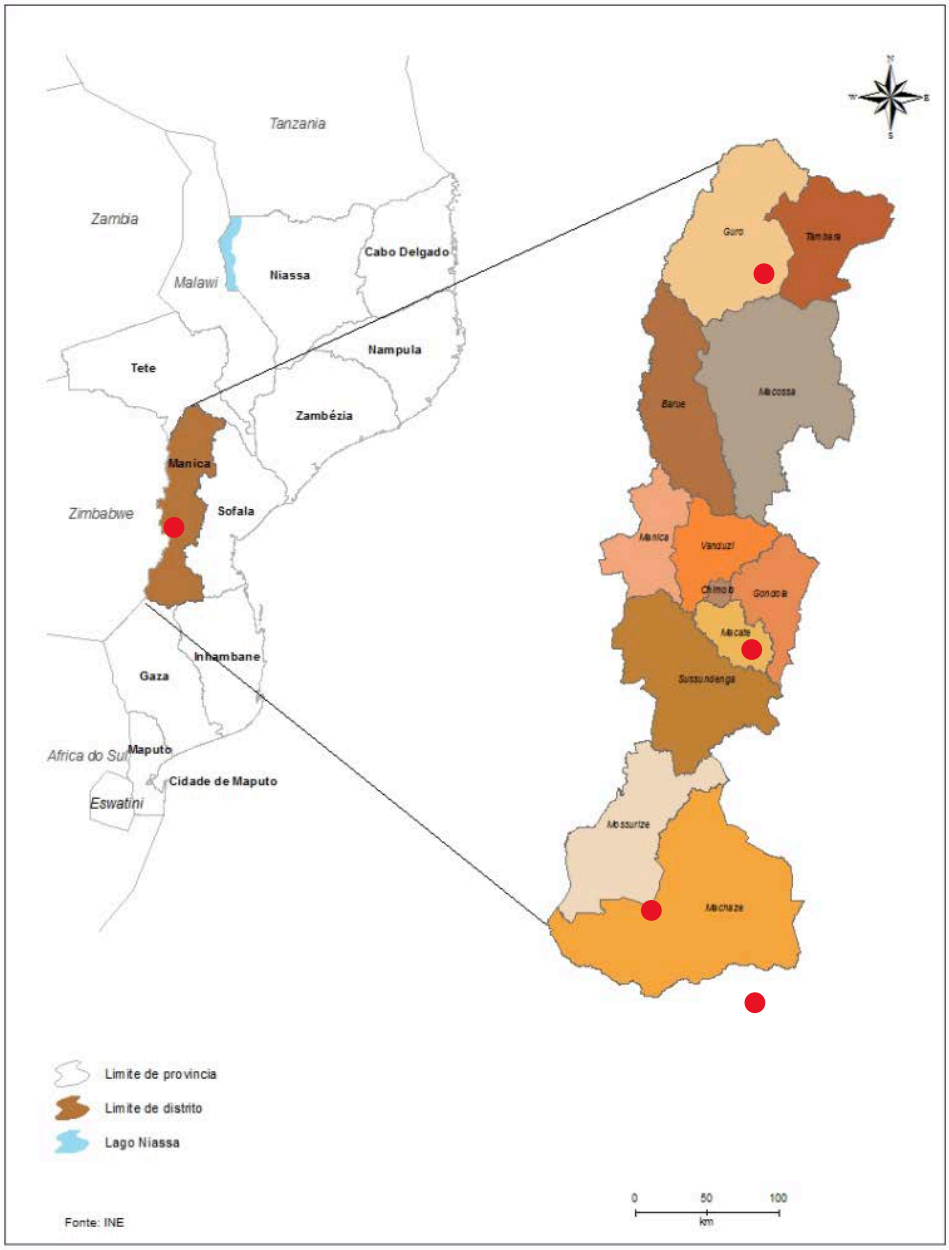

Figure 1: Overview of Manica Province. Source: Instituto Nacional de Estatística (2022)

Chimoio is the provincial capital of Manica and serves as the main economic and administrative hub of the province. It is characterized by relatively good infrastructure, access to markets, and connectivity, including its closeness to the Zimbabwean border (IOM, 2020). The city plays a central role in trade flows, including cross-border trade, and functions as an important distribution point for agricultural- and forest products (ibid). Economic activities frequently extend beyond the limits of the nation-state, creating cross-border networks of exchange that connect rural producers with markets in neighbouring countries (personal communication, March 2026).

Mossurize is a rural district located along the border with Zimbabwe. Livelihoods are mainly based on subsistence agriculture, and collection and trade of natural resources including NWFPs. Cross-border trade is important, and there are transports of both goods and people to both Zimbabwe and South Africa (personal communication, March 2026).

Machaze is a remote district in the southern part of the Manica Province, also with border to Zimbabwe. The district is characterized by high levels of poverty, and it is one of the poorest districts in the central of Mozambique (Club of Mozambique, 2022). It holds limited infrastructure and strong reliance on natural resources for livelihoods. Around 40% of the men in Machaze have migrated to work in the mines in South Africa, hoping to escape poverty (ibid). Households engage in agriculture as well as the collection of forest products for both subsistence and income generation. Access to markets is constrained, and trade is often informal and dependent on mobility and social networks. Previous years El Niño phenomenon are affecting the agricultural production, creating food insecurity with an urgent need for food assistance both in Machaze and as well in Guro district (Club of Mozambique, 2024).

The Guro district is in the northern part of the Manica Province close to the border to the Tete province. The Guro district is characterized by its semi-arid landscape (Uandela & Coultas, 2023). It receives a very small annual rainfall and suffer from water scarcity, has high evaporation rates and holds fragile ecosystems. Livelihoods are primarily based on agriculture and the collection of forest products. Due to limited infrastructure the access to markets from rural areas is challenging, especially during heavy rainfall as roads easily gets disrupted (personal communication, March 2026). However, there are traffic to and from Malawi, as traders come to Guro to purchase a broad variety of NWFP and other products.

3. Conceptual framework

As for the definition of NWFPs it appears far from straightforward. Scholars are highlighting a confusion and inconsistency regarding what should be classified as NWFPs and what should not. Drawing on previous debates in the literature, Shackleton (2011) note that some argue for that it´s easier to classify NWFPs for what it is not. However, ambiguity remains on both sides, for what it is and what it is not (ibid). The most known definition of forest products derives from "*The economic value of NTFPs in southeast Asia"* in which the definition was as NTFPs as encompassing *"all biological materials other than timber which are extracted from forests for human use*" (De Beer and McDermott, 1989).

FAO uses NWFPs instead of NTFPs, excluding any wood products. NWFPs are defined as "*goods of biological origin other than wood derived from forests and other wooded land and trees outside forests"* (FAO, n.d.). From FAOs definition (n.d.), NWFPs include products derived from both natural forests and plantations, such as fruits, honey, medicinal plants, and other plant- or animal-based products. The concept focuses on physical products rather than forest services or environmental benefits.

Shackleton et al (2011) argues that the introduction of the NWFPs concept by FAO was partly driven by an institutional and statistical consideration, with the need to harmonise forest products with FAO's Central Product Classification System and create a division organisationally between wood products and fuelwood, rather than a definition suited for field-based research. Further arguing that this distinction between wood and non-wood products can be less meaningful in practice, as local users and forest managers do not necessarily separate forest products according to these categories (ibid).

However, during fieldwork to describe forest derived products - the most used Portuguese term was *produtos florestais não madeireiros*, which translates more directly to *non-timber forest products (NTFPs)*. Consequently, the term NTFP was primarily used when discussing these products with respondents in the field to align with the term used locally for these products. Nevertheless, throughout this thesis, the term NWFP is adopted in line with FAO terminology and the definition that was used in the project within FAO. Additionally, the NTFPs will be used as well, when used in referenced literature to avoid confusion.

While NWFPs trade systems often are framed through the concept of value chains (Sills et al., 2011., Shackleton et al., 2011) findings from this study suggest that NWFPs trade in Manica Province is better understood as dynamic and

overlapping **trade systems and trade networks** shaped by mobility, informal exchange and adaptive coordination practices. In this thesis, the term **value chains** is used as it is commonly applied within the literature and by actors such as FAO. However, rather than understanding value chains as linear and clearly structured systems in the conventional sense (Stobierski, 2020), this study approaches trade systems as dynamic and overlapping networks of actors, mobility and exchange shaped by both formal and informal relations.

Moving beyond terminology this thesis will use the concept of **nodes** as used by Giroux et al. (2021). Recent research on informal food systems has emphasized the importance of understanding markets not as isolated sites of exchange, but more as interconnected nodes - economically, spatially and socially (Giroux et al., 2021). In their analysis of informal food vendors in sub-Saharan Africa, Giroux et al. (2021) conceptualize vendors as key nodes within wider food systems, embedded in networks of suppliers, transport systems, financial actors and customers. Rather than viewing informal economies as separate from formal systems, they highlight how formal and informal actors intersect and depend upon one another through various forms of linkage and coordination.

This thesis applies the concept of nodes to understand how NWFPs value chain and trade is organized across rural collection sites, roadside markets, transport routes, border crossings, intermediaries and export-oriented companies. In this context, nodes refer not only to physical locations but also to socially embedded points through which products, information and mobility are coordinated. This perspective helps capture the relational and spatial complexity of NWFP trade systems that are often described as “informal” or “remote,” yet in practice depend upon extensive networks of coordination and circulation.

Building on this the thesis will use the concept of **bricolage** to help unpack the blended and contingent nature of these nodes within the NWFPs trade systems. Bricolage refers to a process in which people often as a response to challenges or constraints, in a creative and pragmatic way, draw on what they already know to solve problems, rather than following fixed rules or formal systems (Liu, 2024; Cleaver, 2002). Liu (2024) uses the concept to show how actors respond in flexible and improvised ways, shaped by social relations and everyday practices, in which existing arrangements are adapted and reused for different purposes. One crucial aspect here is that the bricolage arrangements are embedded within networks of social relations, norms and everyday practices.

This bricolage processes are thus not linear or planned but rather flexible and adaptive. The individual actors, i.e. the bricoleurs, are continuously moving

between agency and structural constraints (Cleaver, 2002). Building on this, Liu (2024) highlights how bricolage connects to changing circumstances, meaning that people continuously adjust their strategies depending on factors like time, place and social connections. Bricolage is described as originated from structure, aimed at reproducing structure - but can contribute to the change of the structure (Liu, 2024). As bricolage is understood as deeply relational and embedded within broader social structures (Cleaver, 2002), it is also necessary to highlight the wider socio-spatial context in which these governance arrangements emerge and evolve.

Building on this, this thesis will use the concept of **access** defined by Jesse Ribot and Peluso (2009) as *"the ability to derive benefits from things,"* and distinct from the classical definition focused on property rights. With this definition, access is thought of as a "*bundle of powers,"* (Ribot & Peluso, 2009), and incorporates social relations and other processes that can enable or constrain individuals to benefit from different resources. Access to natural resources is therefore not seen as something neutral, but rather shaped by social, political, and cultural contexts. Different actors may gain or be excluded from access, depending on factors such as gender, social status, or position within local power structures. Access to resources is closely linked to power relations and governance arrangements (Ribot & Peluso, 2009). This perspective is particularly relevant for the study of NWFPs, as access may depend not only on property rights but on social networks and the ability to navigate complex trade systems.

4. Methods

4.1 Qualitative research

To assess NWFPs trade systems are organized in practice and implications for rural livelihoods and development interventions, this thesis adopts a qualitative research approach using an inductive logic, grounded in a perspective where the social world is understood as being constructed by the people involved in it (Robson & McCartan, 2016). Knowledge is understood as being co-produced through interactions between individuals, and where reality is shaped through interpretation (ibid).

This approach was chosen to enable for in-depth observations from the field that later is developed and understood using broader analytical concepts. Rather than seeking generalizable findings, there is an emphasis of identifying and understanding local dynamics that can be analyzed using relevant concepts (Robson & McCartan, 2016). Furthermore, the role of the researcher is recognized as central to the research process, making reflexivity and personal engagement important components of the study.

4.2 Selection of study site and delimitation

The selection of the geographical location for this thesis was made together FAO and it was based on several analytical and practical considerations. Firstly, the study sites had to be situated in a province with an already ongoing project of FAO, as this would do the logistical arrangements easier and ensure that the research would be relevant for ongoing development initiatives. Secondly, as one aim of the thesis was to explore the informal cross-border trade of NWFP it was logical to select the district of Manica as the primary site of collection of data, as there is a lot of NWFPs movement and it is located close to the border with Zimbabwe. This enabled for engagement with both the people involved with collection the products, along the value-chain to the customers bringing these products to Zimbabwe. As one of the aims was to explore the rural livelihoods of people living close to the border, engaging in cross border trade and how that relates to the forest governance. Relevant for ongoing development initiatives and potential stakeholder recommendations.

Initially at the beginning of my stay at FAO I got exposed to a broad variety of projects related to natural resource governance management of forest-based livelihoods and value-chains. Together with my supervisors at FAO and supervisor at SLU the thesis focus was narrowed down.

This processes of narrowing down happened as a process where I first followed a team from FAO for a one-week field-mission around Manica province. During this field trip, project activities related to NWFP was monitored and I managed to get an overview of the topic, with some valuable insights into which products were sold, where they were sold, and which actors are involved in this value chain.

These insights then guided me in the formulation of the research questions and design of the thesis project following consultation with my supervisor. However, the formulation of the thesis scope was carried out independently from FAO to maintain academic integrity.

4.3 Working together with FAO

This thesis was conducted in collaboration with FAO as a part of an internship, connected to their ongoing project on forest restoration and sustainable livelihood related to NWFP in Mozambique. Through these arrangements I was able to engage with a broad variety of projects, benefit from institutional knowledge and take part of long-term experience working with forest-based value chains and trade systems in the study areas, take part of the long-term expertise regarding technical aspects and the knowledge gained from working with this topic and in the chosen areas. The collaboration facilitated for access to areas and communities involved with the NWFP that might not have been as easily accessible otherwise within the frame of the study.

4.4 Reflexivity

This thesis was conducted simultaneously with an internship at FAO, which was a significant asset. It provided first-hand insight into how an international organisation works in practice with the drafting and implementation of projects related to the same topics that I was researching. It also gave me access to valuable practical support and networks, including insights from colleagues and partner organisations, as well as logistical resources such as transport and translation assistance from colleagues at FAO during fieldwork.

At the same time to work so close with an international organisation and doing independent research required constant reflexivity regarding my own positionality, the potential influence of FAO on my work, and what it mean to be perceived as FAO staff from interviewees and the potential conflicts of interest between the organisation and my independent research.

For example, when conducting interviews in the field I travelled with team members from FAO, as such the presence of FAO might have influenced how interviews approached me or what they decided to talk to me about. In addition, while conducting interviews for the thesis during field missions with FAO, I was simultaneously working on related topics through my internship. This somehow created a dual role as both researcher and intern, which might have influenced how respondents perceived my purpose, as well as how I interpreted and engaged with the material I collected. This also raises questions regarding potential conflicts of interest between the objectives of the organisation and the independence of the research.

At the same time, it's also important to stress that the thesis was conducted independently with support from my supervisor at SLU. While FAO gave support on the institutional support, contextual insights, logistical arrangements, and local contacts, I developed the research design, data collection and analysis of the data.

4.5 Data collection methods

4.5.1 Interviews

In total, 17 semi-structured interviews were conducted on NWFPs across 4 districts in the Manica province (*see Table 1*).

Table 1: List of respondents

Interview ID	**Number of respondents**	**Role**	**Place**	**Date**
Interview 1	1	Bus driver	Chimoio	March 2026
Interview 2	1	Trader/ passenger	Chimoio	March 2026
Interview 3	10	Collector	Guro	April 2026
Interview 4	35	Collector	Guro	April 2026
Interview 5	5	Collector	Guro	April 2026
Interview 6	1	Market	Guro	April 2026
Interview 7	2	Company	Guro	April 2026
Interview 8	5	Merchants/ trader	Guro	April 2026
Interview 9	1	Collector	Guro	April 2026
Interview 10	1	Merchant	Mossurize	March 2026
Interview 11	1	Merchant/collector	Mossurize	March 2026
Interview 12	1	Merchant	Machaze	March 2026
Interview 13	1	Merchant	Machaze	March 2026
Interview 14	1	Consumer	Mossurize	March 2026
Interview 15	1	Bus station	Mossurize	March 2026
Interview 16	1	Merchant	Chimoio	March 2026

Interview 17	1	Merchant	Guro	April 2026

All interviews were conducted together with at least one or more colleagues from FAO and, in many cases, also with local representatives from Serviço Distrital de Actividades Económicas (SDAE) (District Service for Economic Activities). As I only speak English, colleagues from FAO translated between English and Portuguese, while either SDAE representatives or FAO colleagues further translated into local languages when necessary. This was particularly important given the diversity of spoken languages in Mozambique, where more than 40 local languages are spoken across the country.

The interviews therefore involved several stages of translation which made the process time-consuming and also created a risk that certain meanings, nuances or details may have been lost in translation. For this reason, direct quotations are used only a few times in this thesis and are then from interviews conducted directly in English by myself.

None of the interviews were audio recorded. This decision was made as multiple stages of translation made it difficult to obtain recordings with a good sound, particularly as interviews were often conducted in noisy environments such as markets, transportation hubs or outside in rural settings. Instead, detailed notes were taken during and immediately after interviews.

The interviews took place in a variety of settings depending on the interview respondents and research focus. Initial interviews were conducted in market settings to identify which NWFPs were being sold and traded. I then visited bus stations and transportation connecting points to map aspects of cross-border trade and interview passengers and transport operators. In addition, I interviewed collectors and traders both in markets where products were sold and in rural villages where interviews were conducted in respondents homes and surrounding environments. I also conducted interviews with a baobab association in a rural area that collected baobab products for commercial purposes.

The interviews were semi-structured and followed an interview guide adapted to different categories of respondents. Questions focused on livelihood activities, NWFP collection and trade, seasonal dynamics, market access, transportation, governance structures, challenges. Follow-up questions were used to allow respondents to elaborate on issues they considered important, and I found interesting. With semi-structured interviews, themes could be created in advance to provide direction for the interview whilst there was room for flexibility, to change and adjust depending on the answers (Bryman, 2002). This approach

allowed for an inductive logic since it created room examine new ideas or directions based on what appeared important for the respondents (ibid).

Throughout the data collection process the focus was not limited to one single NWFPs but aimed to capture a broad range of products that respondents are collecting, selling, consuming or engaging with in other ways. This approach was inspired by an inductive logic, not to focus on a few known pre-selected NWFP but keeping an openness to what seems relevant and actual for respondents.

4.5.2 Observations

In addition, observations took place in market settings, rural villages and along roads together with colleagues from FAO. This allowed for direct observation of markets, assessing which products were available (or not), where they were located and interactions between buying and selling actors. Observations were also carried out at key connecting points, such as bus stations in all of the 4 districts with known cross-border movement of people, to observe movements of people and goods.

Added to this, my simultaneous internship at FAO provided opportunities to participate in meetings, workshops, and field visits related to NWFPs. While these interactions and observation were not treated as formal empirical data, they contributed to a broader contextual understanding of the governance, development, and commercialization processes surrounding NWFPs in Mozambique. Insights gained through these experiences helped inform the interpretation of the interview material and the broader institutional context in which the study is situated.

4.6 Thematic data analysis

Continuously throughout the fieldwork the data collected was transcribed and organized into a document. Respondents were pseudonymised for confidentiality purposes, while a separate document linking respondents to identifying information was stored securely.

The thematic analysis begun with an initial coding process searching for recurring words, concepts or practices kept in a separate document. Later these codes were grouped into themes such as mobility, messiness, access, commercialisation, constraints, NWFPs and livelihoods. These themes were not predetermined but followed an inductive logic in which themes was generated based on what appeared as relevant and crucial for the respondents.

Once the themes had been generated, conceptual frameworks were used to analyse, interpret and understand the material, rather than using theory to predetermine the data collection or findings.

5. Findings

5.1 Diversity of NWFP products in Manica province

Field visits rapidly underscored that NWFPs in the Manica Province cannot be understood as a single, uniform category. Instead, respondents repeatedly showed how they engage with a wide range of forest products which are collected, consumed and traded in different ways depending on the context. These products served multiple functions, including food, income generation and medicinal uses. Its importance varies across geographical areas as well as cultural and religious contexts. As such, treating NWFPs as a homogeneous group risks oversimplifying the diversity of practices, meanings and trade dynamics associated with them.

However, for the purpose of the study to be able make a more in depth analyze, findings will focus on three selected NWFPs; caterpillars (*harati*), honey and baobab. They have been selected because they were repeatedly mentioned by respondents and commonly found in the visited markets. These three products do not represent all NWFPs in the study areas and additional NWFPs was mentioned during interviews with some that might even grow in the same physical spaces as the chosen three ones. Below follows a short description of the three NWFPs.

5.1.1 Caterpillars (*harati)*

The selling of caterpillars, locally referred to as *harati*, were found in the districts of Mossurize, Machaze and Chimoio. *Harati* are collected from the tree *Burkea africana* and sold in local markets at varying prices. This typically happens in measurements of 20, 30 and 50 Meticais (approximately 0.31, 0.47, 0.78 USD), depending on quantity and quality *(see Figure 2).*

Figure 2. Caterpillars, (harati) for sale in a local market, arranged according to price (20, 30, and 50 MZN depending on cup size).

Harati has a targeted market as not everyone consumes them. When asking around among market visitors, some described *harati* as a delicacy whilst others seemed disgusted by the idea of eating them. Some also mentioned religious reasons for not eating *harati*. Despite such different preferences, merchants in Chimoio, Mossurize and Machaze consistently emphasized that demand for caterpillars is very high, especially from customers in Zimbabwe. In Chimoio, no caterpillars were available during the time of the study, yet one merchant who would sell *harati* when seasonally available (Interview 18) and one bus driver (Interview 1) described a well-established demand-driven trade network that will be explained more in depth in section 5.2.1. In contrast, *harati* were found in the markets during the time of the fieldwork in the Mossurize district.

The movement of *harati* from collection sites to markets was difficult to map as it did not appear in a linear manner. Instead, it is highly informal with seasonal supply chains and a variability between actors and locations. Only one merchant in Mossurize described how she collects the caterpillars herself before selling them at the market (Interview 12), while other respondents referred more generally to traders, transporters and cross-border buyers involved in the trade. Despite repeated attempts across several districts, it proved difficult to identify and interview active *harati* collectors directly. This may partly reflect the seasonal nature of collection practices, but also the dispersed and informal character of the trade network itself.

Nevertheless, respondents consistently described caterpillar trade as demand-driven and embedded within broader cross-border market relations, particularly

connected to Zimbabwe and, to some extent, South Africa. Respondents suggested that purchasing patterns were shaped not only by affordability, but also by opportunity in terms of seasonal availability, market-access and cross-border trade dynamics.

5.1.2 Honey

Honey was observed both in local markets, where it is sold in reused plastic bottles (*see Figure 3),* and in supermarkets marketed through more formalized value chains. The later involves both local and international companies. Honey sold in local markets mainly originates from traditional beehives and is distributed through informal trade networks, while honey found in supermarkets is part of more structured value chains; processed, packaged and distributed (MITADER, 2018).

Figure 3: Honey for sale in a plastic bottle in a store.

One example of informal honey trade is roadside selling, carried out by intermediaries and merchants operating through flexible market relationships (Interview 8). These actors establish informal or semi-formal agreements with collectors, often travelling to rural villages to source honey. In doing so, the buyers rely on communication with collectors, who inform them when and where honey is available. Once informed, intermediaries travel to the villages and purchase the honey, typically in large quantities - often around 60 litres. These volumes are divided into smaller bottles which are resold along roadsides or in local markets. However, the intermediaries mentioned they are often constrained by limited liquidity, and they may lack the financial capacity to purchase larger volumes even when such are available (Interview 8).

5.1.3 Baobab

Baobab was a product observed in local markets of Machaze, Mossurize and Chimoio. It is mainly sold through informal arrangements and purchased by local consumers although some cross-border trade was mentioned by some merchants. Although baobab trees were reported to be abundant in Guro (*see Figure 4),* baobab products were not observed in local markets during the fieldwork. The reasons for this were not identified.

In parallel to the informal arrangements, baobab is also part of more formalized trade system. In this study, one company was identified as sourcing raw materials from local associations and processing it into value-added products, such as powders which are then sold through formal markets, including to the international market. In Guro a commercial interest could be observed as collectors mentioned high competition for baobab from buyers coming from Malawi, in addition to the baobab company.

Figure 4: Baobab tree

The baobab fruit (*see Figure 5)* can be used for several products, and these can have both consumption and medicinal purposes. Informants e.g. described local uses such as preparing porridge, ice cream and yoghurt (interview 4). In addition, baobab was repeatedly mentioned as a fruit associated with several perceived health benefits in treating conditions such as migraines and diabetes.

Figure 5: Baobab fruit

5.2 Organization and coordination of NWFP trade systems

Findings suggest a diversity and complexity of the chosen NWFP value-chains as mapped out above. However, and as will be shown below, these systems also exhibit patterns of coordination and structure within the informal practices and networks. In the following section such patterns across the three products will be analysed across the three products in. A central finding regarding NWFPs trade systems in Manica Province is that all three selected products; baobab, honey, and *harati*, are embedded within broader cross-border trade networks extending beyond the local study areas. Although collected in the province, the products frequently moved through interconnected market nodes linking rural collection sites with consumers, traders, intermediaries and markets in Zimbabwe, Malawi, South Africa and urban areas in Mozambique.

5.2.1 Market nodes of NWFPs trade systems

A key finding regarding the trade of NWFPs in the Manica Province is the complex system of interconnected key market nodes – which includes actors, actions and networks, moving these products through the system, from collector to consumer and often cross-borders. The deep entanglement of these nodes makes it hard to distinguish a “chain”. Instead, the system can be understood as

resembling a mycelium network where interconnected pathways branch out and overlap across different nodes and actors just like a hyphae.

Nodes are understood as socially and spatially embedded key points, where products, actors, information and market relations (Giroux et al., 2021) through which NWFPs are connected and coordinated. Such nodes are not only limited to physical places, but also emerge as flexible and temporary with key connecting points under certain circumstances such as seasonality, transport availability, cross-border mobility, demand, social relations and timing. Some examples of what such nodes might look like:

- A bus route may become a node through the movements of products, passengers and market information across borders and within the country (Interview 12; Interview 18; Interview 1; Interview 2)
- A roadside honey seller may function as a node, connecting rural collectors and consumers traveling within the country and cross borders (Interview 8)
- A visiting Malawian trader may temporarily activate a market node by arriving at collection sites to purchase baobab during harvest season (Interview 4)
- Villages may become seasonal trade nodes during periods of NWFP collection

While some products are organized through formalized export-oriented systems involving a company, certification and quality standards, a significant share of the NWFPs trade assessed in the study move through informal networks coordinated through mobility, timing, cross-border arrangements and interpersonal relations. Rather than operating separately, the informal and formal arrangements frequently overlap and interact.

5.2.2 Transportation network and cross-border mobility

A particularly striking finding was the extent to which all three NWFPs were embedded within broader cross-border mobility systems. Nearly all interviewed merchants described selling products either to Zimbabwean buyers or to Mozambican migrants travelling to South Africa for work, who transported the products across borders. For the baobab collectors they mentioned a strong presence of Malawian traders interested in purchasing baobab.

One key element in the organization and coordination of these cross-border NWFPs trade system are the transportation networks, particularly buses and bus drivers, intermediaries and traders. Enabling for the products to move through and out of the country and linking otherwise dispersed key nodes. Much like a

mycelium, these transportation networks continuously connect diverse collection sites, markets and cross-border destinations, enabling the movement of both people and products. The buses that were assessed in the study are not only a means of passenger transportation but also carry goods and enable for opportunities across distances (Interview 1). The intermediaries, drivers and merchants, act as crucial connectors within this system, facilitating exchanges and linking producers to multiple markets.

The cross-border movement of *harati* from Mozambique to Zimbabwe, was described as following by one informant (Interview 1): One bus driver regularly operates between Chimoio and Zimbabwe, taking passengers cross the border. Chimoio is located around 85 km from the border to Zimbabwe. Occasionally the bus driver receives orders from his boss. The boss has then collected a list with people in Zimbabwe interested in bying *harati*. On this list, the quantity they wish to buy is stated. The boss then sends this list to the bus driver, who collects the requested volumes in Chimoio and transports them to Zimbabwe, also taking the passengers across the border. In Zimbabwe the boss receives the volumes and he distribute these to respective customer. In this case, approximately 80 kg of *harati* were transported per trip, illustrating the scale and regularity of this trade.

The case of *harati*, revealed how caterpillars are not only harvested and consumed within the province - but in many cases transported to consumers in Zimbabwe and South Africa. The dispersed nodes between collector and consumer are connected across borders through bus drivers, regular bus routes and intermediaries. Rather than acting solely as transport providers, the bus drivers function as key intermediaries, coordinating the movement of goods, information and demand. Through their (more or less) regular mobility patterns, they connect scattered collection sites in Mozambique to consumers in Zimbabwe and South Africa, effectively linking supply and demand.

Another interviewee revealed a slightly different configuration in the coordination of the trade nodes, which highlights the role of social relations and communication technologies connecting the nodes. A merchant in Chimoio selling *harati* (Interview 18) described a process in which rural intermediaries informed her in Chimoio in advance, sometimes weeks ahead, concerning when the *harati* would become available. She would then communicate this information via mobile phone to customers in Zimbabwe, who then travelled to Chimoio to purchase the caterpillars from the merchant in the market. Illustrating a more interactive and demand-driven form of coordination, enabled by social relations and communication technologies.

One key aspect emerging from the observed cross-border movements are their embeddedness within routine transport circulation, where passengers, goods and market information travel together. These transport networks facilitate the movement and informal coordination of exchange across space and enable buyers, traders and intermediaries to connect across borders. This suggests that NWFPs trade systems are closely interconnected with regional labour migration, transport infrastructures and transnational livelihood networks, rather than restricted to local rural markets.

5.2.3 Flexible and opportunistic organization of trade system nodes

Across the three studied NWFPs, most commonly the trade systems are organized through informal, flexible and opportunistic arrangements, rather than formal, standardized buyer-seller relations. While the trade systems as observed are strongly shaped by demand from Zimbabwe, Malawi and South Africa - coordination depends on timing, mobility, seasonal availability and the physical presence of traders and intermediaries. The trade system nodes were activated through the temporary presence of intermediaries and traders moving across rural and cross-border spaces, often correlating with the seasonality of these products.

For baobab informal trade where observed, some collectors mentioned selling their products to whoever showed up after harvest time. One group of village respondents (Interview 3) explained how the intermediaries know when the baobab harvest season is, and they show up in the village to buy. When asking the villagers why they did not have a more established contact with the same intermediary each year, they answered that they did not want to rely on such more permanent seller and buyer relationships with specific intermediaries or buyers. They regarded that such arrangements increased the risk of getting a lower (or no) price for their collected fruits. This buyer might not turn up in the end. Instead, once the baobab fruits were harvested and dried for approximately one month on drying racks, the fruits were sold to the buyer who arrived first to purchase them. In many cases these buyers were traders coming from Malawi. This case suggests an organization of the trade system through more open and opportunistic market nodes. In such cases, coordination is more dependent on being at the right place in the right time.

This flexibility could be argued to be especially important given the highly seasonal nature of NWFPs collection. Products such as baobab and *harati* is harvested during specific periods of the year, and honey is collected only a limited number of times annually from each hive. The flexibility may also be necessary due to infrastructural challenges as roads sometimes become damaged or

inaccessible within a short period of time, making it difficult for traders and intermediaries to reach collection sites. As a result, opportunities for collection and trade are temporally constrained which might explains the rationale behind selling to anyone that shows up (Interview 3).

Similar opportunistic coordination patterns are also visible in the *harati* trade. While the movement of *harati* is partly structured through demand nodes originating from actors in Zimbabwe and South Africa (Interview 12), the actual movement of the caterpillars seemed to correlate with mobility opportunities and transport. The bus route functioned as a temporary market and transport node, activated through the movements of drivers, passengers, traders, and goods moving cross-borders. Access to the *harati* market is therefore not dependent only on an established demand, but also on the opportunity and ability to connect to the market through such transportation networks. Even though the bus routes are operating on a regular basis they can be considered as flexible and opportunistic mechanisms, as the flow of *harati* appeared to correlate with opportunity.

In the case of honey, the coordination nodes were rather flexible but shaped around issues of trust, distrust and market legitimacy. The interviewed roadside sellers in Guro described how consumers are suspicious against the honey quality, suspecting adulteration such as an addition of sugar, or questioning the authenticity of the honey (Interview 8). Therefore sellers perform their own verification practices when they sell such as test of burning or pouring which should demonstrate product quality to the buyer, rather than relying on a formal quality control systems. These dynamics influences the spatial organization of the honey trade. When asked why these roadside sellers do not sell the honey in the central market of Guro, but instead about 20 minutes away from the city center *(see Figure 6),* one collector explained that selling in the city center is difficult due to “problems” which creates a bad working environment for the honey sellers. It was not entirely clear what specific problems he referred to, but he hinted that it relates to how people (other sellers and buyers) could question whether the honey was stolen and/or fake. Although the roadside honey sellers appeared to be physically able to access the central market in Guro, the sellers described this environment as unpleasant and difficult to operate within due to customer distrust and suspicions regarding product authenticity and theft (Interview 8). Therefore, he and other merchants preferred selling the honey along the road where they performed their own quality assurances to convince the customers.

Figure 6: Honey sold by the road

The issues of trust/distrust in honey quality and its origin were challenges emphasized also by the honey collectors. When a honey collector was asked why he didn't sell directly to consumers at the market at a better price instead to intermediaries, he answered: "*It is (due to) problems. People think the honey is stolen, or that the honey is fake, mixed up with something. It is not easy to sell honey in the city center of Guro. When selling it directly from my house, I can prove that I haven't stolen the honey."* (Interview 9).

In the case of honey, the decisions for organization of the trade systems are taken by collectors and merchants as a response to the structural conditions of distrust and limited market legitimacy in the honey trade. As a result, the nodes around the organisation of honey trade have been adapted and expanded to other spatial organization and dynamics outside the city market.

In this context, considering the opportunities and flexible organisation of trade systems as with baobab, honey and *harati* the lens of bricolage highlights the improvised and pragmatic forms of trade and market integration that actors develop. It also sheds light on how these arrangements are temporary and flexible arrangements, constantly evolving according to opportunities, constraints and social relations. Rather than following a one-way structure, the actors in NWFPs trade systems in Manica Province continuously assemble and adapt a diverse set of practices.

Such bricolage within the trade systems is therefore shaped by the changing conditions of seasonality, infrastructure constraints or mobility possibilities, distrust/trust and market opportunities. As a result, the trade systems are coordinated through flexible, opportunistic and context-dependent arrangements.

5.2.4 Interactions between formal and informal market systems

The case of baobab clearly illustrates how informal and more formalized market nodes coexist within the same system. On the one hand, informal intermediaries purchase baobab from collectors and distribute it through local, urban and cross-border markets. In parallel there is also a presence of baobab exporting companies, with more formalized market nodes, including processing facilities, contractual relationships, and regulated export channels.

The formalized baobab export system is organized using certification and traceability systems and quality control mechanisms. During an interview with a group of women from a baobab association in Guro, it was described how the women before starting to sell to the company had to undergo a training as the company is organically certified and requires compliance with food safety standards (Interview 4). The interviewed women gather baobab fruits from fallen trees in the forest, to which they have open access, and sell the baobab as whole fruits to the company. The company staff then travel to their village to collect the harvested fruits. They weigh the fruits on-site, with supervision of the head of the association, and the women are paid 9 meticais (0.14 USD) per kilogram for dried baobab through a voucher system.

One of the perceived advantages of this more formalized trade arrangement is that the company reportedly pays substantially higher prices than informal intermediaries. One interviewee mentioned getting paid 2 Meticais (0.031 USD) per kilo, demonstrating a substantial difference. Several respondents therefore associated participation in the formal value chain with improved and more stable income opportunities compared to informal trade systems.

The formal baobab value chain enables for a more structured and standardized pathway for the baobab products. The company is mainly export-oriented and integrated into broader global value chains, driven by a baobab demand from consumers in North America, Europe as well as in Africa. However, the integration into formalized markets have implications on the opportunities for local participation in the value addition (Interview 7). Previously women from the baobab association used to be engaged in the local value addition, by working a processing unit established by the company in the village, extracting baobab pulp at the community level for the company (Interview 4). However, the respondents

explained that this activity was closed due to the challenges in complying with formal regulations, especially related to food safety standards (i.e. laboratory testing showed contamination in the processed pulp), within the village processing unit. As a result, the women now sell the raw material to the company, who processes it in a centralised plant, taking place outside the local collection sites.

While the formalisation of the processing of baobab enhances the product quality to meet standards in formalized and international export markets, it has limited opportunities for local actors to participate in value added processes of the products. While formal regulatory requirements facilitate for the access to formal and larger markets, they may also create barriers for small-scale collectors who are unable to meet these standards. In this case, the inability to meet formal food safety standards created a situation in which the local people are the raw material suppliers within the value chain, while the value addition and thus higher returns is captured further away from the collection site.

However, despite the presence of the formal contractual arrangements the informal trade systems simultaneously takes place within the same spatial context. The respondents, including representatives from the baobab company, emphasized that the road conditions in Guro becomes significantly bad during the rainy season which makes it difficult to access the collection sites and transport the baobab fruits to the plant (Interview 7). A company representative explained how frequent delays in reaching the baobab collecting villages often meant that the product had sometimes already been sold to intermediaries, typically traders from Malawi, once they arrived. Interestingly, this happens despite the presence of formal contractual arrangements, stating that collectors should not sell to other buyers. This show how such agreements are difficult to enforce in practice in environments with multiple constraints. For the collectors this parallel market might be a backup; when the company don't appear due to infrastructural problems they can still sell to other buyers who are physically present and able to purchase the products. Despite the presence of formal contractual arrangements, the functioning (or not functioning) of the formal trade systems continues to interact with informal trade relations and practical access to collection sites.

A similar dynamic was identified in the case of honey. Logistic constraints frequently disrupt agreed honey transport arrangements, and this make collectors selling to those intermediaries who reach them first or who can offer immediate payment. The road sellers described a situation in which they are sourcing honey from the same collectors as one of the largest honey companies in Mozambique (Interview 8). While this claim could not be independently verified, it provides an indication of how formal and informal market systems sometimes overlap and

interlink. Informal discussions with representatives from the large honey-company also highlighted the challenges associated with maintaining stable relationships with the collectors/producers across the honey value chain. Furthermore, unstable relationships were described as a constrain for upholding a steady supply of raw material. However, no solution was identified for maintaining these relations, other than just being there physically.

The examples of baobab and honey exemplify how formal rules coexist with, and are frequently overridden by, informal arrangements and practical realities on the ground. Further, the company's access to the baobab collection is not determined only by making contractual agreements but also by their ability to reach these key selling nodes in time. The baobab example highlights how formal structures struggle to maintain their nodes in a context where access highly depends on mobility, timing as well as physical presence and where trust is continuously happening in practice. In this sense, the access to and movements of these products are relational: it depends on being there and being connected to people physically.

One could argue that informal market structures cannot be considered only secondary or residual to the formal ones. Formal and informal trade systems operate within the same market spaces, where actors often compete over the same resource base, market opportunities and consumers and with informal actors filling gaps left by formal structures. In a rural context of limited and unreliable infrastructure something repeatedly mentioned as a key challenge in many interviews, the trade system is pieced together by pragmatic solutions in which informal actors such as bus drivers become central to sustaining the trade. This in turn also reinforce the more flexible and opportunistic forms of exchange. These adaptive practices are essential to the functioning of the nodes within the NWFPs trade systems and people's livelihood, particularly in contexts where the formal trade systems are few and constrained by logistical and infrastructural limitations.

5.3 When commercialization clash with subsistence

NWFPs hold crucial roles in people's everyday life in terms of contributing to food security and food safety. Baobab was described by many respondents as a traditional food product, rich in nutrients: *"Baobab has a lot of vitamins, we eat it fresh, in porridge, and we also do yoghurt.*" (Interview 4).

As was mentioned by multiple respondents when asked about the importance of NWFPs when there are insecurities, droughts and floods one respondent explained: "*When the agricultural season is bad, they (*NWFPs) are really important. During a bad year, when we are hungry and don't have food – all of*

these products are important because it gives us food. We can eat it when we are hungry, and we can also sell it to get some money."

At the same time, many of the forest resources that contribute to household food security and subsistence are also within commercial trade systems driven by urban and cross-border demand. This raises the issue on how increasing commercialization may influence local access to and use of NWFPs for rural livelihoods. These dynamics differ across products and respondents as citated above referred more broadly to the importance of multiple NWFPs in supporting livelihoods during periods of insecurity, rather than to a single product alone.

When asked how the resource pressure on baobab has changed over time in the Guro districts, it was explained by the women from the baobab association that when people from Malawi started to arrive to purchase baobab in the village something changed related to the subsistence use of baobab. This change was explained as linked to the increased demand for the product, resulting in the product being sold and less consumed local. This dynamic was further reinforced with the introduction of the baobab company now purchasing a stable and larger quantity of baobab each harvest season. The change resulted in:

- That baobab is now selectively allocated between household consumption and market sale
- The collectors allocate small or damaged/bad baobab fruits for the household, whilst the big/good ones are prioritized for selling to the company (Interview 4)
- That in general the amount of baobab available for household consumption locally in that village has decreased

The income generated from the sale of baobab should not be overlooked. Respondents (Interview 4) mentioned that the income instead is used for essential livelihood needs, including house construction, school expenses, and the purchase of basic goods such as oil, flour, rice and salt. Some respondents emphasized how the earnings from their baobab sales had enabled them to build their house.

6. Discussion

The empirical context for this study is a FAO project aimed at promoting sustainable forest management in Mozambique and Zimbabwe, through enhancing the production of NWFPs and integrating smallholders into commercial value chains. Thus, this chapter aims at discussing not only the characteristics of the trade systems but raise broader questions regarding rural livelihoods and how NWFPs trade systems can be approached by development initiatives.

6.1 Successful NWFPs initiatives and interventions must grasp the mycelium

Rather than linear chains the organization of the trade systems appeared dependent on coordination shaped by mobility, social relations, timing and cross-border circulation. Consequently, interventions aimed at enhancing production of NWFPs must consider not only the collectors and the ecological and biological resource, but also incorporate all the nodes spanning from the locality and cross-border. Such as the bus drivers, bus stations, Mozambican migrant workers travelling to South Africa, Malawian traders, consumers in Zimbabwe and rural collections sites. Giroux et al. (2021), describe informal vendors as key nodes within food systems in Sub-Saharan Africa. Similarly, the findings of this thesis demonstrate that actors involved in NWFPs trade function as key nodes within broader market networks extending from rural collection areas to urban markets and cross-border trade routes.

Considering the contextual “messiness” surrounding NWFPs, researchers strongly argue against standardised governance, or a single, comprehensive agreement or rule applied broadly to all NWFPs (Peters, Gentry & Mendelsohn, 1989). Previous studies have highlighted the importance of both recognising the broad variety of NWFPs species as well as the social and economic importance of such species (Laird, Wynberg & McLain, 2010). Based on the findings it can be argued that policy interventions, need to assess how these trade systems are organized and coordinated in practice and interacts with formal and informal structures and cross-border demand. The findings further suggest given the mycelium of the nodes that NWFPs trade systems or value chains development cannot be treated as straightforward technical fixes, but must engage with the fluid, complex structures through which these nodes operate.

Rather than moving through linear and easily understandable chain products frequently move through mobile and overlapping trade systems involving

numerous actors that sometimes are temporary. In most cases, it was difficult to identify how many key nodes a single product passed through before reaching the final consumer or where value is concentrated or captured. An initial methodological idea in this research process was to physically trace a value chain of one chosen NWFPs, to travel from the start point to the end of the product. Such an approach appeared simply not possible due to the complexity and mobility of the trade systems in focus, given the time allocated. More importantly, the study generated findings showing a complexity of interconnected trade nodes and its entanglements in rural livelihoods.

6.2 Rural collection sites – maybe not so rural?

Previously NWFPs have often been described as mainly important within a rural context but van Vliet, Nasi & Taber (2011) argue that the importance of NWFPs span into urban livelihoods. Similar tendencies have been observed in this study. This argues against a simplistic understanding of NWFPs as simply isolated to rural areas and remoteness. While infrastructural constraints are visible, these areas were not disconnected. Through buses, intermediaries, motorcycles, roadside trade, mobile communication and cross-border mobility, actors are continuously creating practical solutions that enables products to move considerable distances. The rural markets of this study are by no means isolated but a part of a system of cross-border movements, where people, goods and market information are moving around together. As commercial interest grows and cross-border demand has increased through Malawian traders, urban markets and formalized export systems, respondents described how a growing share of baobab was sold rather than consumed locally.

Vliet et al. (2011) further argue how demand extending beyond the local context blurs the distinction between subsistence and commercial use with effects on the resource availability and sustainability outcomes. As could be observed with baobab, NWFPs commercialisation give important income opportunities for rural population, at the same time increasing demand also appeared to influence local access and resource allocation. As such, when assessing how to support NWFPs value chains, one must move beyond the rurality and take into consideration regional and global networks that these collections sites are connected to. Vliet et al. (2011) points to how increased urbanisation, instead of declined interest in NWFPs might instead increase the interest of such products. This as cultural preferences, traditions and local consumption practices affects the consumption and interest of NWFPs (Sills et al. (2011).

This may, for example, be reflected in the case of *harati*, where several buyers expressed that they purchased the product because they genuinely appreciate it

rather than out of economic necessity and with Mozambican migrant workers travelling to South Africa bringing *harati* with them. Similarly, baobab products were observed being sold in local markets, sold to urban consumers in Chimoio, city and to migrant workers going to South Africa. The fact that consumers actively purchase products that may also be collected freely suggests broader cultural, culinary or market-based form of demand. Indicating a relationship between consumption, commercialization and dependence on NWFPs that is differentiated and context dependent. In that sense this study further reinforces the suggestions of Vliet et al. (2011) that assessing rural areas only are not enough, but rather understanding broader trade dynamics.

6.3 Acknowledging the opportunistic and flexible trade flows

The trade systems studied are characterized by a mobility-dependent forms of coordination, closely co-existing with existing movements of people, goods and transport infrastructure, which are activated under certain conditions. This creates a fluid and mixed trade system. The coordination of nodes as described in the findings does not appear to be centrally coordinated but as emerged through a process in which market exchange is shaped by actors' ability to "make use" of opportunities that emerge through mobility and market access.

In this context bricolage emphasizes the pragmatic approach from actors continuously adapting their practices in which actors draw on available resources, relationships and opportunities to sustain flows of goods across space (Cleaver, 2002). Bricolage is often mentioned as a response to changing market conditions, transportation challenges, access and demands from buyers, to get these products moving and sold in markets, across dispersed nodes in a trade system with formal and informal market structures.

This opportunistic organization of trade systems can be situated within a broader Mozambiquean political and socio-economic context characterized by historical conflicts, political insecurity, recent demonstrations, corruption and somehow volatile state presence (The World Bank, 2026). In such a context the flexibility and adaptability may not only represent characteristics of the NWFPs trade system but are necessary conditions for its functioning. Organizational sociologists have argued that entrepreneurs and organizations can overcome constraints through bricolage, emphasising bricolage practices as a successful strategy to deal with turbulent environments and overcoming crises (Liu, 2024).

The ability of the opportunistic trade system and its actors to continuously adjust to shifting circumstances could therefore be understood as central to how these

value chains persist and operate. Additionally, as this adaptability can be argued to contribute to making NWFPs activities for the important livelihood strategy they are in rural areas, especially in a context with for example political insecurity and climate change. At the same time, Liu (2024) argues that bricolage practices should not be considered as unconstrained or free. It is rather shaped by structural constraints, experiences, capacities or objectives of the bricoleurs – the actors within the trade systems. For NWFPs factors such as infrastructural constraints or distrust are still present. However, the extent of the constraints, the experienced impact or restrictions on the movements of NWFPs were not assessed in this study.

Recognising the more opportunistic trade systems should not imply leaving actors to manage these constraints on their own. Instead, interventions play an important role in supporting existing systems through improved infrastructure, strengthened local processing and storage capacities and context-sensitive forms of capacity building. For example, support for small-scale honey collectors and traders could strengthen product quality without necessarily requiring adaptation to large-scale production models with high barriers to entry.

6.4 What is a possible inclusive pathway forward?

When discussing NWFPs it is necessary to acknowledge their importance as livelihood strategies across the study areas. Particularly in contexts characterized by agricultural insecurity, infrastructural limitations and fluctuating economic opportunities. NWFPs trade systems cannot only be understood solely through their biological origin or ecological characteristics, but must also be understood through the socioeconomic relations, market dynamics and governance arrangements that shape access to commercialization and benefit distribution.

With this background, Shackleton et al. (2007) argues that export markets are not necessarily the most important livelihood contribution in terms of rural income generation, employment or livelihood security. The importance of the local markets for rural livelihoods cannot be emphasized enough, considering that all the assessed products were found in every local market visited, except one in Guro District. Previous studies point to how local markets are frequently overlooked despite their major importance for rural livelihood (Shackleton et al, 2007). This suggests that interventions aimed at strengthening NWFPs trade systems need to consider local markets and commercial value chains targeting the locality and the actors already participating in them, rather than focusing exclusively on commercialization for international markets. It is important in the Mozambiquan context because local markets are accessible markets with low entry barriers, in comparison to more formalized export markets. Seasonality is

presented as one factor contributing to the invisibility or marginalization of these markets. At the same time, seasonality may also contribute to the adaptive flexibility of NWFP trade systems, allowing actors to shift between products, markets and livelihood activities depending on changing environmental and economic conditions.

However, there is a risk of exclusion. As highlighted by Cleaver (2002) informal systems might appear inclusive but still reproduce and reinforce existing social divisions. From the study of informal and formal interactions in food systems, the authors caution against romanticizing local systems, emphasizing that they are also shaped by power dynamics, politics and social inequalities (Bloom and Hinrichs, 2011). Consequently, this questions the possible appearance of informal and local trade systems as automatically more inclusive or equal. Instead, participation and benefits are embedded in relations, trust, legitimacy but also social positioning within market structures.

Local, informal or formal, either way previous studies have argued that harvesters, traders and processors receive unequal share of profits within NWFPs value chains, with harvesters often receiving a smaller fraction of the final products value (Laird et al., 2010). Often profits from NWFPs value chains increases with additional processing and upgrading of the value chain, but so does the political power too (ibid). As such, devotion must be given to assess questions of distribution of value within them, especially how value chains interventions might affect concentration or distribution of value. However, findings in this study complicate such understandings of a structured value chains making it even more important to in detail map out the actors involved and assess questions of distribution.

Added to the entanglement of NWFPs and livelihoods there is also a vulnerability dimension. Addressed by Sills et al. (2011), arguing that the use of and dependence on NWFPs are often associated with poverty and limited livelihood opportunities rather than solely with the attractiveness of the products themselves. If dependence on NWFPs is closely linked to poverty and limited livelihood alternatives, interventions may disproportionately affect vulnerable groups.

Findings also point to access as a central factor shaping the participation of NWFP trade systems. This is not only about access to forest resources themselves, but also access to collection nodes, transport routes, intermediaries and market sites. The perspective of access as discussed by Jesse Ribot and Peluso (2009) perspective is particularly relevant for the study of NWFPs, where access to forest

resources and participation in value chains is often mediated through a combination of formal and informal practices.

For inclusive pathways forwards, trade systems must engage with the entanglement of NWFPs and livelihoods. Laird et al. (2011) highlights how implementation of laws governing NWFPs must recognise the complex trade systems, taking into consideration subsistence needs. Based on the findings one must identify critical access points, vulnerability, dependency, power imbalances, uneven benefits and possible areas for tensions between subsistence and commercialization.

6.5 Reflections for future NWFPs initiatives

Findings in this study further resonate with a broader discussion raised by Laird et al. (2011) and Shackleton et al. (2011), regarding the challenges of market-oriented NWFPs interventions in remote forest contexts. Previous studies note that export-oriented commercialization opportunities for remote forest-dependent communities are too high risks, not possible to access or just inappropriate (Shackleton et al., 2011). Studies then emphasize that the greatest value of NWFPs for local livelihoods are often within the subsistence-use and local or regional trade systems.

At the same time, findings in this study suggests that NWFPs trade systems in Manica Province are already connected to broader regional and cross-border trade networks. Often through informal and locally embedded forms of exchange, rather than formal export system and not necessarily connected to high-end international export markets. Findings therefor support the argument emphasizing the importance of recognizing local and regional trade systems with rural and urban linkages of NWFPs, rather than focusing only on formal export markets.

Previous research and discussions about NWFPs and sustainability often put strong emphasis on overharvesting, while forest degradation such as illegal logging, mining and agriculture cause a much greater environmental impact (Shackleton et al., 2011). Highlighting the importance of situating NWFP trade systems within a broader political, environmental and land-use context. Consequently, future research could further assess how NWFPs trade systems in Mozambique interact with wider processes of land-use change and to examine to what extent the promotion and commercialization of NWFPs in reality contributes to more sustainable forest management and strengthened livelihood opportunities in Mozambique.

As Shackleton et al. (2011) argue *"cursory attention has been drawn to NTFPs as one potential means to mitigate environmental harm and socioeconomic ills".* This study shows how NWFPs are entangled in a complex reality, resembling a mycelium that does not work well with quick-fixes, simplified solutions or quick technical fixes. Considering the crucial livelihood functions that NWFPs already serve and with growing uncertainties in the future such as climate change, environmental pressure and economic uncertainty (The World Bank, 2026) Shackleton et al.'s (2011) pinpoints that "*in an uncertain future, their role is likely to expand"*. Great attention must be devoted to understanding the organization, coordination, mobility and interactions of the trade systems through which these products move. This requires devoted time and resources invested over time, engaging with the NWFPs trade systems.

Based on findings, the discussion and the work of Laird, Wynberg and McLain (2011) this study generates several considerations for future interventions and governance initiatives targeted NWFPs trade systems in Mozambique:

- Account for the complex and overlapping nature of NWFPs trade systems.
- Recognize the broader spatial context in which NWFPs trade systems operate - from remote rural areas and cross-borders.
- Acknowledge NWFPs not only as ecological resources supporting biodiversity but also as part of broader socioeconomic systems shaped by mobility, cross-border demand and diverse livelihoods.
- Engage with already embedded informal, local and formal systems of coordination, rather than assuming separate systems.
- Make use of already existing creative solutions in place to get these trade systems functioning instead of "reinventing the wheel"
- Participation in trade systems is not only shaped by access to the resource but by connectivity, trust, mobility and market functions.
- Conduct systematic assessment of opportunities and threats associated with the NWFPs trade systems, rather than as a response to a single crisis
- Include traditional knowledge-holders of NWFPs to benefit from the trade of the products and give ownership and ask permission to the knowledge-holders if their knowledge is used for commercialisation.

6.6 Limitations and considerations

Some limitations will be acknowledged for this study. Firstly, as shown in the findings NWFPs are complex and nevertheless comprehensive. With this, carefulness should be taken not to overgeneralize findings from the three selected products or from the specific study areas to all NWFPs or broader contexts in

Mozambique. The findings are based on a qualitative study conducted in selected areas within four districts in Manica Province, and the contextual nature of the findings is therefore strongly emphasized.

Given the time constraints for a master thesis, limitations existed regarding the ability to fully map and trace such broad, mobile and overlapping trade systems. While one initial ambition was to physically follow products through the value chains, this appeared difficult due to the fluid and constantly shifting nature of the trade systems. The findings represent a snapshot of trade systems organization and coordination under specific temporal and contextual conditions. Since NWFPs trade is highly seasonal and influenced by changing market demands, infrastructure conditions and mobility patterns, these systems may look different across periods and contexts.

Lastly, the study focused mainly on the organization, coordination and livelihood dimensions of NWFPs trade systems rather than conducting ecological assessments of harvesting practices related to sustainability or quantitative assessments of value distribution and profit capture across actors.

7. Conclusions and contributions

The purpose of this thesis is to unfold the complexities of NWFPs trade system within the Mozambiquan context in the Manica Province by examining how NWFPs trade systems are organised and coordinated, and what implications such trade systems have for rural livelihoods. The research questions have focused on three products; caterpillars (*harati)*, honey and baobab. The study has been carried out in collaboration with the FAO and is connected to an ongoing regional project *Integrated Transboundary Sustainable Management of the Miombo Forests*. Data was collected through interviews and observations in the districts of Chimoio, Mossurize, Machaze and Guro.

Rather than moving through simple and linear vale chains this study argues that NWFPs trade systems have numerous "ingredients" and show how they are organised and coordinated. The organization of the NWFPs trade systems might appear messy, but in practice exhibit patterns of coordination and structure as portrayed through the key nodes. These nodes have revealed transportation networks spanning cross-border connecting dispersed rural collection sites in Mozambique with demand in Zimbabwe, Malawi, South Africa as well as urban areas within Mozambique. The role of mobility opportunities has appeared as central to the organization of the trade systems, as buses and transport routes did not only move people but also products, information and market connections cross-borders. The studied trade systems depend heavily on flexibility, timing, personal relationships and the opportunities that emerge through these mobility patterns. Bus drivers and intermediaries often fucntion as key coordinators linking collectors in remote rural areas with buyers in neighboring countries, illustrating how demand from cross-border shape the movements of these products. Interventions targeting NWFPs trade systems must therefore engage and properly assess the mycelium of nodes within the system, not only limited to rural areas. The study also shows how formal and informal trade systems interact as some products are traded through formalized markets at the same time as they move through informal trade networks. Rather than operating separately these systems interact and uphold different functions but also compete for same resources.

Findings stress the fact that NWFPs trade systems must engage with the entanglement of NWFPs to people's lives, as it has different implications for livelihoods. NWFPs are embedded in livelihoods and if they are not treated as such there are risks of disrupting the socioeconomic and cultural systems that depend on them. NWFPs contribute to food security and income generation. At the same time increased commercial interest and urban demands create a clashing interest and blurred line between subsistence use and market demand.

Implications on rural livelihoods are increased resource pressure and with urbanization and commercialization this tension could increase. This highlights that understanding trade dynamics in rural areas itself are not enough, but it is necessary to see the larger trade systems and “the wholeness of markets”.

NWFPs as an approach towards a sustainable future in which biodiversity conservation is maintained whilst supporting livelihoods, local and national economies - requires in-depth understanding of the products entanglements in livelihoods. Their contribution to income, as safety-nets, cultural meanings and embeddedness in local and formalized markets. Specific attention must be given to possible unequal access to resources, infrastructure and knowledge, commercialisation demand and pressure, cross-border dynamics, uneven and even distribution of benefits. But nevertheless, understanding and making use of already creative solutions existing making these trade systems functioning, instead of “reinventing the wheel”.

This thesis contributes to conceptualizing NWFPs trade systems as a non-linear, interconnected “mycelium of nodes” challenging linear value chains analyses. Furthermore, by introducing mobility, transportation networks and interactions as important variables to understand NWFPs trade systems. Thereby expanding the understanding of how NWFPs can be organized and coordinated and shaped by cross-border market demands. By paying attention to both formal and informal systems at the same time, the study demonstrates how these two systems interact, compete for resources and uphold complementary and supporting functions.

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Popular science summary

Forests are important for many people around the world. In rural areas of southern Africa forests provide food, medicine, income, fuel, construction and is part of culture and traditions. In Mozambique products are collected from forests, and this study has focus on three products from the forest: edible caterpillars (*harati)*, honey and baobab. They are commonly referred to as Non-Wood Forest Products (NWFPs). These products are increasingly promoted in development and conservation projects to support rural livelihoods while also encouraging sustainable forest management.

The thesis explores how NWFP trade systems are organized and coordinated in Manica Province, Mozambique. The study has been carried out in collaboration with the Food and Agriculture Organization (FAO) of the United Nations (UN) and is connected to an ongoing regional project on sustainable Miombo woodland management in Mozambique and Zimbabwe. Data was collected through interviews and observations in the districts of Chimoio, Mossurize, Machaze, and Guro in Mozambique.

Findings show how trade of NWFPs is organised and coordinated in a dynamic way. Rather than moving through “one way of doing it”, the products travel through overlapping and flexible networks involving collectors, traders, bus drivers, intermediaries, roadside sellers, companies and cross-border buyers. These networks connect rural villages in Mozambique with consumers and markets in Zimbabwe, Malawi, South Africa, and local markets and urban areas within Mozambique.

One important finding is the central role of mobility and transportation with many dynamic interactions between people, with buses not only moving people but also products across borders. The study shows how these trade-systems depend heavily on flexibility, timing and opportunities that emerge through mobility and informal exchange. The study also highlights how formal and informal trade systems coexist and interact. Some traded products traded through more formalized ways in the system, at the same time moving through informal trade networks. Rather than operating separately, these systems often overlap and depend on one another. Another important finding concerns livelihoods as NWFPs contribute to food security and income generation, particularly during droughts, crop failures, or periods of economic hardship. At the same time, increasing commercialization create a possible clash with subsistence use with less resources allocated for the household and local market demand. However, the income from these products

was described as important for paying school fees, building houses and buying food and household goods.

The thesis argues that NWFPs are important for rural livelihoods contribution to income, as safety-nets, cultural meanings and are important to local and formalized markets. Specific attention must be paid to possible unequal access to resources, infrastructure and knowledge, commercialisation demand and pressure, cross-border dynamics, uneven and even distribution of benefits.

Findings can contribute to a better understanding of how rural livelihoods, informal economies, cross-border mobility and forest-based trade systems are interconnected. The study can also contribute with insights relevant for future development initiatives aiming to support sustainable forest management and rural livelihoods in for example southern Africa.

Appendix: Declaration of AI use

This thesis follows the AI policy of the Division of Rural Development level 2 which allows for limited AI use during preparations but not as part of the submitted thesis document.

During preparations the following AI tools have been used:

- ChatGPT
    - The purpose of the tools was to translate an interview guide from English to Portuguese.
    - The prompt used to translate: Translate this interview guide for a NWFPs assessment from English to Portuguese.
    - I revised and verified the output from the tool through asking a colleague at FAO who is a native Portuguese speaker to verify the correctness of the translation. Some adjustments were made to the interview guide following the colleagues suggestions. This colleague is also knowledgeable about the topic itself.
    - I have verified the correctness of the tool by taking the following steps: I have conducted research that could recommend this tool for translating documents.
- Google Translate
    - The purpose of the tools was to translate pdf files in Portuguese to English.
    - The following documents were translated using Google Translate: MITADER (2018). *Produtos Florestais Não Madeireiros (pfnm). Visao 2035: For uma management integrada dos recursos Desenvolver as cadeias de valor dos pfnm: Florestais and abastecimento do mercado Nacional and international*
    - The prompt used to translate: Translate this pdf to English.
    - With limited access to a Portuguese native speaker that could revise and verify the output from the tool, I myself went through the cited sources in the pdf that was commonly in English. In that way I could check the original sources. For the information that could not be found in English sources I cross checked the translation using another function of Google translate.
    - I have verified the correctness of the tool by taking the following steps: I have conducted research that could recommend this tool for translating documents.

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